



# Vaish College, Bhiwani

(Affiliated to Chaudhary Bansi Lal University, Bhiwani-Haryana)



**Assessment Period: 2018-2023**

**Supporting Document: 3.3.1**

Number of research papers published per teacher in the journals notified on UGC care list during the last five years



# **Vaish College, Bhiwani**

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**Research Papers serial Number 81-100**



# A Study of the Mughal Emperor's Military Organisation and How it Played a Major Role in the Consolidation of the Empire

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**Abstract:** *Three distinct categories comprised the Mughals' effective military structure: the regular standing army, the provincial army, and regional or local forces. Provincial forces comprised subordinate zamindar contingents that were mobilised for military objectives in times of conflict, whereas high-ranking officials were required to adhere to specific principles. Regional forces consisted of infantry, cavalry, and other armaments designated as mandates for the Mahals and Sarkars in Ain-i-Akbari. Cavalry, which held a distinct position in Europe by virtue of their swiftness and mobility, was the most spectacular element of the Mughal military apparatus. The Mansabdari system was a model cavalry organisation in Europe, distinguished by the horse-riding army's position. During the Mughal period, the substandard quality of the Indian horse breed necessitated the importation of horses from Kabul, Khuran, and Iran, which demonstrated the most exceptional standard among Indian horses. Their speciality was Mughal artillery, which Babur introduced to India first and improved periodically thereafter. A multitude of artillery installations were constructed, including the Sherdahad and Fatehlaskar, which were purposefully engineered as waggons to optimise both usability and convenience. A multitude of scholars, such as Lieutenant Colonel Gautam Sharma, Captain B.N. Maliwal, Major Shaimlal, and Major R.C. Kulshreshtha, have collectively recognised that the Mughal Empire, with the exception of Turkey, possessed artillery capabilities that were unparalleled. The Mughal Empire maintained a naval contingent under the command of Amir-ul-Bahr, or Admiral. This individual was tasked with various responsibilities, including ensuring the availability of elephant-carrying vessels, appointing skilled seamen with the ability to forecast sea temperatures, guarding rivers, and overseeing the imposition, execution, and remission of duties and equipment. From seafaring lineages, mariners were enlisted, and naval batteries were constructed. Shipbuilding received considerable emphasis in the regions of Allahabad, Lahore, Kashmir, Bengal, and Thatta, all of which were located on the banks of the Indus, throughout the Great Mughal Empire.*

**Keywords:** *Military Organization, Mughal Empire, Cavalry, Mughal Navy.*

## Content

The Mughals possessed an effective military structure. As a result, three distinct categories of forces were sustained. To commence, there were certain tenets that all high-ranking officials, whether Hindu or Muslim, were obligated to uphold in accordance with their respective ranks. This was a component of the Mughal Empire's regular standing army, which was maintained for the security and defence of the realm as a whole. Additionally, the provincial army, comprised of subordinate zamindar contingents mobilised for military purposes during times of conflict, was the second component. The third category of regional or local forces comprised cavalry, infantry, and other armaments specified in Ain-i-Akbari as quotas allocated to the Mahals and Sarkars. These forces were subordinate to petty Faujdars and Faujdars. In strategic locations including Attock, Lahore, Sialkot, Muttan, Jammu, Nagarkot, Man, Jaswan, Kahlur, Auler, Mankot, Jasrota, and Lakhanpur, cantonments were established. Military jagirs were bestowed upon the Mansabdars in all regions of the province, and they provided contingents during periods of conflict. Having been of considerable assistance to the Mughal emperors, these jagirdars eventually rose to the rank of petty chief. In addition to the Jagirdar, the forts were staffed with Faujdars tasked with upholding law and order, preventing theft and vandalism from the roadways, and ensuring compliance with imperial regulations. They supervised a small force tasked with carrying out police duties, quelling minor uprisings, dispersing or apprehending bandit bands, investigating all violent crimes, and resorting to force demonstrations in order to subdue opposition from the revenue authorities, the criminal judge, or the censor.

Banduqchis (gunmen), Darbans (porters), Shamsherbaz (swordmen), Khidmatyas (environmental guardians of the imperial palace), Pehalwans (wrestlers), and Kahars (doli-bearers) comprised the infantry. The emperor served as the principal commander and supervised a number of commanders known as sipahsalar. Matchlockmen and archers comprised the actual infantry. Twelve thousand matchlockmen were under Akbar's maintenance at the court. A department comprising a registrar, a treasurer, and a superintendent constituted their administration. In contrast, the compensation of the four classes of minar officers ranged between 260 and 300 dams. Each of the fifteen grade levels comprised a combatant, with three grades constituting a class. One hundred ten dams to two hundred fifty dams comprised the range of their wages. Such an opportunity arose for extensive promotion. Due to the continued ineffectiveness of the matchlocks, the archers were occasionally more effective than the matchlockmen in combat. They became overheated following firing and required an interval of cooling prior to being reloaded. Mansabdars were also provided with infantry in the form of dakhill soldiers. Matchlockmen comprised one-fourth of these contingents; archers comprised the remainder.

The most magnificent component of the Mughal military apparatus was the cavalry. The Mansabdari system constituted an exemplary cavalry organisation. The horse-riding army occupied a unique position in Europe, and Mughal emperors similarly staged exhibitions featuring cavalry. As a result of their swiftness and mobility, the cavalry was regarded as the most effective unit for achieving victory in the conflict. Babar prevailed over Panipat with the assistance of twelve thousand cavalry. The inferior quality of the Indian horse breed during the Mughal period was a consequence of unfavourable atmospheric conditions; consequently, horses were imported from Kabul,



Khuran, and Iran. With respect to activity level, these horses exhibited the highest level among Indian horses. As a result of their horses' galloping pace of at least sixty miles per day, the Mughals were able to attack and retreat from India with relative ease, whereas the Rajputs were unable to do the same. Administrative officers ordinarily engaged in civil activity, the Mansabdars (rank-holders) were required to provide the quantity of troops for which they possessed the Mansab. Consequently, the Mansabdari System necessitated that civil officers immediately provide military service when the need arose. Although the official count listed sixty-six grades of Mansabdars was thirty-three, the practical implementation was significantly lower. The initial three grades, which spanned from 7,000 to 10,000, were exclusively designated for individuals hailing from the imperial family. Exceptions to this rule were occasionally granted, and individuals who demonstrated exceptional merit were promoted to the rank of 7,000. For example, Quilch Khan, Rajah Todar Mal, Rajah Man Singh, and Mirza Shah Rukh each possessed a mansab worth 7,000. In addition to receiving remuneration from the state treasury, the Mansabdars were obligated to furnish their portion of the expenses for horses, elephants, animals of burden, and carriages. The authority to determine their appointments, promotions, subordinates, and terminations resided with the Emperor, who rigorously enforced his regulations pertaining to the Mansabdari System. On account of personal aptitude and military merits, the Mansab was bestowed. It was not a hereditary trait. Sons of the Mansabdars were required to begin a fresh existence, separate from the services and social standing of their fathers. Regarding the Mansabdari System, two significant terms, namely *zat* and *swar*, have confounded the efforts of academicians in determining their distinction. According to Dr. Ishwari Prasad, the statement "The *Zat* was the personal rank of Mansabdar; to this, an officer was permitted to draw an additional allowance; this was referred to as his *Sawar* rank," is only an approximation of the truth. In addition to the Mansabdars, there were additional foot soldiers called *Dakhilis* and *Ahadis*. The former commanded the Mansabdars with a fixed number of soldiers. They were funded through state funding. The latter individuals formed an independent class. They were gentleman soldiers who had been personally conscripted by the Emperor for his service.

In his work *Ain-i-Akbari*, Abul Fazal discusses the remuneration of troopers. Individuals originating from Central Asia or Iran were remunerated at a greater rate, which likely encouraged their migration to the subcontinent. For their own defence, the Muslim empires of this region have always encouraged migration from Muslim nations. The expatriates received a monthly stipend of twenty-five rupees, while Indians employed in military capacities received twenty rupees. A five percent deduction was applicable to these salaries, which the mansabdars were authorised to deduct as administrative commission for ancillary expenses. An additional monthly salary deduction was made annually to cover the expenses associated with the state-provided horse and other equipment until the debt was fully repaid. The state maintained a fifty percent profit margin on the horse's purchase price; however, the trooper was considered to have paid an equitable price due to the government's advantageous equine procurement practices.

Mughal artillery was their area of expertise. Babur was the first to employ artillery in India. He periodically implemented improvements to his artillery. They established numerous artillery facilities. According to legend, Humayun possessed 750 cannons, and Akbar regarded cannons as the most vital weaponry for state defence. Akbar

developed formidable cannons such as the Sherdahad and Fatehlaskar with great success. In order to enhance convenience and functionality, the artillery were designed in the form of waggons. Diverse academics, including Lieutenant Colonel Gautam Sharma, Captain B.N. Maliwal, Major Shaimlal, and Major R.C. Kulshreshtha, have widely acknowledged that the Mughal Empire possessed superior artillery capabilities than any other nation, except for Turkey. Transporting one of the enormous cannons demanded the assistance of several camels and a thousand cattle. The Mughal artillery experienced enhancements due to interactions with both the Deccan and Europeans. At the Battle of Qanauj, Humayun possessed twenty-one pieces; at this juncture, Sher Shah possessed the upper hand in artillery. The Deccan had achieved more substantial artillery progress compared to the northern region due to its interactions with the Persians and Turks. It was acknowledged that the most proficient artillerymen were the Europeans, who had established themselves along the western coast by this time. Adu-Fadl acknowledges the criticality of artillery. The firearms were "spread throughout the entirety of the empire with great care, ensuring that each province received an appropriate assortment of pieces." It was believed that artillery was essential for "capturing fortifications and naval engagements."

A naval contingent was maintained by the Mughal Empire. To defend against the Portuguese from Mundalgarh and the Mughals of Arakan, the great Akbar maintained a meticulously organised fleet along the coast. Amir-ul-Bahr, or Admiral, was the officer in charge of the naval departments. His fourfold responsibilities included ensuring the provision of elephant-carrying vessels, appointing proficient seamen capable of predicting the sea's temperature, guarding the rivers, and supervising the imposition, execution, and remission of duties and equipment. From the seafaring clans, mariners were recruited and naval batteries were established. During the Great Mughal Empire, significant attention was devoted to shipbuilding in Allahabad, Lahore, Kashmir, Bengal, and Thatta, situated on the bank of the Indus! In addition to the aforementioned components, the imperial army also comprised an elephant corps. An exceptionally high level of efficacy was maintained. Halqas, or circles, were the common names given to the ten, twenty, or thirty elephants that constituted the organisation. Their primary functions were to breach the fort's ramparts, instill fear in the adversary, and engage in combat on the battlefield.

Much like the Rajputs, the Mughals prioritised the development of fortifications as a means to fortify the empire's defences. They built numerous forts in strategic locations. The Red Forts of Agra and Delhi continue to be renowned for their strength, grandeur, and security. The Mughals intelligently implemented the principles of military architecture when they erected forts in strategic locations. Benefit was consistently derived from a beneficial natural attribute; in regions such as the plains of the Northern Provinces, where such attributes were uncommon, they were occasionally man-made. Fortifications were typically situated in close proximity to water sources, with river bends serving as advantageous features. The fort was elevated, and in the event that no natural fortification was available, an artificial one was constructed by accumulating soil; the excavation site yielded an additional defensive feature in the form of a lake or estuary. Forts were typically enclosed by moats; in order to impede the approach of an adversary, dense bamboo jungles, thorny shrubs, or trees were occasionally erected beyond the moats. If the weather conditions were unfavorable, an extensive forest of stone blocks was cultivated as a means to obstruct the cavalry. The

fortification's entrances were substantial and secured with wooden or iron beams; at times, multiple concentric walls were present; regardless, the ascent to the citadel was arduous and protracted. Machicolation was used to construct the walls, which were also adorned with parapets. The forts were formidable and able to withstand protracted sieges.

**References:**

- A.K. Singh: Indian Military History.
- Ain-i-Akbari, Vol. II- Jarrett.
- Elliot & Dowson: History of India, Vol. III.
- Lt. Col. Gautam Sharma: Indian Army Through Ages.
- Major R.C. Kulshreshtha: Bhartiya Sainyavigyan.
- Major Shyam Lal: Military Science.
- W. Irvine: The Army of Indian Mughals.





## भागवत गीता: भारतीय मनोविज्ञान का प्रतीक

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### सार

निसंदेह श्रीमद् भगवत गीता को परमात्मा के ज्ञान, आत्मा के ज्ञान और सृष्टि विधान के ज्ञान के आधार के रूप में पूरे विश्व में स्वीकार किया जाता है। यह भी सत्य है कि इसे चरित्र निर्माण का सबसे उत्तम शास्त्र भी माना जाता है। भारतीय जनमानस में श्रीमद्भगवद्गीता मात्र पुस्तक नहीं बल्कि जीवन को सीखने व समझने का बहुत बड़ा माध्यम है। यह कहना अतिशयोक्ति नहीं कि गीता संपूर्ण जीवन को जीने की संहिता है। क्योंकि गीता ना सिर्फ जीवन का सार समझाती है, अपितु यह 21वीं सदी के डिजिटल युग में तनाव, दुविधा, प्रसन्नता, विषाद व जीवन के द्वन्दों से मुक्ति का रास्ता भी दिखाती है। इसीलिए गीता धर्मशास्त्र से बढ़कर मनोविज्ञान है। भारतीय मनोविज्ञान की भांति गीता भी मनुष्य की चेतन संरचना, व्यवहारिक व मनोगत्यात्मक पक्षों के साथ-साथ मनुष्य के संज्ञानात्मक, मानवतावादी व अस्तित्व संबंधित पक्षों को भी उजागर करती है। प्रस्तुत शोधपत्र में श्रीमद् भगवत गीता में निहित विभिन्न मनोवैज्ञानिक पहलुओं को दर्शाया गया है, साथ ही यह भी दिखाया गया है कि किस प्रकार गीता के विभिन्न योग जैसे अर्जुन विषाद योग, सांख्य योग, कर्म योग आदि दैनिक जीवन संबंधी समस्याओं को मनोवैज्ञानिक रूप से सुलझाने में मदद करते हैं।

### मुख्य शब्द- भागवत गीता, मनोविज्ञान, योग

भारतीय मनोविज्ञान की शुरुआत लगभग 19वीं शताब्दी के अंत से मानी जाती है। शुरुआत में बेसेट एंड दास (1905), अरबिंदो (1928), तिलक(1935) द्वारा भागवत गीता के बारे में दिए गए विचारों में मनोविज्ञान का कोई जिक्र नहीं किया गया था। इसके बाद बदलते समय के साथ विभिन्न शोधकर्ताओं के विचारों में भी बदलाव आना शुरू हुआ। सन् 1928 में भारतीय शास्त्रों में रुचि दिखाने वाले शोधकर्ता डॉ विजी रेले ने "मनो दर्शन और मनोविश्लेषण" के आधार पर भारतीय गीता की पहली व्याख्या की। इसके बाद प्रोफेसर जादू नाथ सिन्हा ने सन 1933 में भारतीय मनोविज्ञान पर तीन खंडों का प्रकाशन किया, उनमें भी भारतीय गीता के कई संदर्भ देखने को मिलते हैं। धीरे-धीरे भागवत गीता में मनोविज्ञान पर बहुत से शोध और पुस्तकों का निर्माण होने लगा। इसी कड़ी में हमने भी इस शोधपत्र में भारतीय गीता में निहित विभिन्न मनोवैज्ञानिक पहलुओं को उजागर कर उन्हें मनोवैज्ञानिक संप्रत्यों के माध्यम से व्याख्यित करने की कोशिश की है। गीता को इन निम्न छह पंक्तियों से समझा जा सकता है।



गीता गीत है ब्रह्म ज्ञान का आत्मबोध जगाती है  
अर्थ धर्म और काम मोक्ष का सच्चा शोध कराती है  
सच्चा शोध कराती है ये मिथ्या अहम को मारे है  
रहनी करनी पुख्ता करती कर्म योग को धारे है  
चित्त बुद्धि की शुद्धि करती पूरा मनोविज्ञान है ये  
हरिकेश निज अंतर माही सत् का अनुसंधान है ये

श्री कृष्ण और अर्जुन के मैत्री भाव से उत्पन्न हुई है भागवत गीता। प्रश्न यह है कि कैसे भागवत गीता हमें मानसिक रूप से दृढ़ बनाती है? मनोवैज्ञानिक दृष्टिकोण से भागवत गीता किसी भी समस्या के समाधान के लिए व्यवस्थित व वैज्ञानिक दृष्टिकोण रखती है। यह व्यक्ति के आत्मबोध में अहम भूमिका निभाती है। गीता व्यक्ति में निहित कमजोरी, अवसाद और तनाव को दूर करने के लिए शरीर व मन को प्रशिक्षण देती है। मानव के अंदर उपस्थित अशुद्ध ईगो को शुद्ध करके स्फिरिचुलाइज्ड करने में भी हमारी मदद करती है। निसंदेह विश्व के सभी ग्रंथ जैसे बाइबिल, कुरान, गुरु ग्रंथ साहिब आदि सभी मानव को उसके जीवन के अर्थ एवं महत्व को समझाने में अहम भूमिका निभाते हैं फिर भी गीता इन सबमें अग्रणी भूमिका निभाती है। भारतीय सकारात्मक मनोविज्ञान का केंद्रीय विषय आत्मबोध (self-realization) रहा है और भागवत गीता भी मनुष्य को आत्मबोध (self-realization) के बारे में ज्ञान कराती है-

आत्मबोध तो अमरमणि है पर मिल पानी औखी है  
आदमदेह अब मिली है बन्दे पा ले किस्मत चौखी है  
पा ले किस्मत चौखी है तू साध तेरे तन और मन को  
भूखे पेट भी बोध होए ना कर मेहनत तू कमा धन को  
बोध होए तेरी शोध हो पूरी घट में मिले परमात्म तोरा  
हरिकेश तेरे कांधे छोरा फिर पीटे क्यों गाम ढिढोरा

जिस प्रकार मनोविज्ञान में व्यवहार के दो पक्ष उजागर होते हैं- आंतरिक एवं बाह्य पक्ष, उसी प्रकार भागवत गीता भी प्रकृति के दो रूपों पर पूर्णतः प्रकाश डालती है- परा और अपरा। परा प्रकृति जीव के रूप में दिखती है जबकि पृथ्वी, वायु, जल, आकाश, अग्नि, बुद्धि, मन, अहंकार के रूप में अपरा प्रकृति दृष्टिगोचर होती है। मनुष्य परा और अपरा के बीच सामंजस्य बैठाने की भरपूर कोशिश करता है। इसी कोशिश में वह कभी आक्रामक होता है तो कभी रक्षात्मक। आत्मरक्षा मनुष्य की मूलभूत प्रवृत्ति है। इस प्रवृत्ति के साथ यदि मनुष्य में दया अहिंसा और सहिष्णुता जैसे गुण जुड़ जाते हैं तब यह प्रवृत्ति निष्काम प्रवृत्ति के रूप में सामने आती है। यही भाव भागवत गीता में उभरा है। दया अहिंसा और सहिष्णुता जैसी रक्षात्मक प्रवृत्तियों का अत्यधिक प्रयोग किंचित अहंकार को जन्म दे सकता है और यही अर्जुन के साथ हुआ। जब मनुष्य में अपने पराए का भाव आ जाता है तो उसमें अहंकार घर करने लग जाता है। अहंकार के कारण मनुष्य अपना प्रतिमान किसी दूसरे विषय में स्थापित कर उसे अपना मान लेता है। विषादित अर्जुन की इसी मनःस्थिति को भाप कर श्री कृष्ण उसके अपने -पराए का भाव हरते हैं और अर्जुन के अहंकार का लोप करते हैं। गीता का संपूर्ण विषाद योग अवसाद और उसके मनोवैज्ञानिक उपचार पर प्रकाश डालता है। संपूर्ण गीता में भगवान श्री कृष्ण एक मनोचिकित्सक व अर्जुन एक मनोरोगी के रूप में नजर आते हैं। अपने सामने पितामह भीष्म, गुरु द्रोणाचार्य, कृपाचार्य सहित अपने स्वजनों को खड़ा पाकर अर्जुन जब अवसाद, मानसिक संघर्ष, मिथ्या आदि व्याधियों से गिर जाता है तब भगवान श्रीकृष्ण गीता के अध्याय 2 के श्लोक 2 में अर्जुन को समझाते हैं-

कुतस्त्वा कश्मलमिदं विषमे समुपस्थितम् । अनार्यजुष्टमस्वर्ग्यमकीर्तिकरमर्जुन

यहां भगवान कृष्ण ने अर्जुन को उसके जीवन मूल्यों के बारे में समझाया साथ ही उसको अपने कर्तव्य से विमुख ना होने की सलाह दी। यहां पर श्री कृष्ण ने मन को पूरा महत्व दिया है। उनके अनुसार मन ही उपरोक्त सभी मनोदुविधाओं का केंद्र है। मन के अंदर जिस प्रकार के विचार लाए जाएंगे उसी के अनुरूप हमारा मानव शरीर कार्य करेगा। भगवान श्री कृष्ण ने गीता के अध्याय 2 में स्थित श्लोक 23,24 व 25 में मन की चेतना को भौतिक वस्तुओं से अपरिवर्तनीय रूप से भिन्न बताया है। जिस प्रकार मनोविज्ञान का केंद्र बिंदु प्राचीन समय से ही आत्मा, मन और चेतना रहा है उसी प्रकार गीता में भी मनुष्य व्यवहार का मूल आत्मा, मन और चेतना बताया गया है।

मनोविश्लेषण मॉडल के संस्थापक फ्राइड द्वारा मन के विभिन्न भागों की व्याख्या इड, ईगो, सुपर ईगो के माध्यम से की गई है। उन्होंने बताया कि हम अपनी इड के फलस्वरूप इंद्रियों के वशीभूत होकर मन की तृप्तियों को पूरा करने में लगे रहते हैं। हम बुद्धि और विवेक हीन होकर बस अपने सुख प्राप्ति के लिए निरंतर प्रयासरत होते हैं। ठीक इसी बात का संदेश हमें गीता के अध्याय 2 में स्थित श्लोक 67 और 68 से मिलता है-

इन्द्रियाणां हि चरम विधीयते ।

तदस्य हरति प्रज्ञां वायुना ॥६७॥

तस्माद्यस्य महाबाहो निगृहीतानि सर्वशः ।

इन्द्रियाणीन्द्रियार्थभ्यस्तस्य प्रज्ञा प्रतिष्ठिता ॥६८॥

अर्थात् हमें अपने इंद्रियों के स्वभाव में उनके वशीभूत होकर होने वाले कार्यों के परिणाम को समझकर अपनी इंद्रियों पर उचित नियंत्रण करना चाहिए ताकि हम अपने क्षेत्र में उत्कृष्ट प्रदर्शन कर पाए एवं अपने संज्ञानात्मक पक्ष का प्रयोग कर अपने कार्यों को सही गति दे सके।

गीता के अध्याय 3 में स्थित श्लोक 34 में बताया गया है कि प्रत्येक इंद्रि तथा उसके विषय से संबंधित राग द्वेष जो व्यवस्थित मन के नियम होते हैं, मनुष्य को ऐसे राग तथा द्वेष के वशीभूत नहीं होना चाहिए क्योंकि यह आत्म साक्षात्कार के मार्ग में अवरोधक हैं। बिल्कुल इसी परिप्रेक्ष्य में फ्राइड द्वारा "लिबिडो शक्ति" के विषय में बताया गया है कि प्रत्येक व्यक्ति में यह शक्ति निहित होती है और सभी इसका सुख पाना चाहते हैं लेकिन जब यह काम शक्ति अत्यधिक उग्र रूप धारण कर व्यक्ति पर हावी हो जाती है तो मनुष्य की सभी इंद्रियां इसके वशीभूत होकर गलत कामों की तरफ अग्रसर होती है और मनुष्य अपनी इंद्रियों की तृप्ति करते करते पथभ्रष्ट हो जाता है। जब व्यक्ति पूरी तरह से अपना नियंत्रण अपनी इंद्रियों पर से खो देता है तो उसके लिए आत्मसाक्षात्कार के मार्ग पर चलना कठिन हो जाता है। बहुत सारे मनोवैज्ञानिकों जिनमें मुख्य रूप से वुंट का नाम आता है मानसिक विकारों के उपचार में आत्म साक्षात्कार विधि को महत्वपूर्ण चिकित्सकीय विधि माना है।

मनोविज्ञान के अंदर मन-शरीर संबंध को बहुत अहम माना गया है। इसमें बताया गया है कि प्रत्येक व्यक्ति के विचारों, क्रियाओं और व्यवहारों का संचालन मन-शरीर द्वारा ही किया जाता है। अर्थात् व्यक्ति क्या सोचता है और उसे किस तरह से अपनी क्रियाओं में समाहित करता है यह सब उसके मन एवं शरीर के आपसी संबंध द्वारा निर्धारित होता है। बिल्कुल यही व्याख्या गीता के अध्याय 3 के श्लोक 40 में की गई है-

इन्द्रियाणि मनो बुद्धिरस्याधिष्ठानमुच्यते ।

एतैर्विमोहयत्येष ज्ञानमावृत्य देहिनम् ॥ ४० ॥

अर्थात् मन तथा शरीर व्यक्ति के सभी क्रियाकलापों का केंद्र बिंदु होता है। इसी मन-शरीर द्वारा जीव के वास्तविक ज्ञान को ढक कर व्यक्ति को मोहित कर लिया जाता है। व्यक्ति अपने काममय बुद्धि से अपनी आत्मा को प्रभावित कर लेता है जिसके फलस्वरूप उसमें अहम की उत्पत्ति होती है तथा आत्मा को भौतिक इंद्रियों का भोग करने की लत पड़ जाती है। जिसे व्यक्ति वास्तविक सुख मान उसी में लीन रहता है। इसीलिए सबसे पहले आवश्यक है कि अपनी इंद्रियों को वश में किया जाना चाहिए ताकि वह मन एवं बुद्धि को अपने वश में कर इंसान की सोचने व समझने की शक्ति को दबा ना सके।

स निश्चयेन योक्तव्यो योगोऽनिर्विण्णचेतसा ।

सङ्कल्पप्रभवान्कामास्त्यक्त्वा सर्वानशेषतः ।

मनसैवेन्द्रियग्रामं विनियम्य समन्ततः ॥ २४ ॥

भागवत गीता के अध्याय 6 के उपरोक्त श्लोक 24 में बताया गया है कि व्यक्ति किस प्रकार अपने लक्ष्य की प्राप्ति में आने वाली अड़चनों से घबरा जाता है। प्रत्येक मनुष्य को चाहिए कि व्यक्ति को पूरे संकल्प तथा श्रद्धा के साथ योगाभ्यास में लगना चाहिए ताकि वह अपने पथ से विचलित ना हो व्यक्ति को दृढ़ निश्चय के साथ अपने लक्ष्य की प्राप्ति हेतु अभ्यास करते रहना चाहिए उसे यह सोचना चाहिए कि अभ्यास के फल स्वरूप उसकी सफलता निश्चित है। उसे मनो द्वंद से उत्पन्न हुई इच्छाओं को त्याग कर लक्ष्य की ओर अग्रसर होना चाहिए तथा रुकावट व अड़चनों से ना घबराकर निरंतर प्रयासरत रहना चाहिए क्योंकि ऐसे दृढ़ अभ्यासी की सफलता सुनिश्चित होती है इसी बात की व्याख्या मनोवैज्ञानिक थॉर्नडाइक ने अपने सिद्धांत में करते हुए कहा है और यही इशारा निम्न पंक्तियाँ भी कर रही है -

डगमग डगमग गिर उठकर ही देखो माँ का लाल चला  
सहस्र गलतियाँ हुई तब जा कर एडिसन का बल्ब जला  
एडिसन का बल्ब जला ये युगों युगों से ज्ञान फला  
कैसे अभ्यास बिना कहो जड़मति होए सुजान भला  
भूल ज्ञान की मूल बताई गलती से भला क्या घबराना  
हरिकेश तू सीख भूल से मिले सफलता का नजराना

हम सभी अपने जीवन में सफलता पाने के इच्छुक है तथा इसी के फलस्वरूप अपने लक्ष्य की ओर चलते रहते हैं लेकिन इस राह में हमें अनेक भौतिक चीजें अपनी तरफ खींचती हैं तथा हमारे ध्यान को विचलित करती हैं। इसी बीच हमें असफलताओं का भी सामना करना पड़ता है और कई बार तो बीच में आने वाली अड़चनें हमें हतोत्साहित तक कर देती हैं। अंततः हम मिलने वाली असफलताओं और अड़चनों आदि से प्रभावित होकर अपने लक्ष्य से भटक जाते हैं एवं लक्ष्य को बिना प्राप्ति के ही बीच में छोड़ देते हैं। लक्ष्य प्राप्ति के लिए आवश्यक है दृढ़ निश्चय और अभ्यासी होना।

यं सन्न्यासमिति प्राहुर्योगं तं विद्धि पाण्डव ।

न ह्यसन्यस्तसङ्कल्पो योगी भवति कश्चन ॥ २ ॥

गीता में स्थित उपरोक्त अध्याय 6 के श्लोक 2 में बताया गया है कि हर इंसान तभी सफल हो सकता है जब वह अपने आपको अपने मन से ऊपर उठा लेगा क्योंकि व्यक्ति मन की सहायता से ही अपना उद्धार कर सकता है। मन ही है जो व्यक्ति को आगे बढ़ने में एक सच्चे दोस्त की तरह मदद करता है लेकिन इसके विपरीत अगर यह मन व्यक्ति के ऊपर हावी हो जाता है तो एक शत्रु की तरह व्यवहार करने में भी देर नहीं लगाता। सार रूप से यही मन आपको आबाद व बर्बाद दोनों कर सकता है निर्भर करता है कि आप इसके प्रति किस प्रकार की प्रतिक्रिया करते हैं। इसी प्रकार गीता में स्थित 6 व 15 अध्याय के श्लोक

12 व 7 में निहित है कि अपने मन इंद्रियों व कर्मों को वश में करके मन को एक बिंदु पर स्थिर करना बहुत ही आवश्यक है। ठीक यही विचार मनोविज्ञान भी देता है कि मन एक सेंट्रल प्रोसेसर की तरह होता है तथा इसमें ध्यान अन्य कार्यों को विश्लेषण करने में महत्वपूर्ण भूमिका निभाता है। यह एक आंतरिक संवेगी अंग के रूप में भी कार्य करता है।

अध्याय 6 के श्लोक 33-34 में विदित है कि जब मनुष्य के मन में अंतरद्वंद्व चल रहे हो तो वह विचलित हो जाता है। व्यक्ति इस संघर्ष के फलस्वरूप निरंतर अस्थिर अशांत एवं तनावग्रस्त रहता है। व्यक्ति व्यवहारिक जीवन में फंसा होता है और इन संघर्षों से निकल पाना उसके लिए बहुत ही मुश्किल से प्रतीत होता है। इसी मुश्किल का हल भगवान श्री कृष्ण ने गीता के अध्याय 6 के ही श्लोक 35-36 में बताया है कि यदि व्यक्ति अपने अस्तित्व के लिए चिंतित है, संघर्षरत है तो इसके लिए सबसे पहले मन को स्थिर एवं शांत करने का प्रयास करें और इसी प्रयास में पहले अहम का विखंडन कर उसे अपने मन से अलग करें। इसके अलावा आत्मसाक्षात्कार भी एक महत्वपूर्ण विधि बताई गई है जिसके द्वारा व्यक्ति उपरोक्त समस्याओं से निजात पा सकता है। भारतीय व पाश्चात्य दोनों मनोविज्ञान में ही आत्म साक्षात्कार विधियों का प्रयोग मानसिक समस्याओं के समाधान के लिए किया जाता रहा है। इस विधि में व्यक्ति अनेकों बार असफल भी हो सकता है लेकिन लगातार सतर्कता के साथ प्रयास करते रहने पर व्यक्ति सफलता प्राप्त कर लेता है -

गीता भी विज्ञान है जैसे मनोविज्ञान  
दोनो मन व्यवहार और चेतन का प्रमाण  
चेतन का प्रमाण दोनो जीवन का आधार  
अहम की शुद्धि कराये आत्म साक्षात्कार  
मनसा वाचा कर्मणा गीता को अपनाओ  
हरिकेश मन साध कर तुरत फकीरी पाओ

जैसा कि गीता के अध्याय 15 के श्लोक 8,9 एवं 10 में बताया गया है कि

शरीरं यदवाप्नोति यचाप्युत्क्रामतीश्वरः।

गृहीत्वैतानि संयाति वायुर्गन्धानिवाशयात् ॥ ८ ॥

श्रीत्रं चक्षुः स्पर्शनं च रसनं प्राणमेव च ।

अधिष्ठाय मना विषयानुपसेवते ॥ ९ ॥

उत्क्रामन्तं स्थितं वाऽपि भुखानं वा गुणान्वितम् ।

विमूढा नानुपश्यन्तिपश्यन्ति ज्ञानचक्षुषः ॥ १० ॥ ॥

व्यक्ति का मन, मस्तिष्क और शरीर के साथ मिलकर वातावरण के अनुकूल हो जाता है और उसी के फल स्वरूप शारीरिक कारकों द्वारा विवश एवं संचालित सा प्रतीत होता है। इस वातावरणीय प्रभाव के फलस्वरूप मन अहंकार की अभिव्यक्ति करता है। बिल्कुल यही बात अध्याय 3 के श्लोक 27 में केंद्रित है कि अहंकार की भावना व्यक्ति के अंदर में के रूप में प्रकट होती है। वह स्वयं व दूसरों के बीच भेद दर्शाने लगता है। मनोवैज्ञानिक फ्रायड द्वारा विकसित मनोविश्लेषणात्मक सिद्धांत के अनुसार व्यक्ति अहम रक्षा युक्तियों को नियंत्रित अवस्था में प्रयोग करके कुछ हद तक उपरोक्त समस्याओं का समाधान कर सकता है। और अहंकार से बचने का सबसे सरल उपाय आशावादिता और सकारात्मक दृष्टिकोण को अपनाना होता है।



हम सभी प्राणियों में एक छुपी हुई अंतर शक्ति होती है जिसके बारे में कभी तो हमें पता होता है और कभी नहीं। इसी शक्ति एवं क्षमता के बारे में बताते हुए अध्याय 15 के श्लोक 5 में कहा गया है कि-

निर्मानमोहा जितसङ्गदोषा

अध्यात्मनित्या विनिवृत्तकामाः ।

द्वन्द्वैर्विमुक्ताः सुखदुःखसंज्ञै-

र्गच्छन्त्यमूढाः पदमव्ययं तत् ॥ ५ ॥

अर्थात् जब व्यक्ति का मन स्थिर हो जाता है और वह अपने अहंकार को नियंत्रण में कर लेता है तो व्यक्ति किसी भी वस्तु व्यक्ति व घटना के प्रति कम पक्षपाती होता है। वह अपनी चेतना से अवगत रहता है व इसे अनुभव करते हुए सत्य के करीब जाने को प्रयासरत रहता है। व्यक्ति अधिक से अधिक जानने व सीखने की कोशिश करता है और अंततः अपने भीतर छिपी मानवीय क्षमता तक पहुंच ही जाता है। मनोविज्ञानी कार्ल रोजर्स द्वारा भी व्यक्ति के "पूर्ण प्रकार्यशील" की मानवीय क्षमता पर जोर दिया गया है।

संज्ञानात्मक मनोविज्ञान के अनुसार हमारी सभी मानसिक प्रक्रियाओं का केंद्र व संचालक संज्ञानात्मक तंत्र होता है। इसी संज्ञानात्मक तंत्र द्वारा हम अपनी इंद्रियों, कर्मों व व्यवहार को नियंत्रण में रखते हैं। व्यक्ति का प्रत्यक्षण, चिंतन स्मृति, समस्या समाधान, आदि सभी संज्ञानात्मक तंत्र द्वारा घटित होती है। भागवत गीता के अध्याय 2 के श्लोक 67-68 में इसी संज्ञानात्मक तंत्र की व्याख्या करते हुए कहा है कि व्यक्ति को अपनी ईड (फ्रायड द्वारा बताया गया मन का भाग) के वशीभूत होकर अपने मन को हमेशा सुख प्राप्ति में, इच्छाओं की पूर्ति में ही नहीं लगाए रखना चाहिए। बल्कि वह अपने क्षेत्र में उत्कृष्टता प्राप्त करना चाहता है तो अपनी इंद्रियों के वशीभूत होकर करने वाले कार्यों को संज्ञानात्मक तंत्र की सहायता से नियंत्रण में करना चाहिए। इसी नियंत्रण के बाद वह अपने ट्रांसकोग नेटिव राज्यों तक पहुंच सकता है। अध्याय 6 के श्लोक 24 में भी इसी प्रकार के संज्ञानात्मक प्रक्रियाओं का जिक्र किया गया है कि व्यक्ति को अपनी ईड के फलस्वरूप उत्पन्न इच्छाओं को त्यागकर दृढ़ निश्चयी बनना चाहिए और पूरी दृढ़ता के साथ अभ्यास करते हुए अपने पथ पर आगे बढ़ते रहना चाहिए। व्यक्ति की सफलता उसकी संज्ञानात्मक प्रक्रियाओं का ही फल मात्र है। इसी संज्ञानात्मक तंत्र से निकलने वाली ऊर्जा व्यक्ति को ट्रिगर करती है विभिन्न प्रक्रियाओं को करने के लिए।

गीता के महत्वपूर्ण योग, मनोविज्ञान व समस्याओं का निवारण-

अर्जुन विषाद योग जो की पूरी तरह विषादी भावनाओं पर आधारित है। अर्जुन अपने सामने रिश्तेदारों को देखकर दुख और अन्य भावनाओं से अभिभूत है एवम अपने आप को अक्षम महसूस करता है। ऐसे में भगवान कृष्ण उसे विषादी स्थिति से बाहर निकालने को उपदेश देते हैं। हम सब भी आधुनिक युग में इसी तरह के संघर्ष प्रतिदिन अनुभव करते हैं। ऐसे में हमें अर्जुन विषाद योग को आधार मान समझना चाहिए कि दुख ज्ञान लाता है। इसी दुख की वजह से अर्जुन को गीता का ज्ञान होता है, इसीलिए हमें कभी भी विपरीत परिस्थितियों की आलोचना नहीं करनी चाहिए। हम सभी अपने जीवन में कभी न कभी इस तरह की परिस्थिति से जरूर गुजरते हैं जब अपनों के साथ ज्यादा लगाव होने पर कठोर निर्णय लेना मुश्किल हो जाता है। हम लगातार अन्याय को चुपचाप सहते हुए निराशा व असंतोष से भरा जीवन जीते रहते हैं। जो कि सही नहीं है। अतः हमें परिस्थितियों की नजाकत को समझते हुए बिना परेशान हुए समस्याओं का सामना कर उनके निवारण हेतु प्रयासरत रहना चाहिए।

सांख्य योग व्यक्ति को ज्ञान व आत्मबोध (self-realization) के बारे में बताता है। इस योग में भगवान कृष्ण अर्जुन को उसके धर्म व कर्म के बारे में बताते हैं। अर्जुन को उसके वास्तविक स्व (true self) से अवगत

करवाते हैं। हम सब भी अपने जीवन में इसी दुविधा में फंसे हुए हैं कि कर्म करने से पहले ही उसके फल की इच्छा रखते हैं और फल की यही आसक्ति हमें धर्म के अनुसार कर्म करने से रोकती है। कर्म हमारी क्रिया है जो कि हमारा भविष्य निर्धारित करती है। प्रत्येक व्यक्ति को अपना कर्म फल की आसक्ति से रहित होकर करना चाहिए क्योंकि हमारा अधिकार और नियंत्रण सिर्फ क्रिया पर है परिणाम पर नहीं। यही मनोविज्ञान कहता है कि हमें अपने वर्तमान पर ध्यान देना चाहिए भविष्य की सोच तो धीरे-धीरे चिंता तनाव और अंततः विषाद को जन्म देती है। लेकिन जब आप भूत और भविष्य को छोड़ वर्तमान में जीते हैं तो वह आपको एक आंतरिक खुशी देता है, आप सांसारिक चाह से ऊपर उठ चुके होते हैं, किसी भी तरह की कठिन परिस्थितियां आपको विचलित नहीं करती और ना ही हर्षित अवस्था आपको उत्तेजित करती है। अतः हमें अपना कर्म, धर्म समझकर निर्वहन करना चाहिए-

कल क्या होगा कल क्या होगा सोच सोच कर रोते हो

ओ अज्ञानी मूढ़ बावलो वर्तमान को खोते हो

वर्तमान को खोते हो कोई कैसे बेड़ा पार करे

पानी मथने वाला देखो मक्खन की दरकार करे

रावण जैसा महाबली भी कल को जीत ना पाया है

हरिकेश कल उसका बेहतर जिसने आज कमाया है

कर्म योग में भगवान श्री कृष्ण अर्जुन को कर्म और धर्म के संबंध में विस्तार से समझाते हैं। कृष्ण कहते हैं कि अगर तुमने सच्चे स्व (true self) को समझ लिया तो तुम्हारे सारे संदेह दूर हो जाएंगे। मनोवैज्ञानिक कार्ल रोजर्स भी इसी बात पर बल डालते हैं कि अगर इंसान वास्तविक स्व (true self) और आदर्श स्व (ideal self) के बीच संगतता रखता है तो वह अपने कर्म और धर्म को ठीक प्रकार से समझ सकता है। अगर इन दोनों में असंगतता होती है तो व्यक्ति विभिन्न प्रकार के मानसिक रोगों का शिकार हो जाता है। प्रत्येक मनुष्य अपने कर्म को समझना चाहता है लेकिन इसमें सबसे बड़ी बाधा आसक्ति और विरक्ति है। सर्वप्रथम मनुष्य को आसक्ति का त्याग करना पड़ता है तभी वह निष्काम निर्णय ले पाता है। यदि व्यक्ति अनासक्त होकर कार्य करता है तो उसकी बहुत सारी समस्याओं का हल हो सकता है अगर प्रत्येक व्यक्ति अपने धर्म-कर्म को समझकर कार्य करें तो हम अपने समाज व देश को प्रगति की ओर लेकर जा सकते हैं।

कर्म सन्यास योग में शांति एवं ध्यान का महत्व बताया गया है। इसमें भगवान श्री कृष्ण, अर्जुन की दुविधा कि ज्ञान मार्ग और कर्म मार्ग में उच्च कौन है...? का समाधान करते हैं। भगवान कृष्ण कहते हैं कि ज्ञान मार्ग और कर्म मार्ग दोनों की मंजिल एक ही है। व्यक्ति निष्काम कर्म करके ही ज्ञान की प्राप्ति कर सकता है। और कर्म तभी वांछित परिणाम देगा जब हम इसे सही ज्ञान के साथ करेंगे। अतः ज्ञान और कर्म अविभाज्य हैं, दोनों साथ साथ चलते हैं। इस योग में ध्यान (meditation) के माध्यम से एकाग्रता पर जोर दिया गया है। स्वास्थ्य मनोविज्ञान में भी बहुत सारे शारीरिक व मानसिक विकारों को दूर करने के लिए ध्यान को एक महत्वपूर्ण मनोचिकित्सा के रूप में प्रयोग किया जाता है।

ध्यान साधना एक चिकित्सा हरती मनो विकारों को

मनोदशा को ठीक करे ये मारे बुरे विचारों को

## निष्कर्ष-

उपरोक्त तथ्यों एवं व्याख्या के आधार पर कहा जा सकता है कि भारतीय मनोविज्ञान एवं गीता के बीच एक सकारात्मक संबंध है। दोनों ही मानव जीवन से संबंधित महत्वपूर्ण पहलुओं व समस्याओं पर ध्यान देकर

उनका निवारण करवाते हैं। भारतीय मनोविज्ञान को गीता के माध्यम से सजीव रूप प्राप्त हुआ है, जो मानव अस्तित्व संबंधित संकट की बेहतर समझ, प्रबंधन एवं निराकरण प्रदान करता है। जिस प्रकार भारतीय मनोविज्ञान मानव चेतना की बात करती है उसी प्रकार भागवत गीता भी किसी व्यक्ति को समझने की कुंजी चेतना को बताती है। मनोविज्ञान और गीता का गहरा संबंध श्री कृष्ण को पहला मनोचिकित्सक, परामर्शदाता, सलाहकार एवं अर्जुन को पहला मनोरोगी सिद्ध करता है। गीता हमें यह मनोवैज्ञानिक सीख भी देती है कि

योग्य समर्थ ज्ञानवान से सलाह करण में ना घाटा  
सलाह खोलती राह नई भाई चिंता पर मारे काटा  
चिंता पर मारे काटा कर परामर्श खुल कर भाई  
मात पिता गुरु संगी साथी सलाह देते है सुखदायी  
सलाह सोच कर ही लेना पर एक सलाह ये भी मानो  
हरिकेश सतगुरु से बढ़कर सलाहकार कोई ना जानो

### संदर्भ-सूची

अरबिंदो, श्री। (1973) उत्तरपाड़ा भाषण पांडिचेरी, श्री अरबिंदो आश्रम  
कृष्णकृपामूर्ति।(2019)। श्रीमद् भगवद्गीता। संस्थापकाचार्य: अंतर्राष्ट्रीय कृष्णभावनामृत संघ। भक्तिवेदांत  
बुक ट्रस्ट।  
माइनर, रॉबर्ट। (1991) । भगवद गीता के आधुनिक व्याख्याकारों में गीता - योगिन के रूप में श्री अरबिंदो  
रेले, वीजी (1928)। भगवद गीता - मनो-दर्शन और मनोविश्लेषण के आधार पर एक प्रदर्शनी। बॉम्बे,  
डीबी तारापोरवाला संस एंड कंपनी ।  
राव, के.आर. और परांजपे, ए. (2017) भारतीय परंपरा में मनोविज्ञान। नई दिल्ली, डीके प्रिंटवर्ल्ड ।  
सिंह, ए. के।(2009)। उच्चतर सामान्य मनोविज्ञान। मोतीलाल बनारसी दास।  
सिंह, ए. के।(2014)। उच्चतर नैदानिक मनोविज्ञान। मोतीलाल बनारसी दास।

# वाङ्मय

A Refereed & Peer Reviewed Bilingual Half Yearly  
Research Journal of Humanities and Social Science



प्रधान सम्पादक  
प्रो. अनिल कुमार विश्वकर्मा



## हिंदी लघुकथा में दलित चेतना का संदर्भ

डॉ. विपिन गुप्ता

एसोसिएट प्रोफेसर, हिंदी विभाग  
वैश्य कालेज, भिवानी, हरियाणा

'दलित शब्द का प्रयोग समाज के किन वर्गों के लिए हुआ हो, यह भी पूर्णतया स्पष्ट नहीं है। दलित चिंतक कमल भारती ने लिखा है, 'वास्तव में दलित वही व्यक्ति हो सकता है जो सामाजिक और आर्थिक—दोनों दृष्टियों से दीन हीन हो, जिस पर अस्पृश्यता का नियम लागू किया गया हो, जिसे कठोर और गंदे कर्म करने के लिए बाध्य किया गया हो, जिसे शिक्षा ग्रहण करने और स्वतंत्र व्यवसाय करने से मना किया गया और जिस पर सामाजिक निर्याग्यताओं की संहिता लागू होगी, वही और सिर्फ वही दलित है।' डॉक्टर शरण कुमार लिंबाले ने अपनी पुस्तक 'दलित साहित्य का सौंदर्यशास्त्र' में कहा है कि दलित शब्द की व्याख्या में केवल अछूत जाति का उल्लेख करने से नहीं चलेगा। इसमें आर्थिक दृष्टि से पिछड़े हुए लोगों का भी समावेश करना होगा।'

दलित समाज का मुख्य प्रश्न सामाजिक समानता और आत्मसम्मान का है जिससे इन्हें सदियों से वंचित रखा गया। दलित संदर्भों का साहित्य बीसवीं सदी में सामने आया है। समकालीन दौर में दलित समाज पर रचित हिंदी साहित्य मुख्य रूप से कविताओं और आत्मकथाओं के रूप में आया है। उपन्यास और कहानियां भी ध्यान खींचती हैं। चारों रूपों में दलित साहित्य के प्रमुख लेखकों में ओमप्रकाश बाल्मीकि, कुसुम मेघवाल, मोहनदास नैमिशराय, रतन कुमार सांवरिया, जयप्रकाश कर्दम, सूरजपाल चौहान, विपिन बिहारी आदि आते हैं। आलोचना क्षेत्र में कमल भारती, डॉ. धर्मवीर, शयोत्तराज सिंह बेचौन, शरण कुमार लिंबाले, रमणिका गुप्ता आदि ने दलित विमर्श पर काम किया है।

हिंदी लघु कथा में जिस प्रकार आठवें दशक में तेजी आई है, उसी प्रकार दलित चेतना की लघु कथाएं भी बड़ी संख्या में लिखी जाने लगी हैं। डॉक्टर राम कुमार गौतम द्वारा संपादित पुस्तक 'दलित समाज की लघु कथाएं' इस दृष्टि से आधार सामग्री का काम करती हैं। यह प्रयास महत्वपूर्ण है कि सदियों से एक उपेक्षित समाज को संस्कृति व सभ्यता में साहित्य में ही समुचित प्रतिनिधित्व नहीं दिया गया, साहित्य में भी वह लगभग हर विधा में ही गुम है, उसकी उपस्थिति ही दर्ज नहीं है।'

अमर सिंह की 'खार खखार' में स्वर्ण जाति के पाखंड, स्वार्थ और दलितों के प्रति नफरत को दृढ़ता से उभारा गया है। गांव के पुजारी पंडित राम रतन का जीवन

माला, मंदिर, शिवलिंग पर केंद्रित है, पर उन्हें चिंता है कि मनुस्मृति से चलने वाला कर्म भ्रष्ट हो रहा है। हालांकि उनका बेटा पोलेट्री फार्म खोलता है, बेटा बिल्ली पालती है जो कि उनकी मान्यताओं के लिहाज से संस्कार भ्रष्ट और मलेच्छ होने चाहिए, लेकिन यहां उनकी मान्यता बदल जाती है, पर छोटी जाति के लोगों के बारे में वह नहीं बदलता। जातिवादी संघ के नेता का रूप पंडित राम रतन के शब्दों में देखिए, 'अछूत कितनी भी डिग्रियां ले ले, अछूत ही रहेगा। अंगूठा टेकने वाला बामन तो बामन ही कहलाएगा, यह ब्रह्मा का विधान है।' इसके बाद लेखक लघुकथा को कठोर धरातल पर ले जाता है। राम रतन की मुर्गियां बुधुआ भेंगी की खार बलगम को दनादन चट कर जाती हैं, रामरतन और उसका लड़का दोनों उन मुर्गियों के अंडे बेचते भी हैं और खाते भी हैं। लेखक प्रकारांतर से सवाल करता रहता है 'बुधुआ तो अछूत है, पर उसकी खखार।' पाखंडी हिंदू समाज के पास इसका कोई जवाब नहीं है।

अमित कुमार की 'सोशल इक्विटी' कहानी देखने में सरल रचना है, पर हिंदू समाज के पाखंड और नफरत को सहजता से उघाड़ देती है। बैंक काउंटर पर खड़े लोग जब देखते हैं कि काम बड़ी धीमी गति से हो रहा है तो कोई कह देता है, कोटे से आया लगता है। कैशियर उठकर बाहर आ जाता है और पूछता है कि किस ने यह कहा। उसके साथी कहते हैं, जाने दिए मिश्रा जी। भीड़ को उसके सवर्ण जाति होने का पता चल गया। अब वह लाइन में शांत खड़े थे। पढ़े—लिखे मध्यमवर्गीय सवर्ण कहते हैं कि आप समाज में कहां है नफरत? यह प्रमाण देख ले। यह केवल रचना नहीं, भारतीय समाज का सच है।

बाबूराम बागुल ने एक लेख में लिखा है कि अस्पृश्यता हर एक नव अंकुर, महत्वाकांक्षा, स्वप्न को नष्ट कर देती है। इस संदर्भ में प्रताप सिंह सोढी की रचना 'शक्ति बिखर गई' में सवर्ण लड़की अपने हरिजन प्रेमी के समक्ष दृढ़तापूर्वक जात-पात भी मानती है और परजाति में शादी को ना मानने की बात भी कहती है। लड़का अंत में स्पष्ट कहता है, मैं हरिजन जाति का हूँ और जाति के इसी तूफान ने मेरी शक्ति को ध्वस्त कर मेरी शक्ति को बिखर दिया है।' इस सत्य को भारत के 2000 वर्षों के सामाजिक इतिहास पर लागू करके कुछ निष्कर्ष निकाले जा सकते हैं।

पूरन सिंह की 'सुरक्षित सीट' लघु कथा में सवर्णों द्वारा

जाति व राजनीति के मेल से गांव में अपना वर्चस्व बनाए रखने की बात कही गई है। गांव में सवर्ण अवर्णों की तुलना में 1% होने पर भी प्रधानी सवर्णों के पास ही रहती है। सुरक्षित सीट घोषित होने के बाद भी सरपंच संतोष हमारे पंडित जी के घर झाड़ू-पोंछा ही कर रही है। गांव में हर हाल में जाति ही सर्वोच्च है। बलराम की 'माध्यम' लघुकथा ग्रामीण दलित यथार्थ की सशक्त रचना है। दिखावा सांसी को गांव के बड़े लोगों का नेटवर्क मिलकर अपने शिकंजे से मुक्त नहीं होने देता, इसलिए वह चौधरी की मजूरी से मुक्त नहीं हो पाता। बलराम अग्रवाल की लघुकथा 'रामभरोसे' रचना में यह ऐतिहासिक सत्य बाहर आ गया है कि धर्म, स्वर्ग-नरक जैसी बातें दलित समाज को आगे बढ़ने से रोकती है।

रतन कुमार सांभरिया की लघु कथाएं दलित संदर्भ की दृष्टि से आश्चर्य करती हैं। इनकी 'कोड़ा' लघुकथा में दलितों द्वारा किए जाने वाले काम के महत्व को तर्क के द्वारा उभारा गया है। दलित स्त्रियों में स्वाभिमान जगाती यह पंक्तियां आज बेशक अव्यावहारिक लगे, पर सिर्फ तनखाह मिलने पर आक्रोश फूटना स्वाभाविक है, 'बीबी जी, हम तुम्हें अपने पूरे महीने की तनखाह दे देती हैं, पर तुम एक दिन हमारे घर पोंछा-बर्तन कर आओ।' इन्हीं की '50 पैसे' लघुकथा में मोची को 50 पैसे न दे पाने के लिए व्यक्ति आचरण पर शर्मिदा तो होता है, पर उसके पास से कई दिन गुजरने पर भी 50 पैसे नहीं देता। रतन कुमार सांभरिया की रचना 'द्रोणाचार्य जिंदा है' बताती है कि घृणा के कारणों में जाति सबसे ऊपर है। इसी कारण दूसरों को मूल्य सिखाने वाला अध्यापक स्वयं मूल्य तोड़ता है, गांव थूक कर आँट लेगा मुझे कि गुरु जी के लड़के से मौसी का लड़का ज्यादा होशियार है।<sup>8</sup>, इसलिए रामदीन की सभी उत्तर पुस्तिकाओं में से अंक कम कर उसे प्रथम आने से रोक दिया जाता है।

रमेश प्रसाद गर्ग की रचना 'रक्ताभिषेक' में गांव के जातिवाद को दर्शाया गया है। यह रचना दलित स्त्रियों को अपनी भूमिका आगे बढ़ाने की को प्रेरित करती है। रामकुमार की 'एक युद्ध यह भी' रचना दलित संदर्भ में संघर्ष चेतना को प्रतीक रूप में उभरते हुए सवर्णों की संकीर्ण मानसिकता बताती है। 'समय समय की बात' रचना इस महत्वपूर्ण तथ्य को कथा द्वारा बेहतर ढंग से उभारती है कि दलित वर्ग को ठाकुरों के अन्याय से लड़ने के लिए स्वयं ऊंचे पदों तक पहुंचना होगा।

सतीश दुबे की कहानी 'रीढ़' सवर्णों की सदियों से चली आ रही मानसिकता की दस्तावेजी रचना है। ठाकुर पिता अपने पुत्र को दलितों के बारे में कहते हैं, गरीब और

गरीबी गांव की रीढ़ है। इन लोगों से इनकी प्रगति की बात कहो, पर होने मत दो।<sup>9</sup>

'यथार्थ का एहसास' कल आज और कल-तीनों कालों से जुड़ी दृढ़ चरित्र को रचने वाली लघुकथा है जिसका वाक्य है

हुजूर, जब कल आज नहीं रहा, तो फिर आज कल कैसे रहेगा?<sup>10</sup>

सुकेश की लघुकथा 'आधे अधूरे' में सहजता से तीन बिंदु उभरकर सामने आते हैं कि सवर्णों में जातिगत संकीर्णता और इनका आकार बड़ा गहरे बैठे हुए हैं। नीची जाति के लोगों का ही कुआं सूखे से बचता है तो ऊंची जाति के लोगों ने कुएं के निकट सभा कर कहा, हम सब एक हैं। छुआछूत ढकोसला है।<sup>11</sup> उन्हें उनके द्वारा दलितों के शोषण और उन्हें काबू में रखने के लिए इस्तेमाल किए जाने वाले हथियारों में से एक है। इस रचना में एक मुख्य बिंदु और है कि युवकों द्वारा कुएं के बंटवारे के विरुद्ध आवाज उठाई गई है।

हरनाम शर्मा की शसंस्कार कथा इस तथ्य को सामने ला देती है कि हमारे समाज में जाति की जड़ें बहुत गहरी हैं। कमलेश भारतीय की लघुकथा 'परंपरा' में गांव के कटु यथार्थ को उभारा गया है कि दलित वर्ग को जीवन में कई बार अपमान के कड़वे घूंट पीने पड़ते हैं। यह दलित विमर्श के साथ स्त्री विमर्श की रचना भी है। कमल चोपड़ा की लघुकथा 'पत्थर से पत्थर तक' में लेखक की पक्षधरता ढीली पड़ गई क्योंकि पाठक की इस रचना का उल्टा अर्थ भी लगा सकता है।

रामरतन यादव की रचना 'अछूत' में एक विडंबना को सहज रूप से उभारा गया है। जिस कलाकार ने अपने हाथों से कृष्ण मूर्ति रची, उस मूर्ति को तो स्वर्ण पूजते हैं, पर उस कलाकार को मंदिर में प्रवेश की अनुमति नहीं है। 'आत्मनिर्भरता' लघुकथा में दलितों को लेकर मध्य वर्ग में जो संकीर्ण सोच बनी है, वह उभर कर आती है। लेखक हरिजन लड़कों को सरकार द्वारा मिलने वाले वजीफे का विरोध करता है, वह आरक्षण के नाम पर सरकारी नौकरी लेने वाले के बारे में कहते हैं, 'वह केवल कुर्सी तोड़ रहा है'।

संकीर्णता और घृणा का कोई तार्किक आधार नहीं होता। इसे माधव नागदा की लघुकथा 'डैड' बखूबी भारती है। गोलू को उसके पापा कहते हैं कि आज से पापा को डैडी कहना क्योंकि रुमलिया कुमार का बेटा भी अपने बाप को पापा कह कर बुलाता है। कुछ दिन बाद गोलू को नया

निर्देश देते हैं कि अब उन्हें डैडी नहीं, डैड कहा करो क्योंकि सफाई वाली बाई का कूड़ा छोरा भी अपने बाप को डैडी कहने लगा है। गोलू का प्रश्न है, अगर उनमें से कोई 'डैड' कहने लग जाएगा तो<sup>12</sup> पिता के पास इसका कोई उत्तर नहीं।

प्रताप सिंह सोढ़ी की लघुकथा 'शक्ति बिखर गई' यह स्पष्ट करती है कि दलित समाज के लोगों को सामाजिक संस्थाओं से संघर्ष करने में ही अपनी बहुत सी शक्ति लगानी पड़ती है। इस कारण प्रेम और सम्मान जैसे अधिकारों से भी वे प्रायः वंचित रहते हैं।<sup>13</sup>

कुछ कहानियों में ऐसे उदाहरण हैं जो सवर्णों की दलितों के बारे में संकीर्णता घृणा और यथास्थिति तरफ सोच को दर्शाते हैं, जैसे –

- 1 जिन्होंने सदियों से मैला ढोया, आज हम पर शासन करेंगे, हमारी बराबरी करेंगे।<sup>14</sup>
- 2 नीच जात का जीव खंडित होना शुभ होता है।<sup>15</sup>
- 3 बात व्यवहार की, दमड़ी भर अक्ल नहीं।<sup>16</sup>

इसी तरह दलित पात्रों/लेखक द्वारा कहे गए कुछ वाक्य भी विचार करने योग्य हैं –

- 1 सवर्ण बड़े तमीज दार बनते हैं। हमें तो इंसान समझते ही नहीं।
- 2 उस परंपरा को तोड़ो जो आदमी को भेड़िए और औरत को जिंदा गोश्त में बदलती है।<sup>17</sup>
- 3 जब भंगन ब्राह्मण की रजाई में घुस सकती है तो रसोई में क्यों नहीं?<sup>18</sup>

सदियों से हाशिए से बाहर बहिष्कृत बस्तियों में रहने वाले वाला समाज आज भी कमोबेश वैसी ही स्थितियों में जी रहा है। उनके अपमान और व्यथा के कुछ स्वर इन लघु कथाओं में अवश्य मिलते हैं। इन लघु कथाओं में कहीं विरोध प्रतिरोध मिलता है, तो कहीं-कहीं दृढ़ चित्रों के जरिए विद्रोह के स्वर भी सामने आए हैं।<sup>19</sup>

दलित समाज पर लिखे उपन्यासों, कहानियों के कविताओं की भांति इन लघु कथाओं में भी परंपरागत मूल्यों को अस्वीकार किया गया है। शरण कुमार लिंबाले ने शदलित साहित्य का सौंदर्यशास्त्र शनामक पुस्तक में सत्य

,शिव और सुंदर की नई परिभाषा दी है –

- 1 मनुष्य सर्वप्रथम मनुष्य है, यही सत्य है।
- 2 मनुष्य की स्वतंत्रता ही शिव है।
- 3 मनुष्य की मनुष्यता ही सुंदरिया है।

इन लघु कथाओं में मान्य व्यवहार के विरुद्ध स्वर मुखरित हुआ है। दलित समाज संबंधी लेखन में बनी बनाई संवेदना उसे आगे जाने की जरूरत है। जहां ऐसा हुआ है, वहां रचना अधिक असरदार बनी है, ऐसा करते हुए लघु कथा के बारे में बनी बनाई सोच वह सांचे को तोड़कर नहीं, सोच की दुनिया में प्रवेश करना संभव होगा जिसमें अभिव्यक्ति की संभावनाएं अधिक होंगी।

संदर्भ :

- 1 कंवल भारती, भारतीय दलित साहित्य की अवधारणा, पृष्ठ 25
- 2 डॉक्टर शरण कुमार लिंबाले, दलित साहित्य का सौंदर्यशास्त्र, पृष्ठ 38
- 3 रामकुमार घोटड़, संपादक रूदलित समाज की लघु कथाएं, पृष्ठ 31
- 4 वही, पृष्ठ 31
- 5 वही, पृष्ठ 32
- 6 वही, पृष्ठ 59
- 7 रतन कुमार सांभरिया, प्रतिनिधि लघुकथा, पृष्ठ 45
- 8 वही, पृष्ठ 69
- 9 वही, पृष्ठ 123
- 10 वही, पृष्ठ 126
- 11 वही, पृष्ठ 131
- 12 कंवल चोपड़ा (संपादक), संरचना 2010, पृष्ठ 110
- 13 अशोक भाटिया, निर्वाचित लघु कथाएं, पृष्ठ 218
- 14 राजकुमार, दलित समाज की लघु कथाएं, पृष्ठ 44
- 15 वही, पृष्ठ 48
- 16 वही, पृष्ठ 53
- 17 वही, पृष्ठ 49
- 18 वही, पृष्ठ 86
- 19 अशोक भाटिया, समकालीन हिंदी लघु कथा, पृष्ठ 106

## The 21st Century's Use of Human Resource Information System (HRIS) and Their Effectiveness

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### Abstract

Human resource information systems (HRIS) are now used by businesses, governments and non-profits all over the world to facilitate information sharing and to facilitate downsizing and reengineering initiatives. HRM and information systems are combined to generate human resource information systems (HRIS).

HRIS or human resource information system, enables HR managers to use technology to carry out HR responsibilities in a more effective, methodical, and organized manner.

**Keywords:** Information System; Human Resource Management (HRM); Human Resource Information System (HRIS).

### Introduction

The main use of technological improvement in business has sparked changes in working methods, requirements and styles. When work productivity and effectiveness are improved, following time management plans and being devoted to punctuality standards, there are greater profits for the employees, the best use of the resources available and a successful deal with corporate. All of the features in the business system are referred to as the human resource management system (HRMS) or human resource information system (HRIS). The process used by HRMS combines more advanced technological advancement with traditional methods of the human resource mode of working. The structures and processes between information technology and human resource management (HRM) are known as a human resource information system (HRIS) or HR system. HRM is a body that strikes a balance between information technology and its fundamental HR goals and processes.

According to (S.I.Tannenbaum, 1990) Human Resource information System (HRIS) as “one which is used to acquire, store, manipulate, analyze, retrieve and distribute information about an organization’s human resource”. HRIS is well thought-out as a organized process for gathering, storage, sustaining and recuperating data essential by the establishments about their human resources, employees activities and organizational features (Kovach K. , 2002).

Consequently, HR professionals can achieve HR goals with the use of HR information systems. Business establishments may quickly obtain information, discuss information and reap intended benefits thanks to human resource information systems. HRIS, the Internet, and related communication technologies are currently changing how human resource management is done and how employees interact within firms. Although becoming increasingly sophisticated and multidimensional, human resource information systems can be simple or complex, sophisticated or non computerized.



## Human Resource Information System (HRIS)

Technological advancements involving software and minicomputers had a significant impact on how evidence was used when managing human resources.

Supercomputers were historically only used in human resources to manage compensation and benefits, such as payroll. However, new advancements in microprocessor technology have made it possible to compile vast volumes of data on employees' PCs and do numerical analysis, which were previously only possible with enormous mainframe computer processors. HRIS can therefore be used to analyze and appraise programs or policies, to support and carry out daily operational issues, to avoid litigation and to assist and sustain tactical and strategic decision making. Additionally, the HRIS integrates human resources. The kind of human resource information system used must be ordered according to the particular needs of the company enterprises. Any development that could be as unique, complex and time-consuming as the addition or progress of an HRIS requires careful planning and scheduling.

The following issues must be resolved in order to implement an HRIS:

- Thorough require analysis?
- What kind and degree of HRIS should be put into place?
- Should I choose an advanced software package or pre-existing software?
- Would the HRIS be implemented all at once or in stages?

A computerized HRIS is a system that uses computers to monitor, control and influence human movement from the moment a person indicates their intent to connect to a commercial location until they are isolated from it after connecting.

Human resource administrators and shareholders put the data produced by human resource information systems into effect and rely on it. Systems for managing human resources tend to be comprehensive and integrated with an organization's planning, recruitment and advancement goals and objectives. Examples of data that is kept in and accessible from a human resource information system are:

- Information for supply and demand projections and industry forecasting.
- Information required to meet a regulation or a stakeholder requirement.
- Data on concurrent service, divorces, and applicant experiences.
- Details on trainee work performance and training program expenditures.
- Details about pay finances, salary forecasts, and salary growth.
- Information about contract discussions and the need for employee help (Kovach, 1999).

The following sub-systems make up it.

- **Employment Information:** It includes all-purpose requirement and training prerequisite information, as well as the appointment information bank announcement component.
- **Employee Statistics:** This section includes information about employees, including details about increment and promotion rates as well as transference tracking.

- **Workforce Development Statistics:** These statistics aim to provide data that might support the use of human resources, career development, succession planning, and contributions to skill progression.
- **Training Evidence:** It provides information for planning course materials, putting together for fundamental basis training, and cost analysis of training, among other things.
- **Health Information System:** This subsystem provides information on employee health and wellbeing-related events.
- **Evaluation Information:** It deals with performance evaluation and quality evaluation data that is useful for career progression, increase, separation and scheduling, among other things.
- **Employees Payroll System:** This system contains data on wages, incentives for wages, payments, gratuity discounts for provident funds etc. It also contains information on the applicant's payment plan.
- **Employees Facts Structure:** This database of pertinent and up-to-date information is used by many different types of specialists.

When HRIS demonstrated their ability to enhance the management of an organization's human capital, they subsequently became a commonplace component of business practices and corporate culture. Business establishments receive an organizational benefit from HRIS, which typically explains to a practical benefit. HRIS systems are increasingly being referred to as employee self-service (ESS) systems in modern business enterprises. ESS architecture allow employees to access and update their records without the assistance of human resources staff. The client-server architecture of HRIS has been replaced by a web-based environment. In order to make it simple for employees to update their HR information, many businesses have integrated interactive voice response (IVR) into their HRIS. Address information, retirement information and other details can all be changed on web-based or interactive voice response HRIS.

## **Importance of Information System to HR**

Because HRIS is well integrated into HR functions, it offers better safety, better service, competitive advantage, fewer errors, greater accuracy, improved communication, increased efficiency, increased productivity, supplemental well-organized management, additional prospects, compact work requirements, condensed expenses, higher decision-making strategies, higher controller etc.

### **Creating the HRIS**

As with any significant change, effective planning is a must for carrying out the HRIS in a successful manner. The exact processes required for properly creating and putting into use an HRIS are described in the steps that follow.

- Idea generation must begin at the point where the creator of the idea first makes a statement about the necessity of an HRIS and what it may accomplish for commercial enterprises.

- Feasibility study: A feasibility study evaluates the present organization and particulars of an HRIS. It evaluates the cost and benefits of an HRIS.
- Selecting the project team: The project team needs to be chosen after the viability assessment has been acknowledged and the assets assigned. A member of the project team must be a HE from the management information structure and workforce.
- Outlining the specifications What the HRIS will do must be specified in detail in a declaration of needs. The facts of the reports that will be created typically make up a sizable piece of the declaration of wants. In fact, the declaration actually outlines more specific requirements. This often consists of written explanations of how employers create and compile information, reach agreements, follow detailed procedures, retrieve information and carry out other non-technical tasks linked to the use of HRIS. Making sure that the HRIS project actually satisfies management's requirements for an HRIS is crucial in this situation.
- Vendor research is done at step number five, which determines which hardware and software are most likely to meet the organization's needs at the lowest cost. It's a challenging job. The best approach is often not to ask vendors whether a particular package can satisfy the needs of the business institution, but rather how it will satisfy those needs.
- Contract negotiations as a package: The contract must be negotiated once a vendor has been chosen; it details the seller's obligations with relation to software, installation, servicing, maintenance training and documentation.
- Training: Training often starts as soon as possible once the agreement is put into effect. The project team's HR members must first be certified to utilize the HRIS. The HR professionals will instruct managers from other departments near the conclusion of the implementation on how to input information into the HRIS and how to seek information from it.
- The system is then modified, with changes made to the structure to best meet the needs of the enterprise. A general rule of thumb is to avoid modifying the seller's packaging because such changes frequently lead to issues. A different approach is to develop plans that add to the seller's database, slightly altering it.
- Data collection: Before the Human Resource system is launched, it is imperative that pertinent data be gathered and inputted.
- Testing the system: After the system has been modified to meet the demands of the company and the data has been entered, there is a testing phase. The testing phase's goal is to ensure that the HRIS is producing the intended results and is performing as intended.
- Initial Starting Up: When all current activities are entered into the system and information is formed, start up officially begins.

- **Parallel operation:** Even after the new HRIS has been tested, it is preferable to use both systems concurrently for a while. This makes it possible to evaluate the system's overall performance and look into any errors.
- **Maintenance:** It typically takes several weeks or even months for the HR staff to be satisfied with the cutting-edge system. It is necessary to maintain any minor errors and adjustments throughout this maintenance period.
- **Evaluation:** The HRIS should be evaluated once it has been in operation for a reasonable amount of time. Is the HRIS appropriate for the company and being used properly?

## **Digitized talent databases**

These comprise information like

- Work History
- Strong points
- Identification of specific training strategies and programs needed to address shortcomings
- Possibility of raising profile
- Career objectives
- Private information
- The number and variety of staff managed
- The entire budget was used
- Prior organizational obligations

Human resource records are frequently computerized and rearranged. Updates are finished at least once every two years. Prior to updating, workers are encouraged to take into consideration any significant changes to their professions, such as the acquisition of new skills, the completion of higher education, the change in responsibilities, attendance at seminars, the publication of papers etc.

## **HRIS Uses**

A human resource information system (HRIS) is a system for gathering, classifying, processing, noting and disassembling evidence that is necessary for a well-organized and effective organization of human resources inside an organization. Numerous problems make such a system more necessary.

1. In organizations that hire a lot of people, it is important to advance the employee record in order to attract personnel.
2. Every workplace in a totally discrete firm needs accurate and relevant data to organize its workforce. If data is stored in several locations, cost and error will increase.

3. The compensation package of today is complex and includes several payments and deductions, among other things. A conveniently located source of information can prove useful for making wise decisions.
4. Organizations are required to abide by a number of property rules. An electronic data system would quickly and correctly store and restore data, enabling the company to adhere to legal requirements.
5. Manager record and file can be combined and recovered with the use of automation employee information system for cross-referencing and prediction. The system would be more concerned about close record keeping than close conclusion.
6. Automatic information systems can be built with the necessary flexibility for response to changes occurring in the environment.

Information systems in the field of human resource management have only been used for workforce training, job position and employee previous reports of new hires, conclusion, and compensation assurance. Advanced businesses have gradually begun using electronic information systems for cooperative bargaining, staff guidance, training, performance evaluation and other purposes. Computer-generated information systems can be used for almost all aspects of human resource management with the help of sophisticated software.

### **HRIS efficacy evaluation**

HRIS effectiveness should be assessed in order to ascertain whether it has worked as expected and whether it is being utilized to its full potential (Byars, 2004). Measuring the effectiveness of their human resources information system (HRIS) in order to demonstrate the value-added contribution of the HRIS to the accomplishment of the organization's mission is one of the most significant difficulties that community employee managers face today (Hagood, 2002). Implementing an HRIS platform may seem like a need for a business, but unless it is a useful tool for HR operations, it won't help efficiency grow and might even hurt it.

The Toshiba America Medical Systems, Inc. (TAMS) is one business that has implemented an HRIS system. When TAMS revolutionized healthcare providers, it posted all employee assistance data online and created an open registration choice. As soon as the UltiPro portal [new HRIS technology] was made available to employees, TAMS began to notice developments, including a predictable 70% increase in open registration productivity.

### **Benefits of HRIS**

- Clearly defined objectives.
- A reduction in the amount and price of human resource data storage.
- The availability of relevant and accurate information regarding human possessions.
- The expansion of the human resources division's performance standards.
- More thorough career guidance and planning at all levels.
- Individual progress through the link between performance rewards and job training.

- High ability to solve problems quickly and effectively.
- Implementing training programs designed using data on administrative requirements.
- The capacity to adapt to a legal and other environment that is constantly changing.
- Reputation for human resource purposes as a result of its capability for planned expansion across the board.

## **HRIS Limitation and Protection**

The confidentiality of employee data has grown into a significant problem in recent years. Employees are becoming more concerned about the protection of their personal information as a result of fraud being a widespread problem. Companies can make their employees safer with the security of their information by ensuring that employee data stored in the HRIS has relevance to the business and that there is limited access (password protection) to such information. Employee files, whether digital or printed, must be handled with care. A balance must be struck between merging HR policy, system expertise, and day-to-day operations when establishing security and end-user rights (O'Connell, 1994).

CS Stars, LLC was one business that experienced a significant security issue. One of CS Stars' supercomputers that was restricted to individual data, including names, addresses, and Social Security and workers' compensation payouts, lost its way. The bigger issue was that CS Stars neglected to inform the impacted clients and staff about the missing machine. Although the supercomputer was recovered and it appeared that no information was compromised, many employees lost confidence in the company. The Information Security Breach and Notification Law in New York, which took effect in December 2005, mandates that companies that retain computerized data containing private information immediately notify the owner of any breach of system security after becoming aware of it if it is practically thought that someone obtained the private information without having received the proper consent (Cadrain, 2007). Businesses with challenges resembling those with human resources information technology and human resources information systems include CS Stars LCC, Terasen Pipeline, BM and Toshiba America Medical Systems, Inc. All of those businesses recognize the value of modern technology, information systems for managing human resources and data security.

## **Conclusion**

Despite the fact that the majority of HR managers recognize the value of HRIS, the general opinion is that its implementation is not necessary. Therefore, only major businesses have begun utilizing HRIS to enhance their HR functions. The fear of "technology" and "IT" that older management has developed is the primary cause of the lag in the introduction of HRIS in businesses. They might not be very tech savvy and worry about getting passed over.

But as more and more businesses understand the value of IT and technology, trends are shifting in a positive direction. Major HRIS suppliers are focusing on small and medium-sized businesses as well as big businesses for their own products.



## References

- Byars, R. (2004). *Human Resource Management*. The McGraw-Hill Companies.
- Cadrain. (2007). *Company settles Data Breach Charges*. New York.
- Hagood. (2002). Using the balanced scorecard to measure the performance of your HR information system. . *Public Personnel Management* .
- Kovach. (1999). Human resource information systems(HRIS): providing business with rapid data access, information exchange and startegic advantage. *Public Personnel Management* .
- Kovach, K. (2002). Administrative and strategic advantages of HRIS. *Employment Relations Today* .
- O'Conell. (1994). Security for HR records-Human Resources. *HR magazine*.
- S.I.Tannennbaum. (1990). HRIS: User Group Implications. *Journal of System Management* , 27-32.
- <http://www.whatishumanresource.com/human-resource-information-systems>
- <http://www.enotes.com/research-starters/human-resource-information-systems>
- <http://EzineArticles.com/708751>



## Effect of Variable Permeability on MHD Flow through Channel

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### Introduction

The unsteady flow and heat transfer through a channel have many applications in the field of Mechanical engineering, Chemical Engineering and Aerodynamics etc. The pulsatile flow through a channel filled with porous material have practical applications in bio-fluid flow, in the dialysis of blood in artificial kidney etc. Magnetic field on the fluid flow i.e. Magnetofluiddynamic flow is used as controlling device on the flow. Many scientist have used magnetohydrodynamic flow for the pumping of blood through an artery. Sharma and Sharma (1997) have discussed unsteady flow and heat transfer between two parallel plates and obtained skin-friction and Nusselt number. Sorundalgekar and Lahurikar (2002) have worked out generalized MHD Couette flow with variable viscosity. Sharma and Sharma(2003) have worked out heat transfer through steady MHD flow between two inclined Walls and discussed numerically the effect of magnetic field on the flow and heat transfer in terms of skin friction and Nusselt number. Chamkha(2004) has worked out an unsteady MHD convective heat and mass transfer past a semi-infinite vertical permeable moving plate with heat absorption. Sharma and Sharma (2004) have studied unsteady free convection flow between horizontal parallel porous plates in the presence of heat source. Attia(2005) has studied MHD couette flow with variable physical properties. Makinde and Mhone (2006) have studied the thermally developing Hartman flow in a channel of uniform width.

In the present paper an attempt has been made to study the effect of variable permeability and transverse magnetic field on fluid flow and heat transfer when the upper plate of the channel is oscillating.

### Formulation of the problem

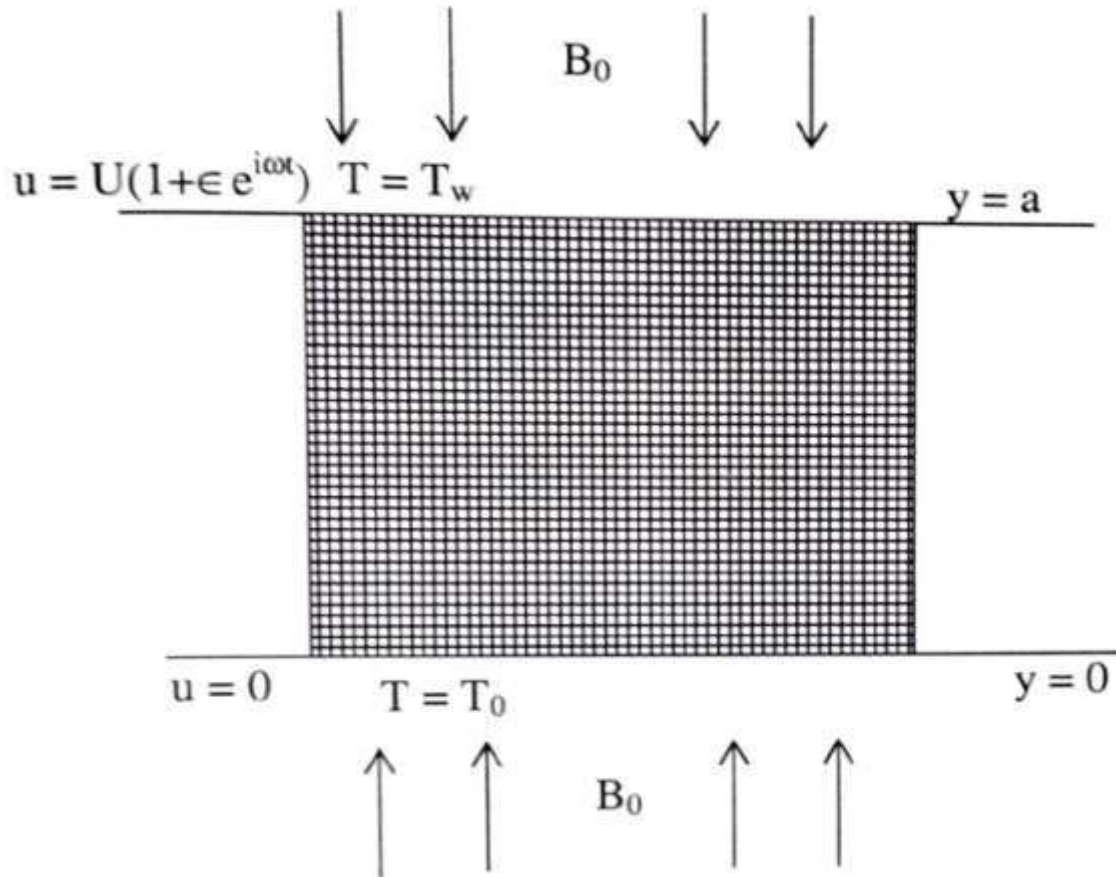
A semi infinite long channel of width  $a$  is filled with saturated medium is considered to study the effects of magnetic field under variable permeability on the fluid flow and heat transfer. The fluid is viscous incompressible electrically conducting. It is assumed that the fluid has small electrical conductivity and the electromagnetic force produced is very small. The  $x$ -axis is taken along the channel, and  $y$ -axis in the normal to the channel. The lower plate of the channel is static and kept at constant temperature  $T_0$ , while upper plate of the channel is oscillating with velocity  $U(1 + \epsilon e^{i\omega t})$  and kept at constant temperature  $T_w$ . Using Boussinesq approximation the equations governing the motion are given by

$$\frac{\partial u}{\partial t} = -\frac{1}{\rho} \frac{\partial P}{\partial x} + \nu \frac{\partial^2 u}{\partial y^2} - \frac{\nu}{K} u - \frac{\sigma e B_0^2 u}{\rho} + g\beta(T - T_0)$$

$$\frac{\partial T}{\partial t} = \frac{k}{\rho c_p} \frac{\partial^2 T}{\partial y^2} - \frac{1}{\rho c_p} \frac{\partial q}{\partial y'}$$

with the boundary conditions

$$\begin{aligned} y = z: \quad & u = U(1 + \epsilon e^{i\omega t}), \quad T = T_w, \\ y = 0: \quad & u = 0, \quad T = T_0 \end{aligned}$$



Physical model of the problem



where,

- $u \rightarrow$  axial velocity,
- $t \rightarrow$  time
- $T \rightarrow$  fluid temperature,
- $p \rightarrow$  pressure
- $g \rightarrow$  gravitational force,
- $q \rightarrow$  radiative heat flux
- $\beta \rightarrow$  coefficient of volume expansion due to temperature
- $c_p \rightarrow$  specific heat at constant pressure
- $k \rightarrow$  thermal conductivity,
- $\rho \rightarrow$  fluid density
- $K \rightarrow$  porous medium permeability coefficient.
- $B_0 = (\mu_e H_0)$ , the electromagnetic induction,
- $\mu_e \rightarrow$  magnetic permeability,
- $H_0 \rightarrow$  kinematics viscosity. Intchsity of magnetic field
- $\sigma_e \rightarrow$  conductivity of the fluid,
- $v \rightarrow$  kinematics viscosity.

It is assumed that both wall temperature  $T_0, T_w$  are high enough to induce radiative heat transfer. Further, it is assumed that the fluid is optically thin with a relatively low density and the radiative heat flux is given by

$$\frac{\partial q}{\partial y} = 4\alpha^2(T - T_0)$$

where,  $\alpha$  is the mean radiation absorption coefficient. Further, it is assumed that  $K$ , the porous medium permeability coefficient is variable, given by

$$K = K_0(1 + \epsilon e^{i\omega t})$$

with this value the equation becomes

$$\frac{\partial u}{\partial t} = -\frac{1}{\rho} \frac{\partial P}{\partial x} + v \frac{\partial^2 u}{\partial y^2} - \frac{v}{K_0(1 + \epsilon e^{i\omega t})} u - \frac{\sigma_e B_0^2}{\rho} u + g\beta(T - T_0)$$

To convert governing equation of motion in non-dimensional form introducing following non-dimensional parameters



$$\begin{aligned} \text{Re} &= \frac{Ua}{\nu}, \bar{x} = \frac{x}{a}, \bar{y} = \frac{y}{a}, \bar{u} = \frac{u}{U} \\ \theta &= \frac{T - T_0}{T_w - T_0}, H^2 = \frac{a^2 \sigma_e B_0^2}{\rho \nu}, \bar{t} = \frac{U}{a}, \\ \bar{P} &= \frac{aP}{\rho \nu U}, D_a^2 = \frac{K}{a^2}, \text{Gr} = \frac{g(T_w - T_0)a^2}{\nu U} \\ \text{Pe} &= \frac{Ua\rho c}{k}, N^2 = \frac{4\alpha^2 a^2}{k} \end{aligned}$$

The dimensionless governing equations of motion and energy are

$$\begin{aligned} \text{Re} \frac{\partial u}{\partial t} (1 + \epsilon e^{i\omega t}) &= -(1 + \epsilon e^{i\omega t}) \frac{\partial P}{\partial x} + (1 + \epsilon e^{i\omega t}) \frac{\partial^2 u}{\partial y^2} \\ &\quad - s^2 u - H^2 u (1 + \epsilon e^{i\omega t}) + \text{Gr} \theta (1 + \epsilon e^{i\omega t}) \end{aligned}$$

and

$$\text{Pe} \frac{\partial \theta}{\partial t} = \frac{\partial^2 \theta}{\partial y^2} + N^2 \theta$$

Corresponding boundary conditions are

$$\begin{aligned} y = 1: \quad u &= 1 + \epsilon e^{i\omega t}, \quad \theta = 1 \\ y = 0: \quad u &= 0, \quad \theta = 0 \end{aligned}$$

For the sake of brevity the bars are dropped immediately. Here

U → mean flow velocity

Gr → Grashoff Number

H → Hartmann Number

N → radiation parameter

Pe → Peclet Number

Re → Reynolds Number,

Da → Darcy Number

$s = \left(\frac{1}{Da}\right)$  → porous medium shape factor parameter

Method of Solution



The governing equation of motion is nonlinear coupled partial differential equation. For its solution, let us consider

$$-\frac{\partial P}{\partial x} = \lambda(1 + \epsilon e^{it})$$

$$u(y, t) = u_0(y) + \epsilon u_1(y)e^{iwt}$$

and

$$\theta(y, t) = \theta_0(y) + \epsilon \theta_1(y)e^{iwt}$$

where

$$\lambda \rightarrow \text{constant, } w \rightarrow \text{frequency of the oscillations.}$$

On substituting the above expressions in the equations, we get

$$\begin{aligned} \text{Re}[\epsilon u_1(y)e^{iwt} iw][1 + \epsilon e^{iwt}] &= (1 + \epsilon e^{iwt})(1 + \epsilon e^{iwt})\lambda \\ &+ (1 + \epsilon e^{iwt})\left(\frac{d^2 u_0}{dy^2} + \epsilon \frac{d^2 u_1}{dy^2} e^{iwt}\right) \\ &- s^2(u_0 + \epsilon u_1 e^{iwt}) \\ &- H^2(u_0 + \epsilon u_1 e^{iwt})(1 + \epsilon e^{iwt}) \\ &+ \text{Gr}[\theta_0 + \epsilon \theta_1 e^{iwt}](1 + \epsilon e^{iwt}) \end{aligned}$$

and

$$\text{Re}[\epsilon \theta_1 i w e^{iwt}] = \frac{d^2 \theta_0}{dy^2} + \epsilon e^{iwt} \frac{d^2 \theta_1}{dy^2} + N^2(\theta_0 + \epsilon \theta_1 e^{iwt})$$

On comparing the coefficients of like powers of  $\epsilon$ , we have

zero-order equations

$$\begin{aligned} \frac{d^2 u_0}{dy^2} - (s^2 + H^2)u_0 &= -\lambda - \text{Gr}\theta_0 \\ \frac{d^2 \theta_0}{dy^2} + N^2\theta_0 &= 0 \end{aligned}$$

First-order equations





$$\frac{d^2 u_1}{dy^2} - (s^2 + H^2 - \text{Re}i\omega)u_1 = -2\lambda - \frac{d^2 u_0}{dy^2} + H^2 u_0 - \text{Gr}\theta_0 - \text{Gr}\theta_1$$

$$\frac{d^2 \theta_1}{dy^2} + (N^2 - \text{Pe}i\omega)\theta_1 = 0$$

Second-order equations

$$\frac{d^2 u_1}{dy^2} - (H^2 + \text{Re}i\omega)u_1 = -\lambda - \text{Gr}\theta_1$$

with the corresponding boundary conditions

$$y = 0: \quad u_0 = 0, \quad u_1 = 0, \theta_0 = 0, \theta_1 = 0$$

$$y = 1: \quad u_0 = 1, \quad u_1 = 1, \theta_0 = 1, \theta_1 = 0$$

The solution of the equation is

$$\theta_0(y) = c_1 \cos Ny + c_2 \sin Ny$$

On applying boundary condition,  $\theta_0(0) = 0$  and  $\theta_0(1) = 1$ , we get

$$c_1 = 0 \text{ and } c_2 = \frac{1}{\sin N}$$

Thus, under the prescribed boundary conditions the solution of  $\theta_0(y)$  is given by

$$\theta_0(y) = \frac{1}{\sin N} \sin Ny$$

Now consider the equation

$$\frac{d^2 \theta_1}{dy^2} + (N^2 - \text{Pe}i\omega)\theta_1 = 0$$

or

$$\frac{d^2 \theta_1}{dy^2} + A_1^2 \theta_1 = 0$$

where

$$A_1 = \sqrt{N^2 - \text{Pe}i\omega}$$

The solution of the equation is given by

$$\theta_1(y) = c_3 \cos A_1 y + c_4 \sin A_1 y$$



On applying boundary conditions  $\theta_1(0) = 0$  and  $\theta_1(1) = 0$ , we get

$$c_3 = 0 \text{ and } c_4 = 0$$

Thus, under the prescribed boundary conditions the solution

$$\theta_1(y) = 0$$

Now, we solve equation

$$\frac{d^2 u_0}{dy^2} - (s^2 + H^2)u_0 = -\lambda - Gr \theta_0$$

with the help of the equation, the above equation can be rewritten as

$$\frac{d^2 u_0}{dy^2} - (s^2 + H^2)u_0 = -\lambda - \frac{\sin Ny}{\sin N} Gr$$

or

$$\frac{d^2 u_0}{dy^2} - A_2^2 u_0 = -\lambda - \frac{\sin Ny}{\sin N}, \text{ where}$$

$$A_2 = \sqrt{s^2 + H^2}$$

The complementary function is given by

$$C \cdot F = c_5 \cosh A_2 y + c_6 \sinh A_2 y$$

and Particular Integral is

$$\begin{aligned} P.I &= \frac{1}{m^2 - A_2^2} \left( -\lambda - \frac{\sin Ny}{\sin N} Gr \right) \\ &= \frac{1}{m^2 - A_2^2} (-\lambda) + \frac{1}{m^2 - A_2^2} \left( -\frac{\sin Ny}{\sin N} Gr \right) \\ &= \frac{1}{A_2^2} \lambda + \frac{1}{N^2 + A_2^2} \frac{\sin Ny}{\sin N} Gr \end{aligned}$$

Thus the complete solution is

$$\begin{aligned} u_0(y) &= C \cdot F + P \cdot I \\ &= c_5 \cosh A_2 y + c_6 \sinh A_2 y + \frac{1}{A_2^2} \lambda + \frac{1}{N^2 + A_2^2} \frac{\sin Ny}{\sin N} Gr \end{aligned}$$

on applying the boundary conditions,  $u_0(0) = 0, u_0(1) = 1$



$$c_5 = \frac{-\lambda}{A_2^2}, c_6 = \frac{1}{\sinh A_2} \left[ 1 + \frac{\lambda}{A_2^2} \cosh A_2 - \frac{\lambda}{A_2^2} - \frac{Gr}{N^2 + A_2^2} \right]$$

Then under the prescribed boundary conditions the mean flow velocity profile is given by

$$\begin{aligned} u_0(y) &= \frac{\lambda}{A_2^2} \cosh A_2 y + \frac{1}{\sinh A_2} \left[ 1 + \frac{\lambda}{A_2^2} (\cosh A_2 - 1) - \frac{Gr}{N^2 + A_2^2} \right] \sinh A_2 y \\ &+ \frac{1}{A_2^2} \lambda + \frac{1}{N^2 + A_2^2} \frac{\sin Ny}{\sin N} Gr \\ &= -A_3 \cosh A_2 y + (A_5 + A_6 + A_7) \sinh A_2 y + A_3 + A_4 \sin Ny \end{aligned}$$

where

$$\begin{aligned} A_3 &= \frac{\lambda}{A_2^2} \\ A_4 &= \frac{Gr}{(N^2 + A_2^2) \sin N} \\ A_5 &= \frac{1}{\sinh A_2} \\ A_6 &= \frac{A_3}{\sinh A_2} (\cosh A_2 - 1) \\ A_7 &= -\frac{A_4 \sin N}{\sinh A_2} \end{aligned}$$

Now consider the equation

$$\frac{d^2 u_1}{dy^2} - (H^2 + Re \omega) u_1 = -\lambda - Gr \theta_1$$

$$\text{or } \frac{d^2 u_1}{dy^2} - A_8^2 u_1 = -\lambda - Gr \theta_1$$

where

$$A_8 = \sqrt{H^2 + Re \omega}$$

with the help of equation , this can be written as

$$\frac{d^2 u_1}{dy} - A_8^2 u_1 = -\lambda$$

Its solution is given by

$$u_1(y) = C \cdot F + P \cdot I$$

$$= c_7 \cosh A_8 y + c_8 \sinh A_8 y + \frac{1}{A_8^2} \lambda$$

In view of the boundary condition,  $u_1(0) = 0, u_1(0) = 1$

we get

$$c_7 = -\frac{1}{A_8^2} \lambda$$

$$c_8 = \frac{1}{\sinh A_8} \left[ 1 + \frac{\lambda}{A_8^2} (\cosh A_8 - 1) \right]$$

Then under the prescribed boundary conditions the expression of transient velocity profile is given by

$$u_1(y) = -\frac{1}{A_8^2} \lambda \cosh A_8 y + \frac{1}{\sinh A_8} \left[ 1 + \frac{\lambda}{A_8^2} (\cosh A_8 - 1) \right] \sinh A_8 y$$

$$+ \frac{1}{A_8^2} \lambda$$

$$= -A_9 \cosh A_8 y + (A_{10} + A_{11}) \sinh A_8 y + A_9$$

where  $A_9 = \frac{\lambda}{A_8^2}$

$$A_{10} = \frac{1}{\sinh A_8}$$

$$A_{11} = A_9 \cdot A_{10} (\cosh A_8 - 1)$$

Hence, the expression of velocity profile and temperature distribution are derived and given by

$$u(y, t) = (u_0(y) + \epsilon u_1(y)) e^{i\omega t}$$

$$= -A_3 \cosh A_2 y + (A_5 + A_6 + A_7) \sinh A_2 y$$

$$+ A_3 + A_4 \sin Ny + \epsilon [-A_9 \cosh A_8 y + (A_{10} + A_{11}) \sinh A_8 y + A_9] e^{i\omega t}$$

and

$$\theta(y, t) = \theta_0(y) + \epsilon \theta_1(y) e^{i\omega t}$$

$$= \theta_0(y)$$

$$= \frac{1}{\sin N} \sin Ny$$



## References:

1. Attia, H. A. (2005) "MHD couette flow with variable physical properties" AMSE Modelling B. Vol. 74 n° 2, 25.
2. Chamkha Ali. J., Umavathi J.C., Abdul Mateen (2004), Oscillatory flow and heat transfer in two immiscible fluids, International J. of fluid Mechanics Research, Vol. 316.
3. Makinde O.D., Osalusi E. (2006), MHD steady flow in a channel with slip at the permeable boundaries. Rom. J. of Phys, 51(3-4), 319-328.
4. Makinde, O. D.; Mhone, P. Y. (2006) "Thermally developing hartman flow in a channel of uniform width". AMSE, Modelling B, Vol. 75 n° 649.
5. Mankinde O.D. and Mhone P.Y. (2005) Heat Transfer to MHD Oscillatory Flow in a Channel filled with Porous Medium. Rom. Journ., Phys., Vol. 50 Nos. 9-10, P. 931-938.
6. Massoudi M.M.; Phuoc T.X.T.X.(2000) The effect of slip boundary condition on the flow of granular materials: a continuum approach. International Journal of Non-Linear Mechanics, Volume 35, Number 4, July 2000. pp. 745-761(17).
7. Murdoch A. I., Soliman A. (1999), On the Slip-Boundary Condition for Liquid Flow over Planar Porous Boundaries. Proceedings: Mathematical, Physical and Engineering Sciences, Vol. 455, No. 1984 (Apr. 8, 1999), pp. 1315-1340.
8. Rao I. J. and Rajagopal K. R. (1999) Acta Mechanica Volume 135, Numbers 3-4/September, 1999, 113-126. 33. Raptis A., Kofousias N. (1981), Heat transfer in flow through a porous medium bounded by an infinite vertical plate under the action of a magnetic field. Inter Science, Int. J. of Energy Research. Vol. 6, no. 3, 241-245.
9. Sharma Anil, Sharma M.K. (2004) Unsteady Free Convection Flow between Horizontal Parallel Porous Plates in the Presence of Heat Source- Applied Sciences Periodical, Vol. VI (3), 145-154.
10. Sharma P.R. and N. Kumar (1997), Unsteady flow and heat transfer through a viscous incompressible fluid over a porous surface moving in oscillating free stream, Bull. Purel. APpl. Sciences, India, 16E, 147-154.
11. Sharma P.R., Gaur Manish and Gaur Y.N. (2003), steady magnetohydrodynamics flow past a vertical porous, hot plate with periodic temperature, AMSE periodicals modeling, measurement and control, 'B'.. AMSE, J., France 72, 37-49.
12. Sorundalgekar V.M.; Lahurikar R.M. (2002) "Generalized MHD Covette flow with variable viscosity" AMSE, Modelling B, Vol. 71 n° 261.



## Some basics of fluid Dynamics for young mind

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**Abstract:** Fluid mechanics dealt with the behaviour of fluids under the action of various forces. The fluid mechanics provide the knowledge for the analysis and design of a system in which fluid is a working medium. Such systems are used in aerodynamics, automobiles, hydraulic machines, heomodynamics etc. So, In this paper some fundamental terms are explained to understand the concept of fluid dynamics.

**Introduction:** First we define the fluid, then types of fluid and fluid properties are given.

**Fluid:** It is defined as a substance which must continue to change shape as long as there is a shear stress however small present.

**Fluid as a continuum:** All fluids are made up of molecules which are separated from each other by spaces. At the microscopic level, the properties of fluids cannot be defined in these spaces due to non-existence of mass. To overcome these difficulties, a fluid is regarded as a continuum i.e. a hypothetical continuous substance. The study model on continuum hypothesis breaks down whenever the mean free path of the molecules approaches the smallest characteristic dimension of the problem under consideration.

**Fluid Properties:** Manifestations which are primarily characteristic of a particular fluid and not the manner of the flow are called fluid properties. Viscosity and surface tension are examples of fluid properties, whereas pressure and density of gases are primarily flow-dependent and hence are not considered fluid properties.

### Types of Fluids:

(i) **Ideal Fluid:** An ideal fluid is one that is incompressible and has no viscosity i.e.

$$\text{Ideal Fluid Flow : } \left\{ \begin{array}{l} \text{Inviscid Fluid} \quad v = 0 \\ \text{Incompressible Flow} \quad \frac{d\rho}{dt} = 0 \quad \text{or} \quad \nabla \cdot \vec{v} = 0 \end{array} \right.$$

It is termed as inviscid fluid. No real fluid is inviscid. In flat-plate, the flow at a sufficiently large distance from the plate, fluid will behave as a non-viscous flow system. The reason for this behaviour is that the velocity gradient normal to the flow direction is very small and hence the viscous-shear forces are small.

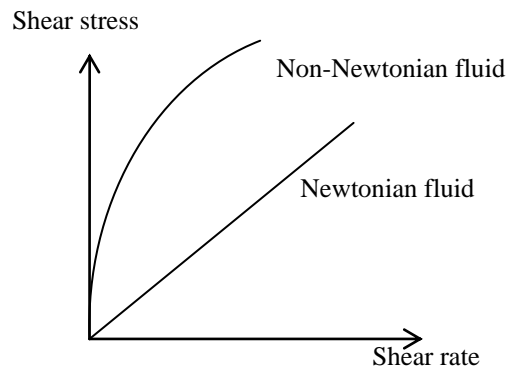
**Viscous Fluid :** Fluid in which friction (viscosity) has significant effect on the solution. The inclusion of the frictional forces in the fluid layers was lying on following observation.

When a sphere moves with uniform velocity in an ideal fluid at rest at infinity or fluid past through a sphere at rest, there was no drag observed on the sphere. This result was not simply a consequence of the symmetrical shape of the sphere, but a body of the arbitrary shape at rest in a uniform stream or moving uniformly through a fluid at rest experiences no force. The inability of an ideal fluid to produce a force in such circumstances is known as D'Alembert's Paradox. But in real situations this is not possible. Therefore,

ideal fluid theory does not explain adequately drag on the rigid body in the fluid. In this connection to explain the drag, the concept of viscous fluid theory was introduced by Prandtl (1904).

If fluid is located between two parallel plates, the ratio of the shear force  $F$  to the contact area between the liquid and the plate give rise to the *shear stress*.

ratio of the relative velocity of the top and bottom plate with the distance between the plate is called *shear rate*.



The viscosity of the fluid is defined as the ratio of the shear stress and shear rate. Thus the slope of the relation between shear-stress and shear-rate gives the viscosity ( $\eta$ ). If the plot between shear-stress and shear-rate is a straight line, the fluid is Newtonian, otherwise, it is non-Newtonian.

**Incompressible Fluid:** If density of the fluid under static condition undergo very little change despite the existence of large pressures. These fluids are invariably in the liquid state for such behaviour. For incompressible fluid it is assumed that during computation of such type of fluid, density is constant.

**Compressible Fluid:** A fluid is called compressible, if the pressure variation in the flow field are large enough to effect substantial change in the density of fluid.

**Newtonian Fluid :-** A fluid which obey Newton's law of viscosity i.e. A fluid for which shear force per unit area is proportional to the negative of the local velocity gradient.

$$\tau_{yx} = -\mu \frac{dv_x}{dy}$$

where

$\tau_{yx}$   $\rightarrow$  shear stress exerted in the x-direction

$\mu$   $\rightarrow$  viscosity

$v_x$   $\rightarrow$  velocity of the fluid along x-axis.

**(vi) Non-Newtonian Fluid:** Fluids, those doesn't obey Newton's law of viscosity are known as non-Newtonian fluid.

The power law is one way to describe the behaviour of Non-Newtonian fluids

$$\tau = k \left( \frac{dv}{dy} \right)^n$$

for  $n < 1$ , fluid is called 'pseudoplastic' and for  $n > 1$ , the fluid is called 'dilatant'.

**References:**

- [1] Bansal, J. L., 1994, "Magnetofluidynamics Jaipur Pub. House, Jaipur, India
- [2] Batchelor, G., 1967, "An introduction to fluid dynamics", Cambridge University Press.
- [3] Berger, S.A. and Jou, L. D., 2000, "Flows in stenotic vessels", Annual Review of Fluid Mechanics, **32**, 347-384.
- [4] Cowling, T. G. (1957) Magnetohydrodynamics, Interscience Publishers, New York.
- [5] Jeffrey, A., 1966, "Magnetohydrodynamics", Oliver and Boyd, London.
- [6] Moreau, R., 1990, "Magneto- hydrodynamics", Kluwer Academic Publishers, Dordrecht .
- [7] Vand, V., 1948, "Viscosity of solutions and suspensions", J. Phys. Colloid. Chem., **52**, 277-321.
- [8] Yuan, S.W., 1976, " Foundation of fluid mechanics", Prentice Hall of India Pvt., Ltd., New Delhi.
- [9] Young, D.F. ,1979, "Fluid mechanics of arterial stenoses", **101**, 157-175.
- [10] Zhao, T. S., Cheng, P., 1996 , "The Friction coefficient of laminar oscillatory flow in a circular pipe", Heat Fluid Flow, **17**, 167-172 .



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## Synthesis and Characterization of Silicon Cobalt mixed Nano Ferrites

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### Abstract-

Silicon Cobalt mixed oxide sample, with different compositions from 0.0 to 2.0 at 20<sup>0</sup>C, 40<sup>0</sup>C and 60<sup>0</sup>C cobalt wt% were synthesized using a modified Wet-Chemical and Sol-Gel method. Proposed composite materials which are based on transition metal nano particles expressed in surface area to volume matrix gives different properties as optical, adsorptive, magnetic and catalytic. This sample also dispersed in proposed gas sensor on catalyses for different reactions. The synthesis method in dispersion of metal oxide articles and generally on chemical properties of such systems. The wet chemical and sol-gel procedure for the advantage of synthesis condition which allow the surface chemical properties. In this work, we obtained the sample prepared by a modified sol-gel and wet chemical properties and their structure.

**Keywords:** Cobalt, Nickel nanoand mixed ferrites, magnetic properties, solvent

### Introduction-

Silicon Cobalt mixed oxide sample prepared with different compositions of 0.0 to 2.0 at 20<sup>0</sup>C, 40<sup>0</sup>C and 60<sup>0</sup>C cobalt wt% were synthesized using a modified Wet-Chemical and Sol-Gel method. The materials that characterised in order to correlate with structural and chemical properties to synthesize. TG/DTA measurements and X-ray diffraction XRD were used to follow the thermal evolution and the crystallization behaviour of the samples. The textural and red-ox properties were evaluated by N<sub>2</sub> adsorption, desorption isotherms and TPR measurements. Lewis's acidity and redox properties of cationic sites were studied by FTIR spectra of the exposed sample to NO. It was found that the nature of Cobalt oxide species and their interaction with silica matrix depends on the Cobalt content. No Cobalt

oxides were observed in 20<sup>0</sup>C sample while Co<sub>3</sub>O<sub>4</sub> was present as a segregated phase in the samples at higher Cobalt loading. TPR measurements strength of observations takes place unless 20<sup>0</sup>C sample 40<sup>0</sup>C and 60<sup>0</sup>C shows to TRP peaks in the range from Room Temperature to 300<sup>0</sup>C. The attribution of two-step reduction in Co<sub>3</sub>O<sub>4</sub> phase followed by a single at about 250<sup>0</sup>C that is the probably due to the reduction of Co species are more strongly bonded to silica. N<sub>2</sub> adsorption and desorption measurements indicate that the Co content affects the micropore and mesopore volumes. FTIR spectra recorded after NO adsorption at different temperature which show two-week acid Lewis sites due to Co<sub>2</sub> surface. Yet, the presence of NO weekly adsorb over Co<sub>3</sub> cannot be excluded.

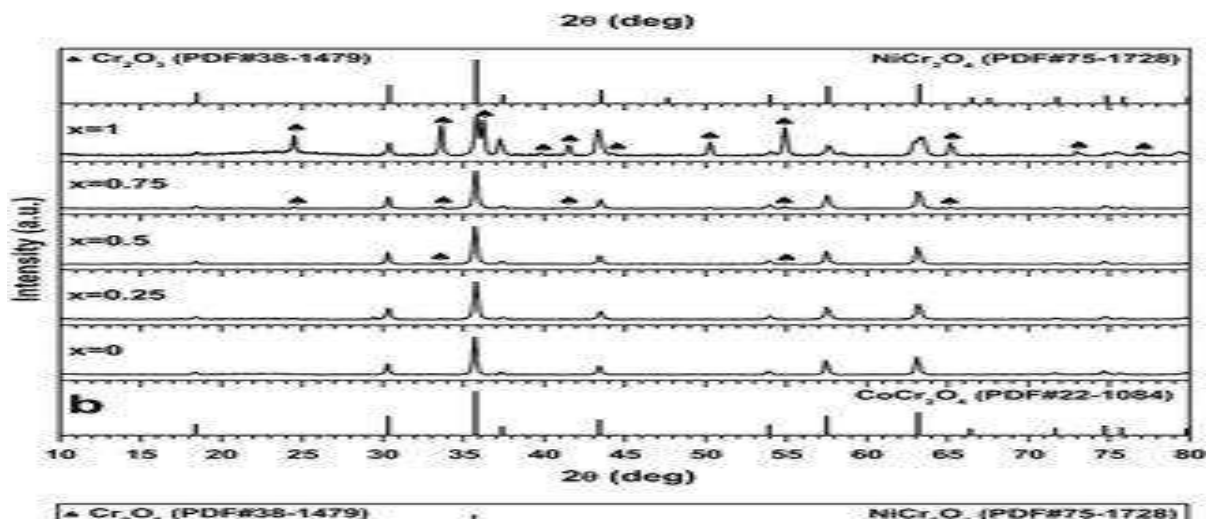
**Experimental Setup-** Cobalt oxide prepared by sol-gel and wet chemical method using cobalt nitrate hexa hydrate Co(NO<sub>3</sub>)<sub>2</sub>.6H<sub>2</sub>O and tetraethoxysilane TEOS as starting materials. Tetraethoxysilane (TEOS) sample hydrolysed for 2 hours at 100<sup>0</sup>C using nitric acid without alcoholic solvent. The ratio of all solvents such TEOS:H<sub>2</sub>O:HNO<sub>3</sub> are in 2:8:0.02 and this solution cooled at room temperature with a definite quantity of Co(NO<sub>3</sub>)<sub>2</sub>.6H<sub>2</sub>O which added slowly on magnetic stirrer. From this method three samples with 20<sup>0</sup>C, 40<sup>0</sup>C and 60<sup>0</sup>C cobalt wt% obtained. After 24 hours a transparent and pink gel were obtained in each composition. This obtained gel sample kept in room temperature for 72 hours. The obtained gels dried at 120<sup>0</sup>C in electric oven for 24 hours then obtained sample slowly heated upto 300<sup>0</sup>C. Thermogravimetric/differential TG/DTA carried out by using simultaneously thermos analyser STA at 210<sup>0</sup>C in Al<sub>2</sub>O<sub>3</sub> using reference materials. The obtained sample as dried gel found in the nature of Amorphous. The crystallizing phase obtained by XRD determination by diffractometer using monochromatic radiations at 0.75 and 2θ at 200<sup>0</sup>C N<sub>2</sub> adsorptions desorption obtained. The isotherms elaborated by α-plot and BET method using N<sub>2</sub> as silica reference. Cobalt oxides catalysts characterized using temperature programmed reduction (TPR) using 4% H<sub>2</sub>/Ar as reducing gas. During this process the consumption of H<sub>2</sub>O was measured by TCD at room temperature to 300<sup>0</sup>C. The prepared catalyst sample of weight 200mg and temperature range 20<sup>0</sup>C /min from FTIR spectra.

## **Result and Discussion-**

The prepared sample characterized by XRD and FTIR methods. The prepared sample gel hydrolysis slowly aqueous acid environment according to modified Sol-Gel and Wet Chemical method. According to the process of prepared wet gel sample was formed by Siloxane network with cobalt species trapped. This process takes place until pinkish colour of all wet gels by all studied compositions exhibits for 24 hours. Thus, the prepared sample selected on the basis of the result of thermal analysis.

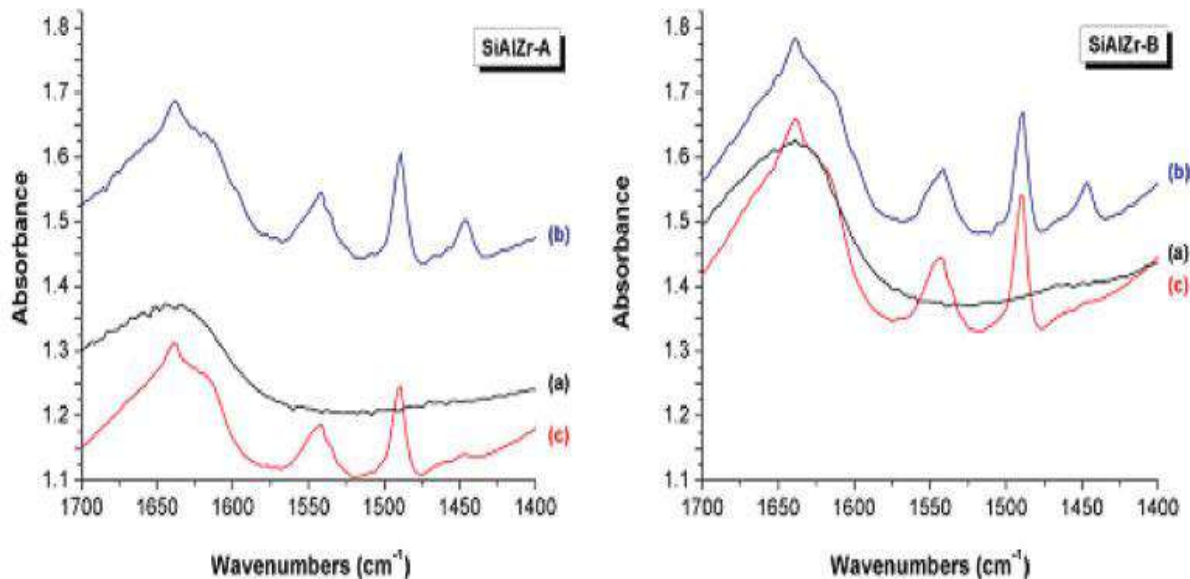


**XRD Studies**-In this result the TG curves shows 36wt% for 20<sup>0</sup>C, 39wt% for 40<sup>0</sup>C and 48wt% for 60<sup>0</sup>C. The wt% loss in each case obtained at room temperature to 200<sup>0</sup>C. In this range the evaporation of solvents, subsequent and residual organic molecules are overlapped the decomposition of Co(NO<sub>3</sub>)<sub>2</sub>.H<sub>2</sub>O upto 230. The XRD pattern for this given range of 15, 25 and 35<sup>0</sup>C samples which heated upto 300<sup>0</sup>C shows in figure. As 20<sup>0</sup>C was keeps as amorphous nature. The crystallization of mixed sample of cobalt oxides Co<sub>3</sub>O<sub>4</sub> annealing at 300<sup>0</sup>C. For the formation of Co<sub>2</sub>SiO<sub>4</sub> crystallites in all three samples. These results shows that the prepared gel composition and calcination plays an important role to find out the nature of cobalt and interacts with silica matrix.



**Figure**-XRD pattern of prepared gel sample from room temperature to 300<sup>0</sup>C as Co<sub>2</sub>SiO<sub>4</sub>

**FTIR Studies**-The catalysts of prepared sample characterized from room temperature to 300<sup>0</sup>C as the maximum temperature at which it is found that the catalysts reduced at 300<sup>0</sup>C as the maximum temperature. The interaction of NO with Co<sub>3</sub>O<sub>4</sub> is very complex and gives different species at different temperature. Below 300<sup>0</sup>C the transformation characteristic of prepared sample molecularly adsorbed NO bands found in the range of 1700 to 1400cm<sup>-1</sup>.



**Figure 2-**FTIR spectra of adsorbed NO and NO<sub>2</sub> as 20<sup>0</sup>C at Room Temperature to 300<sup>0</sup>C as max temperature

Diatomic molecule shows stronger in Infra-Red spectra at single band of 1620cm<sup>-1</sup>. The weaker band is shifted of the NO stretching band of adsorbed nitrogen monoxide characteristics. It is found that a band probably coupled observed above 1700 cm<sup>-1</sup>. On increasing the temperature coupled band disappear. In the particular region below 1700cm<sup>-1</sup> the complex absorption in the range 1700to 1400 cm<sup>-1</sup> is due at different forms of nitrate also NO<sub>2</sub>cannot be excluded. The prepared sample produced NO oxidation. The adsorption of NO at different temperature gives rise to very uniform and similar spectra. The overall difference causes the reduced transparency of the prepared sample and resolution of spectra. However, all the band at different ranges observed over 20<sup>0</sup>C are detectable. So, the small change in similar intensities of same band can be detected.

## Conclusion-

In conclusion, the x-ray diffraction patterns of all the samples confirm that single phase cubic spinal structure. By Sol-Gel method the cobalt ferrites displays much better result of degree of crystallinity than the Co-NO ferrites shows that these ferrites are slightly amorphous in nature. The prepared sample obtained by ball milling of Co-NO in HNO<sub>3</sub> ferrite samples experience smaller intensities and higher line broadening due to surface disorder introduced during Ball Milling and Sol-Gel method. The average particle size of prepared sample was discussed in XRD patterns and observed the range of the size of prepared sample from 20-84nm. This samples were resulting in lightly magnetisation and coercivity as the temperature varies from 100 to 300<sup>0</sup>C. It was also observed that the Particle size and inversion parameters attributed at lower temperature. The FTIR spectra of prepared

sample found deduced such as resonance field and line width are in accordance with the particle size and magnetisation data of different systems. Further the measurements are underway to complement the particle size as well as superparamagnetic nature which could help us to understand the system easily.

**Acknowledgements-** I thankful to all my IIT and University friends to carry out the characterization of this research work.

### **References-**

1. Van de Loosdrecht, J.A.M Van der Kraan, M.Van der Haar, A,J.VanDillen, J.wGeus, Appl. Catal, A. Gen 150, 365(1997)
2. Aromne A., M.Turco G, Bagnasco, P. Pernice, M. Di Serio, N.J Clayden, E. Backman, L.B. A. Rautianen, Chem. Mater, 17, 208 (2005)
3. GOYA, G.F. and Rechenberg, H.R, J of Applied physics 84: 1101-1108(1998)
4. Mays, C.W., Surf .Sci. 12:134(1968)
5. Jozwiak, W.K., E.Szubiakiewicz, J. Goralski, A.Klonkowski, T.Paryjczak, Kinetics and Catalysis, 45,247 (2004)
6. Chandrasekaran G and NimySebastain P. Materials Letters 37:17-20(1998)
7. Dutta P, N.O Elbashir, A.Manivannan, M.S Sheera, C.B.Roberts, Catal Lett, 98,203 (2004)
8. Qi, W.H.,Wang M.P.,J. Mater. Sci. Lett. 21: 877(2002)
9. Baekman, L.B., A.Rautianen, M.Lindblad, O.Jylha, A.O.I, Krause, Appl. Catal, A.General,208,223 (2001)
10. Gregg, S.J, K.S.W, Sing, Adsorption, Surface Area and Porosity, Academic Press London (1967)
11. Sharma M.P.and DOLIA S.N.Indian J. Pure & app. Phy 44:774-776(2006)
12. Koshizak.N, K.Yasumoto, T.Sasaki, Sens. Actuators B66 122, Li J.L., N.J. Coville,2001, Appl. Catal, A.Gen 208,177 (2000)
13. Pradeep, a, and Thangasamy , C., J. of material science &electronics 15:797-802(2004)
14. Manish Shrivastava J. of Alloys and Compounds 481:515-519(2009).



## MHD FLOW OF VISCOUS FLUID THROUGH A CIRCULAR TUBE FILLED WITH A MEDIUM OF VARYING PERMEABILITY

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### Abstract : -

The flow of a viscous incompressible electrically conducting fluid in a circular tube filled with a medium of variable permeability has been considered. The permeability of the porous medium is exponentially decreasing in the radial direction. A transverse static magnetic field is applied and problem has been modeled with Brinkman Model. The modeled problem has been attempted to solved by Adomian Decomposition method. The effect of various parameters on wall shear stress, volume rate of flow and resistivity to flow has been computed and presented through the graphs.

Keywords: Magneto hydrodynamics, porous medium, Adomian Decomposition.

**Introduction :-** Song and Wang (2013) dealt that in this examination, we present a latest advanced Adomian decomposition procedure, that establishes a confluence- restraint parameter into the Adomian decomposition procedure and introduces a latest insistent method. It shows that the proposed procedure is authentic, valid, simple to execute from a mathematical stance. It can be engaged to acquire profitably systematic indefinite solution of fractional differential equation. Prasad and Kumar (2011) considered that through a porous medium, an analytical solution of the flow of a hydromagnetic fluid between permeable beds is acquired and analyzed. It is observed that the fluid is under an exponential decaying pressure gradient and the stable magnetic field in a direction normal to the flow saturated porous medium .

Eldesoky (2012) analyzed that unsteady pulsatile flow of blood through porous medium in an artery under the impact of periodic body acceleration and slip condition. With the Laplace transform, mathematical solution of the equation of motion is acquired. The mathematical definite expressions of axial velocity, wall shear stress and fluid acceleration are given.

Herzallah and Gepreel (2012) dealt that in this study we operate the adomian decomposition procedure, by establishing the fractional derivatives in the sight of Laputo, to build the indefinite solutions for the cubic non linear fractional Schordinger equation with time and space fractional derivatives. Tanveer (2016) considering blood as a couple stress, fluid, the mathematical model for steady flow of blood through a porous medium in a rigid circular tube under the influence of periodic body acceleration and magnetic field is studied. An exact solution in the Bessel's Fourier series form by the finite Hankel transform techniques, the physiological parameters that affect human body such as axial velocity shear stress and the flow rate have been computed analytically Velocity of blood decreases with increase in magnetic field, whereas increases with increase in permeability of the porous media and body acceleration. So graphically effects of shear stress and other parameters are shown.

**Formulation of the problem:** Let us consider a steady, viscous, axially symmetric, incompressible fluid in a circular tube of radius  $R$ . A static transverse magnetic field of uniform strength has been applied. Considering cylindrical polar co-ordinates  $(r, \theta, z)$ , where  $z$ -axis coincide with the axis of tube, then Brinkman momentum equation and boundary conditions are:

$$\mu_{eff} \left( \frac{d^2 u'}{dr^2} H + \frac{1}{r} \frac{du'}{dr} \right) - \frac{\mu}{K} u' + J - \sigma B_0^2 u' = 0 \quad \dots(1)$$

$$r=R : u' = 0 \quad (\text{no slip condition}) \quad \dots(2)$$

$$r=0 : \frac{\partial u'}{\partial r} = 0 \quad (\text{symmetry condition}) \quad \dots(3)$$

where  $u'$ ,  $\mu$  and  $\sigma$  are the axial velocity, viscosity and magnetic conductivity of the fluid,  $K$  the permeability of the porous medium,  $B_0$  the **electromagnetic induction**,  $J = -\frac{\partial p}{\partial z}$  the constant pressure gradient,  $\mu_{eff}$  the effective viscosity.

Introducing following non dimensional parameters

$$r^* = \frac{r}{R}, \quad u^* = \frac{u'}{\left( \frac{JR^2}{\mu} \right)}, \quad \tau^* = \frac{\tau}{JR}, \quad Q^* = \frac{Q}{\left( \frac{R^4 J}{\mu} \right)}, \quad \lambda^* = \frac{\lambda}{\left( \frac{\mu}{KR^2} \right)},$$

$$M = \frac{\mu_{eff}}{\mu}, \quad Da^2 = \frac{K}{R^2}, \quad H^2 = \frac{R^2 \sigma B_0^2}{\mu}, \quad s = \frac{1}{Da}$$

... (4)

**Case-I: Constant permeability (K=constant)**

The equation of motion in dimensionless form is defined by

$$\frac{d^2u}{dr^2} + \frac{1}{r} \frac{du}{dr} - \left( \frac{s^2 + H^2}{M} \right) u = -\frac{1}{M} \quad \dots (5)$$

The corresponding boundary conditions are

$$r=1 : u' = 0$$

...(6)

$$r=0 : \frac{\partial u'}{\partial r} = 0$$

...(7)

**Method of solution :**

Employing Adomian Decomposition Method, the equation (5) reduced to

$$L_n u = -\frac{1}{M} - \frac{1}{r} \frac{du_n}{dr} + \left( \frac{s^2 + H^2}{M} \right) u_n \quad \dots(8)$$

$$L_n^{-1} = \int_0^r \int_0^r (\cdot) dr^2 \quad \dots(9)$$

Applying  $L_n^{-1}$  to both sides of the equation (8) and using the boundary condition (7), we obtain

$$u(r) = A - \frac{1}{M} \frac{r^2}{2!} - L_n^{-1} \left( \frac{1}{r} \frac{du_n}{dr} \right) + \left( \frac{s^2 + H^2}{M} \right) L_n^{-1} (u_n) \quad \dots(10)$$

where  $A=u(0)$  is to be determined from the boundary condition (6). As usual in Adomian Decomposition Method ,the solution of the equation (10) is approximated as an infinite series

$$u(r) = \sum_{i=0}^{\infty} u_i \quad \dots (11)$$

thus, we can write equation(10) as

$$u = u_0 + u_{n+1}$$

where

$$u_0 = A - \frac{1}{M} \frac{r^2}{2!} \quad \dots(12)$$



$$u_{n+1} = -L_n^{-1} \left( \frac{1}{r} \frac{du_n}{dr} \right) + \left( \frac{s^2 + H^2}{M} \right) L_n^{-1}(u_n) \quad \dots(13)$$

thus

$$u(r) = 2A \left\{ \begin{aligned} & \left[ \frac{1}{2} - \frac{r^2}{2!} + \left( \frac{10}{27} N^2 + \frac{10}{18} N^4 \right) \frac{r^4}{4!} - \left( \frac{548}{450} N^4 + \frac{16}{60} N^6 \right) \frac{r^6}{6!} \right] \\ & + \left( \frac{71}{105} N^6 + \frac{1}{2} N^8 \right) \frac{r^8}{8!} - N^8 \frac{r^{10}}{10!} \end{aligned} \right\} + O(r^{11}) \quad \dots(14)$$

where  $N^2 = \left( \frac{s^2 + H^2}{M} \right)$

**Case-II : Variable permeability defined by**

$$K = K_0 \exp(-ar) \quad \dots(15)$$

The equation of motion (1) reduces into

$$\mu_{eff} \left( \frac{d^2 u}{dr^2} + \frac{1}{r} \frac{du}{dr} \right) - \frac{\mu}{K_0 \exp(-ar)} u + J - \alpha B_0 u = 0 \quad \dots(16)$$

Invoking following dimensionless parameters

$$\frac{K_0}{R^2} = Da, \quad \alpha = aR, \quad A_1 = \frac{1}{MDa^2}, \quad A_2 = \frac{H^2}{M}, \quad A_1 + A_2 = N^2 \quad \dots(17)$$

alongwith the dimensionless parameters defined in (4), the equation (16) reduces to

$$\frac{d^2 u^*}{dr^{*2}} + \frac{1}{r^*} \frac{du^*}{dr^*} - A_1 \exp(\alpha r) u^* + \frac{1}{M} - A_2 u^* = 0 \quad \dots(18)$$

for the sake of brevity, asterisks are dropped immediately

$$\frac{d^2 u}{dr^2} + \frac{1}{r} \frac{du}{dr} - A_1 \exp(\alpha r) u + \frac{1}{M} - A_2 u = 0 \quad \dots(19)$$

Using Adomian Decomposition Method the solution of the equation (19) is obtained and given by

$$u(r) = u_0 + u_{n+1}$$

$$u(r) = 2A \left\{ \begin{aligned} & \frac{1}{2} - \frac{r^2}{2!} + \frac{1}{4} \alpha A_1 \frac{r^3}{3!} + \left( \frac{1}{3} \alpha^2 A_1 + \frac{1}{3} N^2 + \frac{1}{2} N^4 \right) \frac{r^4}{4!} \\ & + \left( -\frac{\alpha^3 A_1}{8} + 2\alpha A_1 A_2 + \frac{15}{4} \alpha A_1 + 2\alpha A_1^2 \right) \frac{r^5}{5!} \\ & + \left( -\frac{\alpha^4 A_1}{10} + \frac{36}{5} \alpha^2 A_1 + \frac{11}{2} \alpha^2 A_1^2 - N^4 + \frac{7}{2} \alpha^2 A_1 A_2 \right) \frac{r^6}{6!} + \dots \end{aligned} \right\} \dots(20)$$

where

$$u_0 = 2A \left( \frac{1}{2} - \frac{r^2}{2!} \right)$$

**Wall Shear Stress** : The dimensionless wall shear stress is defined by

$$\tau^* = \frac{-\mu \left( \frac{\partial u}{\partial r} \right)_{r=R}}{JR} = - \left( \frac{\partial u^*}{\partial r} \right)_{r=1} \dots(24)$$

**Volume rate of flow**: The dimensionless volume rate of flow Q is defined by

$$Q^* = 2\pi \int_0^1 r^* u^* dr^* \dots(25)$$

**Resistivity of flow**: The Resistivity of the flow is given by

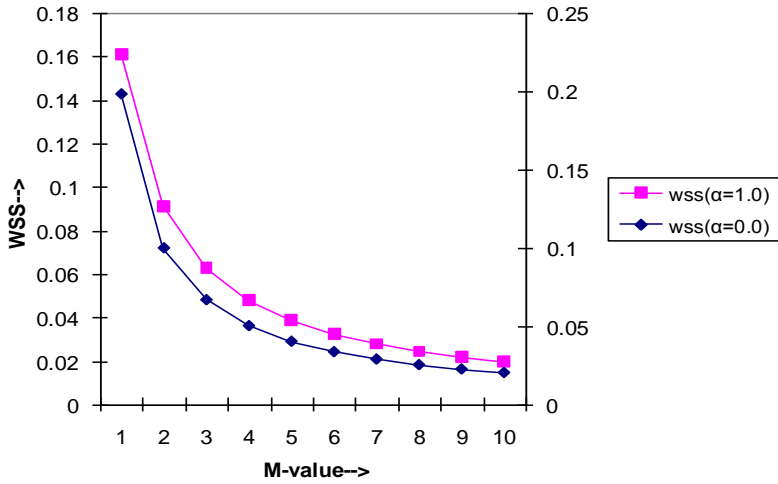
$$\lambda = \frac{\nabla p}{Q} = - \frac{\mu u}{KQ}$$

The dimensionless form is defined by

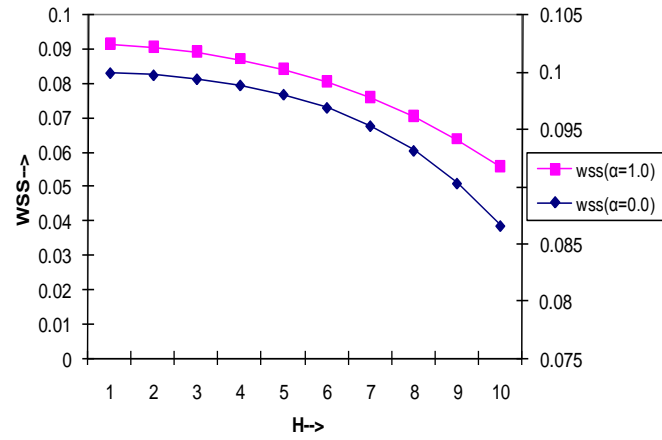
$$\lambda^* = - \frac{u^*}{Q^*} \dots(26)$$

**Result:**

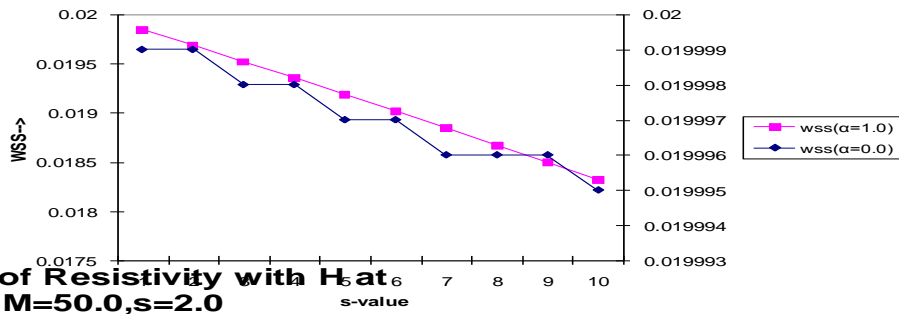
**Variation of WSS with M at H=1.0,s=2.0**



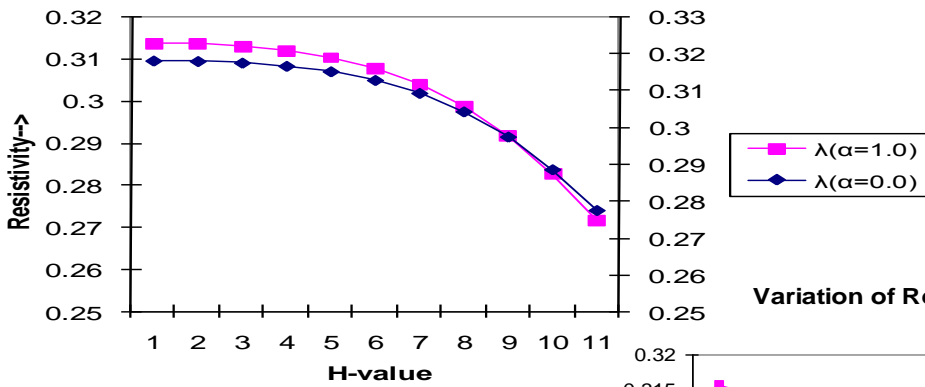
**Variation of WSS with H at M=50.0,s=2.0**



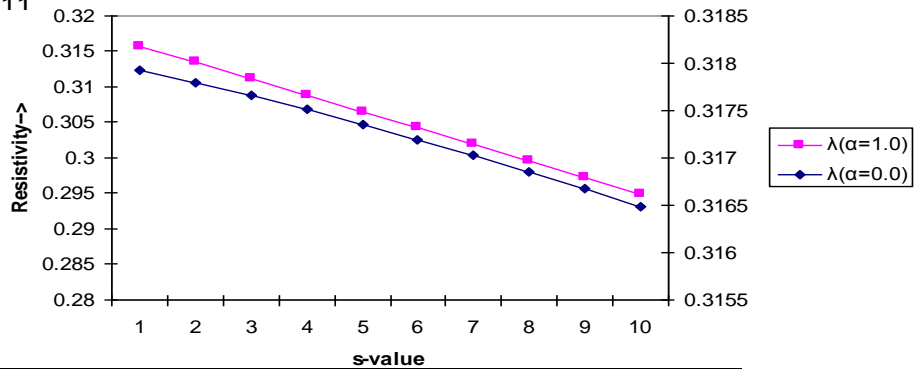
**Variation of WSS with s at H=1.0,M=50.0**



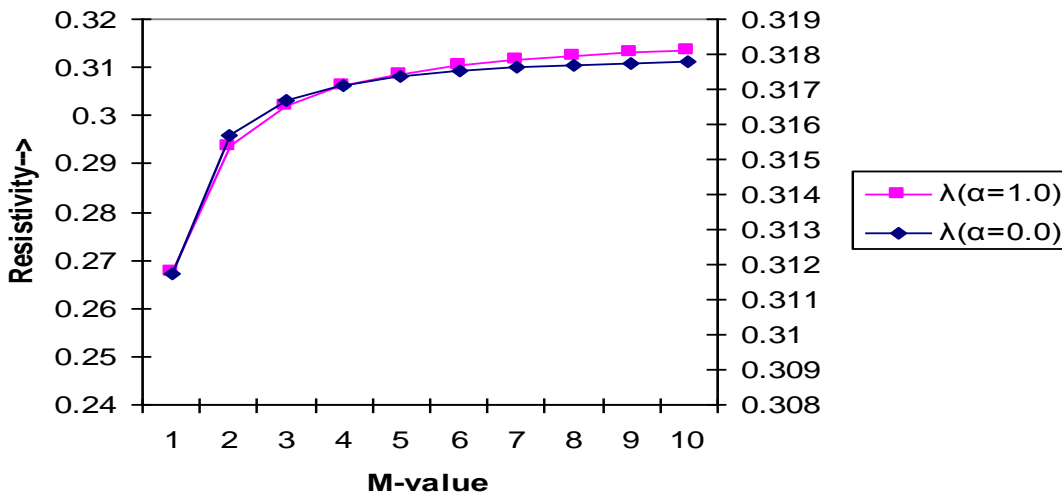
**Variation of Resistivity with H at M=50.0,s=2.0**



**Variation of Resistivity with s at M=50.0,H=1.0**



### Variation of Resistivity with M at s=2.0,H=1.0



Hence there is a significant effect of non dimensional parameters on hemodynamic parameters.

#### References:

- A. Kechil, I. Hasim, Non perturbative solution of free-convective boundary layer equation by Adomian Decomposition method, *Physics Letters, A*, 363, 110-114 (2007).
- R.S Agarwal, K.G, Upmanyu, Laminar free convection flow with and without Heat sources in a circular pipe, *Bull. Cal. Math. Soc.* 68, 285-292 (1976)
- E. Amos, A.Ogulu, Magnetic effect on pulsatile flow in a constricted axis-symmetric tube. *Ind. J. pure appl. Math*, 34(9), 1315-1326 (2003).
- G. K Batchelor, *An Introduction to Fluid Dynamics*, Cambridge University Press 1967.
- J. Biazar, E Babolian., A Nouri., R Islam., An alternate algorithm for computing adomain decomposition method in special cases, *Appl. Math.Comput*, 38/2-3, 523-529, (2003).
- H.W Cho, J.M Hyun., Numerical solution of pulsating flow and heat transfer characteristics in a pipe, *Int. J.Heat Fluid flow* 11(4), 321-330 (1990).
- G. Adomian, *Solving Frontier Problems of Physics: The Decomposition Method*, Kluwer Academic, Boston, 1994.

- K Hoonam, M Gorji- Bandpy, Effects of viscous dissipation of thermally developing forced convection in a porous medium; parallel plate channel or circular tube with walls at constant temperature. Iranian J.Sci Tech. Submitted(2002)
- K. Hoonam., A.A Ranjbar-Kani, A perturbation based analysis to investigate forced convection in a porous saturated tube. J. Comp. App. Math 162(2), 411-419 (2004).
- K Hoonam., A.A Ranjbar-Kani, Viscous dissipation effects on thermally developing forced convection in a porous medium; circular duct with isothermal wall. Int. comm.. heat mass transfer, Vol 31(6), 897-907 (2004)
- D.A Nield, A Bejan., Convection in Porous Media; 2<sup>nd</sup> ed. Springer – Verlag, New-York 1999
- P.R.Sharma and Harish Kumar, On the steady flow and heat transfer of a viscous incompressible non-Newtonian fluid through uniform circular pipe with small suction, Proc. Nat. Acad. Sci. , India, Vol.65 A, 75-88, (1995)
- P.R.Sharma and Harish Kumar, On the unsteady velocity and temperature distributions of visco-elastic fluid through a circular pipe (Co-author - Harish Kumar). Bull. Pure Applied Sciences, India. Vol. 17E, No. 1, 219-226, (1998)
- M Quintard., S Whitaker, Transp. Porous Media 14, 163 ,(1994)
- R.Moreau, Magnetohydrodynamics, Kluwer Academic Publishers, Dordrecht 1990
- J. A Shercliff, The flow of conducting fluids in circular pipes under transverse magnetic field J. fluid Mech. Vol (66), 644-666,(1956)
- T.S Zhao., P Cheng. The friction coefficient of laminar oscillatory flow in a circular pipe. Int. J. Heat Fluid flow 17,167-172 (1996).
- Song, L. and Wang, W., 2013, "A new improved Adomian decomposition method and its application to fractional differential equations", Applied Mathematical Modelling, 37(3): 1590-1598.

## Influence of Slip condition on MHD Flow through Channel

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### Introduction

In dealing with fluid flow over solid surfaces it is well accepted that the relative velocity of the fluid and the surface is zero, i.e. no-slip condition is satisfied. But, at the microscopic level when the surface is moving, it is assumed that there is a possibility of fluid slip at a solid boundary. The possibility of this fact was incorporated by the Navier in the general boundary condition. In the general boundary condition proposed by Navier it was assumed that velocity,  $v_x$  at the solid surface is proportional to the shear stress at the surface.  $v_x = \gamma(dv_x/dy)$ , where  $\gamma$  is the slip strength. The fluid slippage phenomenon at the solid boundaries appear in many applications in microchannels and in thin film formation of light oil attached to the moving plates.

Murdoch and Soliman (1999) have studied the effects of Slip-Boundary Condition for Liquid Flow over Planar Porous Boundaries. Rao and Rajagopal (1999) have investigated the consequences of slip at the wall on the flow of a linearly viscous fluid in a channel. The flow of a linearly viscous fluid when the slip depends on both the shear stress and the normal stress has been considered. In this studies it was comes out that in regions where the slip velocity depends strongly on the normal stress, the flow field in a channel is not fully developed and rectilinear flow is not possible. Massoudi and Phuoc (2000) have discussed the effect of slip boundary condition on the flow of granular materials with continuum approach. Spille, et al., (2001) has Investigated the linear stability of plane Poiseuille flow in 2D under slip boundary conditions. They found that, the critical Reynolds number depends smoothly on  $s$  but increases quite rapidly. Sami A. AlSanea (2003), convection regimes and heat transfer characteristics along a continuously moving heated vertical plate. Makinde and Mhone(2005) have investigated the combined effect of transverse magnetic field and radiative heat transfer to unsteady flow of through a channel filled with saturated porous medium. Makinde O.D., Osalusi E. (2006), MHD steady flow in a channel with slip at the permeable boundaries.

The present chapter, is following the paper of Mankinde to investigated the combined effect of transverse magnetic and variable permeability of the medium on unsteady flow of through a channel

### Formulation of the problem

Let us consider the electrically conducting fluid in a channel filled with saturated porous medium. Fluid considered is an incompressible and viscous. A uniform magnetic field of strength  $B_0$  is applied to the transverse direction. The upper plate is moving with mean velocity  $U$ . and heated at constant temperature. Radiation effect is also taken into account.

Then the dimensionless governing equations together with the suitable boundary conditions are given by



$$\operatorname{Re}\left[\frac{\partial u}{\partial t}(1 + \epsilon e^{i\omega t})\right] = -(1 + \epsilon e^{i\omega t})\frac{\partial P}{\partial x} + (1 + \epsilon e^{i\omega t})\frac{\partial^2 u}{\partial y^2} - s^2 u - H^2 u(1 + \epsilon e^{i\omega t}) + Gr\theta(1 + \epsilon e^{i\omega t})$$

and

$$Pe \frac{\partial \theta}{\partial t} = \frac{\partial^2 \theta}{\partial y^2} + N^2 \theta$$

with the boundary conditions

$$y = 1: u = 1 + \epsilon e^{i\omega t}, \theta = 1$$

$$y = 0: u - \gamma \frac{\partial u}{\partial y} = 0, \theta = 0$$

where  $\gamma$  is the slip strength or slip coefficient.

## Method of Solution

The governing equation of motion is nonlinear coupled partial differential equation.

Let

$$-\frac{\partial P}{\partial x} = \lambda(1 + \epsilon e^{i\omega t})$$

$$u(y, t) = u_0(y) + \epsilon u_1(y)e^{i\omega t}$$

and

$$\theta(y, t) = \theta_0(y) + \epsilon \theta_1(y)e^{i\omega t}$$

where,  $\lambda$  is a constant,  $\omega$  is frequency of the oscillation. Then

zero-order equations

$$\frac{d^2 u_0}{dy^2} - (s^2 + H^2)u_0 = -\lambda - Gr\theta_0$$

$$\frac{d^2 \theta_0}{dy^2} + N^2 \theta_0 = 0$$

First-order equations

$$\frac{d^2 u_1}{dy^2} - (s^2 + H^2 - \operatorname{Re}\{i\omega\})u_1 = -2\lambda - \frac{d^2 u_0}{dy^2} + H^2 u_0 - Gr\theta_0 - Gr\theta_1$$

$$\frac{d^2 \theta_1}{dy^2} + (N^2 - \operatorname{Pe}\{i\omega\})\theta_1 = 0$$

## Second-order equations

$$\frac{d^2 u_1}{dy^2} - (H^2 + \text{Re}(i\omega))u_1 = -\lambda - \text{Gr}\theta_1$$

The corresponding boundary conditions are :

$$y = 0: u_0 - \gamma \frac{du_0}{dy} = 0 = u_1 - \gamma \frac{du_1}{dy}, \theta_0 = 0 = \theta_1$$

$$y = 1: u_0 = 1, u_1 = 1, \theta_0 = 1, \theta_1 = 0$$

The solution of is  $\theta_0(y)$  is

$$\theta_0(y) = \frac{1}{\sin N} \sin Ny$$

Similarly,

$$\theta_1(y) = 0$$

Now, we solve equation

$$\frac{d^2 u_0}{dy^2} - (s^2 + H^2)u_0 = -\lambda - \text{Gr}\theta_0$$

Which can be written as

$$\frac{d^2 u_0}{dy^2} - (s^2 + H^2)u_0 = -\lambda - \frac{\sin Ny}{\sin N} \text{Gr}$$

or

$$\frac{d^2 u_0}{dy^2} - B_2^2 u_0 = -\lambda - \frac{\sin Ny}{\sin N} \text{Gr}$$

where

$$B_2 = \sqrt{s^2 + H^2}$$

The complementary function is given by

$$C. F = c_5 \cosh B_2 y + c_6 \sinh B_2 y$$

and particular integral is

$$\begin{aligned}
 \text{P.I} &= \frac{1}{m^2 - B_2^2} \left( -\lambda - \frac{\sin Ny}{\sin N} \text{Gr} \right) \\
 &= \frac{1}{m^2 - B_2^2} (-\lambda) + \frac{1}{m^2 - B_2^2} \left( \frac{-\sin Ny}{\sin N} \text{Gr} \right) \\
 &= \frac{1}{B_2^2} \lambda + \frac{1}{N^2 + B_2^2} \frac{\sin Ny}{\sin N} \text{Gr}
 \end{aligned}$$

The solution for  $u_0(y)$  is given by

$$\begin{aligned}
 u_0(y) &= \text{C.F} + \text{P.I} \\
 &= c_5 \cosh B_2 y + c_6 \sinh B_2 y + \frac{1}{B_2^2} \lambda + \frac{1}{N^2 + B_2^2} \frac{\sin Ny}{\sin N} \text{Gr}
 \end{aligned}$$

To invoke prescribed boundary conditions:

$$\begin{aligned}
 y = 0: & \quad u_0 - \gamma \frac{du_0}{dy} = 0 \\
 y = 1: & \quad u_0 = 1
 \end{aligned}$$

we first find  $u_0 - \gamma \frac{du_0}{dy}$

From the equation

$$\frac{du_0}{dy} = c_5 \sinh B_2 y + c_6 B_2 \cosh B_2 y + \frac{1}{N^2 + B_2^2} \frac{\cos Ny}{\sin N} \text{Gr} N$$

$$\therefore u_0 - \gamma \frac{du_0}{dy} = c_5 (\cosh B_2 y - \gamma B_2 \sinh B_2 y)$$

$$\begin{aligned}
 &+ c_6 [\sinh B_2 y - \gamma B_2 \cosh B_2 y] \\
 &+ \frac{1}{B_2^2} \lambda + \frac{1}{N^2 + B_2^2} \frac{\text{Gr}}{\sin N} (\sin Ny - \gamma N \cos Ny)
 \end{aligned}$$

Putting in the equation, we have

$$\begin{aligned}
 c_5 &= \frac{\gamma B_2}{\gamma B_2 \cosh B_2 + \sinh B_2} \left[ + \left( \frac{1}{B_2^2} \lambda - \frac{\gamma N \text{Gr}}{N^2 + B_2^2} \cdot \frac{1}{\sin N} \right) \cosh B_2 \right. \\
 &\quad \left. - \frac{1}{B_2^2} \lambda - \frac{1}{N^2 + B_2^2} \text{Gr} \right] - \frac{1}{B_2^2} \lambda \\
 &\quad + \frac{\gamma N}{N^2 + B_2^2} \text{Gr} \frac{1}{\sin N} \\
 c_6 &= \frac{1}{\gamma B_2 \cosh B_2 + \sinh B_2} \left[ 1 + \left( \frac{1}{B_2^2} \lambda - \frac{\gamma N \text{Gr}}{N^2 + B_2^2} \frac{1}{\sin N} \right) \cosh B_2 \right. \\
 &\quad \left. - \frac{1}{B_2^2} \lambda - \frac{1}{N^2 + B_2^2} \text{Gr} \right]
 \end{aligned}$$

Finally, the expression for mean flow velocity profile under the prescribed boundary is obtained and given by

$$\begin{aligned}
u_0(y) &= \left\{ \frac{\gamma B_2}{\gamma B_2 \cosh B_2 + \sinh B_2} \left[ 1 + \left( \frac{1}{B_2^2} \lambda - \frac{\gamma N Gr}{N^2 + B_2^2} \cdot \frac{1}{\sin N} \right) \cosh B_2 \right. \right. \\
&\quad \left. \left. - \frac{1}{B_2^2} \lambda - \frac{1}{N^2 + B_2^2} Gr \right] \frac{1}{B_2^2} \lambda \right. \\
&\quad \left. + \frac{\gamma N Gr}{N^2 + B_2^2} \frac{1}{\sin N} \right\} \cosh B_2 y \\
&+ \left[ 1 + \left( \frac{1}{\gamma B_2 \cosh B_2 + \sinh B_2} \lambda - \frac{\gamma N Gr}{N^2 + B_2^2} \cdot \frac{1}{\sin N} \right) \cosh B_2 \right. \\
&\quad \left. - \frac{1}{B_2^2} \lambda - \frac{1}{N^2 + B_2^2} Gr \right] \sinh B_2 y \\
&\quad + \frac{1}{B_2^2} \lambda + \frac{1}{N^2 + B_2^2} \frac{\sin Ny}{\sin N} Gr \\
&= B_9 \cosh B_2 y + B_{11} \sinh B_2 y + B_4 + B_{12}
\end{aligned}$$

where

$$B_3 = \frac{\gamma B_2}{\gamma B_2 \cosh B_2 + \sinh B_2}$$

$$B_4 = \frac{\lambda}{B_2^2}$$

$$B_5 = \frac{\gamma N Gr}{N^2 + B_2^2} \cdot \frac{1}{\sin N}$$

$$B_6 = \frac{1}{N^2 + B_2^2} Gr$$

$$B_7 = 1 + (B_4 - B_5) \cosh B_2$$

$$B_8 = B_3 (B_7 - B_4 - B_6)$$

$$B_9 = B_8 - B_4 + B_5$$

$$B_{10} = \frac{1}{\gamma B_2 \cosh B_2 + \sinh B_2}$$

$$B_{11} = B_{10} \cdot \frac{B_8}{B_3}$$

$$B_{12} = \frac{1}{N^2 + B_2^2} \frac{Gr}{\sin N}$$

Now consider the equation

$$\frac{d^2 u_1}{dy^2} - (H^2 + \text{Re}(\omega)) u_1 = -\lambda - \text{Gr} \theta_1$$

or

$$\frac{d^2 u_1}{dy^2} - B_{13}^2 c_{11} = -\lambda - \text{Gr} \theta_1$$

where

$$B_{13} = \sqrt{H^2 + \text{Re}(\omega)}$$

This can be rewritten as

$$\frac{d^2 u_1}{dy^2} - B_{13}^2 u_1 = -\lambda$$

For the solution of this equation

$$C.F = c_7 \cosh B_{13} y + c_8 \sinh B_{13} y$$

$$\begin{aligned} \text{P.I} &= \frac{1}{m^2 - B_{13}^2} (-\lambda) \\ &= \frac{1}{B_{13}^2} \lambda \end{aligned}$$

Hence, the solution of  $u_1(y)$  is given by

$$\begin{aligned} u_1(y) &= C.F + P.I \\ &= c_7 \cosh B_{13} y + c_8 \sinh B_{13} y + \frac{1}{B_{13}^2} \lambda \end{aligned}$$

To invoke prescribed boundary conditions:

$$\begin{aligned} y = 0: \quad u_1 - \gamma \frac{du_1}{dy} &= 0, \\ y = 1: \quad u_1 &= 1 \end{aligned}$$

we first find  $u_1 - \gamma \frac{du_1}{dy}$ .

From the equation

$$\frac{du_1}{dy} = c_7 B_{13} \sinh B_{13} y + c_8 B_{13} \cosh B_{13} y$$

$$\begin{aligned} \therefore u_1 - \gamma \frac{du_1}{dy} &= c_7 [\cosh B_{13} y - \gamma B_{13} \sinh B_{13} y] \\ &\quad + c_8 [\sinh B_{13} y - \gamma B_{13} \cosh B_{13} y] + \frac{1}{B_{13}^2} \lambda. \end{aligned}$$

Putting in the equation, we have

$$c_7 = \frac{\gamma B_{13}}{\gamma B_{13} \cosh B_{13} + \sinh B_{13}} \left[ 1 + \frac{\cosh B_{13}}{B_{13}^2} \lambda - \frac{1}{B_{13}^2} \lambda \right]$$

and

$$c_8 = \frac{1}{\gamma B_{13} \cosh B_{13} + \sinh B_{13}} \left[ 1 + \frac{\cosh B_{13}}{B_{13}^2} \lambda - \frac{1}{B_{13}^2} \lambda \right]$$

Hence, the solution of the transient part is given by

$$\begin{aligned}
 u_1(y) &= \left\{ \frac{\gamma B_{13}}{\gamma B_{13} \cosh B_{13} + \sinh B_{13}} \left[ 1 + \frac{\cosh B_{13}}{B_{13}^2} \lambda - \frac{1}{B_{13}^2} \lambda \right] \right. \\
 &\quad \left. - \frac{1}{B_{13}^2} \lambda \right\} \cosh B_{13} y \\
 &+ \left\{ \frac{1}{\gamma B_{13} \cosh B_{13} + \sinh B_{13}} \left[ 1 + \frac{\cosh B_{13}}{B_{13}^2} \lambda - \frac{1}{B_{13}^2} \lambda \right] \right\} \sinh B_{13} y \\
 &+ \frac{1}{B_{13}^2} \lambda \\
 &= B_{18} \cosh B_{13} y + B_{19} \sinh B_{13} y + B_{16}.
 \end{aligned}$$

where

$$\begin{aligned}
 B_{14} &= \frac{\gamma B_{13}}{\gamma B_{13} \cosh B_{13} + \sinh B_{13}} \\
 B_{15} &= \frac{\cosh B_{13}}{B_{13}^2} \lambda \\
 B_{16} &= \frac{1}{B_{13}^2} \lambda \\
 B_{17} &= \frac{1}{\gamma B_{13} \cosh B_{13} + \sinh B_{13}} \\
 B_{18} &= B_{14} (1 - B_{15} - B_{16}) - B_{16} \\
 B_{19} &= B_{17} (1 + B_{15} - B_{16})
 \end{aligned}$$

Finally, the expression for the velocity profiles and temperature distributions are obtained and given by:

$$\begin{aligned}
 u(y, t) &= u_0(y) + \epsilon u_1(y) e^{i\omega t} \\
 &= B_9 \cosh B_2 y + B_{11} \sinh B_2 y + B_4 + B_{12} \\
 &\quad + \epsilon [B_{18} \cosh B_{13} y + B_{19} \sinh B_{13} y + B_{16}] e^{i\omega t}
 \end{aligned}$$

and

$$\begin{aligned}
 \theta(y, t) &= \theta_0(y) + \epsilon \theta_1(y) e^{i\omega t} \\
 &= \theta_0(y) \\
 &= \frac{\sin Ny}{\sin N}
 \end{aligned}$$

Hence the effects of various parameters on the flow rate has been obtained and observed that there is great influence of various non-dinentional parameters on velocity of flow.



## References:

1. Chamkha Ali. J., Umavathi J.C., Abdul Mateen (2004), Oscillatory flow and heat transfer in two immiscible fluids, International J. of fluid Mechanics Research, Vol. 31, 6.
2. Makinde O.D., Osalusi E. (2006), MHD steady flow in a channel with slip at the permeable boundaries. Rom. J. of Phys, 51(3-4), 319-328.
3. Makinde, O. D.; Mhone, P. Y. (2006) "Thermally developing hartman flow in a channel of uniform width". AMSE, Modelling B, Vol. 75 n° 649.
4. Mankinde O.D. and Mhone P.Y. (2005) Heat Transfer to MHD Oscillatory Flow in a Channel filled with Porous Medium. Rom. Journ., Phys., Vol. 50,Nos. 9-10, P. 931-938.
5. Massoudi M.M.; Phuoc T.X.T.X.(2000) The effect of slip boundary condition on the flow of granular materials: a continuum approach. International Journal of Non-Linear Mechanics, Volume 35, Number 4, July 2000. pp. 745-761(17).
6. Murdoch A. I., Soliman A. (1999), On the Slip-Boundary Condition for Liquid Flow over Planar Porous Boundaries. Proceedings: Mathematical, Physical and Engineering Sciences, Vol. 455, No. 1984 (Apr. 8, 1999), pp. 1315-1340.
7. Murdoch A. I., Soliman A. (1999), On the Slip-Boundary Condition for Liquid Flow over Planar Porous Boundaries. Proceedings: Mathematical, Physical and Engineering Sciences, Vol. 455, No. 1984 (Apr. 8, 1999), pp. 1315-1340.
8. Rao I. J. and Rajagopal K. R. (1999) Acta Mechanica Volume 135, Numbers 3-4/September, 1999, 113-126. 33. Raptis A., Kofousias N. (1981), Heat transfer in flow through a porous medium bounded by an infinite vertical plate under the action of a magnetic field. Inter Science, Int. J. of Energy Research. Vol. 6, no. 3, 241-245.
9. Spille, Andreas; Rauh, Alexander; Buehring, Heiko (2001), Critical curves of plane Poiseuille flow with slip boundary conditions. eprint arXiv: physics/0101018.
10. Srivastava, V.P. (2002), Particulate suspension blood flow through stenotic arteries, Effects of hematocrit and stenosis shape, Indian J. Pure Appl. Math. Vol. 33(9), 1353-1360.

## महिला सशक्तिकरण की ओर अग्रसर हरियाणा सरकार: एक वश्लेषण

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संक्षेप:

सशक्तिकरण से अ भप्राय ऐसी प्र क्रया से है जो कसी भी व्यक्ति की योग्यता और क्षमता से है जो उसे अपने जीवन में जुड़े कसी भी वषय से संबं धत निर्णय लेने में सक्षम बनाती है। अर्थात वह अपने जीवन से जुड़े सामाजिक, आ र्थक, राजनीतिक, सांस्कृतिक, नैतिक कसी भी पहलू से संबं धत निर्णय लेने में सक्षम होता है उसे सशक्तिकरण कहा जाता है। जब हम महिला सशक्तिकरण की बात करते हैं तो यहां भी हम उसकी क्षमता की बात करते हैं जहां पर वह अपने भ वषय के निर्माण के लए अपने जीवन से संबं धत निर्णय लेने में पूर्ण तरह से स्वतंत्र हो। परिवार , समाज के बंधनों से परे वह अपने जीवन से जुड़े तमाम निर्णय लेने के लए पूर्ण रूप से स्वतंत्र एवं सक्षम हो।

परिचय:

समाज रूपी गाड़ी को चलाने के लए नर और नारी दो पहियों के समान होते हैं जिसमें दोनों का संतुलन होना आवश्यक है यदि कोई भी एक पहिया समान नहीं होगा तो समाज रूपी गाड़ी सही प्रकार से नहीं चल पाएगी और समाज का संतु लत वकास नहीं हो पाएगा। भारतीय संस्कृति के अनुरूप नारी को शक्ति का रूप प्रदान किया गया है। वेदों का अध्ययन करने से हमें पता चलता है क प्राचीन भारतीय समाज सर्वप्रथम मातृसत्तात्मक था नारी समाज का मूलाधार थी। परिवार की पहचान माता के नाम से होती थी अर्थात परिवार की मुख्या माता होती थी। वेदों में कहा गया है क

*"यत्र नार्यस्तु पूज्यंते रमंते तत्र देवता"*

अर्थात जिस परिवार में नारी की पूजा होती है देता भी वही निवास करते हैं। प्राचीन संस्कृति के अनुसार समाज में परिवार में कोई भी शुभ कार्य नारी के हाथों से ही करवाया जाता था। कोई भी यज्ञ बिना नारी की उपस्थिति के संपूर्ण नहीं होता था। नारी को पूजनीय माना जाता था उसकी स्थिति परिवार में, समाज में सबसे ऊपर थी। परंतु जैसे-जैसे समय बीता गया समाज में और सामाजिक परिवेश में भी परिवर्तन आता गया जिसके परिणाम स्वरूप नारी की स्थिति में भी परिवर्तन होता चला गया। मध्य युग में नारी की स्थिति दयनीय होती चली गई। समाज पुरुष प्रधान हो गया और महिलाओं पर अनेक प्रकार के अत्याचार शुरू हो गए जैसे बाल ववाह, वधवा पुनर्ववाह ना होना, कन्या भ्रूण हत्या, यौन हिंसा, दहेज प्रथा, बलात्कार। महिला को एक उपभोग की वस्तु बनाकर घर की चारदीवारी में बंद कर दिया गया। उसका काम चूल्हे चौके तक सी मत कर दिया गया। उसे शिक्षा के अधिकार से वंचित कर दिया गया। जिसके कारण महिलाओं की स्थिति में दिन-प्रतिदिन गरावट आती चली गई। महिला को मनोरंजन का साधन बना दिया गया और उसे, "दासी और पैरों की जूती" कहकर संबोधित किया गया। कबीर ने अपने दोनों ने कहा है

*नारी की झाई पड़त अंधा होत भुजंग।*

*कबिरा तिनकी कोन गति, जो नित नारी के संग।।'*

मैथलीशरण गुप्त ने कहा-

*अबला जीवन हाय तुम्हारी यह कहानी,  
आँचल में दूध और आंखों में पानी ।*

भारतीय समाज में स्त्रियों की बिगड़ती हुई स्थिति को सुधारने के लिए अनेक समाज सुधारकोने प्रयास किए जैसे राजा राममोहन राय के अथक प्रयासों के परिणाम स्वरूप ही सती प्रथा को बंद किया गया तथा 1829 में सती प्रथा पर रोक लगा दी। कहा जाता है कि सभी समस्याओं का समाधान शिक्षा के माध्यम से ही निकल सकता है इसी कड़ी को आगे बढ़ाते हुए नारियों की स्थिति के उत्थान के लिए ज्योतिबा फुले ने नारी को शिक्षित करने के लिए अनेक प्रयास किए और अनेक कष्टों का सामना करते हुए नारी को शिक्षा के अधिकार दिलाने में अमूल्य योगदान दिया। उनका यह मानना था कि यदि एक नारी को शिक्षित किया जाता है तो न केवल एक परिवार अपितु दो परिवार शिक्षित होते हैं। इसके साथ-साथ भारत के स्वतंत्रता संग्राम में भी महिलाओं ने अपना योगदान दिया भारत की आजादी के लिए उन्होंने पुरुषों के साथ कंधे से कंधा मिलाकर कार्य किया।

भारतीय महिलाओं की स्थिति

भारत ने 15 अगस्त 1947 को आजादी प्राप्त की तथा 26 जनवरी 1950 को भारत का संवधान लागू हुआ स्वतंत्रता के पश्चात भारत में महिलाओं की स्थिति में सुधार के लिए अनेक प्रावधान किए गए और आजादी के 75 वर्षों के पश्चात यदि हम अध्ययन करते हैं कि भारतीय महिलाओं की स्थिति में सुधार करने के लिए और उनकी गरिमा पूर्ण तौर पर प्रदान करने के लिए अनेक कानूनी प्रावधानों का समावेश किया गया है जिसके तहत उनकी स्थिति में काफी हद तक सुधार हुए हैं। भारतीय संवधान के अनुच्छेद 14 के अनुसार कानून के समक्ष समानता का प्रावधान किया गया है जिसके अंतर्गत भारत में स्त्री और पुरुष दोनों को समानता का दर्जा प्रदान किया गया है। अनुच्छेद 15 के अनुसार भेदभाव की मनाही की गई है अर्थात् सरकार के द्वारा किसी भी नागरिक के साथ किसी भी आधार पर धर्म भाषा जाति रंग लिंग के आधार पर कोई भेदभाव नहीं किया जाएगा अर्थात् स्त्री और पुरुष को सामान समझा जाएगा अनुच्छेद 15(3) यह प्रावधान करता है कि राज्य सरकारें महिलाओं एवं बच्चों की सुरक्षा उन्नति एवं विकास के लिए विशेष प्रावधान भी कर सकती हैं। अनुच्छेद 16 के तहत प्रावधान किया गया है कि भारत में अवसर की समानता स्थापित की जाएगी अर्थात् प्रत्येक व्यक्ति को योग्यता के अनुसार रोजगार प्रदान किया जाएगा। परंतु अगर हम वास्तविकता देखें तो यह आंकड़ा केवल कागजों तक ही सीमित है हमारे देश में दिन प्रतिदिन होने वाले अपराधों का अगर विश्लेषण करें तो स्पष्ट होता है कि प्रति 6 मिनट में एक महिला के साथ छेड़छाड़ या सार्वजनिक अपमान उसके साथ किया जाता है और प्रत्येक 7 मिनट में एक महिला की हत्या का प्रयास बलात्कार उत्पीड़न और अश्लीलता जैसी घटनाएं घटित होती हैं। संपूर्ण भारतवर्ष का अध्ययन करने के पश्चात हमारे सामने उभर कर आता है कि भारत में महाराष्ट्र, मध्य प्रदेश, आंध्र प्रदेश और राजस्थान में महिलाओं के साथ ज्यादा अपराध घटित होते हैं इन अपराधों की रोकथाम के लिए भारत सरकार के द्वारा समय-समय पर कठोर नियम और कानून बनाए जाते हैं लेकिन इसमें बदलाव तब तक नहीं आएगा जब तक हमारे समाज की सोच में परिवर्तन नहीं होगा। भारतीय संवधान द्वारा महिलाओं के अधिकारों की रक्षा के लिए अनेक संवैधानिक अधिकार प्रदान किए गए हैं तथा उनके सफलतापूर्वक लागू करने के लिए अनेक प्रकार के आयोगों की स्थापना भी की गई है प्रस्तुत शोध पत्र में हमें जानने का प्रयास करेंगे कि हरियाणा सरकार के द्वारा महिला सशक्तिकरण के लिए कौन-कौन सी योजनाएं नियम कानूनों का निर्माण किया गया है। भारतीय संवधान के भाग 4 में राज्य के नीति निर्देशक सिद्धांतों वाले अध्याय में भी महिलाओं को आर्थिक न्याय प्रदान करने के लिए भी भारत सरकार के द्वारा अनेक प्रावधान किए गए हैं। अनुच्छेद 39 (क) में प्रावधान किया गया है कि एक स्त्री को आजीवन के लिए पर्याप्त साधन प्राप्त करने का अधिकार है तथा

अनुच्छेद 39 में स्त्री और पुरुष को समान कार्य के लिए समान वेतन प्रदान किया जाएगा। अनुच्छेद 42 में प्रावधान किया गया है कि महिला को कार्यस्थल पर कार्य करते समय विशेष प्रसूति अवकाश प्रदान किया जाएगा ताकि मां और बच्चे दोनों का स्वास्थ्य सही रहे और प्रसूति अवकाश के बाद वह अपने कार्य पर ध्यान केंद्रित कर सके। अनुच्छेद 46 इस बात का ध्यान रखता है कि राज्य सरकार के द्वारा दुर्बल कमजोर वर्ग के व्यक्तियों के लिए शिक्षा एवं अर्थ संबंधी हितों की वृद्धि के लिए कार्य किया जाएगा उन्हें सामाजिक अन्याय और सभी प्रकार के शोषण से मुक्त रखने के लिए विशेष प्रावधान किए जाएंगे। भारतीय संवधान के भाग 4 A मौलिक कर्तव्य वाले अध्याय में अनुच्छेद 51 A(e) के अंतर्गत प्रावधान किया गया है कि भारतीय अपनी संस्कृति एवं गौरवशाली परंपरा के महत्त्व को समझते हुए एवं उसका अनुसरण करते हुए ऐसी प्रथम एवं परंपराओं का त्याग करेंगे जो स्त्रियों के सम्मान के वरुद्ध हों।

भारतीय संवधाननिर्वाचन क्षेत्रों में महिलाओं के लिए आरक्षण

भारतीय संवधान के अनुच्छेद 243 (द) (3) में प्रावधान किया गया है कि भारत में स्थापित पंचायती राज में प्रत्यक्ष रूप से निर्वाचन के आधार पर भरे जाने वाले स्थानों की कुल संख्या के 1 बटा तीन स्थान स्त्रियों के लिए आरक्षण होंगे प्रत्येक पंचायत में प्रत्यक्ष निर्वाचन से भरे गये स्थानों की कुल संख्या के 1/3 स्थान स्त्रियों के लिए आरक्षण रहेंगे और चक्रानुक्रम से पंचायती राज के अंतर्गत आने वाले व भन्न निर्वाचन क्षेत्रों में आवंटित किए जाएंगे। अनुच्छेद 243 D(4) में यह प्रावधान किया गया है कि पंचायतों के चेयरपर्सन के लिए भी महिलाओं के लिए एक तिहाई सीटें आरक्षण की जाएंगी। भारतीय संवधान के अनुच्छेद 243 तीसरी के अंतर्गत प्रावधान किया गया है कि नगर पालिका एवं नगर निगम में भी एक तिहाई सीटें अनुसूचित जाति और जनजाति की महिलाओं के लिए आरक्षण की जाएंगी तथा चक्रानुक्रम व भन्न निर्वाचन क्षेत्रों में आवंटित की जाएंगी। भारतीय संवधान का अनुच्छेद 325 या प्रावधान करता है कि निर्वाचक नामावली में भी महिला एवं पुरुष दोनों को समान रूप से सम्मिलित होने का अधिकार प्रदान किया जाएगा। कस अनुच्छेद के द्वारा संवधान निर्माताओं ने इस बात को दर्शाने की कोशिश की है कि भारत में स्त्री और पुरुष दोनों को मताधिकार से संबंधित समान रूप से अधिकार प्रदान किए गए हैं उसमें किसी भी प्रकार का कोई भेदभाव नहीं किया गया है। आईपीसी की धारा 375 में बलात्कार को परिभाषित किया गया है एवं धारा 376 में बलात्कार के लिए दंड का प्रावधान किया गया है। भारतीय दंड संहिता की धारा 498a में यह प्रावधान किया गया है कि अगर किसी महिला का पति या उसका रिश्तेदार अपनी ववाहित पत्नी के साथ निर्दयता पूर्वक या क्रूरता पूर्वक व्यवहार करता है या दहेज को लेकर उसे प्रताड़ित करता है तो न्यायालय के द्वारा उसे 2 साल तक की सजा का प्रावधान किया जा सकता है। भारतीय दंड संहिता की धारा 509 के अंतर्गत यदि कोई व्यक्ति किसी स्त्री की मान मर्यादा एवं लज्जा का अनादर करने की मंशा से कोई शब्द कहता है या कोई ध्वनि उत्पन्न करता है या अनुच्छेद करता है या कोई वस्तु प्रदर्शित करता है या कोई भी ऐसा कार्य करता है जिससे किसी स्त्री की एकांता या मान मर्यादा का उल्लंघन होता है तो ऐसे व्यक्ति को 1 वर्ष तक की सजा एवं जुर्माना या दोनों से ही दंडित किया जा सकता है।

भारत महिलाओं की सुरक्षा एवं उन्नति

भारत महिलाओं की सुरक्षा उनकी उन्नति उनके विकास के लिए समय-समय पर अनेक प्रकार के अधिनियम पारित किए गए हैं ताकि समाज में प्रचलित कुरीतियों और कुप्रथा को रोका जा सके और एक महिला को सुरक्षा एवं सम्मान के साथ जीवन यापन का अधिकार प्रदान किया जा सके। जिसमें से कुछ निम्नलिखित हैं:-

(1) राज्य कर्मचारी बीमा अधिनियम 1948

(2) दि. प्लांटेशनस लेबर अधिनियम 1951

- (3) परिवार न्यायालय अ धनियम, 1954
- (4) वशेष ववाह अ धनियम, 1954
- (5) हिन्दु ववाह अ धनियम 1955
- (6) हिंदूउत्तरा धकारी अ धनियम, 1956 (संशोधन 2005)
- (7) अनैतिक व्यापार निवारण अ धनियम 1956
- (8) प्रसूति प्रसू वधा अ धनियम 1961 (संशोधन 1995)
- (9) दहेज प्रतिषेध अ धनियम 1961
- (10) गर्भ का च कत्सकीय समापन अ धनियम 1971
- (11) ठेका श्र मक अ धनियम 1976
- (12) दि इक्वल रियुनरेशन अ धनियम 1976
- (13) बाल ववाह प्रतिषेध अ धनियम 2006
- (14) आपरा धक व ध (संशोधन) अ धनियम 1983
- (15) कारखाना (संशोधन) अ धनियम 1986
- (16) इन्डिकेंट रिप्रेसेन्टेशन आॅफ वुमेन एक्ट 1986
- (17) कमीशन आॅफ सती (प्रवेन्शन) एक्ट, 1987
- (18) घरेलू हिंसा से संरक्षण अ धनियम 2005

इनके प्रस्तुत शोध पत्र में हम हरियाणा सरकार के द्वारा महिलाओं की उन्नति और विकास के लिए कौन-कौन

से नियम अ धनियम एवं योजनाओं का कार्य किया गया है उस पर विस्तार से चर्चा करेंगे।

बेटी बचाओ बेटी पढ़ाओ योजना

हरियाणा सरकार के द्वारा बेटी बचाओ बेटी पढ़ाओ योजना की शुरुआत 22 जनवरी 2015 में पानीपत में की गई थी इसका संचालन महिला एवं बाल विकास मंत्रालय स्वास्थ्य एवं परिवार कल्याण मंत्रालय और मानव संसाधन विकास मंत्रालय द्वारा मलकर राष्ट्रीय स्तर पर किया जा रहा है। इस योजना का उद्देश्य महिला सशक्तिकरण को बढ़ावा देना, लंगानुपात में लड़कियों के अनुपात में हो रही कमी को दूर करना लड़कियों के साथ होने वाले भेदभाव को समाप्त करना और लड़कियों के प्रति लोगों की नकारात्मक सोच एवं मानसिकता में बदलाव लाना है। इस योजना के तहत न केवल हरियाणा में बल्कि राष्ट्रीय स्तर पर लड़कियों को शिक्षा प्रदान करके समाज में उनकी भागीदारी को बढ़ाना है। इस योजना के अंतर्गत अगर कोई परिवार बेटी के अकाउंट में हजार रुपए जमा करवाता है तो 14 साल में कुल रकम 168000 होगी। और जब बेटी 21 साल की हो जाएगी तो बेटी को ₹600000 से अधिक पैसे बैंक के द्वारा दिए जाएंगे जो उस बेटी की उच्च स्तरीय शिक्षा में सहायता प्रदान करेंगे। इस योजना के अंतर्गत सामाजिक बदलाव और सुधार लाने के लिए स्थानीय निकायों के साथ-साथ सरकारी स्कूल के कर्मचारियों को प्रशिक्षण प्रदान किया जाता है ताकि वे लड़कियों के गरीब शिक्षा स्तर को बढ़ा सकें और समाज में उनकी भागीदारी निश्चित कर सकें। सरकार ने यह योजना महिलाओं के साथ होने वाली घरेलू हिंसा को रोकने के लिए उनकी मदद के लिए शुरू की है। इस योजना के माध्यम से सरकार उन महिलाओं को जिन्हें घरेलू हिंसा के माध्यम से पीड़ित किया जाता है को कानूनी एवं चिकित्सा संबंधी सुविधाएं प्रदान की जाती हैं। पारिवारिक हिंसा का शिकार महिलाएं 181 नंबर पर संपर्क करके कानूनी सहायता प्राप्त कर सकती हैं

सुकन्या समृद्ध योजना

इस योजना की शुरुआत बेटियों के उज्ज्वल भविष्य के लिए और उनकी अच्छी शिक्षा के लिए 2015 में की गई थी इस योजना के माध्यम से 10 साल से छोटी बच्चियों को शिक्षा प्रदान की जाएगी और उनके ववाह

के समय उन्हें आर्थिक सहायता प्रदान की जाएगी। बेटियों के बेहतर भवष्य के लिए, उनके अभिभावकों को पैसा जुटाने के लिए, सरकार ने सुकन्या समृद्ध योजना की शुरुआत की है। इसमें हर साल 250 रुपए से 1.50 लाख रुपए तक जमा कर सकते हैं। इस पर सरकार, वर्तमान में 7.6% ब्याज दे रही है, जो क कसी भी बैंक की FD या RD स्कीम से अधिक है। अगर आप हर महीना 500 रुपए भी जमा करते हैं तो 21 साल बाद आपकी बेटि को 2 लाख 54 हजार 606 रुपए मिलते हैं।

#### प्रधानमंत्री उज्ज्वला योजना

यह योजना महिलाओं को रसोई की सुवधा देने के लिए शुरू की गई है। इस योजना की शुरुआत 1 मई 2016 को हुई थी। इसके माध्यम से गरीब व आर्थिक रूप से कमजोर महिलाओं को गैस सलेंडर उपलब्ध कराते हैं और इसका लाभ भारत के करोड़ों परिवार ले चुके हैं। इस योजना के तहत, अगले 3 वर्षों में 1600 रुपए प्रति कनेक्शन के समर्थन के साथ बीपीएल परिवारों को 5 करोड़ एलपीजी कनेक्शन प्रदान किए जाएंगे। महिलाओं के सशक्तिकरण को सुनिश्चित करते हुए, विशेषकर ग्रामीण भारत में, घरों की महिलाओं के नाम पर कनेक्शन जारी किए जाएंगे। 8000 करोड़ रुपए इस योजना के क्रयान्वयन हेतु आवंटित किए गए। सामाजिक आर्थिक जाति जनगणना डेटा के माध्यम से बीपीएल परिवारों की पहचान की जाएगी।

#### सुरक्षित मातृत्व आश्वासन सुमनयोजना

इस योजना की शुरुआत 2019 को की गई थी। इसके अंतर्गत प्रसव के दौरान माँ एवं बच्चे का अच्छे से देखभाल के लिए और उन्हें उचित पोषण प्रदान करने के लिए किया गया है। जिससे माँ और बच्चा दोनों सुरक्षित रहे और नर्सों की देखभाल में प्रसव का कार्य हो। इस योजना के तहत गर्भवती महिलाओं को 4 बार का मुफ्त चेकअप का खर्चा सरकार के द्वारा उठाया जाएगा एवं गर्भवती महिला को 6 महीने से लेकर बच्चे के जन्म के 6 महीने तक मुफ्त इलाज प्रदान किया जाएगा इसके साथ साथ दवाइयां एवं स्वास्थ्य से संबंधित अन्य सेवाएं भी सरकार के द्वारा प्रदान की जाएंगी। इस योजना के अंतर्गत स्वास्थ्य सुवधाएं महिला को 1 घंटे के अंदर अंदर प्रदान की जाएंगी इसके अंतर्गत महिला को सुरक्षित डिलीवरी की गारंटी भी प्रदान की जाएगी इस योजना का मुख्य उद्देश्य महिलाओं एवं नवजात शिशुओं की मृत्यु दरों को कम करना। इस योजना का उद्देश्य महिलाओं को डिलीवरी से पहले एवं डिलीवरी के बाद मिलने वाली सुवधाओं को समय पर उन तक उपलब्ध करवाना है।

#### प्रधानमंत्री समर्थ योजना

इस योजना के माध्यम से महिलाओं को कार्यों के बारे में जानकारी दी जाती है जिससे महिलाएं नई-नई जानकारी ले सकें। इससे महिलाएं भी व्यापार के क्षेत्र में कार्य कर पाएंगी और इसका फायदा उठाकर खुद का व्यवसाय कर पाएंगे एवं आप निर्भरता की तरफ एक कदम उठा पाएंगी।

• इसके अलावा हजारों महिलाओं को घरेलू और अंतर्राष्ट्रीय प्रदर्शनियों में अपने उत्पादों को प्रदर्शित करने व उनके वपणन के अवसर मिलेंगे। साथ ही सार्वजनिक खरीद में महिला उद्यमियों की भागीदारी बढ़ाने के लिये वर्ष 2022-23 के दौरान NSIC की निम्नलिखित वाणिज्यिक योजनाओं पर वार्षिक प्रसंस्करण शुल्क पर 20 प्रतिशत की विशेष छूट की पेशकश की जाएगी:-

- एकल बिंदु पंजीकरण योजना
- कच्चे माल की सहायता और बिल में छूट
- निवृत्त वपणन



### फ्री सलाई मशीन योजना

इस योजना के माध्यम से महिलाओं को आवेदन करने पर फ्री में सलाई मशीन दिया जाता है जिससे वे कड़ाई - बुनाई करके अपना जीवन चला सके और आत्मनिर्भर बने। इसका लाभ शहरी एवं ग्रामीण दोनों क्षेत्र की महिलाएं ले सकती हैं और उनकी आयु 20 वर्ष से अधिक होना चाहिए।

### हरियाणा महिला समृद्ध योजना

इस योजना की शुरुआत राज्य के मुख्यमंत्री मनोहर लाल खर जी के द्वारा महिलाओं को लाभ पहुंचाने के लिए शुरू की गयी है। इस योजना के अंतर्गत हरियाणा सरकार द्वारा राज्य के अनुसूचित जाति ( SC ) श्रेणी की महिलाओं को स्वरोजगार के अवसर प्रदान किये जायेंगे। इस योजना के अंतर्गत राज्य की महिलाओं को खुद के अपना रोजगार स्थापित करने के लिए सरकार द्वारा **Rs.60000** का लोन 5% वार्षिक दर पर मुहैया कराया जायेगा। जैसे की आप जानते हैं कि राज्य में बहुत सी ऐसे महिलाएँ हैं जो अपना खुद का व्यवसाय करना चाहती हैं लेकिन आर्थिक स्थिति कमजोर होने के कारण अपना खुद का रोजगार शुरू नहीं कर पाती इस समस्या को देखते हुए राज्य सरकार ने हरियाणा महिला समृद्ध योजना को शुरू की। इस योजना के जरिये अनुसूचित वर्ग की महिलाओं को आत्मनिर्भर और सशक्त बनाना। सरकार उन्हें अपना व्यवसाय स्थापित करने के लिए एक प्रकार की यह वित्तीय सहायता प्रदान करेगी। महिलाओं व उनके आश्रित को सरकार की ओर से 750/- रुपये गुजारा भत्ता दिया जाता है तथा उनकी लड़कियों को व लड़कों को 16 साल की उम्र तक साथ रखने की आला दी जाती है।

### हरियाणा उत्तर रक्षा गृह कन्या, करनाल (नारी निकेतन)

हरियाणा उत्तर रक्षा गृह कन्या, करनाल (नारी निकेतन) में चलाया जा रहा है जिसका उद्देश्य लड़कियों/महिलाओं जिनकी आय का कोई साधन न हो, को संस्थागत देखभाल, संरक्षण, सामाजिक सुरक्षा, रख-रखाव, शिक्षा और प्रशिक्षण प्रदान करना है। संवा सयों को निःशुल्क कपड़े, भोजन, आवास, शिक्षा और प्रशिक्षण प्रदान किया जाता है।

### महिलाओं के लिए प्रशिक्षण एवं उत्पादन केन्द्र योजना

इस योजना के अधीन स्वैच्छिक संस्थाओं/अर्ध सरकारी संस्थाओं/कल्याण एवं अनुसंधान संस्थाएं जो हरियाणा में कार्यरत हैं और महिलाओं, बच्चों व कशोरियों को सेवार्थ प्रदान करती हैं तथा सामाजिक बुराईयों जैसा कि दहेज, कन्या भ्रूण हत्या, महिलाओं की की कम साक्षरता दर व महिलाओं के प्रति हिंसा आदि को समाप्त करने के लिए सामाजिक लामबन्दी अथवा अभियान चलाती हैं, को सहायक अनुदान प्रदान किया जाता है।

### दहेज प्रतिषेध कार्यक्रम:-

दहेज की बुराई को समाप्त करने के लिए राज्य में दहेज प्रतिषेध अधिनियम लागू किया गया है। अधिनियम को अधिक प्रभावी रूप से लागू करने के लिए निदेशक, महिला एवं बाल विकास विभाग को मुख्य दहेज प्रतिषेध अधिकारी नामांकित किया गया है। राज्य के सभी उपमण्डल मजिस्ट्रों एवं नगराधीशों को दहेज प्रतिषेध अधिकारी नियुक्त किया गया है। दहेज प्रतिषेध अधिकारियों को परामर्श व सहायता देने के लिए सलाहकार बोर्ड/समितियों का गठन किया गया है।

## हरियाणा राज्य महिला आयोग:-

महिलाओं को सवैधानिक एवं कानूनी अधिकारों की रक्षा करने, उनके वरुद्ध भेदभाव तथा उत्पीड़न के मामलों में छानबीन करने के लए रराज्य में महिला आयोग गठित है। राज्य सरकार द्वारा हरियाणा राज्य महिला आयोग अधिनियम 2012 को पास करके आयोग को वैधानिक दर्जा भी प्रदान किया गया है।

## हरियाणा महिला विकास निगम

कमजोर वर्ग की महिलाओं की सामाजिक-आर्थिक स्थिति में सुधार लाने के लए महिलाओं के विकास की गति व धर्यों को वक सत करने, जागृति जागरण, व्यवसायिक प्रशिक्षण व स्वरोजगार स्थापित करने के लए संस्थागत वक्त का प्रबन्ध करने हेतु हरियाणा महिला विकास निगम कार्यरत है।

## महिला सैक्स वर्करस के पुर्नवास बारे योजना:-

हरियाणा सरकार द्वारा महिला सैक्स वर्करस को व भन्न तकनीकी तथा व्यवसायिक प्रशिक्षण प्रदान कर रोजगार के अवसर प्रदान करके उनके लए पुर्नवास की योजना तैयार की गई है। जो महिलाएं अपना स्वरोजगार परियोजनायें शुरू करने की इच्छुक हैं, को राष्ट्रीयकृत बैंकों द्वारा ऋण की सुवधा प्रदान करवाई जायेगी। निगम द्वारा अधिकतम 1000/-रुपये की राश पर 5 प्रतिशत ऋण सब सडी प्रदान की जायेगी।

### आपकी बेटी हमारी बेटी

आपकी बेटी हमारी बेटी हरियाणा राज्य सरकार की एक योजना है जिसमें अनुसूचित जाति / बीपीएल परिवारों की पहली लड़की और कसी भी जाति से संबंधित परिवार की दूसरी संतान के नाम पर जीवन बीमा निगम एलआईसी के साथ 21000 रुपये की राश का निवेश किया जाता है। 18 वर्ष की आयु प्राप्त करने पर, बालका को एक अस्थायी भुगतान किया जाएगा 24.08.2015 से कसी भी जाति से संबंधित परिवारों में जन्म लेने वाली तीसरी बालका को भी कवर किया गया

### उद्देश्य

बालकाओं के जन्म के प्रति सामाजिक दृष्टिकोण में बदलाव लाना। राज्य में बाल लंगानुपात में सुधार करना। वद्यालयों में बालकाओं के नामांकन और प्रतिधारण में सुधार करना और आय सृजन गति व धर्यों को करने के लए लड़कियों की सहायता करना। उम्र बढ़ाने के लए लड़कियों की शादी में।

### निष्कर्ष

अंत में हम कह सकते हैं क कसी भी देश में जहां पर लैंगिक भेदभाव पाया जाता है उस राष्ट्र में सांस्कृतिक राजनीतिक सामाजिक आर्थिक शैक्षणिक अंतर भी आता है जो उस देश को उन्नति और विकास के पद से भ्रष्ट करके उन्नति और पतन की ओर ले जाता है। भारत जैसे विकासशील देश को वक सत राष्ट्र बनाने के लए भारतीय संवधान में वर्णित अधिकारों को समझ जनता के सुनिश्चित करने के लए महिलाओं को सशक्त बनाना सबसे आवश्यक है और महिलाओं के वरुद्ध व भन्न प्रकार की कुरीतियों परंपराओं एवं बुराइयों को मटाने के लए लैंगिक समानता को प्राथमिकता दी जानी चाहिए एवं महिला सशक्तिकरण के लए उच्च स्तर पर कार्यक्रमों का संचालन किया जाना चाहिए जिसके अंतर्गत एक महिला को शारीरिक मान सक एवं सामाजिक रूप से मजबूत बनाकर हम एक सुदृढ भारत की नींव रख सकें। हम

इस बात से भलीभांति परिचित हैं कि एक बच्चे की पहली पाठशाला उसका परिवार होता है और लड़कियों को बचपन से ही सखाया जाता है कि लड़कियां गुड़ियों से सेवर रसोई के बर्तनों से खेलती हैं बड़े होकर उनका काम घर का काम करना है वह परिवार को संभालना है और यह वचार लड़की के मन में इस प्रकार घर कर जाते हैं कि वह चाहकर भी अपने व्यक्तित्व का विकास उस प्रकार से नहीं कर पाती जिस प्रकार वह करना चाहती है बहुत बार एक परिवार में ही एक लड़के को असुरक्षित महसूस करवाया जाता है इसी लिए महिला सशक्तिकरण की शुरुआत सर्वप्रथम परिवार से ही होनी चाहिए यदि परिवार में उसे उचित स्वस्थ एवं संतुलित वातावरण मलेगा तो निसंदेह उसका विकास उसकी उन्नति में कोई भी रुकावट या बाधा नहीं आ सकती है। भारत के प्रथम प्रधानमंत्री पंडित जवाहरलाल नेहरू जी ने भी कहा है कि "लोगों को जगाने के लिए महिलाओं को जागृत होना आवश्यक है" इससे यह स्पष्ट होता है कि महिलाओं को भी अपने अधिकारों के प्रति जागरूक एवं सचेत होने की आवश्यकता है संवधान के द्वारा जो नियम कानून बनाए गए हैं उनके बारे में जानकारी होना आवश्यक है सकारात्मक दृष्टि से ग्रहण करना भी आवश्यक है एक महिला को अपने जीवन के प्रत्येक क्षेत्र में पूरी स्वतंत्रता देना आवश्यक है जो कि उसका जन्मसिद्ध अधिकार है। महिलाओं को भी वर्तमान समय में स्वयं को मजबूत बनाना है और पुरानी अवधारणा जो उन्हें कमजोर और शोषण सहनेवाली अबला के रूप में प्रदर्शित करती है को बदलने की जरूरत है। एक महिला पुरुष के साथ कंधे से कंधा मलाकर ना केवल परिवार, समाज, राज्य एवं अपितु राष्ट्र के विकास में भी अपना बहुमूल्य योगदान देती हैं। आज आवश्यकता है तो पुरुष प्रधान समाज की मानसिकता को बदलने की और एक ऐसे स्वच्छ एवं स्वस्थ सोच वाले भारत के निर्माण की जिसमें महिलाएं स्वयं को सुरक्षित महसूस करें और जीवन के प्रत्येक क्षेत्र में निरंतर आगे बढ़ते हुए देश को भी उन्नति के पथ पर अग्रसर कर सकें जिसके लिए भारत सरकार के द्वारा लगातार प्रयास किए जा रहे हैं और हरियाणा सरकार भी भारत सरकार के दिशा निर्देशों के अनुसार कार्य करते हुए महिलाओं की उन्नति एवं विकास के लिए अनेक योजनाओं का निर्माण कर रही है जिसके तहत आज हरियाणा की बेटियां किसी भी क्षेत्र में पीछे नहीं हैं। साक्षी मलक भारतीय महिला पहलवान हैं। इनका जन्म हरियाणा के रोहतक में हुआ। साक्षी ने ब्राजील के रियो डे जेनेरियो में हुए 2016 ग्रीष्मकालीन ओलम्पिक में कांस्य पदक जीता है। भारत के लिए ओलंपिक पदक जीतने वाली वे पहली महिला पहलवान हैं। इससे पहले साक्षी ने ग्लासगो में आयोजित 2014 के राष्ट्रमंडल खेलों में भारत का प्रतिनिधित्व करते हुए रजत पदक जीता था। 2014 के विश्व कुश्ती प्रतियोगिता में भी इन्होंने भारत का प्रतिनिधित्व किया। गीता फोगाट एक भारतीय महिला फ्रीस्टाइल पहलवान हैं जिन्होंने पहली बार भारत के लिए राष्ट्रमंडल खेलों में स्वर्ण पदक जीता था। गीता ने 2010 राष्ट्रमंडल खेलों में स्वर्ण पदक जीतकर देश का नाम रोशन किया था। साथ ही गीता पहली भारतीय महिला पहलवान हैं जिन्होंने ओलम्पिक में क्वालीफाई किया। 23 दिसम्बर 2016 को प्रदर्शित हुई हिन्दी भाषी दंगल फ़िल्म इन्हीं पर आधारित है, जिसमें इनका करदार फ़ातिमा सना शेख ने निभाया है जबकि आमिर खान ने इनके पता और कोच महावीर सिंह फोगाट का करदार निभाया। हरियाणा की मानुषी छिल्लर ने मस इं डिया 2017 का खताब जीता। रविवार 25 जून को मुंबई के यशराज स्टूडियो में आयोजित समारोह में मस हरियाणा मानुषी को

पछली बार की वजेता रहीं प्रयद र्शनी चटर्जी ने ताज पहनाया। खानपुर मे डकल कॉलेज की स्टूडेंट मानुषी एमबीबीएस सेकंड ईयर में है। मशहूर पहलवान क वता दलाल ने डब्ल्यूडब्ल्यूई में सलेक्ट होकर इतिहास रच दिया है। क वता वहां तक पहुंचने वाली देश की पहली महिला पहलवान बन चुकी हैं। अब वे डब्ल्यूडब्ल्यूई के रिंग में 31 पहलवानों से भड़ेंगी। हरियाणा की रहने वाली क वता पेशेवर रेसलर बनने के लए **WWE** चें पयन रहे द ग्रेट खली के मार्गदर्शन में ट्रेनिंग ले रही हैं। उनकी ट्रेनिंग खली की पंजाब स्थित ट्रेनिंग अकादमी में हो रही है। दीपा म लक शॉटपुट एवं जेव लन थ्रो के साथ-साथ तैराकी एवं मोटर रेस लंग से जुडी एक दिव्यांग भारतीय खलाडी हैं जिन्होंने 2016 पैरालंपिक में शॉटपुट में रजत पदक जीतकर इतिहास रचा। 30 की उम्र में तीन ट्यूमर सर्जरीज और शरीर का निचला हिस्सा सुन्न हो जाने के बावजूद उन्होने न केवल शॉटपुट एवं ज्वलीन थ्रो में राष्ट्रीय अंतरराष्ट्रीय प्रतियो गता में पदक जीते हैं, बल्कि तैराकी एवं मोटर रेस लंग में भी कई स्पर्धाओं में हिस्सा लया है। उन्होने भारत की राष्ट्रीय प्रतियो गताओं में 33 स्वर्ण तथा 4 रजत पदक प्राप्त कये सतंबर 2018 में कैप्टन अ भलाषा को सेना के ए वएशन कोर में कमीशन मला। अब तक वह कई प्रोफेशनल म लट्री कोर्स कर चुकी हैं। कॉम्बैट ए वएटर बनने के लए उन्होने अपनी बाकी पायलट सा थयों की तरह ही 6 महीने का कोर्स पूरा कया है। आने वाले दिनों में ए वएशन कोर के टेक्टिकल इम्पोर्टेंस में फ़ोर्स-मल्टीप्लायर के तौर पर आर्मी की मदद करेंगी। कैप्टन अ भलाषा बराक हरियाणा के पंचकूला जिले की रहने वाली हैं। बुल्गारिया में चल रहे अंडर-20 वर्ल्ड चें पयन शप में हरियाणा की 17 वर्षीय महिला रेसलर अंतिम पंघाल ने गोल्ड मेडल जीतकर इतिहास रच दिया हरियाणा के रोहतक की बेटी ने देश का मान बढ़ाया है। उन्नति हूड्डा ने कटक में आयोजित ओ डशा ओपन 2022 बैड मंटन टूर्नामेंट में तोशनीवाल को फाइनल मुकाबले में सीधे सेटों में हराकर खताब पर कब्जा कया 22 से 28 फरवरी तक रूस के मास्को में वूशु प्रतियो गता में भाग ले भवानी की बेटी कुसुम शर्मा ने गोल्ड मेडल जीतकर भवानी का ही नहीं बल्कि पूरे भारत देश का नाम रोशन कया सरसा: हरियाणा के सरसा की चार बेटियों ने इतिहास रचते हुए स वल सेवा न्यायिक परीक्षा पास कर जज बनने में सफलता हा सल की है। जज बनने वाली बेटियों में सरसा की कोर्ट कालोनी में रहने वाली जैस्मीन प्रीत कौर, ऐलनाबाद के गांव अमृतसर खुर्द की रहने वाली जसप्रीत कौर व गांव मौजदीन निवासी रेनू बाला और चौथी बेटी सरसा के डबवाली के गांव चौटाला की संतोष है। नारनौल के गांव मर्जापुर बाछोद की बेटी तनिष्का यादव ने नीट यूजी 2022 परीक्षा में इतिहास रच दिया है। तनिष्का ने देशभर में टॉप कया है। जींद :- हरियाणा की बेटियां जहां खेलों में अपनी प्रतिभा का लोहा मनवा रही हैं , वहीं अब सेना में जाकर एडवेंचर **Sports** में भी प्रदेश का नाम चमका रही हैं लांस नायक मंजू ने एएलएच ध्रुव हे लकॉप्टर से 10 हजार स्काई फीट की ऊंचाई से छलांग लगाकर **Army** की पहली महिला सोल्जर स्काई डाइवर बनकर यह साबित कर दिया की महिलाएं कसी क्षेत्र में पुरुषों से कम नहीं है हरियाणा के खेड़का गांव में जन्मी भगवानी 95 साल की भगवानी देवी डागर ने इतिहास रच दिया है। भगवानी देवी ने पोलैंड के टोरून में वर्ल्ड मास्टर्स एथलेटिक्स इंडोर चैंपियन शप (World Masters Athletics Indoor Championship) में डस्कस थ्रो में गोल्ड मेडल जीता है। हरियाणा की रहने वाली एथलीट ने इससे पहले फनलैंड में 2022 वर्ल्ड मास्टर्स एथलेटिक्स चें पयन शप ( **World**

**Masters Athletics Championship)** में 90-94 आयु वर्ग में 100 मीटर दौड़ में गोल्ड जीता था। 26 साल की पूजा रोहतक के गढ़ी मोहल्ला की रहने वाली हैं। पूजा ने पैरा लंपक खेलों में तीरंदाजी के लए क्वॉक लफाई कया है। ऐसा पहली बार है जब पैरा लंपक में भारत की ओर से कोई महिला तीरंदाज प्रदर्शन करेगी। बेटियों को हरियाणा की खापलैंड खूब भा रही है। स्वास्थ्य वभाग द्वारा जारी आंकड़ों में जींद जिले का लंगानुपात 986 पहुंच गया है। जींद जिले में जनवरी में जारी कए गए स्वास्थ्य वभाग के आंकड़ों में टॉप कया है.

“समय है सोच में परिवर्तन लाने का महिला सशक्तिकरण की ओर कदम बढ़ाने का”

संदर्भ ग्रंथ-

1. कबीर का दोहा बीजक संग्रह मौ थली शरण गुप्त का पद अबला नारी
2. डा. रानी, आशु (1999) महिला वकास कार्यक्रम, ईनाश्री पब्लिशर्स, जयपुर, पृष्ठ सं. 19
3. भारतीय सं वधान व हिन्दी की दुनिया डॉट कॉम यूथ की आवाज डॉट कॉम
4. ओम प्रकाश, हिंदू ववाह, चतुर्थ संस्करण, वश्व वद्यालय प्रकाशन, नई दिल्ली, 1997, पृष्ठ 182-2001
5. कानिटीकर मुकुलभारत में महिला शक्षा समाज व सरकार की भूमिका, योजना सतंबर 2016, पृष्ठ-37।\*
6. [www.worldwidejournals.com](http://www.worldwidejournals.com) | महिलाओं के लए उपलब्ध सरकारी योजना
7. आर.सी. मजुमदार, द हिस्ट्र एण्ड कल्चर आफ द इण्डियन पीपुल, प्रका शत टवस ग्दक मकपजपवद 1981
8. डाकुलश्रेष्ठ, लक्ष्मी रानी, कुरुक्षेत्र, अक्टूबर -नवम्बर 1997, पृष्ठ सं. 82
9. अंसारी एम ए, "महिला और मानव अधिकार" ज्योति प्रकाशन जयपुर
10. मकोल नीलम शर्मा, संदीप, सामाजिक वकास में श क्षत महिलाओं का योगदान। कुरुक्षेत्र सतंबर 2006 पृष्ठ 53।\*
11. वासी तृप्ता बीएसडब्ल्यू ई- शक्षा में महिला वकास की पहलइग्नू लक्ष्मी प्रंट इंडिया शाहदरा दिल्ली 32 पृष्ठ-66।
12. देवपुरा प्रताप भल "महिला सशक्तिकरण में शक्षा का महत्व", कु रक्षेत्र अंक 5 मार्च 2006 पृष्ठ-5 6
13. श्रीवास्तव सुधारानी (1999) "भारत में महिलाओं की वैधानिक स्थिति", कॉमनवेल्थ पब्लिकेशन नई दिल्ली\*
14. जैन, प्रतिभा (1998), "भारतीय स्त्री संस्कृति संदर्भ" रावत पब्लिकेशन जयपुर।\*

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## A Review on-Nanocomposite Coating on Textile Fabrics

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### Abstract:

There has been an increasing consideration in nanotechnology during the present decade due to its enormous potential in applying and creating novel materials for enhanced properties and applications. Numerous studies were undertaken in improving the textiles and clothing properties and performances by applying nanocomposites. Microscopy technique which is a fundamental tool in nanotechnology has been widely employed for the investigation of particle size, size distribution and the homogeneity of nanocomposite coatings. This technique can also be used to investigate the properties of surface, thickness of applied nano layer and 3D morphology of the surfaces. Current microscopy methods contain a vast majority of analysis that can be applied to characterize nanocomposite coatings on the textiles. These analyses include scanning electron microscope (SEM), transmission electron microscope TEM), atomic force microscope, laser scanning confocal microscope. In this chapter, approaches to develop nanocomposite coating on textile materials are summarized and microscopy methods and analysis conducted by researchers to identify and determine the surface properties of nanocomposite coatings on the textile fibres are discussed. Nanotechnology has been involved in textile performances improvement and/or new functions for several years and has been caught enormous attention in the textile field. Nanomaterials are ultrafine materials in at least one dimension to the size of nanometer order (below 100nm).

**Keywords-** *Nanocomposites, Properties, Techniques, Compounds, Fabrics, Scanning, Coating.*

### Introduction:

A nanocomposite coating is a material composed of in two phases, separated from one another by interface region. The material must contain the nanometer scale in at least one dimension in which the major component is called matrix. Making clothing and fabric with nanoparticles or nanofibers allows the improvement of fabric properties without a significant increase in weight, thickness, or stiffness. For example, incorporating nano-whiskers into fabric used to make pants produces a lightweight water- and stain-repellent material. The proposed method provided Poly the potential applications in smart displays for traffic warning signals, taking into account the challenge of large-scale fabrication of Poly. Blois obtained multifunctional luminescent textiles by applying for the first-time new iridium supported silica ( $\text{Ir}^*\text{SiO}_2$ ) compounds in the form of coating. Treated textiles displayed very promising self-marking properties together with



antibacterial activity. The strong interaction between Ir complexes and silica nanoparticles enabled easy detection under UV light, both when used as coating for textiles and after release in the environment. The homogeneous distribution of such luminescent coating can be usefully exploited as a wear diagnostic tool. The synergetic mechanism of both metal-nonmetal co-doping and dye sensitization on the photocatalytic activities of TiO<sub>2</sub> nanoparticles under visible light irradiation was investigated. The superior photocatalytic activity of the dye-sensitized PET-Ag-N-TiO<sub>2</sub> composite photocatalyst was primarily due to the quick separation of photo-generated electron-hole pairs and efficient interfacial charge transfer. This not only generated more holes, but also inhibited the recombination of electron-hole pairs by the transfer of electrons to the dyed PET substrate and Ag nanoparticles. In comparison to the PET filaments coated with TiO<sub>2</sub> nanoparticles, the PET filaments coated with Ag-N co-doped and dye-sensitized TiO<sub>2</sub> nanoparticles exhibited greatly enhanced light absorption capacity, efficient separation of electron-hole pairs, and substantial photocatalytic activity in degradation of MO dye under visible-light irradiation. The proposed photocatalytic composite structure can be taken as a novel approach to design textile materials based composite photocatalysts for the photo-degradation of organic pollutants. Through a facile coating and sintering process, hybrid polymer-mediated films were made that exhibited low surface resistances of up to 10<sup>-4</sup> W/sq. Furthermore, the surface resistance of the hybrid films appeared to decrease due to the interconnected network formed by the AgNPs. The results indicated that these films are promising as nano-conductors in electronic devices. Silver-based electrodes show demonstrated potential not only in biosensor ECG systems for monitoring cardiac activity, but also in functional biological applications. However, exploring the large-scale production of these films is dependent on commercial viability and uptake. The use of dry electrodes for ECG devices is an exciting application for wearable technology featuring nanohybrid films.

## Preparative Methods

### Sol-Gel Method:

The sol-gel method is suitable to obtain high quality films up to micron thickness and is a complementary of the physical deposition techniques. However, there are limits of sol-gel application to coating on the metallic substrates. This method exhibits several drawbacks involving crackability and thickness limits. Sometimes also the thermal treatment may be critical. Tensile stresses develop during drying and can lead to crack formation if the film is thicker than a critical value. In case of inorganic matrix, the second phase can be added to sol-gel for inorganic nanofillers, such as the I/I coatings. In the case of organic matrix, a well-known approach to generate inorganic nanophases within an organic matrix is to utilize sol-gel chemistry. Inorganic sol-gel precursors such as silicon, titanium, aluminium, and zirconium metal alkoxides are employed in the formulation of nanocomposite coatings. A wide range of oligomers as well as low molecular weight organic compounds are often reported to be used as organic phase precursors. Under controlled conditions, silanes and organic molecules can form coatings containing silica nanoparticles or nanophases. In the presence of a coupling agent, the organic and inorganic phases can be

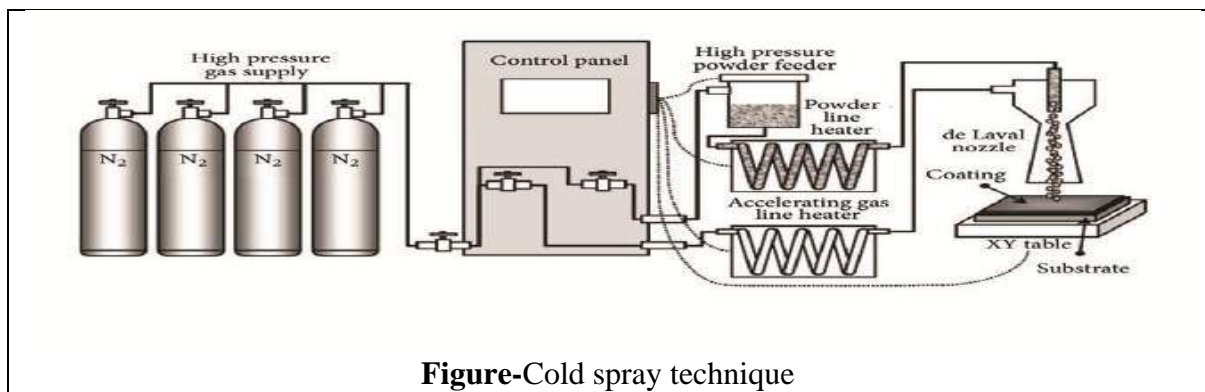


covalently linked. Silica nanofiber formation in a system containing TEOS, methacryloxypropyl-trimethoxysilane (MAPTMS), a urethane acrylate resin, and an acrylatephenyl phosphine oxide oligomer (APPO) has been reported.

The nanofibers were shown to improve the mechanical properties of the organic matrix. By this sol-gel process, Facio and Mosquera also successfully fabricated the nanocomposite coatings containing (i) a mixture of monomeric and oligomeric ethoxysilanes, (ii) a hydroxyl-terminated polydimethylsiloxane, (iii) colloidal silica particles, and (iv) a surfactant (n-octylamine). In addition, the sol-gel method could be used in combination with the electrodeposition for incorporation of inorganic nanofillers into the organic matrix or into inorganic matrix.

### Cold Spray Method:

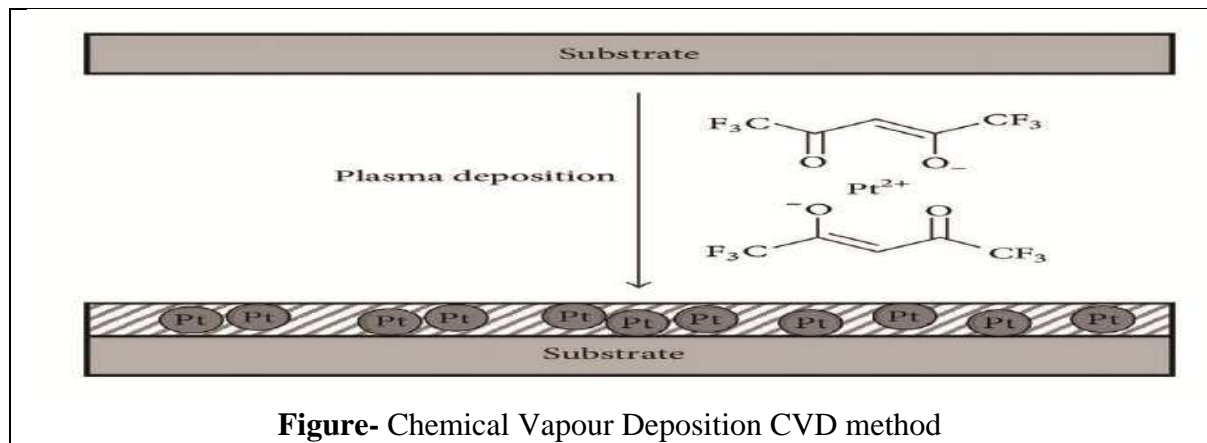
Unlike the traditional thermal spray (gas-flame, plasma, and detonation spraying), cold spraying allows fabrication of coatings at the lower temperatures than melting points of the sprayed materials. Cold spray technique was conducted at low temperatures, so this method avoids the deterioration phenomenon of the materials such as oxidation and decomposition as well as phase transition during the process. The obtained coatings have low porosity (<1%) and low oxygen concentration. In addition, the coatings have high strength (>280 MPa) and strong adhesion (>70 MPa).



This method is used to produce the nanocomposite coating, which has metallic matrix, such as Cu, Al, Co, or alloy matrix, and its nanofillers are nitride, carbide, boride, diamond, CNT and others. To fabricate the nanocomposite powders for this cold spray method, the mechanical alloying (MA) should be used with metallic matrix powders and other nanoparticles.

### Chemical Vapour Deposition (CVD) Method:

This method usually used for the fabricating of the I/I nanocomposite coatings, which include the inorganic matrix and inorganic nanofillers. In order to improve the quality of coating, the aerosol-assisted CVD method can be used. On the other hand, the O/I nanocomposite coatings were also successfully fabricated by using Chemical Vapour Deposition CVD method with platinum (II) hexafluoroacetylacetonate as precursors.



This process allows producing a layer of nanocomposite on the organic substrate by a single step which displays both ionic and electric conductivities. The distinct advantages of this method are related to its high-quality films and its facility for any kind of complex substrates with a good reproductivity.

#### **Plasma Vapour Deposition (PVD) Method:**

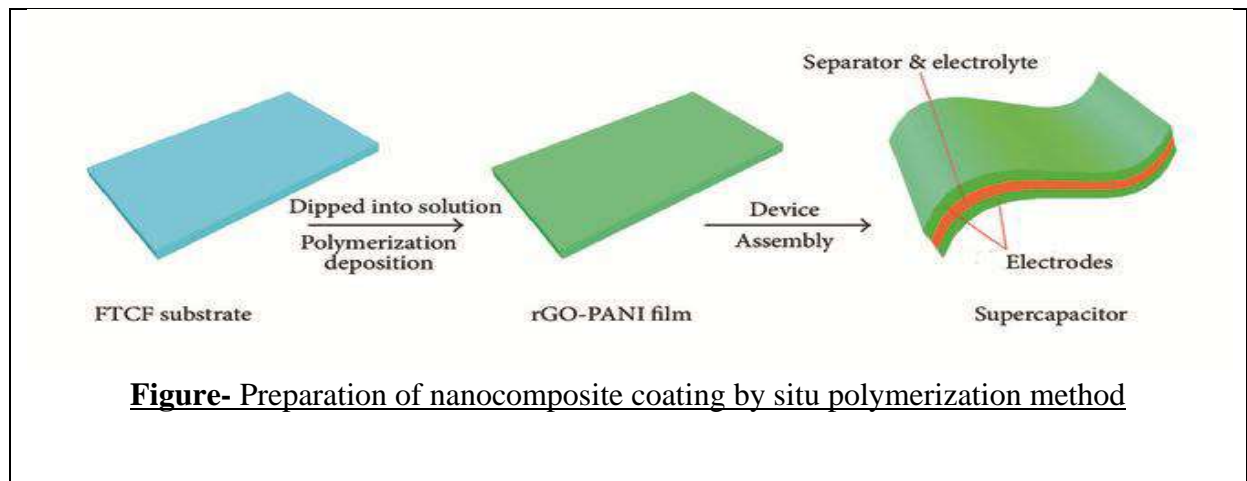
This method is used generally for producing of the I/I nanocomposite coating, which includes the inorganic matrices and inorganic nanoparticles. For these type of coatings Plasma Vapour Deposition is the main method includes the following: laser ablation, thermal evaporation, ion beam deposition, ion implantation, laser-assisted deposition, and atom beam cos puttering technique. In case of O/I nanocomposite coatings, it has been successfully fabricated the nanocomposite coating with organic matrix, by using the aerosol-assisted plasma deposition.

#### **Thermal Spray (TS) Method:**

This method is often used to make nanocomposite coatings with a matrix of metal or alloy. The spray material is a nanosized alloy powder formed by ball milling and dispersed in a suspension solution using suspensions (Thermally Sprayed and Suspension Plasma Spray Process) to conduct plasma thermal spraying.

#### **Polymerization Coating (PC) Method:**

This method was used to fabricate the nanocomposite coatings with organic matrices, which were conducting polymer or other monomers with initiators. The nanofillers were metals or metal oxides. The polymerization takes place by using electric power (electrodeposition), oxidizing agents, or photon (photopolymerized). The similar methods are emulsion polymerization or latex emulsions for organic matrices.



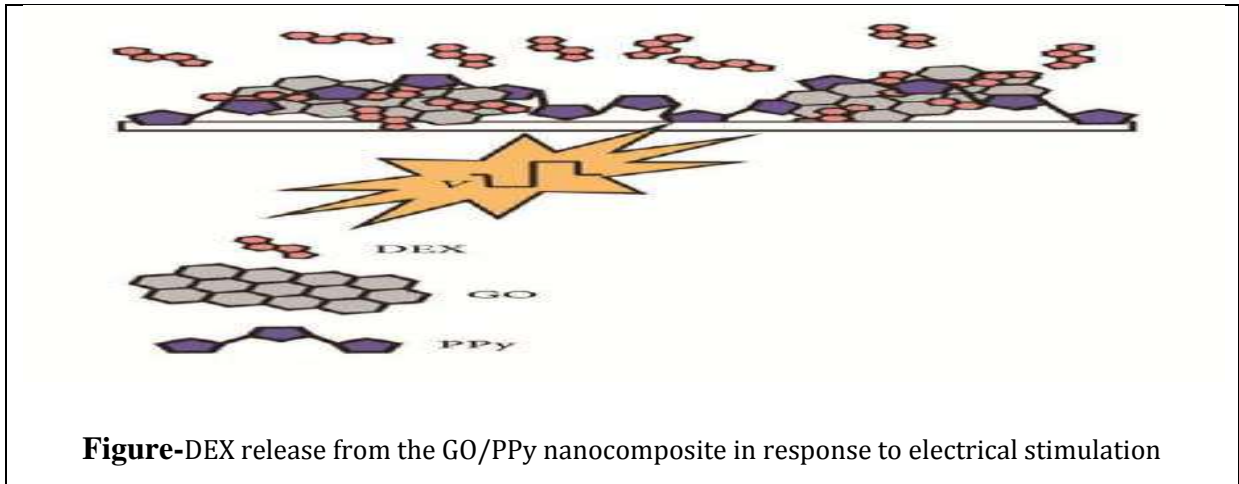
**Figure- Preparation of nanocomposite coating by situ polymerization method**

### **Electro-Less Deposition (ELD) Method:**

This method is usually applied for producing the nanocomposite coatings with Niken matrix and nanofillers are carbide, nitrite, boride, or PTFE. In order to improve the hardness, anticorrosion, and anti-wear of coating, the thermal posttreatment at 500–700°C should be applied.

### **Electro Deposition (ED) Method:**

This method could be used for the fabrication of nanocomposite coatings, which contain organic nanofillers (such as PEO, PTFE) or inorganic matrices or organic matrices. In the case of organic matrices, the electrochemical codeposition of nanocomposites has been reported by many researchers. In this paper we discussed, the various nanostructured organic-inorganic coatings using electrophoretic deposition. The author summarized various organic matrices, such as polyelectrolytes, poly(ethylene imine), which were electrochemically codeposited with metal ions as well as with ceramic nanoparticles. The electrochemical codeposition of carbon nanotubes/conducting polymers has also been reported. Other studies involved the electrochemical codeposition of oxide and metal nanoparticles, such as Ni (as matrix) and  $\text{Al}_2\text{O}_3$  (as nanofiller). It is also observed that as a dominant organic matrix, used for the electrodeposition of nanocomposite coatings. In the case of inorganic matrices, the electrodeposition of nanocomposite coatings can be performed by using the direct current (DC), pulsed current (PC), and pulsed reverse current (PRC) methods. Among these 3 methods, the PC method provides more control on structure and properties of the coatings through this method we obtained coatings had better tribological and corrosion properties than ones made by DC method. On the other hand, compared with other methods, the electrodeposition technique was much easier in terms of manufacturing processes and lower cost.



The main advantages of this technique are related to the uniform distribution of particles, the ability of continuous processing and the reduction of waste materials. Compared to conventional coatings, nanocomposite coatings exhibit higher hardness and heat resistance due to the presence of nanoparticles in the grain boundaries, which can prevent the dislocations movement and recrystallization at high temperature. As a strong and tough metal, Nickel has been widely used as an electrodeposited metal matrix, in combining with nanofillers such as boron nitride and  $\text{Al}_2\text{O}_3$  nanoparticles. Some authors reported that the changing duty cycle and frequency during pulsed electrodeposition can also produce nanocomposite coatings.

#### **Solution Dispersion:**

This method is mainly applied for the preparation of polymer nanocomposite coatings, reinforced with nanofillers such as metal oxides, nanoclay, and carbon nanotube (CNT). In this method, beside the use of traditional magnetic/mechanical stirring methods, the ultrasound-assisted (sonication) stirring was used for better dispersion of nanofillers into polymer matrices.

#### **Spray and Spin Coating (SSC) Methods:**

These methods are widely used for the preparation of polymer nanocomposite coatings. In the case of spray coating, by using the atomizer, the nanocomposite coatings had better properties. The atomizer could also be used for thermal spray method, for example, atomized spray plasma deposition. In the case of spin coatings, it provides uniform thin films to flat substrates. The substrate is rotated at high speed in order to spread the coating materials by centrifugal force. This method is suitable for the preparation of thin-film nanocomposite coatings.

#### **Dip Coating (DC) Method:**

This technique is widely used in industry; the dip coating technique consists in soaking a substrate in a solution of nanocomposite and pulled up at a constant and controlled speed. The substrates are then covered with nanocomposite as it is removed from the solution. Due to the imposed pulled up rate, the amount of nanocomposite on the substrate surface is also controlled. There are two pulled out rates of the substrate, which have direct effect on the thickness of the film. At low pulled up rates, there is the capillary regime where the rate of evaporation of the solvent is greater than that of the shrinkage of the plate. This

means that the shorter the shrinking speed, the thicker the film. At high pulled up rates, the trend is reversed. In this so-called drainage regime, it is the combination of the adhesion of the solution to the substrate and the gravity that forces the drainage of the solution. This causes thickening of the films as the shrinkage rate increases. The advantage of this technique is that the preparation of a flat surface is therefore suitable for all forms of coated substrates. The fact that the solution can be reused until evaporation or depletion of the solute also makes this technique particularly convenient, especially for industrial applications.

#### **Layer-by-layer (LBL) Method:**

Layer-by-layer (LBL) technique is another method for fabricating a thin layer film and is based on the concept of self-assembled nano layers. LBL process causes to enable modifying multi-composite molecular assemblies with a control on the molecular structure and a high degree of control over the thickness. There is more attraction using electrostatic self-assembled (ESA) because of the simplicity and efficiency. In LBL method, polyelectrolytes with opposite charge were alternately deposited on the fabric surface with wash steps in between. For increasing the thickness, cycles of adsorption can be repeated. LBL technique incorporated to nanomaterials was used for applying a thin nanocomposite on the fabric surface and wide range of functionalities have been imparted to fabric with LBL method.

#### **Other Methods:**

There are also several other methods for the elaboration of nanocomposite coatings but they are less popular such as the following: self-assembly (O/I coatings); layer-by-layer assembly (O/O coatings); localized laser heating, solid-state displacement reactions, ball impact deposition (for I/I coatings, resp.); and atomic layer deposition (for I/O coatings).

### **Characterisation:**

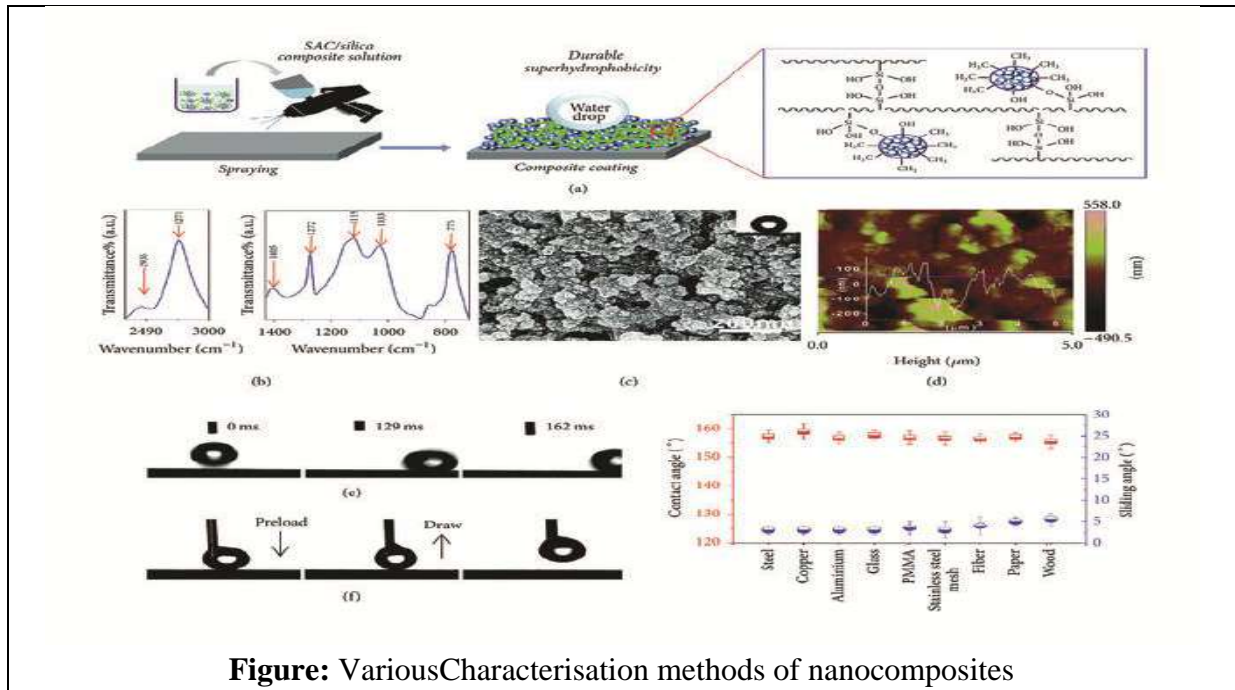
#### **1. Scanning Electron Microscope (SEM):**

Microscopic analyses are essential in nanotechnology. Electron microscopes are one of the most common analysis instruments that use the interaction of emission ray of electrons with the sample atoms to provide magnified image. There are several types of electron microscopes according to the type of electrons that has been using for producing image. Hereon SEM and TEM are two main types of electron microscopes. Electron microscopes are precise instruments and play an important role in nanoscale systems. Electron microscopy can be employed in nanostructure imaging, composition, determine physical properties measurements and even building and manipulating nanostructures.

#### **2. Transmission Electron Microscope (TEM):**

TEM is an important technique in textile used in a wide range of applications. It has the ability to provide detailed information about the ultrastructure and it is applied to investigate the internal structure. For example, TEM was used to study the details of the Microcrystalline cellulose (MCC). TEM provides information on the particle nucleation, core-shell structure of the particles, crystalline nature, film thickness, particle shape, nanofiber diameter, distribution of nanoparticle through nanofiber and structure of coating. In many literatures, the shape, distribution, and particle size of nanomaterials were investigated using TEM images.





### Properties:

1. Effect of Nanofillers on the Microstructure and Morphology of Coatings
2. Effect of Nanofillers on the Mechanical Properties of Coatings
3. Effect of Nanofillers on Thermal Property of Coating
4. Effect of Nanofillers on the Anticorrosive and Anti-wear Properties of Coatings
5. Effect of Nanoparticles in Nonwetting Nanocomposite Coatings

### Applications:

**Medical Uses:** Fabrics are engineered so that they can be used for drug delivery and wound healing. Silver nanoparticles possess antimicrobial properties. Therefore, silver nanoparticles are extensively used in products related to dressings for burns and scald. Nano-engineered fabrics are also used to screen heart rate, body temperature, and breathing rhythm.

**Military Uses:** Production of fabrics that are lightweight but show a high degree of resistance to extreme temperatures, durable, antibacterial activity, improved camouflage, water-resistant, and embedded with multipurpose nanosensors. The textiles also possess high anti-ballistic flame-retardant and RF-shielding properties. Such characteristics are ideal for military usage.

**Antiwrinkle cotton fabric:** For cotton fabrics, wrinkle resistance can be developed by using the nano-engineered cross-linking agents during the fabric finishing process. Besides the wrinkle resistance, such finishing is also capable of eliminating toxic gases, while preserving the preferred comfort properties of cotton.

**Odor-free fabric:** Application of silver nanoparticles on fabrics prevent the nasty odor caused due to the microbial activity. Many companies use fabrics coated with silver

nanoparticles to develop odor-free clothing, such as stockings, socks, and undergarments. Korean-based Hyosung develops nylon fibers containing silver nanoparticles that reduce 99.9% growth of several harmful bacteria.

**Water-resistant fabric:** Silica nanoparticles create a water-resistant coating when inserted into the fabric or sprayed onto the fabric surface.

**Ultraviolet-protective fabric:** When inserted into fabrics, nanoparticles of zinc oxide or titanium dioxide protect the skin from sun damage. These nanoparticles have the ability to scatter the ultraviolet light present in the sun's rays, reducing the risk of skin diseases linked to UV exposure.

**General Uses:**

1. The coating is in the form of an aqueous suspension of nanoparticles based on silicon.
2. It penetrates deeply into the fibre structure and binds to them, creating a thin layer repelling water, fatty substances, dirt anti-bacteria, fungus and germs which significantly facilitates cleaning.
3. The durability of the temporary coating after a proper application is about 5 washing cycles.
4. The air permeability of the coated surface remains unchanged.
5. The product is compatible with all types of fabrics (natural, synthetic and semi-synthetic).
6. Permanent coating does not cause discolouration.
7. Guarantees the safety of use and does not burden the natural environment.
8. The product contains nano-silver, which maintains the sanitary cleanliness of the surfaces to be cleaned, reduces the growth of microbes, bacteria, fungi and mould, protects against unpleasant odours.
9. Can be used on soft furniture as a waterproof coating that provides the stain resistance.
10. Produced in Eco-friendly processes and biodegradable product.

**Conclusions:**

We tried to trace here an overview of the nanocomposite coatings in both basic fundamental and last recent developments in design, preparation, and applications of the nanocomposite coatings. With a rapid growth rate of the nanotechnology and related fields, nanocomposites coatings today become smatter, cheaper, and more functional. The domains of application of nanocomposite coatings are thus expected to be larger in the future, dealing with drug delivery systems, anticorrosion barrier coatings, antibacterial coatings, self-scratch repair, fire retardant coatings, reflective coatings, and screen effect coatings. The nanocomposite coating today not only serves as a protection for the materials but also plays other roles due to the presence of multifunctional nanofillers. Two most popular examples can be cited, and they are antibacterial coatings and smart coatings which are used for sustainable energy fields. In the first case, the nanofillers based silver nanoparticles and their related products are very promising in the next decades. In the future, we will face many risks and challenges, especially energy problems, and the



research on the sustainable energy conversion is expected to explode, in terms of both theory and experiment, and the nanocomposite coating will not stand out of this trend, for example, self-cleaning or “easy-to-clean” coatings, coated on building, protective substrates and on glass, can help save energy and water in facility cleaning while insulant nanocomposite coatings help to save the energy loss saving billions of dollars for maintaining homes in winter, especially in North America where the winter is cool and long.

## References:

- [1] Bhushan B, *Handbook of Nanotechnology*. 2th ed. Springer; 2007.
- [2] Brown PJ, Stevens K, *Nanofibers and nanotechnology in textiles*. Woodhead Publishing Limited and CRC Press LLC; 2007.
- [3] Ner Y, Asemota C, Olson JR, Sotzing GA, Nanofiber Alignment on a Flexible Substrate: Hierarchical Order from Macro to “Nano. *Applied Material and interfaces*”2009;1:2093–2097.
- [4] Sundarrajan S, Chandrasekaran AR, Ramakrishna S, An Update on “Nanomaterials-Based Textiles for Protection and Decontamination” *Journal of the American Ceramic Society*. 2010;93:3955–3975.
- [5] El Shafei A, Shaarawy S, Hebeish A, Application of reactive cyclodextrin poly butyl acrylate preformed polymers containing nano-ZnO to cotton fabrics and their impact on fabric performance. *Carbohydrate Polymers*. 2010;79:852–857.
- [6] Y. Li, D.X. Wu, J.Y. Hu, S.X. Wang, Novel infrared radiation properties of cotton fabric coated with nano Zn/ZnO particles. *Colloids and Surfaces A: Physicochem. Eng. Aspects*. 2007;300:140–144.
- [7] El-Rafie MH, Mohamed AA, Shaheen ThI, Hebeish A, Antimicrobial effect of silver nanoparticles produced by fungal process on cotton fabrics. *Carbohydrate Polymers*. 2010;80:779–782.
- [8] Su C, Li J, The friction property of super-hydrophobic cotton textiles. *Applied Surface Science*. 2010;256:4220–4225.
- [9] Lu H, Song L, Hu Y, A review on flame retardant technology in China. Part II: flame retardant polymeric nanocomposites and coatings. *Polymer Advanced Technologies*. 2011; 22:379–394.
- [10] Ki HY, Kim JH, Kwon SC, Jeong SH, A study on multifunctional wool textiles treated with nano-sized silver. *Journal of Material Sciene*. 2007;42:8020–8024.
- [11] Zhang H., Tang Q., Li Q., Song Q., Wu H., Mao N. “Enhanced Photocatalytic Properties of PET Filaments Coated with Ag-N Co-Doped TiO<sub>2</sub> Nanoparticles Sensitized with Disperse Blue Dyes. *Nanomaterials*. 2020;10:987.
- [12] J. Ren, W. Wang, S. Sun, L. Zhang, L. Wang, J. Chang “Crystallography Facet-Dependent Antibacterial Activity: The Case of Cu<sub>2</sub>O” **Ind Eng Chem Res**, **50 (17) (2011), pp. 10366-10369**
- [13] Yu J., Lee C.H., Kan C.-W., Jin S. “Fabrication of Structural-Coloured Carbon Fabrics by Thermal Assisted Gravity Sedimentation Method” *Nanomaterials*. 2020;10:1133.doi: 10.3390/nano10061133.

- [14] Lim TH, Kim SH, Oh KW. “Fabrication of Organic Materials for Electronic Textiles” In: Tao X, editor. Handbook of Smart Textiles. Singapore: Springer Singapore; 2015. p. 739–73.
- [15] S. Fateixa, P.C. Pinheiro, H.I. Nogueira, T. Trindade. Gold loaded textile fibres as substrates for SERS detection. *J Mol Struct*, 1185 (2019), pp. 333-340
- [16] S. Vasantharaj, S. Sathiyavimal, M. Saravanan, P. Senthilkumar, K. Gnanasekaran, M. Shanmugavel, *et al.* “Synthesis of ecofriendly copper oxide nanoparticles for fabrication over textile fabrics: characterization of antibacterial activity and dye degradation potential” *J Photochem Photobiol, B*, 191 (2019), pp. 143-149
- [17] Y. Gao, C. Xie, Z. Zheng “Textile composite electrodes for flexible batteries and supercapacitors: opportunities and challenges” *Adv Energy Mater*, 11 (3) (2021), p. 2002838
- [18] H. Tian, Y. Zhai, C. Xu, J. Liang “Durable Antibacterial Cotton Fabrics Containing Stable Acyclic N-Halamine Groups” *Ind Eng Chem Res*, 56 (28) (2017), pp. 7902-7909



## Synthesis and Characterization of Mixed/Doped Ferrimagnetic Oxides

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### Abstract

We studied about the auto-combustion synthesis and fabrication of an oxygen-deficient cobalt iron oxide and polydimethylsiloxane composite and tested its feasibility as a magnetic composite. We prepared cobalt iron Co: Fe<sub>2</sub> nanoparticles using two different routes as Sol Gel and wet Chemical method. TEM images shows that the size of nano particles was prepared by Sol gel and wet chemical method which is 40% smaller than the others. The effect of synthesis process on structural and optical properties were determined by XRD and FTIR. It was found that exhibit a polycrystalline nature with polymorphic structural distributions in the structure, unusual ferri-to-diamagnetic transitional property determined by X-ray diffraction, Raman Spectroscopy and vibrating sample of magnetometer studies respectively. Field Transmission Scanning Electron Microscopy results different properties of prepared sample.

**Keywords:** *Synthesis, Magnetic field, Ferrimagnetic, Properties, Materials, Composites*

### Introduction

Magnetic composites of fluids, foam and elastomers are a widely used as scientifically and technologically for smart magneto-responsive materials, which are dispersed in the form of non-magnetic matrix by nano or micron-sized soft-magnetic particles. These particles magnetized under an applied magnetic field. All such magnetic material particles including in matrix in the presence of an external applied magnetic field forms column- or chain-like system in the direction of the magnetic field having dipole-dipole interaction. Such constructed materials reversed into a dispersed form in the absence of a magnetic field. Such materials in phase of fluid shows non-Newtonian behaviour. While the applied magnetic field controls the shear viscosity of the material. This phase changes a liquid to solid transformation, of magnetic materials forms different avenues in commercial applications. Several such type of group materials behave like semi-active controllers in dampers, brakes. On the basis of this material synthesis, it is very helpful in engineering applications. The principal effect on the field- of external magnetic field responsive activity is due to the magnetic particles. The materials utilized in these systems are nano-phase soft-magnetic particles such as iron, ferrites as iron ferrites and iron alloys with variable distributions in shape. It is the particle dimension in shape and size that determine the magnetic properties of the given system. In general, soft magnetic particles are favoured materials for different magnetic properties. The low magnetic hysteresis and high saturation (magnetic) values were observed of prepared sample. From last many years, cobalt iron had been at the centre of industrial and academic research because it has been widely used in the fabrication in MR systems. Although Cobalt Iron is a pure iron powder with highly magnetic and satisfactory dimensions causes major issues with increasing sedimentation. Therefore, other iron-based low-density magnetic particles have been considered to improve the colloidal state within the viscous and achieve carriers. But mostly in D-block

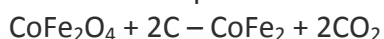


metal oxides, the negative ion-to-metal charge transfer energy is the primary reason for the unusual conductive and magnetic properties. In addition the low-density iron oxide-based compounds having considerable attention for decades owing to their satisfactory various magnetic properties, specific valence states, magnetic interactions, structures, resistive states, and other applications. The unusual quadrivalent state of iron is of interest owing to the distinctive electronic and magnetic properties of ferrites. One such specific material is barium iron oxide and cobalt iron oxide which have different types of structure such as tetragonal, triclinic, hexagonal and rhombohedral depending upon the available oxygen stoichiometry. It was observed that the structure and magnetism within the cobalt ferrite were strongly dependent on the oxygen content. For example,  $\text{CoFeO}_2$  an oxygen-deficient form of  $\text{CoFeO}_3$  demonstrates meta-magnetic transitional behaviour at low temperatures or we can say that at higher temperatures the prepared sample exhibits ferrimagnetic behaviour. However, the  $\text{CoFeO}_3$  system demonstrating ferromagnetism and metallicity behaviour exhibits insulating nature in ferromagnetic behaviour. Owing to the state change due to the oxygen deficiency in the  $\text{CoFeO}_3$  system because its structural variety and magnetic properties are expected to increase at room temperature for various MR applications. These metal oxides are widely carried out by the sol-gel process as well as wet chemical method involving a combination of auto-combustion routes. This process involves the use of low-cost materials and simple apparatus. The combined process of sol-gel with combustion and induces a thermal redox reaction with spontaneous reactions and release the energy in different forms which sustains the reaction in a very short period. These prepared samples are affected by the temperature at high temperature with a release of gaseous agents are directly influenced by the fuel and the oxidant ratio. The product is crystalline, with a homogenous particle size distribution, highly porous structure, high surface area, satisfactory composition, and temperature control. Hence, it is easy to say that scale up is the most industrially viable approach to use in various applications. Thus sol-gel and wet chemical method was used for the synthesis of Cobalt iron oxide particles in this research work.

### Experimental Setup of materials and methods

The hydrothermal method or Wet Chemical Method was used to synthesize cobalt ferrite. This method provides different nanostructured materials and has a lot of benefits such as clean product with high degree of crystallization with a temperature up to  $200\text{ }^\circ\text{C}$ . All reagents used in this synthesis are commercially available and used as without further purification. An appropriate amount of analytical ferrous sulphate and sodium citrate was dissolved in the ratio of 1:2 in pure water. This mixture placed at  $120\text{ }^\circ\text{C}$  for 24 hours. We obtained a blackish precipitate which washed many times in pure water and ethanol. All reagents were utilized for synthesis as-received without any purification. We can use deionized water for the synthesis of prepared sample. Cobalt nitrate,  $\text{Co}(\text{NO}_3)_2$ , with a high purity iron(III) nitrate nona hydrate  $\text{Fe}(\text{NO}_3)_3$ , with a purity of 98% and citric acid,  $\text{C}_6\text{H}_8\text{O}_7$ , with a purity of 99.9% were used with a purity of 98% for the synthesis of Barium  $\text{BaFeO}_3$  powder. We obtained nanocomposites of cobalt ferrites and carbon which was heated at  $900\text{ }^\circ\text{C}$  for 3 hours.

During this process a chemical reduction took place as





This similar process was used to obtain the same nanocomposites of cobalt ferrite in a specific ratio. The activated carbon and cobalt ferrite should be in a molar ratio of 2:1 and 10:1 respectively.

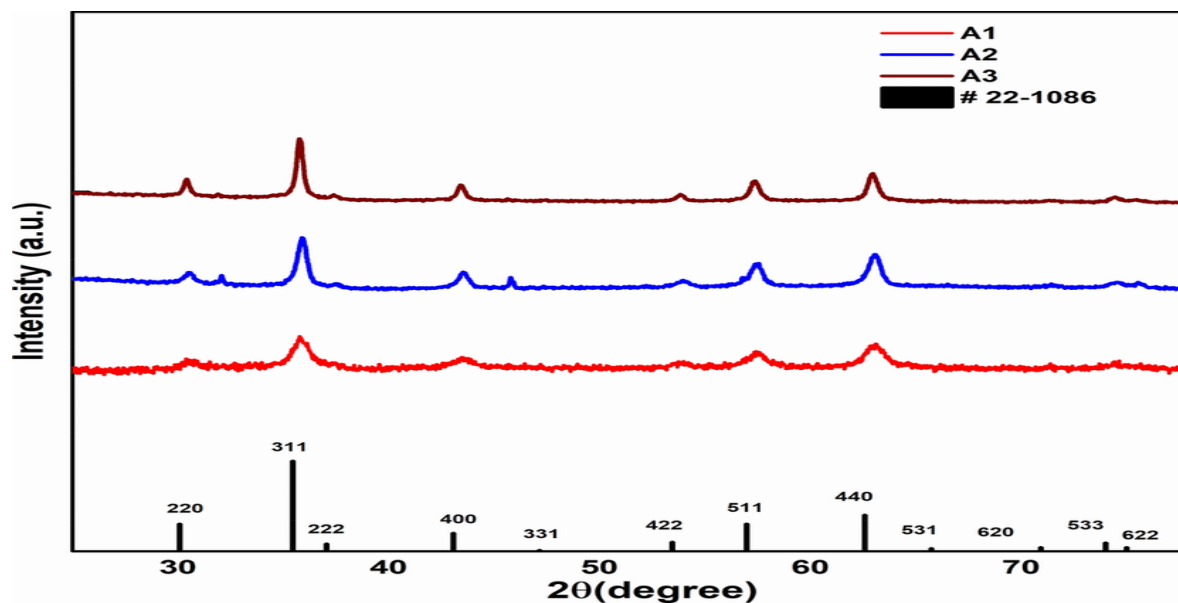
In this research work, we studied mainly on the synthesis and fabrication of magnetic composite-based materials, which consist of their mechanical properties in the presence of an applied magnetic field. Most magnetic composites are prepared by mixing magnetic particles, and magnetic composites in the presence of a magnetic field show various magnetic effects. A magnetic material enables the material to reclaim its natural and original shape and property. These composites may be prospective solid-state analogs of magnetorheological fluids. This magnetic-field effect addresses the major challenges, which include sealing, deposition and coating of iron particles. These magnetic composites have immense potential for designing smart devices in various commercial and non-commercial purposes in various fields like engineering areas like sensing mechanical signals, controllable signals, defined structures, absorption, and isolation of the prepared materials. A major additive for these composites is the magnetic particle having higher saturation, magnetization, permeability, and lower remanence. These properties of magnetic nanocomposites are highly active for various applications. The main application of prepared magnetic particles in the absence of an applied magnetic field and these can be controlled for higher or lower grades. Most of the magnetic composite materials are fabricated under various conditions such as vulcanization based on the magnetic field applied during this process. To obtain prepared nanocomposites can be either anisotropic or isotropic, respectively. The primary aim of this study was to evaluate the influence of different loadings of  $\text{CoFeO}_3$  particles in the magnetic and mechanical behavior of the prepared nanocomposite. Thus, we have to obtain various properties of magnetic and mechanical properties of the composite and molecular structure.

#### **Structural and Magnetic Measurements-**

The crystalline structure and magnetic properties of prepared samples obtained by XRD, SEM, TEM and FTIR are discussed as below

#### **X-Ray diffraction (XRD)**

XRD patterns of pure iron oxide nanoparticles and co-doped iron oxide nanoparticles were shown in Figure below. All peaks in the XRD patterns confirmed the phase and inverse spinel structure of the nanoparticles. The peaks observed at  $30^\circ$ ,  $35^\circ$ ,  $43^\circ$ ,  $56^\circ$  and  $62^\circ$  corresponding to the characteristic crystallographic planes are (2 2 0), (3 1 1), (4 0 0), (5 1 1), and (4 4 0) and peaks were matched.



The lattice parameters were calculated using following relations. Depicts the diffractograms for the annealed prepared powder. As illustrated, the samples exhibit high polycrystallinity, with various polymorphs of the sample in chemical phases that are also highly oxygen-deficient, few phases of iron oxide polymorphs, and cobalt ferrite. Using Scherrer's formula for the strongest peak, the crystallite sizes measured were 54 nm, 43 nm, and 44 nm. List of the peak values shown in figure.

#### Scanning Electron Microscope (SEM)-

The XRD analysis of synthesised powder after calcination that the final product of cobalt ferrite with expected inverse spinel structure. This is very close to the expected for the cobalt ferrite. The diffraction profile obtained for the sample partially reduced obtained and perform XRD measurements. To analysis the cation distribution of the precursor compound of cobalt ferrite spectroscopy experiments at room temperature. The morphology and dimension of nanoparticle were analysed by Scanning Electron Microscope SEM measurements.



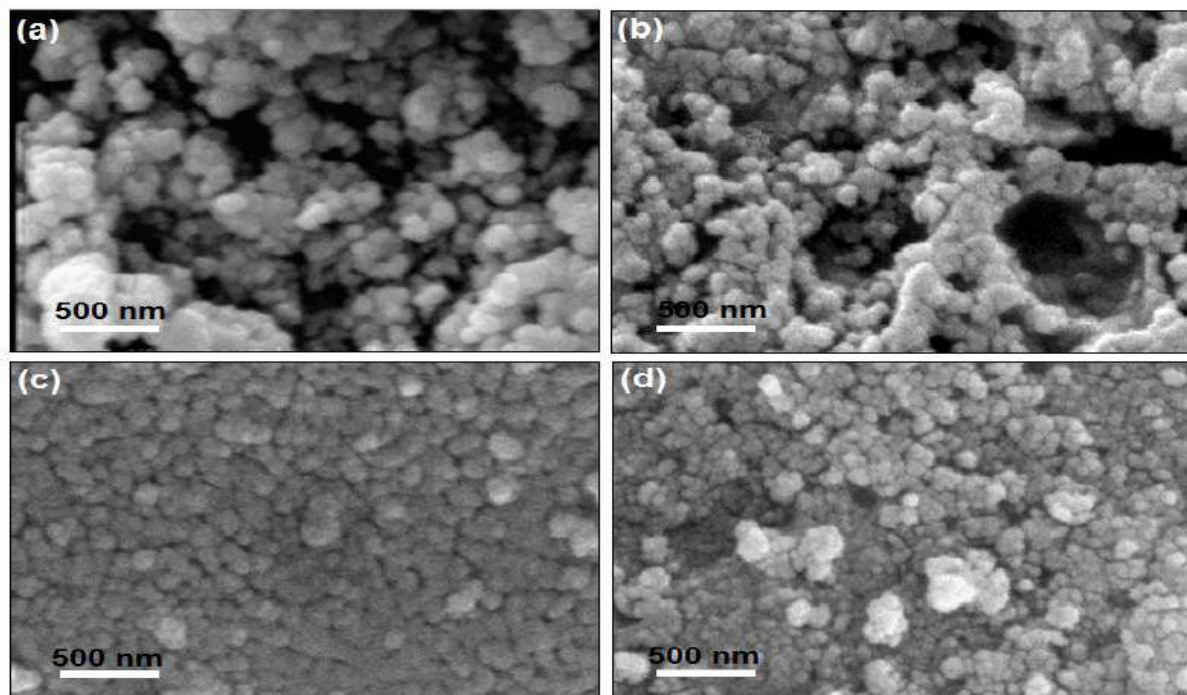


Fig- SEM of cobalt Ferrites sample

The measurements of cobalt ferrite sample read and found that the shell does not cover each nanoparticle but the particles are composed in to parts big core and thin shell about a fewnanometres.

#### Transmission Electron Microscope (TEM)-

The TEM measurements of nanocomposites are roughness at the surface of prepared sample but the roughness not observed at the percussor materials. The superficial materials joined with nanoparticles and most of the part of prepared sample found at interface of the particles. But due to the thickness of shell we consider necessary measurements of high-resolution TEM. TEM analysis indicates that the nanoparticles of nanocomposites are larger than the original nanoparticles show the reduction process to increase the mean size of the nanoparticle up to 98nm. TEM measurement showed that the dimension of the soft phase is larger than the critical size obtained. The cobalt ferrite sample observed the coercivity approximately 1.86kOe at normal room temperature. This results the higher than the coercivity obtained and samples treated by thermal magnetic annealing and mechanical milling respectively.



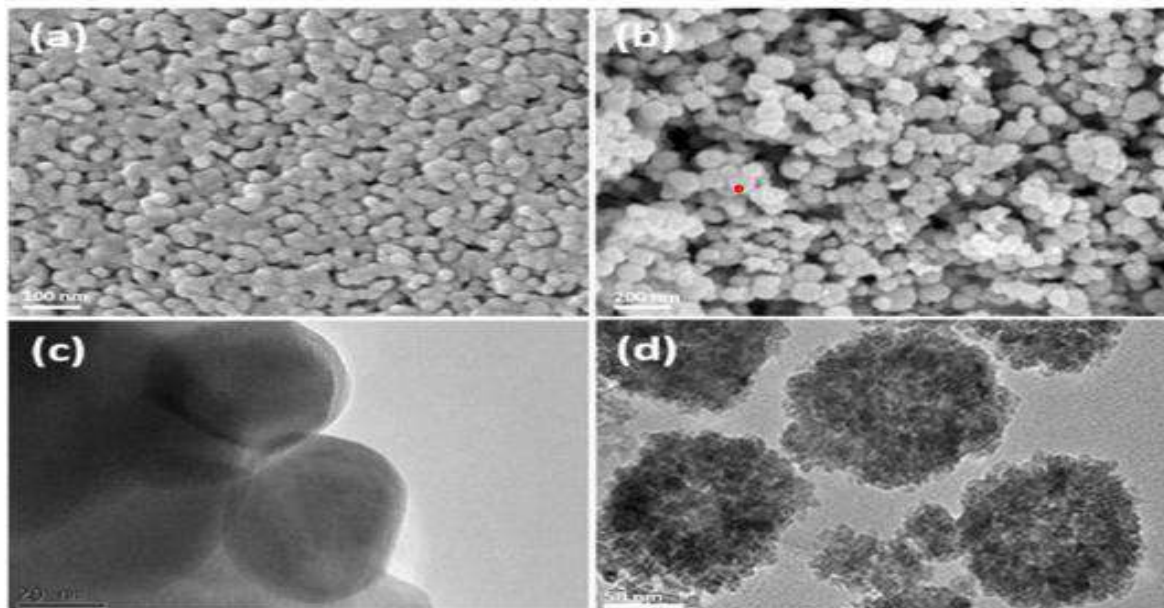


Fig- TEM of Cobalt ferrite Sample

The same behaviour observed to coercivity for the cobalt ferrite was also seen for the nanocomposites. The hysteresis curve of the nanocomposite described by single shape loop is similar to that of the single-phase indication that magnetization of both phases.

### Discussion

The magnetic composites are known to demonstrate a significant nonlinear contact between the matrix and magnetic filler powder. In general practice, a few additives plasticizers are introduced to enhance the strong interaction between the matrix and the filler phase. Researchers normally introduce magnetic particles, such as iron or carbon, to regulate the mechanical properties of the composites. The role played by the amount of cross-linker used is an important factor in moulding. The present work in these deals with the synthesis, characterization and fabrication of low-sedimentation magnetic composite materials. The composites were fabricated by mixing  $\text{CoFeO}_3$  nano powder. Thereafter, the magnetic and mechanical behaviours of the obtained  $\text{CoFeO}_3$  composites were investigated.

### Conclusion

In conclusion, we synthesized prepared powder via auto-combustion and fabricated PDMS-based magnetic composites with different  $\text{BaFeO}_3$  loadings as 0.5, 1.0 and 1.5 g. The highly polycrystalline powder demonstrated the presence of cobalt ferrite, oxygen-deficient  $\text{BaFeO}_3$  and iron oxide phases, which were difficult to separate. When prepared with mixed with the powder yielded a well-dispersed composite, with very limited sedimentation. In this study, XRD demonstrated that the crystalline average size of the cobalt ferrites increased from 11.03 nm of iron oxide to  $\text{Co-Fe}_2\text{O}_4$  with 20% wt, 40 % and size 11.12 nm and 16.35 nm respectively. Morphology of cobalt ferrites depicted the flat surface and negligible agglomerated in SEM study. Magnetic properties of cobalt ferrites were studied Saturation of magnetisation( $M_s$ ) versus Magnetic field strength( $H$ ) it is observed that saturation of magnetization was enhanced with concentration of cobalt metal in iron oxides nanoparticles. Cobalt ferrite nanoparticle can be synthesized by combustion, coprecipitation, and precipitation methods. Average sizes of the crystals were estimated to



be 68.9nm, 48.9nm and 34.7nm for combustion, coprecipitation, and precipitation methods. XRD pattern is in accordance with inverse cubic spinel structure of prepared sample with space group  $fd-3m$ . Also, can be determined the VSM data of samples showed that by decreasing particle size, saturated magnetization has decreased  $H_c$  and  $M_s$  are greatest in the combustion method.

#### Reference:

- [1] A.; Jin, W.; Schnepf, J.; Tieke, B.; Chem. Mater. **2003**, 15, 245.
- [2] Kaye, S.S.; Long, J.R.; Catal. Today **2007**, 120, 311.
- [3] Moore, J.G.; Lochner, E.J.; Ramsey, C.; Dalal, N.S.; Stiegman, A.E.; Angew. Chem. Int. Ed. **2003**, 42, 2741.
- [4] Ferlay, S.; Mallah, T.; Quahès, R.; Veillet, P.; Verdaguer, M.; Nature **1995**, 378, 701.
- [5] Sato, O.; Lyoda, T.; Fujishima, A.; Hashimoto, K.; Science **1996**, 272, 704.
- [6] Dunbar, K.R.; Heintz, R.A.; Prog. Inorg. Chem. **1997**, 45, 283.
- [7] Kahn, O.; Nature **1995**, 378, 667.
- [8] Qiu, J.D.; Peng, H.Z.; Liang, R.P.; Li, J.; Xia, X.H.; Langmuir **2007**, 23, 2133.
- [9] Zhao, G.; Feng, J.J.; Zhang, Q.L.; Li, S.P.; Chen, H.Y.; Chem. Mater. **2005**, 17, 3154.
- [10] Zhao, W.; Xu, J.J.; Shi, C.G.; Chen, H.Y.; Langmuir **2005**, 21, 9630.
- [11] Baioni, A.P.; Vidotti, M.; Fiorito, P.A.; Ponzio, E.A.; Cordoba de Torresi, S.I.; Langmuir **2007**, 23, 6796.
- [12] Pyrasch, M.; Toutianoush, **2003**, 125, 7814.
- [13] DeLongchamp, D.M.; Hammond, P.T.; Adv. Funct. Mater. **2004**, 14, 224.
- [14] Catala, L.; Gloter, A.; Stephan, O.; Rogez, G.; Mallah, T.; Chem. Commun. **2006**, 1018.
- [15] Kumar, S.S.; Joseph, J. K.; Phani, L.; Chem. Mater. **2007**, 19, 4722.
- [16] Zhou, P.; Xue, D.; Luo, H.; Chen, X.; Nano Lett. **2002**, 2, 845.
- [17] Kosaka, W.; Tozawa, M.; Hashimoto, K.; Ohkoshi, S.-i.; Inorg. Chem. Commun. **2006**, 9, 920.
- [18] Uemura, T.; Kitagawa, S.; J Am. Chem. Soc. **2003**, 125, 7814.
- [19] Yamada, M.; Arai, M.; Kurihara, M.; Sakamoto, M.; Miyake, M.; J Am. Chem. Soc. **2004**, 126, 9482.
- [20] Vaucher, S.; Li, M.; Mann, S.; Angew. Chem. Int. Ed. **2000**, 39, 1793.
- [21] Dominguez-Vera, J.M.; Colacio, E.; Inorg. Chem **2003**, 42, 6983.

**THE MOUSE TRAP: A STUDY OF A "PLAY WITHIN A PLAY" TECHNIQUE**

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**Abstract**

The use of “Play within a play” method in *The Mouse Trap* has been examined in this research paper. This method entails performing a play inside the framework of another play, giving playwrights the chance to investigate intricate themes and concepts. The technique's development and several methods within the approach are examined in this article citing instances from well-known play, such as *Hamlet* by Shakespeare. The effects and efficacy of “Play within a Play” device are thoroughly studied in this paper. The study emphasises how this technique gives a distinct viewpoint on the human experience, which makes it a valuable and timeless tool for playwrights working in the modern era.

**Keywords: Murder, mystery, complex, theatre, Play within a play.**

**Introduction**

For a very long time, playwrights have used theatre as a storytelling medium to explore difficult subjects and concepts through the skill of performance. Playwrights accomplish this using the most intriguing and successful device—the “Play within a play.” Using this style, characters in a novel act out a scene or a play within the wider narrative, frequently making comments about or mimicking the actual happenings. This method, which has been employed for centuries, is now a crucial component of theatrical storytelling and enables playwrights to give their stories more depth and meaning.

We will examine the “Play within a play” approach and its importance in theatre in further detail in this article. We will look at the history of this technique, how it has changed over time, and how playwrights have used it. We'll examine how it's used in a number of plays, such as “Hamlet” by William Shakespeare.

We'll also look at how the “Play within a play” approach draws the audience in and gives the story more nuance and complexity. We'll talk about how it enables playwrights to tackle difficult

subjects and concepts while giving audiences a more engaging and dynamic theatrical experience.

We can learn more about the creativity, intricacy, and historical development of theatre by delving into the "Play within a play" approach. We'll examine how playwrights have used this method to craft more captivating and thought-provoking stories, as well as how it affects the audience and its larger cultural relevance in the theatre industry.

### **Development of the Methodology**

Throughout history, writers have employed the "Play within a play" approach in a variety of literary works. The "Play within a play" method, known as "Natika" in ancient Indian Sanskrit drama, was frequently employed to make social and political commentary. The old Indian drama "Swapnavasava datta" by Bhasa is one instance of a play inside a play. In the play, a group of itinerant performers put on a show that amuses the queen. The inner drama provides commentary on the true nature of reality as well as revealing the characters' true characteristics.

Shakespeare's "Hamlet" makes use of the "Play within a play" device as a vital narrative device to reveal the reason behind King Hamlet's murder. The drama "The Murder of Gonzago" that is played within the play mirrors the events that take place in the main story.

### **Importance of the method**

Theatre uses the "Play within a play" approach for a number of reasons. First of all, it gives the story a deeper, more sophisticated level. Playwrights are able to discuss difficult subjects and concepts that might not be able to be addressed directly in the primary narrative by constructing a parallel narrative inside the greater story. Playwrights can make statements about the nature of reality, the place of the artist in society, and the dynamic between the performers and the audience, among other subjects, using this style. The method fosters a feeling of closeness and connection between the audience and the artists by shattering the fourth wall and accepting the presence of the audience. As they watch the characters act out a play inside the bigger story, the audience is drawn into the performance.

Playwrights can make observations about the nature of art and the place of the artist in society by using the "Play within a play" approach. Playwrights can investigate the nature of performance,

the performer-audience interaction, and the power dynamics at work in the theatre industry by crafting a parallel narrative inside the main drama. Lastly, the "Play within a play" method has cultural relevance outside of the theatre industry. It has been utilised to examine difficult subjects and concepts in television, movies, and literature. The method has influenced how we interact with art and tell stories for a long time, becoming an essential component of storytelling.

### **Techniques With in the Technique**

In literature and theatre, the "Play within a play" concept is frequently employed to craft a meta-narrative that offers commentary on the main plot. To create this impact, the "Play within a play" frequently employs a number of strategies. Using characters in the play who are aware that they are in a play is one tactic. This results in a self-referential story that makes observations about theater's character and the place of the artist in society.

Using the "Play within a play" as a mirror of the main story is another tactic. As a result, a parallel story is created, commenting on the events occurring in the main plot. For instance, in Shakespeare's "Hamlet," the play "The Murder of Gonzago" tells the real narrative of the murder of Hamlet's father, while mirroring the events of the main plot.

Using a "Play within a play" to disclose the characters' real identities is a third tactic. For instance, in Bhasa's "Swapnavasavadatta," the play inside the play is employed to comment on the nature of reality and to disclose the characters' true identities.

Playwrights can use these strategies to craft a multi-layered, intricate story that gives viewers a more immersive, engaging experience. Playwrights can make observations about the nature of theatre, the place of the artist in society, and the power struggles that exist in the performing arts industry by using the "Play within a play" technique.

### **Evaluating How the Technique Is Used**

Shakespeare's "Hamlet" employs the "Play within a play" device to disclose the real reason behind the death of Hamlet father. A group of performers in act in "The Murder of Gonzago", a play scheduled by Hamlet to be performed for the court. Hamlet expects that the play, which reflects the events of the broader plot, would expose King Claudius, his uncle, who he believes

killed his father and reveal his guilt as well. Using this method, a parallel story that offers commentary on the events occurring in the main story is created.

Hamlet gives the performers instructions on how to execute the play in Act III, Scene II:

*"I'll have these players*

*Play something like the murder of my father*

*Before mine uncle.*

*I'll observe his looks; I'll tent him to the quick. If he do blench, I know my course"*

(Shakespeare, 1600, lines 604-608)

This scene shows Hamlet's plan to use the play to reveal the truth about his father's murder.

This method is particularly well-exemplified in Agatha Christie's well-known murder mystery play, *The Mousetrap*. The actors in this play act out a play inside the bigger play, which gives the storyline an additional level of complexity and intrigue. The story of *The Mousetrap* opens with a group of guests at Monks well Manor, a guesthouse that was once a sizable farm, being stranded in a snowstorm. They are cut off from the outside world, and when it is learned that there is a murderer among them, tensions grow. The characters' pasts and ulterior intentions are progressively disclosed as the play goes on, building to a thrilling conclusion.

*The Mousetrap* uses the "Play within a play" approach to heighten the suspense and keep the audience guessing. The play's major events are mirrored in a rehearsal of "The Murder of Gonzago," which is presented by one of the characters, Mollie Ralston, in the second act. "The Murder of Gonzago" has a murder mystery, covert identities, and ulterior motives, just like in the main story.

Christie gives the audience a sense of dramatic irony by incorporating this play inside the play. Though the characters in the play are unaware of the links, they are aware that the play being rehearsed is a reflection of the events occurring in real time. By challenging viewers to solve the riddle before the actors do, this strategy creates tension and keeps them interested.

In addition, the "Play within a play" method draws a distinction between fact and fiction. As the characters in *"The Mousetrap"* enact "The Murder of Gonzago," it becomes clear that the play

explores significant issues like the nature of reality, deception, and the identification of the real killer while also reflecting the truth.

In general, the story of "*The Mousetrap*" is made more intricate and nuanced by the addition of "Play within a play." It gives the audience a chance to actively contribute to the mystery's resolution and offers a chance to consider the topics and motifs the play explores. This method is expertly used by Agatha Christie to build suspense, involve the audience, and produce a one-of-a-kind theatrical experience.

## **Conclusion**

To sum up, playwrights have historically employed the "Play within a play" technique as a potent tool to delve deeper into intricate topics and concepts that go beyond the main plot. The methodology has changed and progressed over time, from its initial applications in mediaeval and Renaissance theatre to its ongoing use in contemporary theatre, giving rise to fresh and cutting-edge methods within the technique itself.

The "Play within a play" technique's adaptability and efficacy in examining a variety of issues, from identity and social class to illusion and the transformational potential of art, have been demonstrated through the analysis of its use. Playwrights are able to provide greater insights into the human condition and the power of storytelling by crafting a multi-layered narrative that emphasises the complexity of human existence.

The "Play within a play" technique's effectiveness stems from its capacity to establish a distinct reality that is both apart from and linked to the reality of daily existence. It gives viewers a fresh and original viewpoint on the human experience, opening their eyes to new possibilities.

*The Mousetrap's* application of the "Play within a play" device is very successful for several reasons. First of all, it enables Christie to expose the murderer's identity in a dramatic and gripping manner. Until the very end of the play, when the murderer confesses, the audience is kept in suspense.

Secondly, Christie is able to examine the issues of guilt and innocence because of the "play within a play" technique. All of the play's characters are held accountable for the murder and are made to face their own guilt. Christie is also able to discuss the distinctions between illusion and



reality in the "Play within a play." At first, the play's characters don't realise that the audience is watching them and think the play is real. But as the play goes on, they start to understand that they are entrapped in a play and that the audience is in control of what they do.

Lastly, the play gains excitement and fun through the "play within a play" method. The play's characters captivate the audience, and they look forward to seeing how the murderer will be identified through the play's use.

All things considered, *The Mousetrap's* usage of the "Play within a play" approach is a really clever and successful way to tell a mystery. Christie's use of this device contributes to the thrilling and suspenseful drama that has delighted audiences for many years.

## References

- Babula, William. "The play-life metaphor in Shakespeare and Stoppard." *Modern Drama* 15.3 (1972): 279-281.
- Fischer, Gerhard, and Bernhard Greiner, eds. *The play within the play: The performance of meta-theatre and self-reflection*. Vol. 112. Rodopi, 2007.
- Greiner, Bernhard. "The Birth of the Subject out of the Spirit of the Play within the Play: The Hamlet Paradigm." *The Play within the Play*. Brill, 2007. 1-14.
- Reinert, Otto. "Satiric strategy in *The importance of being earnest*." *College English* 18.1 (1956): 14-18.
- Shakespeare, William. (1600). *Hamlet*.

# शोध दिशा

ISSN 0975-735X

विश्वस्तरीय शोध-पत्रिका

केंद्रीय हिंदी संस्थान, आगरा से अनुदान प्राप्त

UGC APPROVED CARE LISTED JOURNAL

विश्वविद्यालय अनुदान आयोग द्वारा मान्यता प्राप्त शोध पत्रिका

शोध अंक 61/2 जनवरी-मार्च 2023 400.00 रुपए

संपादकीय कार्यालय  
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गीतिका गोयल/ डॉ० अनुभूति

विधि परामर्शदाता

अनिलकुमार जैन, एडवोकेट

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ज्योतिकुमार अग्रवाल, सी०ए०

शुल्क

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वार्षिक शुल्क : एक हजार रुपए

यह प्रति : चार सौ रुपए

प्रकाशित सामग्री से संपादकीय सहमति आवश्यक नहीं है। पत्रिका से संबंधित सभी विवाद केवल बिजनौर स्थित न्यायालय के अधीन होंगे। शुल्क की राशि 'शोध दिशा' बिजनौर के नाम भेजी (सन् 1989 से प्रकाशन-क्षेत्र में सक्रिय)

स्वत्वाधिकारी, मुद्रक, प्रकाशक डॉ० गिरिराजशरण अग्रवाल द्वारा श्री लक्ष्मी ऑफसेट प्रिंटर्स, बिजनौर 246701 से मुद्रित एवं 16 साहित्य विहार, बिजनौर (उ०प्र०) से प्रकाशित। पंजीयन संख्या : UP HIN 2008/25034

संपादक : डॉ० गिरिराजशरण अग्रवाल

'रेत समाधि' उपन्यास का कथानक, भाषा शिल्प एवं रचना-शैली का साहित्यिक विवेचन/ डॉ० पंकजबाला श्रीवास्तव	149
गोदान का महत्त्व/ डॉ० विशेषकुमार राय	155
रामनरेश त्रिपाठी की हिंदी कविता में गांधी का प्रभाव : एक अवलोकन/ राजीवकुमार दास	160
आदिवासी जीवन संघर्ष का कड़वा सच : बस्तर-बस्तर/ डॉ० कुलदीप सिंह मीना	168
दलित-विमर्श की अवधारणा/ राजमणि सरोज	173
औद्योगिक मजदूरों का चित्रण करने वाली शेखर जोशी की कहानियाँ/ डॉ० विजय सिंह	177
भक्तिसंगीत का बदलता स्वरूप/ नेहा सहगल, प्रो० विमल हरियाणा के लोकसंगीतज्ञ पं० निहालचंद के सांगों का भावपक्ष/ उषा, डॉ० आरती श्योकंद	182
विजेंद्र के काव्य में विचारात्मक औदात्य/ मीना देवी, डॉ० कमला कौशिक	188
मधु काँकरिया के उपन्यासों में नारी-जीवन का यथार्थ/ नीतु कुमारी झारोटिया	194
नरेंद्र कोहली के महासमर उपन्यास में आधुनिकताबोध/ तरुणकिशोर नौटियाल	198
रहीम का नीतिकाव्य/ डॉ० अर्चना गौतम	203
'तमस' के विशेष संदर्भ में भीष्म साहनी के उपन्यास और सामाजिक यथार्थ/ डॉ० सुनीता कुमारी	209
हिमांशु जोशी के कहानियों में नारी-विमर्श/ डॉ० सुनील एम० पाटिल	215
मैत्रेयी पुष्पा के उपन्यासों में स्त्री विद्रोह के स्वर/ डॉ० लोकेशकुमार	218
अमृत महोत्सव से संबंधित खबरों के राष्ट्रीय हिंदी न्यूज चैनलों पर प्रस्तुतिकरण का दर्शकों पर प्रभाव: एक विश्लेषणात्मक अध्ययन/ आदर्शकुमार	223
'छप्पर' : दलित संघर्ष-यात्रा के आलोक में/ डॉ० वैशाली विठ्ठल खेडकर	227
समकालीन हिंदी कविता में पुनर्वास/ डॉ० राम बिनोद रे	232
आदिवासी कवयित्रियों की कविताओं में प्रतिरोध के स्वर/ डॉ० सोनम शुक्ला	237
हिंदी उपन्यासों में पर्यायवरण विमर्श/ आरती	243
स्वातंत्र्योत्तरकाल में व्यंग्यात्मक हिंदी-कविताओं के पुरोधः : नागार्जुन/ डॉ० ज्ञानेन्द्रमणि त्रिपाठी	250
मिथकीय प्रयोग और हरिशंकर परसाई/ डॉ० ममता देवी	255
त्राटक साधना पर साहित्यिक व प्रायोगिक अध्ययन/ कृष्णा दग्दी	263
राकेश गिरी, सुरेन्द्रकुमार	271
'महाभोज' उपन्यास में राजनीतिक अवसरवादिता/ मुकेशकुमार जाटव	276
शरद सिंह की कहानियों में वृद्ध स्त्री के अकेलेपन की समस्या/ आशारानी	281
आचार्य केशवदास के काव्यशास्त्रीय सामान्य अलंकार विवेचन में श्रीराम/ अशेष उपाध्याय	285



## शरद सिंह की कहानियों में वृद्ध स्त्री के अकेलेपन की समस्या

आशारानी

एसोसिएट प्रोफेसर वैश्य कॉलेज, भिवानी

भारतीय संस्कृति में माता-पिता को देवतुल्य माना जाता है। उनके विचारों का आदर-सत्कार करना तथा बुढ़ापे में उनके देख-रेख और सेवा करना संतान का परम कर्तव्य माना जाता है। परंतु 21वीं सदी के वर्तमान परिदृश्य पर जब हम दृष्टिपात करते हैं तो पाते हैं कि बढ़ते पूँजीवाद और वैश्वीकरण की होड़ में यह सभी नैतिक मूल्य नष्ट हो गए हैं। वर्तमान समय में प्रत्येक घर में बुजुर्गों की समस्याएँ एक जैसी हैं। अपनी संतानों द्वारा किए जाने वाले उपेक्षित व्यवहार उन्हें अंदर तक तोड़ देता है। बुढ़ापे में जब माता-पिता को अपने बच्चों के प्रेम और साथ की सबसे अधिक आवश्यकता होती है, तब उन्हें या तो वृद्ध आश्रम में भेज दिया जाता है या फिर आपस में उनका बँटवारा कर लिया जाता है। खर्च अधिक न हो इस विचार से एक बेटे के घर पिता और दूसरे बेटे के घर माँ को रख दिया जाता है। उम्र का इतना लंबा समय एक साथ व्यतीत करने और जीवन के सभी सुख-दुख साथ सहने के बाद उन्हें ऐसे अचानक अलग कर देना कितना पीड़ादायक होता है यह ओझल पाकर तड़प उठते थे, वही बच्चे बड़े होकर अपने माँ-बाप को सुख देने की बजाय उन्हें स्वयं पर बोझ समझने लगते हैं और इसी बोझ से छुटकारा पाने के लिए उन्हें वृद्ध आश्रम में अकेले रहने के लिए छोड़ आते हैं।

शरद सिंह ऐसी रचनाकार हैं जिनके लेखन ने सामाजिक सरोकार और संघर्षों को उजागर करते हुए विशेषता पाई है। यथार्थवादी लेखन में विश्वास रखने वाली लेखिका शरद सिंह ने अपनी कहानियों में स्त्री से संबंधित समस्याओं का यथार्थ चित्रण किया है। स्त्री की सामाजिक समस्याओं में एक समस्या है—वृद्ध स्त्री के अकेलेपन की। शरद सिंह ने 'बकरी', 'खाली सीप', 'पत्तों में कैद औरतें' आदि कहानियों में वृद्ध स्त्री के जीवन की समस्याओं को दर्शाया है।

'बकरी' कहानी में बरु के बेटे-बहू उसे अकेला छोड़कर शहर चले जाते हैं। भरे-पूरे परिवार के होते हुए भी बरु अकेली रह जाती है। इस अकेलेपन को दूर करने के लिए उसने एक बकरी अपने पास रखी हुई है। बरु का छोटा बेटा भी अपने स्वार्थसिद्धि के लिए बरु से मिलने आता रहता है। वह चाहता है कि वह अपना पुश्तैनी घर बेचकर सद्भावना नगर में प्लाट ले ले। एक बार छोटा बेटा बरु से मिलने के लिए आता है। वह मन-ही-मन बहुत खुश होती है कि उसके बेटे-बहू उससे मिलने आए। परंतु घर पर बेटा आता है बहू स्टेशन से ही अपनी चाचिया सास के पास चली जाती है इस विषय में लेखिका लिखती है, 'खटमल सुनकर बरु ने बाहर झाँका। हल्के बाड़े का दरवाजा खोल रहा था। बरु का हृदय प्रसन्नता से खिल उठा। पर दूसरे ही पल बरु चकित होकर देखने लगी, हल्के अकेला था। न बहू साथ में, न बच्चे।'







लगी। अब हमारी ऐसी कि चला-चली की बेरा आए। जो कछू बचो सो और भोग लेऊँ बितिया।<sup>15</sup> बूढ़ी अम्मा की बात सुनकर उसका मन उदासी से भर गया। वह सोचने लगी कि इन्हीं के नाम पर इस जमीन का आधा हिस्सा माँगा जा रहा है जो स्वयं जानती है कि अब चला-चली की बेरा है।<sup>16</sup> मैं बूढ़ी अम्मा को ध्यान से देखने लगी। उनका झुर्रियों-भरा चेहरा, लटके हुए कान, ढीली-ढाली बाँहें, उनके शरीर का एक-एक अंग बुढ़ापे की चुगली कर रहा था। देखा जाए तो उनका शरीर भी धीरे-धीरे उनका साथ छोड़ता जा रहा था। आज इस घर में बूढ़ी अम्मा का अस्तित्व मात्र इतना है कि वह संपत्ति पाने का साधन बनकर रह गई है। एक खोखले सीप की तरह जिसकी चमक अभी मूल्यवान है।<sup>17</sup> आजकल की संतानों को अपने माता-पिता की संपत्ति से मतलब होता है उनके दुख-तकलीफ से उन्हें कोई सरोकार नहीं है। वह सिर्फ इसलिए उन्हें भुगतते हैं कि उनके जमीन जायदाद उनके हिस्से आ जाए।

ढलती उम्र के साथ जब माता-पिता बूढ़े हो जाते हैं और वो बीमारी या थकावट के कारण कोई-कार्य करने या किसी प्रकार की सहायता दे पाने में असमर्थ होते हैं तो परिवार में उनकी स्थिति पालतू कुत्ते से अधिक नहीं होती। सब उनसे दूर भागना चाहते हैं। परमात्मा ने व्यक्ति को जितना जीवन दिया है उससे पहले मृत्यु नहीं आ सकती। मगर ऐसे बुजुर्गों को मृत्यु के इंतजार में दिन गुजारने पड़ते हैं। 'बूढ़ी आँखों के मरते सपने' कहानी की रामरती भी ऐसी ही बुजुर्ग है जिसने अपनी आयु के सत्तर बसंत पार कर लिए हैं। उसने अपने परिवार के भरण-पोषण के लिए बीस वर्ष की आयु में बीड़ी लपेटना शुरू कर दिया था। परंतु अब ढलती आयु के साथ हाथों की उँगलियों में पहले जैसी कुशलता नहीं रही। अब उसके हाथ काँपने लगे हैं। आँखों में तंबाकू के कणों के कारण निरंतर आँसू बहने की वजह से धुँधलापन आ गया है। इसी धुँधलेपन के कारण रामरती को सभी आकृतियाँ धुँधली दिखाई देती हैं। पहले वह अकेली बीड़ी लपेटती थी परंतु अब बहू के साथ मिलकर बीड़ी लपेटने का काम करती हैं जिस दिन 'छट्टा' की बीड़ियाँ अधिक निकलतीं, उस दिन बदले में अधिक पैसों की कटौती हो जाती, उस दिन सारी 'छट्टा' बीड़ियों का दोष रामरती की बहू रामरती के माथे पर मढ़ देती थी। बहू झल्लाती हुई रामरती से कहती, 'जब बनाते नहीं बनता है, दिखाई नहीं देता है तो क्यों बनाती हो?'<sup>18</sup> बहू के मुँह से ऐसी बातें सुनकर रामरती सोचने पर विवश हो जाती कि एक दिन में हजार-हजार बीड़ियाँ बनाने वाली उसकी उँगलियाँ उसका साथ क्यों नहीं देती हैं? क्या वास्तव में सारा दोष उसी का है। जबकि सच्चाई तो यह थी कि बहू को भी बीड़ी लपेटना स्वयं रामरती ने ही सिखाया था। आज वही बहू उसे दुत्कारती हुई कहती है, 'छोड़ो अम्मा, तुम्हारे बस का नहीं है यह सब।' यह सब सुनकर रामरती के मन को बहुत पीड़ा पहुँचती पर वह कर भी क्या सकती थी।<sup>19</sup>

रामरती अपनी अंतिम साँस तक सक्रिय रहना चाहती थी, परंतु बुढ़ापे की उम्र में यह सब बहुत कठिन होता है। उनकी बहुएँ उसे अपने साथ रखना नहीं चाहती है परंतु फिर भी यह सोचकर उसे घर से नहीं निकालती कि उनकी सास कम-से-कम उनके बच्चों को सँभालने और बीस-पच्चीस बीड़ियाँ बनाने का काम तो कर ही लेती है। रामरती की स्थिति को दर्शाते हुए लेखिका लिखती है, 'सच तो यह है कि जीवनभर बीड़ियाँ लपेटने के बाद आज अपनी वृद्धावस्था में वह स्वयं 'छट्टा' बीड़ी बन चुकी है, उसके सपने उसकी आँखों में ही तिल-तिलकर मर रहे हैं। बीड़ियों को उसने अपना पूरा जीवन दिया किंतु बीड़ियों ने उसे कभी अच्छा जीवन नहीं दिया।'<sup>10</sup>

नई पीढ़ी के समक्ष नया भविष्य, नई तकनीक, नई आरामदायक जीवनशैली है परंतु इसका

मतलब यह कतई नहीं है कि जो पुराना है वह पूर्ण रूप से बदल गया। आपा-धापी की जीवनशैली में युवाओं के पास घर के बड़े बुजुर्गों के पास कुछ देर बैठने तक का समय नहीं है। सभी अपनी-अपनी दिनचर्या में व्यस्त रहते हैं। लेखिका शरद सिंह ने अपनी कहानियों में वृद्ध स्त्री के जीवन के एकाकीपन को पूर्ण यथार्थ के साथ चित्रित किया है। भरे-पूरे परिवार के होते हुए भी वृद्ध लोगों का जीवन खाली सीप की तरह हो जाता है जो अंदर से खोखला होने पर भी उसकी चमक मूल्यवान होती है।

#### संदर्भ

1. शरद सिंह, बाबा फरीद अब नहीं आते, सामयिक प्रकाशन, नई दिल्ली, प्रथम संस्करण 2012 पृ० 82
2. वही, पृ० 83
3. वही, पृ० 84
4. शरद सिंह, छिपी हुई औरत और अन्य कहानियाँ, वाणी प्रकाशन, नई दिल्ली, 2009, पृ० 130
5. वही, पृ० 130
6. वही, पृ० 131
7. वही, पृ० 131-132
8. शरद सिंह, पत्तों में कैद औरतें, सामयिक प्रकाशन, नई दिल्ली, प्रथम संस्करण 2018, पृ० 100
9. वही, पृ० 101
10. वही, पृ० 105

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# मध्य भारती

ISSN No. 0974-0066

मानविकी एवं समाजविज्ञान की द्विभाषी शोध-पत्रिका

## Certificate of Publication

This is to certify that

आशा रानी

एसोसिएट प्रोफेसर, हिंदी विभाग, वैश्य कॉलेज, भिवानी

For the paper entitled

स्वतंत्रता संग्राम में हिन्दी भाषा का योगदान

Vol 84 No 4, January-June 2023

in

**Madhya Bharti- Humanities and Social Sciences**



Impact Factor- 6.1

UGC Care Approved, Peer Reviewed and Referred Journal



Editor-in-Chief

## स्वतंत्रता संग्राम में हिन्दी भाषा का योगदान

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18 वीं शताब्दी में जब मुगल साम्राज्य का पतन हुआ उस समय भारत सामाजिक राजनीतिक धार्मिक तथा सांस्कृतिक युक दृष्टि से अत्यंत क्षीण अवस्था में था। ऐसी अवस्था में भारत पर अधिकार करने का स्वप्न देखने वाले ब्रिटिश साम्राज्य को एक स्वर्णिम अवसर प्राप्त हुआ। इस अवसर का लाभ उठाते हुए व्यापार के उद्देश्य से आए अंग्रेज देश के राजा बन बैठे। उन्होंने प्रत्येक क्षेत्र में अपनी सत्ता स्थापित कर ली। सत्ता अपने हाथ में आते ही उन्होंने भारतीय जनता पर अपनी अंग्रेजी भाषा को लाद दिया ताकि वे जनता का शोषण कर सकें। अंग्रेजों की बढ़ती अनैतिक नीतियों और क्रूर व्यवहार ने उनको जनता का घोर शत्रु बना दिया। अब लोगों के मन में परतन्त्रता से मुक्ति की भावना छटपटाने लगी। इसी छटपटाहट का परिणाम था अद्वारह सौ सत्तावन ईसवी में हुआ प्रथम स्वतंत्रता संग्राम। 1857 के स्वतंत्रता संग्राम में अंग्रेजी सत्ता के प्रति भारतीयों का विरोध स्पष्ट परिलक्षित हुआ है। भले ही स्वाधीनता को लेकर हुआ प्रथम स्वतंत्रता संग्राम असफल रहा हो किंतु इस आंदोलन ने अंग्रेजी सत्ता की नींव को हिला कर रख दिया। इस आंदोलन के असफल होने के बाद तो भारतीय जनता में अंग्रेजी साम्राज्य के प्रति रोष और अधिक बढ़ गया। परतन्त्रता से मुक्ति के लिए वे लोग निरंतर संघर्ष करते रहे, परंतु उनके समक्ष एक बड़ा प्रश्न यह था कि संपूर्ण भारत को एकता के सूत्र में बांधने के लिए एक ऐसी भाषा की आवश्यकता है जिसे संपूर्ण देश की जनता सहजता से जान-समझ सके। भारत की विभिन्न भाषाओं में हिंदी ही एक ऐसी भाषा है जो कश्मीर से कन्याकुमारी तक तथा कामाख्या से कच्छ तक समझी और बोली जाती है। इसी कारण इस कार्य हेतु हिंदी भाषा को ही उत्कृष्ट भाषा माना गया। क्योंकि हिंदी भाषा में वह अपार शक्ति है जो संपूर्ण राष्ट्र को एकता के धागे में पिरो सके। स्वाधीनता आंदोलन में हिंदी शंखनाद की भाषा बनी। हिंदी के विषय में प्रिय नेता सुभाष चंद्र के उद्गार हैं—“देश की एकता के लिए एक भाषा का होना जितना आवश्यक है, उससे अधिक आवश्यक है देश भर के लोगों में देश के प्रति विशुद्ध प्रेम तथा अपनापन होना। अगर आज हिंदी भाषा मान ली गई है तो वह इसलिए नहीं कि वह किसी प्रांत विशेष की भाषा है, बल्कि इसलिए कि वह अपनी सरलता व्यापकता तथा क्षमता के कारण सारे देश की भाषा हो सकती है।”<sup>1</sup>

राष्ट्रीयता की भावना से प्रेरित होकर लोगों ने विदेशी वस्तुओं का बहिष्कार शुरू कर दिया और साथ ही स्वदेशी चीजों को ग्रहण करने का व्रत लिया। राष्ट्रीयता की इस लहर में हिंदी अपने रंग जमाने लगी। देश के प्रत्येक कोने में हिंदी भाषा को संपर्क और संगठन की भाषा माने जाने लगा। वास्तव में हिंदी भाषा ने स्वाधीनता संघर्ष का प्रचार-प्रसार करते हुए राष्ट्रभाषा के रूप में अपनी अहम भूमिका निभाई। हिंदी की सामर्थ्य शक्ति और शब्द भंडार के विषय में डॉक्टर राम मनोहर लोहिया लिखते हैं—“हिंदी में सात लाख के करीब शब्द हैं जबकि अंग्रेजी के ढाई लाख के आसपास। इसके अलावा अंग्रेजी के शब्द गढ़ने की शक्ति नष्ट हो चुकी है, जबकि हिंदी को अभी अपनी जवानी ही नहीं चढ़ी। संसार की सबसे धनी भाषा है हिंदी। लेकिन बर्तनों की भांति इन शब्दों पर धरे-धरे काई जम गई है। ये बर्तन मांजने पर ही चमकेंगे, किसी रसायनशाला के अनुसंधान से नहीं। जब कोई जाने बहुत उबड़-खाबड़ शब्दों का इस्तेमाल विश्वविद्यालयों, न्यायालय, विधायिकाओं वगैरह में होने लगेगा तब ये चमकेंगे और इनका अर्थ जमेगा। हो सकता है कि कुछ समय के लिए गड़बड़ी और अव्यवस्था हो, लेकिन वह हर हालत में होगी जब कभी अंग्रेजी से हिंदी का पलटाव किया जाएगा, चाहे जितने असंख्य शब्दकोश क्यों न बना लिए गए हैं।”<sup>2</sup>







है। बिहार में हिंदी में पाठ्य-पुस्तकों का प्रचलन तथा बिहार अदालतों में हिंदी नागरी का प्रवेश भूदेव मुखर्जी ने कराया। भूदेव मुखर्जी हिंदी के कट्टर समर्थक थे। अपनी पुस्तक 'आचार प्रबंध' में इन्होंने हिंदी को देश की सबसे अधिक प्रचलित भाषा मानते हुए उसे ही संपर्क भाषा के योग्य घोषित किया।

केशवचंद्र भी हिंदी के प्रबल समर्थक थे। इन्हीं की प्रेरणा से दयानंद सरस्वती ने गुजराती भाषी होते हुए भी हिंदी भाषा में व्याख्यान देना प्रारंभ किया तथा सत्यार्थ प्रकाश की रचना भी हिंदी में ही की। आर्य समाज के संस्थापक स्वामी दयानंद सरस्वती ने न केवल भारत में अपितु विदेशों में भी हिंदी भाषा को प्रतिष्ठित करने का महान कार्य किया। स्वामी जी की हिंदी सेवा के विषय में श्री राम गोपाल लिखते हैं—

"आर्य समाज के प्रवर्तक स्वामी दयानंद ने अपने निजी उदाहरण से अपने अहिंदी भाषी अनुयायियों को भी हिंदी का प्रयोग करने की प्रेरणा दी। वह स्वयं गुजराती थे। उन्होंने हिंदी सीखी और केवल उसे ही अपने व्याख्यान तथा लेखनी का माध्यम बनाया। उनका उद्देश्य आर्य समाज के सिद्धांतों का प्रसार करना था। परंतु उनके तथा उनके अनुयायियों के धर्म प्रचार से जो अधिक उत्तम चीज राष्ट्रीय जीवन को प्राप्त हुई वह थी राष्ट्रभाषा का प्रचार।"<sup>6</sup> आर्य समाज ने अफ्रीका के कई प्रदेशों में हिंदी तथा संस्कृत के अध्ययन के लिए पाठशालाएं स्थापित की।

युगांडा केनिया,फिजी, मॉरीशस,डचगायना, त्रिनिडाड ,ब्रिटिशगायना,लंदन में भी आर्य समाज द्वारा हिंदी प्रचार का पर्याप्त कार्य हुआ। इन्हीं सभी प्रयासों से आज हिंदी विश्व में अपनी अलग पहचान स्थापित कर रही है। इन संस्थाओं के अतिरिक्त सनातन धर्म संस्था, प्रार्थना समाज, थियोसोफिकल सोसायटी,रामकृष्ण मिशन आदि ऐसी संस्थाएं थी जिन्होंने स्वाधीनता संघर्ष के दौरान हिंदी के प्रचार प्रसार में अहम भूमिका निभाई। हिंदी भाषा के संदर्भ में भारतेंदु हरिश्चंद्र द्वारा कही गई यह उक्ति चरितार्थ सिद्ध होती है—

'निज भाषा उन्नति अहै सब उन्नति को मूल बिन निज भाषा ज्ञान के मिटे न हिय को सूल।'

तात्पर्य यह कि मातृभाषा के उन्नति के बिना किसी भी समाज की प्रगति संभव नहीं है तथा अपनी भाषा के ज्ञान के बिना मन की पीड़ा को दूर करना भी मुश्किल है। मन की यह पीड़ा स्वाधीनता संग्राम के समय भारतीयों के दिलों में कांटे के समान चुप रही थी क्योंकि अंग्रेजों ने जबरन भारतीयों पर अपनी मातृभाषा को लात दिया था। भारतीयों के दिलों में हिंदी के प्रति प्रेम को जगाने का कार्य में सामाजिक धार्मिक आंदोलनों के अतिरिक्त साहित्यिक संस्थाओं ने भी बहुमूल्य योगदान दिया। इन साहित्यिक संस्थाओं में नागरी प्रचारिणी सभा हिंदी (1893), हिंदी साहित्य सम्मेलन प्रयाग (1910),दक्षिण भारत हिंदी प्रचार सभा मद्रास(१९१८), राष्ट्रभाषा प्रचार समिति, वर्धा (१९३६),गुजरात विद्यापीठ, अहमदाबाद (१९३५), महाराष्ट्र राष्ट्रभाषा सभा, पुना (१९४५), बिहार राष्ट्रभाषा परिषद, पटना (१९४७), मैसूर हिंदी प्रचार परिषद, बैंगलोर (१९४४)आदि प्रमुख हैं।

हिंदी भाषा को राष्ट्रभाषा तथा राष्ट्रीय लिपि बनाने के ठोस प्रचार के लिए इस सभा की स्थापना 10 मार्च 1893 को वाराणसी में हुई। इनमें पंडित रामनारायण मिश्र, श्री गोपाल सिंह खत्री तथा बाबू श्यामसुंदर दास प्रारंभ में इस के संरक्षक रहे परंतु धीरे-धीरे कई अन्य गणमान्य व्यक्ति इसके सदस्य बन गए। इनमें राधा कृष्ण दास,पंडित मदन मोहन मालवीय, श्री अंबिका दत्त व्यास, श्री राधाचरण गोस्वामी, श्रीधर पाठक तथा श्री बद्रीनारायण चौधरी का नाम उल्लेखनीय है। संपूर्ण हिंदी पत्रिकाओं में यह सर्वाधिक प्राचीन है। यह एक प्रकार की शोध पत्रिका है तथा गत 68 वर्षों में से लगातार प्रकाशित हो रही है। न केवल हिंदी अपितु भारत की सभी भाषाओं में यह एक अनुपम पत्रिका है।आज हिंदी को राष्ट्रभाषा पद प्राप्त करने का जो गौरव प्राप्त हुआ है उसमें सभा का बहुत बड़ा हाथ है। पिछले 75 वर्षों से हिंदी के विकास में सभा का योगदान अतीव गौरवपूर्ण तथा प्रशंसनीय है।

इस सभा के अलावा ऊपर लिखित सभी संस्थाओं ने स्वाधीनता संघर्ष के दौरान हिंदी के प्रचार-प्रसार

में भी रागनी श्लाघनीय योगदान दिया। इन संस्थाओं ने न केवल हिंदी प्रांतों में अपितु संपूर्ण भारत में राष्ट्रभाषा हिंदी के प्रचार-प्रसार की अलख जगाई। और लोगों में विदेशी शासन से मुक्त होने की नई ऊर्जा एवं शक्ति प्रदान की। स्वाधीनता संग्राम के दौरान हिंदी में साहित्य रचना करने वाले लेखकों ने भी भारतीय जनमानस में एक नवीन उर्जा को प्रस्फुटित किया। साहित्य में मैथिलीशरण गुप्त, सियारामशरण गुप्त, माखनलाल चतुर्वेदी, बालकृष्ण शर्मा नवीन, सुभद्रा कुमारी चौहान आदि ने राष्ट्रप्रेम, देशभक्ति और अतीत के गौरव के काव्य से जनमानस को आंदोलित कर दिया। भारत-भारती की रचना पर तो राष्ट्रपिता महात्मा गांधी ने कवि मैथिलीशरण गुप्त को राष्ट्रकवि की उपाधि दी थी। उन्होंने देशप्रेम की भावना को सर्वोपरि मानते हुए भारत-भारती में आह्वान किया है—

“जिसको न निज गौरव तथा निज देश का अभिमान है।

वह नर नहीं, नर-पशु निरा है और मृतक समान है।”<sup>7</sup>

वहीं सुभद्रा कुमारी चौहान की कविता ‘झांसी की रानी’ को कोई नहीं विस्मृत कर सकता। इस कविता में अंग्रेजी साम्राज्य की नींव को हिला कर रख दिया। देश के वीर सैनिकों में देशभक्ति और देशप्रेम का अगाध संचार कर जोश भरने वाले इस अनूठी कविता की प्रासंगिकता आज भी बनी हुई है।

“सिंहासन हिल उठे, राजवंशों ने भृकुटी तानी थी  
बूढ़े भारत में भी आई, फिर से नई जवानी थी,  
गुमी हुई आजादी, कीमत सबने पहचानी थी,  
दूर फिरंगी को करने की सबने मन में ठानी थी,  
चमक उठी सन सत्तावन में वह तलवार पुरानी थी,  
बुंदेले हरबोलों के मुंह हमने सुनी कहानी थी,  
खूब लड़ी मर्दानी वह तो झांसी वाली रानी थी।”<sup>8</sup>

इन वीर रस से ओतप्रोत रचनाओं के अतिरिक्त स्वाधीनता संघर्ष के लिए हिंदी भाषा गीतों, नारों, प्रभात फेरी और भजनों के माध्यम से जन-जन तक हिंदी का प्रसार किया जाने लगा। इनमें विजयी विश्व तिरंगा प्यारा, कवि कुछ ऐसी तान सुनाओ, उठ जाग मुसाफिर भोर हुई, कोकिल बोलो रे, खूब लड़ी मर्दानी वह तो झांसी वाली रानी थी ने जनमानस के प्राणों में नवीन उमंग और उत्साह का संचार कर दिया था। वस्तुतः स्वाधीनता संग्राम के दौरान देश की संपर्क भाषा के रूप में हिंदी के विकास को अवसर प्राप्त हुआ।

निष्कर्षतः कहा जा सकता है कि अंग्रेजी सरकार की भारतीय भाषाओं के प्रति उदासीनता और निष्क्रियता के बाद भी तत्कालीन राजनेता, संस्थाओं, प्रकाशनों और समाचार-पत्रों ने हिंदी भाषा की महत्ता को मानते हुए उसे राजभाषा तथा राष्ट्रभाषा के रूप में स्वीकार किया। उन्होंने तन-मन-धन से हिंदी भाषा की सेवा की और हिंदी भाषा के पक्ष में प्रबल जनमत तैयार किया। इस तैयारी में हिंदी भाषा का रूप भी निखरता गया और कई उतार-चढ़ाव को पार करते हुए आज हिंदी हमारे देश की राष्ट्रभाषा राजभाषा संपर्क भाषा के पद पर विराजमान है।

### सन्दर्भ सूची

1. डॉक्टर शिवराज वर्मा, हिंदी का राष्ट्रभाषा के रूप में विकास, आत्माराम एंड संस, नई दिल्ली, १९७०, पृष्ठ संख्या. 179.
2. डॉ महेंद्र पाल शर्मा, हिंदी भाषा: विकास के सोपान, संजय प्रकाशन, नई दिल्ली, 2003, पृष्ठ संख्या. १०३.
3. किशोरी दास बाजपेई, राष्ट्रभाषा का इतिहास, जनवाणी प्रकाशन, प्रथम संस्करण १९००, पृष्ठ संख्या. १८-१९.
4. डॉक्टर शिवराज वर्मा, हिंदी का राष्ट्रभाषा के रूप में विकास, आत्माराम एंड संस, नई दिल्ली, पृष्ठ संख्या. १५६.



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# मध्य भारती

मानविकी एवं समाजविज्ञान की द्विभाषी शोध-पत्रिका

ISSN: 0974-0066

५.वही. पृष्ठ संख्या. १६२-१६३.

६.वही.पृष्ठ संख्या. १६६.

७. [https%//www-kavitarawat-com-blog-](https://www-kavitarawat-com-blog-)

८.<https%//www-divyahimachal-com->

# Green Approach for the Synthesis of 3-(3-Arylprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones

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Received September 17, 2022; revised October 12, 2022; accepted October 18, 2022

**Abstract**—A facile and eco-friendly method for the synthesis of 3-(3-arylprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones via Claisen–Schmidt condensation of 3-acetyl-2-hydroxycyclohepta-2,4,6-trien-1-one and substituted benzaldehydes in the presence of anhydrous barium hydroxide (C-200) under grinding conditions has been described. This protocol is much more efficient as the reactions are carried out with high yields at room temperature, and the usage of hazardous chemicals is avoided at any stage of the reaction.

**Keywords:** 2-hydroxy-3-(3-arylprop-2-enoyl)cyclohepta-2,4,6-trien-1-ones, 3-acetyl-2-hydroxycyclohepta-2,4,6-trien-1-one, eco-friendly synthesis, C-200, grinding conditions

**DOI:** 10.1134/S1070428023070151

## INTRODUCTION

3-Acetyl-2-hydroxy-cyclohepta-2,4,6-trienone commonly known as tropolone is a non-benzenoid “aromatic” compound, and its derivatives being naturally occurring or synthetic have gained much attention due to its unique structure and properties [1]. A number of natural and synthetic tropolone compounds showed a wide range of remarkable biological properties such as antitumor, antimalarial, and ribonucleotide reductase inhibitory activities [2–9]. Some tropolones extracted from *Goupia glabra* show significant toxicity toward a panel of DNA damage checkpoint defective yeast mutants, behave as genotoxins, and are used as anticancer drugs [10]. The tropolone nucleus also plays a significant role in molecular assemblies for a fast and efficient lead generation toward new drug discovery [11]. They are generally found in lower plants and fungi [12]. Since the tropolone derivatives are scarce [13] and very limited information is available on these compounds, their synthesis remains a considerable challenge for chemists.

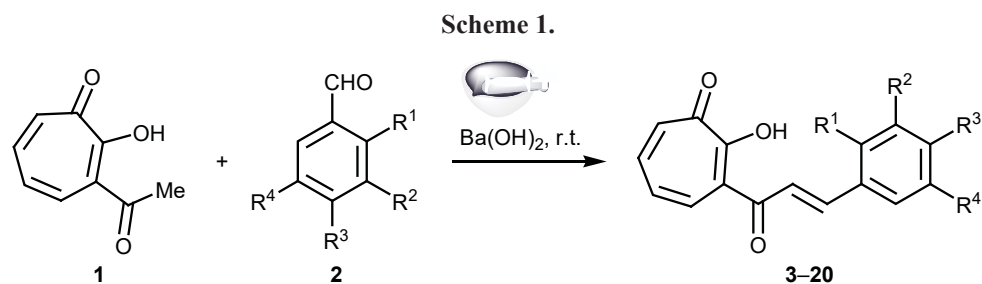
On the other hand, it is well known that 1,3-diphenylpropenones commonly known as chalcones, a class of naturally occurring compounds belonging to the flavonoid family, have a wide range of biological activities, viz. antibacterial [14], antifibrogenic [15], anticancer [16], anti-inflammatory [17], antileishmanial

[18], cytotoxic [19], and anti-HIV activities [20]. They are also used as synthons for various other flavonoids [21]. In recent years, chalcone derivatives have been extensively synthesized, but reports on the synthesis of troponyl-substituted chalcones [3-(3-arylprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones] are very few [22–26]; therefore, they have attracted much attention due to their above-mentioned biological and pharmacological importance. Keeping in view the importance in various fields, continuous efforts have been made to synthesize these chalcones, and several strategies have been adopted for their synthesis.

Generally, chalcones can be synthesized via Claisen–Schmidt condensation of acetophenones with benzaldehydes using various condensing agents such as sodium ethoxide [27], zinc chloride [28], potassium phosphate [29], basic alumina [30], sodium methoxide in methanol [31], AlCl<sub>3</sub> [32], BF<sub>3</sub> [33], Mg–Al–O–Bu [34], NaOH/EtOH [35], KOH/EtOH [36], ultrasonic and microwave conditions [37, 38], SOCl<sub>2</sub>/EtOH [39], and KF-modified clay [40]. The use of *p*-toluenesulfonic acid [41], PdNPs/TiO<sub>2</sub> [42], ionic liquids [43], and MgO nanosheets [44] has also been reported.

Some of the above-mentioned procedures are not free from shortcomings such as the use of harsh and hazardous chemicals and organic solvents, long reaction time, elevated temperature, poor yields, and formation of side products. Due to their volatile nature,





For R<sup>1</sup>–R<sup>4</sup>, see Table 1.

organic solvents affect human health and cause extreme damage to our environment. These shortcomings led us to develop a safe, environmentally benign, and more efficient method for the synthesis of 3-(3-aryprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones. In the last few years, grinding technique fulfilling the green chemistry approach got much attention due to its operational simplicity and also proved an important tool to carry out the reactions under solvent-free conditions with maximum yield and minimum cost as compared to conventional methods [45, 46]. So, in continuation of our work on the synthesis of organic

compounds using the grinding technique and barium hydroxide [47], herein we describe a green approach for the synthesis of 3-(3-aryprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones under solvent-free conditions using grinding technique (Scheme 1).

## RESULTS AND DISCUSSION

A mixture of 3-acetyl-2-hydroxycyclohepta-2,4,6-trien-1-one, substituted benzaldehyde, and anhydrous barium hydroxide (C-200) was ground in a mortar by pestle for 5 min at room temperature without a solvent

**Table 1.** Synthesis of 3-(3-aryprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones catalyzed by Ba(OH)<sub>2</sub> under grinding conditions

Compound no.	R <sup>1</sup>	R <sup>2</sup>	R <sup>3</sup>	R <sup>4</sup>	Time, min	Yield, <sup>a</sup> %	mp, <sup>b</sup> °C
3	H	H	H	H	5	95	145–147
4	H	Me	H	H	5	92	128–130
5	H	H	Me	H	5	94	180–182
6	OMe	H	H	H	10	92	125–127
7	H	OMe	H	H	8	93	143–145
8	H	H	OMe	H	5	95	145–147
9	H	OMe	OMe	OMe	5	92	153–154
10	Cl	H	H	H	7	96	160
11	H	Cl	H	H	8	92	182–183
12	H	H	Cl	H	10	91	184–185
13	Br	H	H	H	5	95	163–165
14	H	Br	H	H	5	95	177–178
15	H	H	Br	H	5	92	200–202
16	H	NO <sub>2</sub>	H	H	7	95	236–238
17	H	H	NO <sub>2</sub>	H	7	97	205
18	Cl	Cl	H	H	10	93	220
19	Cl	H	Cl	H	10	92	221–223
20	H	Cl	Cl	H	10	94	245

<sup>a</sup> Isolated yield.

<sup>b</sup> Melting points are uncorrected and were consistent with literature values [22, 26, 49, 50].

**Table 2.** Synthesis of 3-(3-arylprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trienones using different catalysts

Entry no.	Catalysts	Reaction time	Temperature	Yield, %	Reference.
1	KOH/MeOH	24 h	40°C	79–92	[50]
2	KOH/MeOH	24 h	Room temp.	48–97	[22]
3	Perchloric acid/ethyl orthoformate	10 min	Reflux	95	[26]
4	Ba(OH) <sub>2</sub> /grinding	5–10 min	Room temp.	91–97	This work

(Scheme 1). During grinding, a change in the color of the reaction mixture takes place. The progress of the reaction was monitored by thin-layer chromatography. The product was simply isolated by acidification of the reaction mixture in ice-cold water, so that the use of an organic solvent for extraction was avoided. Attempts were also made to carry out the reaction with other bases such as calcium oxide, magnesium oxide, and calcium hydroxide, but the yields were poor, and complete conversion was not achieved after a long period. When hydrated barium hydroxide was used, the reaction was slow and not completed even after 2–3 h, but with anhydrous barium hydroxide (C-200) the reaction was fast at room temperature. This may be due to the appropriate crystalline structure of anhydrous barium hydroxide and the nature of adsorbed carbanion and aldehyde on it [48].

Further optimum conditions of the reaction were achieved by varying the amount of anhydrous barium hydroxide, and the best results were obtained when 2 equiv of barium hydroxide was used. The scope of the method was then studied by reacting 3-acetyl-2-hydroxycyclohepta-2,4,6-trien-1-one and variously substituted benzaldehydes to give the corresponding 3-(3-arylprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones in excellent yields under solvent-free conditions at room temperature. Also, no cyclization was found to take place under these conditions to give side products. The identity of the compounds (Table 1) was confirmed by their IR and <sup>1</sup>H and <sup>13</sup>C NMR spectral data and comparison of their melting points with literature values. To illustrate the efficiency and generality of the present protocol some of the results of our method are compared with literature methods (Table 2).

Thus, it is evident that the present protocol is superior to the reported methods in terms of time and yield of the product, and also no use of organic solvent at any stage of the reaction, including work-up, is necessary. To our knowledge, it is the first time when anhydrous barium hydroxide has been used for the synthesis of tropolone-based chalcones using grinding technique.

## EXPERIMENTAL

The melting points were determined in open capillaries and are uncorrected. The IR spectra were recorded on a Perkin Elmer Spectrum BX FT-IR spectrophotometer with KBr pellets. The <sup>1</sup>H and <sup>13</sup>C NMR spectra were recorded on a Bruker Avance spectrometer at 400 and 100 MHz, respectively, using TMS as internal standard. All chemicals were obtained commercially and used without further purification.

**General procedure for the preparation of 3-(3-arylprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones 3–20.** A mixture of 3-acetyl-2-hydroxycyclohepta-2,4,6-trien-1-one (**1**, 1 mmol), substituted benzaldehyde **2** (1.5 mmol), and anhydrous barium hydroxide (2 mmol) was ground in a mortar by pestle for 5–10 min at room temperature without any solvent. During grinding, the moisture absorbed by the reaction mixture made it homogeneous. A sudden color change indicated progress of the reaction. The completion of the reaction was checked by thin-layer chromatography. The mixture was diluted with ice-cold water and acidified with concentrated hydrochloric acid, and the solid product was filtered off in a vacuum, washed with water, and recrystallized from ethanol–ethyl acetate. Spectral characteristics of some selected compounds are given below.

**2-Hydroxy-3-[3-(3-methylphenyl)prop-2-enoyl]-cyclohepta-2,4,6-trien-1-one (4).** IR spectrum,  $\nu$ , cm<sup>-1</sup>: 1650 (C=O), 1615 (C=O). <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 2.35 s (3H, CH<sub>3</sub>), 7.10–7.15 m (1H, H<sub>arom</sub>), 7.20 d (1H,  $J$  = 16.0 Hz,  $\alpha$ -H), 7.24–7.32 m (2H, H<sub>arom</sub>), 7.38–7.42 m (3H, H<sub>arom</sub>), 7.50 d (1H,  $J$  = 10 Hz, H<sub>arom</sub>), 7.60 d (1H,  $J$  = 16.0 Hz,  $\beta$ -H), 7.68 d (1H,  $J$  = 10 Hz, H<sub>arom</sub>). <sup>13</sup>C NMR spectrum,  $\delta_C$ , ppm: 21.1, 119.1, 122.9, 124.2, 125.0, 127.2, 128.8, 128.8, 133.7, 134.5, 136.0, 137.3, 146.5, 151.0, 170.1, 174.1, 186.0.

**2-Hydroxy-3-[3-(2-methoxyphenyl)prop-2-enoyl]cyclohepta-2,4,6-trien-1-one (6).** IR spectrum,  $\nu$ , cm<sup>-1</sup>: 1650 (C=O), 1615 (C=O). <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 3.65 s (3H, OCH<sub>3</sub>), 6.95–7.00 m (2H, H<sub>arom</sub>),

7.10 d (1H,  $J = 10.0$  Hz,  $H_{\text{arom}}$ ), 7.25–7.36 m (3H,  $H_{\text{arom}}$ ), 7.44 d (1H,  $J = 15.2$  Hz,  $\alpha$ -H), 7.58 d (1H,  $J = 7.6$  Hz,  $H_{\text{arom}}$ ), 7.66 d (1H,  $J = 9.6$  Hz,  $H_{\text{arom}}$ ), 7.98 d (1H,  $J = 15.6$  Hz,  $\beta$ -H);  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 56.1, 110.1, 119.1, 120.1, 120.9, 123.2, 124.6, 129.9, 131.1, 133.9, 137.1, 143.9, 146.7, 159.8, 170.9, 174.5, 186.0.

**3-[3-(2-Chlorophenyl)prop-2-enoyl]-2-hydroxycyclohepta-2,4,6-trien-1-one (10).** IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 1660 (C=O), 1620 (C=O).  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 7.12–7.17 m (1H,  $H_{\text{arom}}$ ), 7.20 d (1H,  $J = 15.6$  Hz,  $\alpha$ -H), 7.24–7.35 m (2H,  $H_{\text{arom}}$ ), 7.44 d (2H,  $J = 10.2$  Hz,  $H_{\text{arom}}$ ), 7.50–7.55 m (1H,  $H_{\text{arom}}$ ), 7.75–7.80 m (2H,  $H_{\text{arom}}$ ), 8.06 d (1H,  $J = 15.7$  Hz,  $\beta$ -H).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 121.2, 124.4, 126.5, 127.1, 128.5, 129.8, 130.2, 132.7, 133.9, 134.5, 137.0, 141.9, 146.2, 170.5, 174.2, 185.5.

**3-[3-(2-Bromophenyl)prop-2-enoyl]-2-hydroxycyclohepta-2,4,6-trien-1-one (13).** IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 1660 (C=O), 1608 (C=O).  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 7.15–7.18 m (1H,  $H_{\text{arom}}$ ), 7.24 d (1H,  $J = 16.0$  Hz,  $\alpha$ -H), 7.30 d (1H,  $J = 10.4$  Hz,  $H_{\text{arom}}$ ), 7.36–7.46 m (2H,  $H_{\text{arom}}$ ), 7.52–7.56 m (1H,  $H_{\text{arom}}$ ), 7.60–7.70 m (2H,  $H_{\text{arom}}$ ), 7.78 d (1H,  $J = 16.0$  Hz,  $\beta$ -H), 7.88–7.92 m (1H,  $H_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 121.3, 122.8, 123.2, 124.3, 127.2, 127.5, 128.2, 131.1, 133.7, 135.1, 137.1, 146.1, 147.6, 170.2, 174.1, 185.9.

**2-Hydroxy-3-[3-(3-nitrophenyl)prop-2-enoyl]-cyclohepta-2,4,6-trien-1-one (16).** IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 1685 (C=O), 1615 (C=O).  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 7.00–7.15 m (2H,  $H_{\text{arom}}$ ), 7.42–7.48 m (2H,  $H_{\text{arom}}$ ,  $\alpha$ -H), 7.65 d (1H,  $J = 10.8$  Hz,  $H_{\text{arom}}$ ), 7.80 d (1H,  $J = 8.0$  Hz,  $H_{\text{arom}}$ ), 7.88–7.92 m (2H,  $H_{\text{arom}}$ ), 8.45 d (1H,  $J = 15.6$  Hz,  $\beta$ -H), 8.48 d (1H,  $J = 5.6$  Hz,  $H_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 119.1, 122.5, 123.8, 124.2, 125.1, 130.2, 133.4, 133.9, 137.2, 139.0, 146.1, 148.0, 150.9, 170.8, 174.6, 186.1.

**2-Hydroxy-3-[3-(4-nitrophenyl)prop-2-enoyl]-cyclohepta-2,4,6-trien-1-one (17).** IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 1675 (C=O), 1610 (C=O).  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 7.02–7.05 m (2H,  $H_{\text{arom}}$ ), 7.15 d (1H,  $J = 15.6$  Hz,  $\alpha$ -H), 7.35–7.40 m (3H,  $H_{\text{arom}}$ ), 7.50 d (1H,  $J = 4.4$  Hz,  $H_{\text{arom}}$ ), 7.62 d (1H,  $J = 16.0$  Hz,  $\beta$ -H), 8.50 d (1H,  $J = 5.2$  Hz,  $H_{\text{arom}}$ ), 8.64 d (1H,  $J = 5.2$  Hz,  $H_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 119.1, 122.8, 123.9, 123.9, 124.8, 128.5, 128.5, 133.9, 137.1, 140.5, 146.4, 147.5, 151.0, 170.6, 174.3, 186.0.

**3-[3-(3,4-Dichlorophenyl)prop-2-enoyl]-2-hydroxycyclohepta-2,4,6-trien-1-one (20).** IR spectrum,

$\nu$ ,  $\text{cm}^{-1}$ : 1675 (C=O), 1612 (C=O).  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 7.12–7.18 m (1H,  $H_{\text{arom}}$ ), 7.34 d (1H,  $J = 16.0$  Hz,  $\alpha$ -H), 7.50–7.58 m (4H,  $H_{\text{arom}}$ ,  $\beta$ -H), 7.70 d (1H,  $J = 8.0$  Hz,  $H_{\text{arom}}$ ), 7.76 d (1H,  $J = 8.4$  Hz,  $H_{\text{arom}}$ ), 8.06 s (1H,  $H_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 119.2, 122.8, 124.4, 128.2, 129.1, 130.5, 131.0, 133.2, 133.5, 135.0, 137.0, 146.2, 148.4, 170.5, 174.2, 185.7.

## CONCLUSIONS

The presented approach for the synthesis of 3-(3-arylprop-2-enoyl)-2-hydroxycyclohepta-2,4,6-trien-1-ones using anhydrous barium hydroxide is highly efficient and eco-friendly as it avoids the use of organic solvents at any stage of the reaction. It is a clean, mild, and expeditious method which gives high yields of the target products without formation of any cyclization by-product.

## ACKNOWLEDGMENTS

The author is very much grateful to Prof. Dr. J.K. Makrandi (retired), Department of Chemistry, Maharishi Dayanand University, Rohtak, India, for his endless support to carry out this research work.

## CONFLICT OF INTEREST

The author declares no conflict of interest.

## REFERENCES

- Liu, N., Song, C., Schienebeck, M., Zhang, M., and Tang, W., *Tetrahedron*, 2014, vol. 70, p. 9281. <https://doi.org/10.1016/j.tet.2014.07.065>
- Yamato, M., Ando, J., Sakai, J., Hashigaki, K., Wataya, Y., Tsukagoshi, S., Tashiro, T. and Tsuruo, T., *J. Med. Chem.*, 1992, vol. 35, p. 267. <https://doi.org/10.1021/jm00080a010>
- Harris, G.H., Hoogsteen, K., Silverman, K.C., Raghobar, S.L., Bills, G.F., Lingham, R.B., Smith, J.L., Dougherty, H.W., Cascales, C., and Pal  ez, F., *Tetrahedron*, 1993, vol. 49, p. 2139. [https://doi.org/10.1016/S0040-4020\(01\)80357-4](https://doi.org/10.1016/S0040-4020(01)80357-4)
- Mayerl, F., Gao, Q., Huang, S., Klohr, S.E., Matson, J.A., Gustavson, D.R., Pirnik, D.M., Berry, R.L., Fairchild, C., and Rose, W.C., *J. Antibiot.*, 1993, vol. 46, p. 1082. <https://doi.org/10.7164/antibiotics.46.1082>
- Miyamoto, D., Kusagaya, Y., Endo, N., Sometani, A., Takeo, S., Suzuki, T., Arima, Y., Nakajima, K., and Suzuki, Y., *Antiviral Res.*, 1998, vol. 39, p. 89. [https://doi.org/10.1016/S0166-3542\(98\)00034-5](https://doi.org/10.1016/S0166-3542(98)00034-5)

6. Cai, P., Smith, D., Cunningham, B., Brown-Shimer, S., Katz, B., Pearce, C., Venables, D., and Houck, D., *J. Nat. Prod.*, 1998, vol. 61, p. 791.  
<https://doi.org/10.1021/np9800506>
7. Lange, U., Schumann, C., and Schmidt, K.L., *Eur. J. Med. Res.*, 2001, vol. 6, p. 150.
8. Matsumura, E., Morita, Y., Date, T., Tsujibo, H., Yasuda, M., Okabe, T., Ishida, N., and Inamori, Y., *Biol. Pharm. Bull.*, 2001, vol. 24, p. 299.  
<https://doi.org/10.1248/bpb.24.299>
9. Baldwin, J.E., Mayweg, A.V.W., Pritchard, G.J., and Adlington, R.M., *Tetrahedron Lett.*, 2003, vol. 44, p. 4543.  
[https://doi.org/10.1016/S0040-4039\(03\)00987-0](https://doi.org/10.1016/S0040-4039(03)00987-0)
10. Mesa-Siverio, D., Estévez-Braun, A., Ravelo, Á.G., Murguía, J.R., and Rodríguez-Afonso, A., *Eur. J. Org. Chem.*, 2003, vol. 2003, p. 4243.  
<https://doi.org/10.1002/ejoc.200300284>
11. Dolle, R.E. and Nelson, K.H., *J. Comb. Chem.*, 1999, vol. 1, p. 235.  
<https://doi.org/10.1021/cc9900192>
12. Angawi, F., Swenson, D.C., Gloer, J.B., and Wicklow, D.T., *Tetrahedron Lett.*, 2003, vol. 44, p. 7593.  
<https://doi.org/10.1016/j.tetlet.2003.08.057>
13. Ellington, E., Bastida, J., Viladomat, F., Simanek, V., and Codina, C., *Biochem. Syst. Ecol.*, 2003, vol. 31, p. 715.  
[https://doi.org/10.1016/S0305-1978\(02\)00248-X](https://doi.org/10.1016/S0305-1978(02)00248-X)
14. Liu, M., Wilairat, P., and Go, M.L., *J. Med. Chem.*, 2001, vol. 44, p. 4443.  
<https://doi.org/10.1021/jm0101747>
15. Lee, S.H., Nan, J.X., Zhao, Y.Z., Woo, S.W., Park, E.J., Kang, T.H., Seo, G.S., Kim, Y.C., and Sohn, D.H., *Planta Med.*, 2003, vol. 69, p. 990.  
<https://doi.org/10.1055/s-2003-45143>
16. Konieczny, M.T., Konieczny, W., Sabisz, M., Skladanowski, A., Wakiec, R., Augustynowicz-Kopec, E., and Zwolska, Z., *Chem. Pharm. Bull.*, 2007, vol. 55, p. 817.  
<https://doi.org/10.1248/cpb.55.817>
17. Jin, F., Jin, X.Y., Jin, Y.L., Sohn, D.W., Kim, S.A., Sohn, D.H., Kim, Y.C., and Kim, H.S., *Arch. Pharm. Res.*, 2007, vol. 30, p. 1359.  
<https://doi.org/10.1007/BF02977357>
18. Narender, T., Khaliq, T., Shweta, Nishi, Goyal, N., and Gupta, S., *Bioorg. Med. Chem.*, 2005, vol. 13, p. 6543.  
<https://doi.org/10.1016/j.bmc.2005.07.005>
19. Wu, J.H., Wang, X.H., Yi, Y.H., and Lee, K.H., *Bioorg. Med. Chem. Lett.*, 2003, vol. 13, p. 1813.  
[https://doi.org/10.1016/S0960-894X\(03\)00197-5](https://doi.org/10.1016/S0960-894X(03)00197-5)
20. Nem, N.H., Kim, Y., Yu, Y.J., Hong, D.H., Kim, H.M., and Ahn, B.Z., *Eur. J. Med. Chem.*, 2003, vol. 38, p. 179.  
[https://doi.org/10.1016/S0223-5234\(02\)01443-5](https://doi.org/10.1016/S0223-5234(02)01443-5)
21. Harborne, J.B., Mabry, T.J., and Mabry, H., *The Flavonoids*, London: Chapman & Hall, 1975.
22. Chang, M., Li, Y., Zhang, H., and Gao, W., *J. Chem. Res.*, 2010, p. 269.  
<https://doi.org/10.3184/030823410X12740293863464>
23. Imafuku, K. and Yamaguchi, K., *Bull. Chem. Soc. Jpn.*, 1981, vol. 54, p. 2855.  
<https://doi.org/10.1246/bcsj.54.2855>
24. Honda, M. and Imafuku, K., *Bull. Chem. Soc. Jpn.*, 1985, vol. 58, p. 508.  
<https://doi.org/10.1246/bcsj.58.508>
25. Gao, W.T. and Zheng, Z., *Chin. Chem. Lett.*, 2000, vol. 6, p. 503.
26. Imafuku, K., Wang, D-L., and Jing, Z-T., *J. Heterocycl. Chem.*, 1990, vol. 27, p. 891.  
<https://doi.org/10.1002/jhet.5570270413>
27. Dhar, D.N. and Lal, J.B., *J. Org. Chem.*, 1958, vol. 23, p. 1159.  
<https://doi.org/10.1021/jo01102a021>
28. Reddy, G.V., Maitraie, D., Narsaiah, B., Rambabu, Y., and Rao, P.S., *Synth. Commun.*, 2001, vol. 31, p. 2881.  
<https://doi.org/10.1081/SCC-100105339>
29. Pore, D., Desai, U., Thopte, T., and Wadgaonkar, P., *Russ. J. Org. Chem.*, 2007, vol. 43, p. 1088.  
<https://doi.org/10.1134/S107042800707024X>
30. Rajender, S.V., George, W.K., Lan, T.E., and Richard, M.P., *Synth. Commun.*, 1985, vol. 15, p. 279.  
<https://doi.org/10.1080/00397918508063800>
31. Domínguez, J.N., Charris, J.E., Lobo, G., de Domínguez, N.G. de, Moreno, M.M., Riggione, F., Sanchez, E., Olson, J., and Rosenthal, P.J., *Eur. J. Med. Chem.*, 2001, vol. 36, p. 555.  
[https://doi.org/10.1016/S0223-5234\(01\)01245-4](https://doi.org/10.1016/S0223-5234(01)01245-4)
32. Calloway, N.O. and Green, L.D., *J. Am. Chem. Soc.*, 1937, vol. 59, p. 809.  
<https://doi.org/10.1021/ja01284a011>
33. Breslow, D.S. and Hauser, C.R., *J. Am. Chem. Soc.*, 1940, vol. 62, p. 2385.  
<https://doi.org/10.1021/ja01866a035>
34. Kantam, M.L., Prakash, V.B., and Reddy, C.V., *Synth. Commun.*, 2005, vol. 35, p. 1971.  
<https://doi.org/10.1081/SCC-200065006>
35. Dave, S.S., Ghatole, A.M., Rahatgoankar, A.M., Chorghade, M.S., Chauhan, P.M.S., and Srivastava, K., *Indian J. Chem., Sect. B*, 2009, vol. 48, p. 1780.  
<http://nopr.niscpr.res.in/handle/123456789/6865>
36. Sirsat, S.B., Halikar, N.K., Pund, M.M., and Vartale, S.P., *Res. J. Pharm., Biol. Chem. Sci.*, 2012, vol. 3, p. 240.
37. Tiwari, V., Ali, P., and Meshram, J., *Green Chem. Lett. Rev.*, 2011, vol. 4, p. 219.  
<https://doi.org/10.1080/17518253.2010.544262>
38. Tiwari, V., Ali, P., and Meshram, J., *Int. J. ChemTech Res.*, 2010, vol. 2, p. 1031.
39. Zhu, H., Tang, L., Zhang, C., Wei, B., Yang, P., He, D., Zheng, L., and Zhang, Y., *Front. Pharmacol.*, 2019, vol. 10, article no. 3141.  
<https://doi.org/10.3389/fphar.2019.01341>

40. Bentahar, S., Taleb, M.A., Sabour, A., Dbik, A., Khomri, M.E., Messaoudi, N.E., and Lacherai, A., *Russ. J. Appl. Chem.*, 2020, vol. 93, p. 983.  
<https://doi.org/10.1134/S107042722007006X>
41. Adnan, D., Singh, B., Mehta, S.K., Kumar, V., and Kataria, R., *Curr. Res. Green Sustainable Chem.*, 2020, vol. 3, article ID 100041.  
<https://doi.org/10.1016/j.crgsc.2020.100041>
42. Chaker, H., Ferouani, G., Chikhi, I., Djennas, M., and Fourmentin, S., *Colloid Interface Sci. Commun.*, 2021, vol. 43, article ID 100461.  
<https://doi.org/10.1016/j.colcom.2021.100461>
43. Selvaraj, G.G., Jayaraman, S., Selvarasu, U., Velumani, B.P., and Parasuraman, K., *Curr. Catal.*, 2021, vol. 10, p. 103.  
<https://doi.org/10.2174/2211544710666210716113451>
44. Ekanayake, U.G.M., Weerathunga, H., Weerasinghe, J., Waclawik, E.R., Sun, Z., MacLeod, J.M., O'Mul-lane, A.P., and Ostrikov, K.K., *Sustainable Mater. Technol.*, 2022, vol. 32, article ID e00394.  
<https://doi.org/10.1016/j.susmat.2022.e00394>
45. Sharma, D., Kumar, S., and Makrandi, J.K., *Green Chem. Lett. Rev.*, 2015, vol. 8, p. 21.  
<https://doi.org/10.1080/17518253.2015.1058975>
46. Sharma, D. and Kumar, S., *Bulg. Chem. Commun.*, 2017, vol. 49, p. 309.
47. Sharma, D., *Res. Chem. Intermed.*, 2015, vol. 41, p. 927.  
<https://doi.org/10.1007/s11164-013-1245-6>
48. Alcantara, D.R., Marinas, J.M., and Sinisterra, J.V., *Tetrahedron Lett.*, 1987, vol. 28, p. 1515.  
[https://doi.org/10.1016/S0040-4039\(01\)81030-3](https://doi.org/10.1016/S0040-4039(01)81030-3)
49. Imafuku, K., Yamane, A., and Matsumura, H., *J. Synth. Org. Chem.*, 1980, vol. 38, p. 308.  
<https://doi.org/10.5059/yukigoseikyokaishi.38.308>
50. Gao, W., Zheng, Z., and Chen, H., *Acta Sci. Nat. Univ. Pekin.*, 2001, vol. 37, p. 205.





## Annals of the Bhandarkar Oriental Research Institute

ISSN: 0378-1143

### Theatrical Articulation of Irish Nationalism in the Abbey Theatre:

#### Contexts of Discontents and Controversies

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#### Abstract

The Irish theatre has been a significant platform for cultural expression and socio-political discourse. Throughout its history, however, it has also witnessed several instances of riots, where conflicts stemming from differing ideological, cultural, and nationalistic viewpoints erupted into violence. This paper seeks to analyze the causes, events, and outcomes of these riots, shedding light on the broader implications for Irish society and its artistic landscape. Each riot can be attributed to a complex interplay of socio-political factors, including religious conflicts, national identity struggles, economic inequality, and cultural representation disputes. The paper examines how these elements interacted within the specific historical context of each incident, contributing to the eruption of violence with special reference to J.M. Synge *The Play boy* of the western world. Riots in the Irish theatre provide valuable insights into the complexities of socio-political interactions within the cultural domain. By understanding the causes, events, and outcomes of these riots, we can better appreciate the significance of theatre as a reflection of society and as a tool for shaping collective identity.

**Keywords:** Irish theatre, riots, artistic freedom, socio-political factors, cultural expression, nationalism, discourse.

The Abbey Theatre and the plays performed by its founding figures have been examined with their theoretical contents and theatrical depictions, bearing the dissatisfactions and riotous sentiments of the audiences. The riots and the controversies that the plays generated during and after the performance disrupted the playwrights' intentions and imaginations of creating an Irish Nation through literary and theatrical adventures. The nationalist press echoed with disgrace and condemned the play as an "unmitigated, protracted libel upon Irish peasant men and, worse still, upon Irish peasant girlhood." (Kilroy, 7) The furor came to be known as the "Playboy riots."





## Annals of the Bhandarkar Oriental Research Institute

ISSN: 0378-1143

The Abbey Theatre played a significant role in articulating Irish nationalism during the late 19th and early 20th centuries. This period was marked by various contexts of discontent and controversies that shaped the theatre's mission and productions. Let me briefly explore the historical and cultural backdrop against which the Abbey Theatre emerged, its contribution to Irish nationalism, and some controversies it faced. Colonialism and cultural suppression as a means to subjugate Ireland was a British colonial intent. Ireland had a long history of English colonialism and cultural suppression, which profoundly impacted the Irish people's sense of identity and nationhood. The Irish language, traditions, and culture were systematically marginalized during this period.

The emergence of the Abbey Theatre and the founding figures W.B. Yeats, Lady Augusta Gregory, and John Millington Synge in 1904 were established to promote Irish playwrights, actors, and cultural expression. The Abbey Theatre became a platform for promoting Irish culture, history, and nationalism. It played a pivotal role in the revival of Irish literature and theater. Representation of Irish Life by Playwrights associated with the Abbey, like J.M. Synge and Sean O'Casey, depicted the lives of ordinary Irish people, often focusing on their struggles and injustices.

Despite controversies, the Abbey Theatre played a crucial role in the cultural renaissance of Ireland. It nurtured talented playwrights and actors, contributing to Irish literature and theater development. The Abbey inspired many Irish people to embrace and celebrate their cultural heritage, fostering a sense of Irish nationalism. The Abbey Theatre served as a significant platform for the theatrical articulation of Irish nationalism during a tumultuous period in Irish history. While it faced various controversies and challenges, it played a vital role in shaping Irish cultural identity and promoting the nation's rich literary and theatrical traditions.

The colonial Ireland in the early phase of the 20<sup>th</sup> century witnessed a growth of sentiment against the English occupation, forcing the inhabitants to take a stand on nationalism. Though most favored Irish autonomy, much contention grew to overachieving independence and proceeding after winning it. The more revolutionary Republican nationalists, who sought the collaboration of the masses and often advocated the use of radical - sometimes violent - ways to pursue their cause, attempted to build a foundation for unified patriotism, choosing the Irish peasant as their primary emblem and demanding that in any depiction this icon be portrayed as unfailingly heroic and virtuous. On the other hand, the Cultural Revivalists mentioned in the





introduction generally concerned themselves with building Ireland's reputation through the creation of great art and with using parliamentary means to gain their freedoms.

Nevertheless, they needed to consider this construct a reality. The "peasant plays" that supported the nationalist point of view did prove popular in Dublin theaters, but, refusing to follow the party line, the artists at the Abbey Theatre frequently challenged the idealized image of the Irish peasant perpetuated by the Gaelic League and other nationalist societies in their campaigns and replaced it with portraits which, by painting in the warts and wrinkles, transformed the peasants from political icons into - in their view - iconoclastic works of art.

The Abbey Theatre in Dublin, Ireland, has a rich history of producing plays that often explore themes of conflict and controversy. Over the years, it has been central to many debates and disputes within the theatre community and the broader Irish society. Here are some key examples of conflicts and controversies associated with plays at the Abbey Theatre:

The Senator by Denis Johnston was banned by the Irish government because it was seen as a critique of the political establishment. The censorship of the play raised questions about artistic freedom and government control over the theatre. The Plough and the Stars (1937): The play by Sean O'Casey once again stirred controversy when revived at the Abbey Theatre in 1937. This time, the controversy centered on concerns about how it depicted the Irish struggle for independence, with some feeling it was unpatriotic. Others saw it as a truthful reflection of the period.

The significant impact of controversies in the context of Irish theatrical performances in the Abbey Theatre was a phenomenon. Controversies have impacted the Irish people associated with the theater in some ways. Artistic Expression and National Identity were affected by the riots and controversies in the Abbey Theatre. The Abbey Theatre played a crucial role in shaping Irish national identity through artistic works. Controversies surrounding the content of plays or the representation of Irish culture can lead to debates about what it means to be Irish. Such controversies can prompt discussions about cultural authenticity, national pride, and the role of art in shaping identity.

Syngé's *The Playboy of the Western World* (1907) stirred controversy due to its portrayal of rural Irish life and its use of vernacular language. Upon its premiere, it faced protests and riots in Dublin, as some Irish nationalists viewed it as disrespectful to Irish culture. The Abbey Theatre





often faced censorship and opposition from conservative elements within Irish society who disagreed with its artistic choices and perceived it as too progressive. The Abbey's involvement in political matters, including its support for the Irish Literary Revival and the Gaelic League, also led to controversies and disagreements within the nationalist movement.

J.M. Synge's play caused a major disgrace when enacted at the National Theatre. The story of a young man who boasts about killing his father shocked the conservative Irish audience, leading to riots and protests. The play was seen as a challenge to traditional Irish values. It sparked debates about censorship and the theatres as a cultural apparatus to help shape the nation's cultural identity. *The Plough and the Stars* by Sean O'Casey, set during the 1916 Easter Rising in Dublin, depicted the lives of working-class characters caught up in the conflict. When it premiered, some audience members took offense at its portrayal of Irish nationalism and working-class struggles. Riots broke out, and the controversy surrounding the play led to discussions about the representation of Irish history on stage.

**Censorship and Freedom of Expression:** Throughout its history, the Abbey Theatre faced censorship and bans on certain plays. Controversies related to censorship highlight the tension between artistic freedom and societal norms. Irish people may view these controversies as battles for free expression and resistance against censorship. Controversies related to these themes resonate deeply with the Irish people, as they often touch on traumatic and unresolved issues from the past.

Discussions around the underrepresentation of women playwrights, directors, and actors may lead to calls for greater gender equality and inclusivity within the theater community. These internal debates have had a lasting impact on the morale and direction of the Abbey Theatre. Controversies often lead to increased public attention and engagement with the theater. While some may be drawn to the theater due to the controversy, others may distance themselves. This dynamic can shape the theater's audience and relationship with the broader Irish population. Some controversies may be remembered as pivotal moments in Irish cultural history, while others might be seen as regrettable missteps. Irish people used these controversies as opportunities to address deep-seated issues, such as representation, diversity, and the role of the arts in contemporary society.





## Annals of the Bhandarkar Oriental Research Institute

ISSN: 0378-1143

The controversies and riots in the Abbey Theatre cast a wide-ranging impact on the Irish people, influencing discussions about identity, freedom of expression, politics, gender, and the role of art in society. These controversies are important moments of reflection and change within the theater community and the broader Irish cultural context.

These riots and controversies raised questions about the representation of Irish nationalism. These controversies at the Abbey Theatre reflect Ireland's complex relationship between art, politics, and societal norms. The theatre has often been a platform for challenging established ideas and sparking meaningful conversations about Irish identity, history, and culture. The Abbey Theatre riots in 1907 were primarily associated with the premiere of J.M. Synge's play *The Playboy of the Western World*. This event is one of the most famous controversies in the history of the Abbey Theatre and had a significant impact on Irish theater and cultural discourse.

The premiere of *The Playboy of the Western World* led to protests and riots among the audience. The controversy was not limited to one night but continued for several performances. Some audience members took offense at what they perceived as the play's disrespectful treatment of Irish culture and the portrayal of Christy Mahon as a hero for patricide. Nationalists and conservatives in the audience were particularly outraged by the play, and they disrupted performances by shouting, throwing objects, and even engaging in physical confrontations with actors and other audience members.

The riots warranted significant attention, and *The Playboy of the Western World*, as one of the most talked-about productions of its time, highlighted the cultural and political tensions in Irish society during the early 20th century, particularly between those who wanted to preserve traditional Irish values and those who sought to challenge and modernize them. Despite the initial uproar, the play eventually gained recognition for its artistic merit and is now considered a classic of Irish literature. The Abbey Theatre riots over *The Playboy of the Western World* marked a pivotal moment in the history of Irish theater, reflecting the changing attitudes and values in Ireland during that period. The controversy surrounding the play also underscored the power of theater to provoke discussion and challenge societal norms.

As a self-assigned mediator between the Western Irish peasant and the Dublin theatergoer, he spent sufficient time with his subjects to give credibility to his reportage. In *A Critique of Postcolonial Reason*, Gayatri Chakravarty Spivak provides a telling description of a privileged





writer's relationship to working-class society that resonates in examining Synge's interactions with the Irish peasants. "Can the subaltern speak?" by Spivak poses a grave question because the poorest members of society are usually the least educated, "members of the Indian elite are, of course, informants for first-world intellectuals interested in the voice of the other."

During and after the turmoil instigated by the first performances of *The Playboy*, he repeatedly denied including any political content in the play. Furthermore, the evidence shows that Synge did remove much of the political and social context, founding earlier drafts of the work.

In 1903, at a time when productions with a positive spin on Irish peasant life were delighting audiences, Synge's *In the Shadow of the Glen* caused Willie Fay to remark on its contrast with their other more popular rustic plays. Later, Fay noted the author's inability to "forgive the crass ignorance, the fatuity, the malevolence with which *The Well of the Saints* had been received" in 1905. Despite Lady Gregory's claim that Synge had little interest in politics, he certainly did not mind using the theater to challenge those critics who misinterpreted or unfairly judged his plays.

While the protesters equated anything less than a virtuous and heroic portrayal of the peasant with the hated "Stage Irishman," and the playwrights at the Abbey Theatre fought for their artistic vision, life continued in County Mayo. Evidently, the battle over the image of the Irish peasant that led to rioting in Dublin that January week in 1907 meant much more to others than it meant to the people who had been portrayed themselves. So, after several years of inciting growing wrath among nationalists by taking an inartistic stance that did not always agree with the Republican point of view, the Abbey Theatre began to challenge the opinions of nationalists actively and to insist on the right to present a different perspective on the political state of Ireland at the time. However, nationalism was not the only issue to spark controversy during the period.

#### Work Cited

- Lady Gregory, *Our Irish Theatre: A Chapter of Autobiography*. New York: G.P. Putnam's Sons, 1913.
- Robert Welch, ed., *Oxford Companion to Irish Literature*. Oxford: Clarendon Press, 1996. 533.
- Kilroy, James. *The 'Playboy' Riots*. Freeman's Journal, Dublin: The Dublin Press, 1971.
- Cusack, George. "In the Grip of the Ditch": Nationalism, Famine, and *The Playboy* of the Western World." *Modern Drama* 45.4. 2002: 567-92.
- Doggett, Rob. "The Three Fathers of the Past: A Sociological Reading of *The Playboy* of the Western World and the *Playboy* Riots." *Colby Quarterly* 33.4. 1997: 281-94.



**Annals of the Bhandarkar Oriental Research Institute**

ISSN: 0378-1143

- Ellis-Fermor, Una. "Synge's Poetic Drama." *Twentieth-century interpretations of The Playboy of the Western World: A Collection of Critical Essays*. Ed. Thomas R. Whitaker. Englewood Cliffs, NJ: Prentice-Hall, 1969. 35-48.
- Fanon, Frantz. *The Wretched of the Earth*. New York: Grove, 1963.
- Kiberd, Declan. "The Frenzy of Christy: Synge and Buile Shuibhne." *Eire-Ireland* 14.2. 1979: 68-79.
- Kain, Richard M. "The Playboy Riots." *Sunshine and the Moon's Delight: A Centenary Tribute to John Millington Synge 1871-1909*.
- Greene, David H., and Edward M. Stephens. *J. M. Synge 1871-1909*. New York: Macmillan, 1959.
- Murray, Christopher. *Twentieth-Century Irish Drama: Mirror up to Nation*. Syracuse: Syracuse UP, 1997.



**A REVIEW ON- IMPACT OF NANOTECHNOLOGY ON ENVIRONMENT**<sup>1</sup>Madhu Rani, <sup>1</sup>Dr. Narender Kumar<sup>1</sup>Department of Physics, Vaish College, Bhiwani 127021 HaryanaCorresponding author- mail:- [nk.physics15@gmail.com](mailto:nk.physics15@gmail.com)**Abstract**

The environmental impact of nanotechnology is the possible effects that the use of nanotechnological materials and devices will have on the environment. As nanotechnology is an emerging field, there is debate regarding to what extent industrial and commercial use of nanomaterials will affect organisms and ecosystems. Nanotechnologies environmental impact can be split into two aspects: the potential for nanotechnological innovations to help improve the environment, and the possibly novel type of pollution that nanotechnological materials might cause if released into the environment.

Green nanotechnology refers to the use of nanotechnology to enhance the environmental sustainability of processes producing negative externalities. It also refers to the use of the products of nanotechnology to enhance sustainability. It includes making green nano-products and using nano-products in support of sustainability. Green nanotechnology has been described as the development of clean technologies, "to minimize potential environmental and human health risks associated with the manufacture and use of nanotechnology products, and to encourage replacement of existing products with new nano-products that are more environmentally friendly throughout their lifecycle. Over the years, human activities have unintentionally devastated the environment, leading to climate change, global warming, digital carbon footprint, pollution, ozone layer depletion, waste disposal, and many more issues. Therefore, protecting the environment has become an important yet critical challenge for the human race. It is high time for us to repair the environment. One of the solutions to these environment-related issues is nanotechnology.

**Keywords:** *Nanotechnological materials, Ecosystems, Lifecycle, Environment, Pollution*

**What is Nanotechnology?**

Nanotechnology is a branch of science and technology that deals with dimensions of less than 100 nanometers, especially for the manipulation of individual atoms and molecules. The concept was discovered in 1959 by Dr. Richard P. Feynman, and the term nanotechnology was first coined in 1974 by Norio Taniguchi. Nanotechnology can be used across all the other science fields, such as chemistry, physics, engineering, and biology. It is even used to reduce and prevent damage and repair the environment. Nanotechnology, also shortened to nanotech, is the use of matter on an atomic, molecular, and supramolecular scale for industrial purposes. The earliest, widespread description of nanotechnology referred to the particular technological goal of precisely manipulating atoms and molecules for fabrication of macroscale products, also now referred to as molecular nanotechnology. A more generalized description of nanotechnology was subsequently established by the National Nanotechnology Initiative, which defined nanotechnology as the manipulation of matter with at least one dimension sized from 1 to 100 nanometers (nm). This definition reflects the fact that quantum mechanical effects are important at this quantum-realm scale, and so the definition shifted from a particular technological goal to a research category inclusive of all types of research and technologies that deal with the special properties of matter which occur below the given size threshold. It is therefore common to see the plural form "nanotechnologies" as well as "nanoscale technologies" to refer to the broad range of research and applications whose common trait is size. Everyday products that use nanotechnology Nanotechnology may seem like something out of the future, but in fact, many everyday products are already made using nanotechnology. Take these seven common products, for instance:



## 1. Sunscreen

Nanoparticles have been added to sunscreens for years to make them more effective. Two particular types of nanoparticles commonly added to sunscreen are titanium dioxide and zinc oxide. These tiny particles are not only highly effective at blocking UV radiation, they also feel lighter on the skin, which is why modern sunscreens are nowhere near as thick and gloopy as the sunscreens we were slathered in as kids.

## 2. Clothing

When used in textiles, nanoparticles of silica can help to create fabrics that repel water and other liquids. Silica can be added to fabrics either by being incorporated into the fabric's weave or sprayed onto the surface of the fabric to create a waterproof or stainproof coating. So if you've ever noticed how liquid forms little beads on waterproof clothing – beads that simply roll off the fabric rather than being absorbed – that's thanks to nanotechnology.

## 3. Furniture

In the same way that clothing can be made waterproof and stainproof through nanotechnology, so too can upholstered furniture. Even better, nanotechnology is also helping to make furniture less flammable; by coating the foam used in upholstered furniture with carbon nanofibers, manufacturers can reduce flammability by up to 35 percent.

## 4. Adhesives

Nanotechnology can also be used to optimize adhesives. Interestingly, most glues lose their stickiness at high temperatures, but a powerful “nano-glue” not only withstands high temperatures – it gets stronger as the surrounding temperature increases.

## 5. Coatings for car paintwork

We all know bird droppings can wreak havoc on car paintwork. To combat this, a company called Nanorepel has produced a high-performance nanocoating that can be used to protect your car's paintwork from bird poop. The company also makes coatings to protect car upholstery from stains and spillages.

## 6. Tennis balls

Nanotechnology has found a range of applications in the world of sports equipment, with a couple of great examples coming from one of my favorite sports: tennis. Nanotechnology helps tennis balls keep their bounce for longer, and make tennis racquets stronger.

## 7. Computers

Without nanotechnology, we wouldn't have many of the electronics we use in everyday life. Intel is undoubtedly a leader in tiny computer processors, and the latest generation of Intel's Core processor technology is a 10-nanometer chip. When you think a nanometer is one-billionth of a meter, that's incredibly impressive

## Impacts of Nanotechnology on the Environment

Nanotechnology has the potential to have a significant impact on the environment. From saving raw materials to decreasing greenhouse gasses, it can help us to repair the environment. It can majorly help us with the following things:

### Saving the Seas

We have all read the news about oil spilling into the seas, damaging the oceans, rivers, and marine life residing within. The nanotechnology-based solutions help to save the seas in several ways:

It can yield a new generation of nanomembranes for the separation of water contaminants by removing and reducing water contaminants.

Nanotechnology-based solutions can remove radioactive waste.

The advancement of nanotechnology can help to expand the water supply by developing cost-effective treatments that can overcome the major challenges that current treatment technologies face.

Nanotechnology helps in water cleaning by utilizing iron nanoparticles to remove organic solvents in groundwater.



### **Cleaning the Air**

The planet is warming, and the polar ice caps are melting, all because of an increase in the amount of carbon dioxide. It is the biggest threat to the environment and the human race. Thus, it has resulted in increased amounts of greenhouse gasses, leading to drastic climate change.

Methods for the separation of carbon dioxide from gasses are highly expensive and not competitive for large-scale applications. However, the nanomaterial can work in the same yet cost-effective way without even additional compounds. Various nanoparticles are being developed to reduce greenhouse gas emissions. The addition of nanoparticles to fuel can improve fuel efficiency and reduce the rate of greenhouse gas production resulting from fossil fuel users.

### **Battery Recycling**

Batteries are made up of heavy metals like mercury, lead, nickel, and cadmium, which can contaminate the environment and can cause potential threats to human health. But, with the help of nanotechnology, the use of cathode particles from lithium-ion batteries has made it possible to recycle and regenerate batteries to use as new ones.

### **Nanoparticles are likely to be dangerous for three main reasons:**

1. Nanoparticles may damage the lungs. We know that 'ultra fine' particles from diesel machines, power plants and incinerators can cause considerable damage to human lungs. This is both because of their size (as they can get deep into the lungs) and also because they carry other chemicals including metals and hydrocarbons in with them. Nanoparticles can get into the body through the skin, lungs and digestive system. This may help create 'free radicals' which can cause cell damage and damage to the DNA. There is also concern that once nanoparticles are in the bloodstream they will be able to cross the blood-brain barrier.
2. The human body has developed a tolerance to most naturally occurring elements and molecules that it has contact with. It has no natural immunity to new substances and is more likely to find them toxic. The danger of contact with nanoparticles is not just speculation. As more research is undertaken, concerns increase. Here are some of the recent findings: some nanoparticles cause lung damage in rats. Several studies have shown that carbon nanotubes, which are similar in shape to asbestos fibres, cause mesothelioma in the lungs of rats (see below) other nanoparticles have been shown to lead to brain damage in fish and dogs
3. A German study found clear evidence that if discrete nanometer diameter particles were deposited in the nasal region (in rodents in this case), they completely circumvented the blood/brain barrier, and travelled up the olfactory nerves straight into the brain. Inhaled carbon nanotubes can suppress the immune system by affecting the function of T cells, a type of white blood cell that organises the immune system to fight infections.

### **Application of Nanotechnology to Environmental Issues**

Nanotechnology researchers and developers are using the following avenues to repair the environment.

Generating less pollution during the manufacture of materials.

For the production of solar cells to generate electricity at a competitive cost.

To increase electricity generated by windmills.

For cleaning organic chemicals that pollute the groundwater.

Cleaning up oil spills.

For the reduction of fuel cell costs.

For storing hydrogen for fuel cell-powered cars.

### **Negative Impacts of Nanotechnology on Environment**

Nanomaterials can also have a negative impact. It has the potential to unintentionally form new toxic products. Although there is not much information regarding the environmental risks of manufactured nanomaterials. A few studies have been conducted to discover the impact of nanometers on the environment. There is no clear guideline to qualify the effects. A workshop, conducted by the National Science Foundation, and the US Environmental Protection Agency, to identify the risks concerning



nanomaterials. The workshop aimed at determining the exposure and toxicity of manufactured nanoparticles and the sustainability of nanomaterials.

**Following a critical risk assessment, issues regarding nanoparticles were identified:**

Manufactured nanoparticle's exposure assets. Toxicology of nanoparticles. Environmental and biological fate, persistence, transport, and transformation of manufactured nanoparticles. Recyclability and sustainability of manufactured nanoparticles.

**Conclusion**

Today, nanotechnology is becoming more and more real, and there is a need for discussion about the possible advances and impacts of technology on the environment. The increase in environmental problems is visible. Nanotechnology can cause positive and significant changes to air quality, water quality, and sustainable energy generation. It can help us to repair the environment and save it.

Nanotechnology has the potential to revolutionize our lives. This is because it presents almost unlimited potential to make remarkable changes in virtually all fields ranging from medicine, computer technology, construction, environmental remediation, food industry, to new energy sources. Despite presenting many potential benefits in many areas, nanotechnology of today is still in its infancy as just a few projects have been commercialized. Many are yet to undergo full lifecycle assessment. The number of nanotechnology innovations continues to rise. However, the same cannot be said of research about their potential effects on environment and biological systems. As the world readily adapts to this new technology wave, concomitant effort should be directed to the understanding of their possible impacts. This is essential to ensure that nanomaterials do not become the new hazard of 21st century. The long-long term sustainability of this new technology may depend on the establishment of its risks.

**References-**

1. Ian Sofian Yunus, Harwin, Adi Kurniawan, Dendy Adityawarman & Antonius Indarto (2012) Nanotechnologies in water and air pollution treatment, *Environmental Technology Reviews*, 1:1, 136-148, DOI: 10.1080/21622515.2012.733966
2. Rani K and Sridevi V. An Overview on Role of Nanotechnology in Green and Clean Technology. *Austin Environ Sci.* 2017; 2(3): 1026.
3. <https://www.nano.gov/you/nanotechnology-benefits>
4. <https://www.asme.org/engineering-topics/articles/technology-and-society/10-ways-nanotechnology-impacts-lives>
5. [http://www.academia.edu/7099463/impact\\_of\\_nanotechnology\\_on\\_environment](http://www.academia.edu/7099463/impact_of_nanotechnology_on_environment)
6. Hassellöv, M., and F. von der Kammer. 2008. Iron oxides as geochemical nanovectors for metal transport in soil-river systems. *Elements (Chantilly, VA, U. S.)* 4:401-406.
7. Hochella, M.F., Jr. 2008. Nanogeoscience: From origins to cutting-edge applications. *Elements (Chantilly, VA, U. S.)* 4:373-379.
8. Hochella, M.F., S.K. Lower, P.A. Maurice, R.L. Penn, N. Sahai, D.L. Sparks, and B.S. Twining. 2008. Nano minerals, mineral nanoparticles, and Earth systems. *Science* 319:1631-1635.
9. Bhatt and B. N. Tripathi, "Interaction of engineered nanoparticles with various components of the environment and possible strategies for their risk assessment," *Chemosphere*, vol. 82, pp. 308-317, 2011.
10. Kahru, A., and H.-C. Dubourguier. 2009. From ecotoxicology to nanoecotoxicology. *Toxicology*. doi:10.1016/j.tox.2009.08.016.
11. Kulmala, M., and V.-M. Kerminen. 2008. On the formation and growth of atmospheric nanoparticles. *Atmos. Res.* 90:132-150.



# 5G Technology: Applications and Challenge

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Date of Submission: 01-02-2023

Date of Acceptance: 10-02-2023

5G Technology Network is the next generation of wireless communication. It's much faster and able to connect with more devices than the existing 4G LTE network. China is the first country to officially announce its entry into the 5G era. 5G Technology is ready to start in India soon as per government planning. 5G is a 5th-generation mobile wireless standard network after 1G, 2G, 3G, and 4G. The whole article will expand the understanding of the 5G Technology in India

## 5G Technology: The Concept

5G Technology stands for fifth-generation cellular networks, which is the most advanced and fastest wireless technology available currently. After 1G, 2G, 3G and 4G, 5G opens a new world of possibilities and will provide higher multi-Gbps peak data speeds. This will help in making communication smooth, improve efficiency, enable faster streaming and support not just working professionals but also online learners to do more by using the power of the internet. 5G Technology will bring more dependability, extremely low latency, a massive network, and increased availability with a fast data speed. 5G Technology will be able to share a huge amount of data and connect people; things virtually have the capacity to store, process, and transmit a huge amount of data at high speed.

**Generation Of Mobile Network** Before 5G Technology, we had four more networks, which are used extensively for various things, but the introduction of 5G Technology will change the whole scenario of the digital world; let's talk about some previous networks used in the past and present.

1G: It was introduced in 1980 on radio signal and supported only voice calls

2G: It was introduced in 1990 on radio signal and supported voice and data both

3G: It was introduced in 2000. It has the best speed and support for calling, video, and conferencing.

4G: it was launched in 2010, with a peak speed of 100 Mbps to 1 Gbps supporting 3D virtual reality;

this is the network on which we are relying is present.

## 5G Technology Spectrum Bands

5G Technology operates on three different spectrum bands.

Low-band spectrum - offering exceptional coverage area and wall penetration  
Mid-band spectrum - provides faster speed and lower latency. However, building penetration is lower than the Low-band spectrum.

High-band spectrum - offers the highest speed, but the coverage area and building penetration are significantly compromised.

## 5G Technology : APPLICATIONS

The following are the applications of the 5G Technology network in India:

Faster data processing- 5G Technology has a latency rate of 1 millisecond and a speed range of 20Gbps and more. Thus data collected from various sources can be processed at a fast pace.

High-speed mobile network- 5G will reduce buffering and enhance the download speed on our mobiles. It'll also help in good-quality video calling and conferencing.

Internet of Things- 5G Technology will boost development in the field of IoT.

Artificial intelligence- 5G has added advantages for machine learning, robotics and other programming modules. It can provide faster processing of data.

Education- Due to Covid-19, Online learning has gained a lot of momentum. But the speed of the internet set up a big hurdle in education. 5G Technology can help in faster connectivity and a better learning experience. It'll also open new avenues for learning.

Health sector- 5G Technology will help in the field of Telemedicine and biotechnology. It will help in spreading access to medical services to far-fledged areas.

Employment Opportunities- 5G will open new areas of employment in various sectors like the I.T. sector, construction sector and Cyber sector.



According to an estimate, it can lead to employment opportunities for almost 5 crore youth in India.

Government Services- 5G Technology can help in better access and last-mile access to Government services for the citizens. It will help in faster public grievance redress and ensure transparency and accountability.

Infrastructure OverhaulmmWave is far more complex to design for than low frequency spectrum, and may require advanced levels of training for RF engineers. Challenges of designing for mmWave include poor signal range and increased reflection from building materials. There are also costconsiderationsas in-building mmWaves require an infrastructure overhaul, with new antennae, fiber cabling, and small cells needing to be installed throughout a locale to connect properlyA keyfeature of 5G NR - Beamforming - enables ultra-precise data transfer but requires high-level processing and input during the planning and design stage. It's a powerful tool that demands significant design time investments.

The complexity of reliable, consistent low latency With 5G set to enable smart technology like self-driving cars and automated medical equipment, latency can be catastrophic. Accurate, well designed 5G networks are essential to minimizing latency in these industries.

The cost of evolution

The enhancements that 5G brings don't come without investment. Most 5G equipment is non-compatible with existing infrastructures, so upgrading a network will mean upgrading its antennae. It's no small feat: rolling out 5G across the US could cost an estimated \$300 billion.

### How to correctly plan 5G networks?

Operators, engineers, and system integrators are currently publishing research on the optimal strategy for planning 5G networks, but one thing is for sure:5G network design requires powerful software. India's InitiativesBharatnet project was launched in 2017 for providing digital infrastructure on a non-discriminatory basis by affordable broadband connectivity for all households. The objective is to facilitate the delivery of e-health, e-governance, e-banking, e-education, Internet and other services to rural areas.National Optical Fibre Network (NOFN) aims at bringing a broadband revolution in rural areas. Its objective is to connect all the Gram Panchayats in the country with 100 Mbps connectivity. As we have seen earlier, fibre

provides strong backhaul, thus facilitates the adoption of 5G.High-level forum to develop 5G roadmap – Recently, the Department of Telecommunications set up a high-level forum to evaluate roadmaps and create a strategy to adopt 5G in the country by 2020.Waivers for Private telecoms -The government also announced a subsidy of Rs 3,600 crore to private telecom players such as Bharti Airtel, Vodafone India, and Reliance Jio to establish Wi-Fi in rural areas as part of the second phase of the BharatNetproject.The government is working on creating a corpus of Rs 500 crore to fund 5G activity, India's National Digital Communications Policy 2018 emphasizes the importance of 5G when it mentions that the convergence of a cluster of revolutionary technologies including 5G, the cloud, Internet of Things (IoT) and data analytics, along with a growing start-up community, promise to accelerate and deepen its digital engagement, opening up a new horizon of opportunities.

**Way forward:** Increasing domestic 5G manufacturing: Government should encourage and boost its local 5G hardware production at an exceptional rate if it needs to achieve the 5G India dream. PricingRationalisation: Rationalisation of this spectrum pricing is required so that the government generates sufficient revenue from the auction without affecting the roll-out plans for 5G in India.

Filling the Rural-Urban Gap: 5G can be launched at different band spectrums and at the low band spectrum, the range is much longer which is useful for the rural areas

### CONCLUSION

Earlier deployment of 5G technology in India will help companies design and manufacture 5G products and solutions in India, thus creating some essential Intellectual Property Rights (IPR) in the 5G standard. It is high time that India strengthens the domestic telecommunication manufacturing market to enable local industries to capture both domestic as well as global market. particularly on research and product development.

### REFERENCES

- [1]. <http://www.slideshare.net/upadhyayniki/5g-wireless-technology-14669479>
- [2]. 5G – <https://en.wikipedia.org/wiki/5G>
- [3]. <http://recode.net/2015/03/13/what-is-5g-and-what-does-it-mean-for-cons>

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**An Interdisciplinary View of Governance and Good Governance in India**

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**Abstract**

In the contemporary governmental system, the idea of "good governance" is crucial. People in today's society are extremely conscientious and constantly aware of how the government is operating. As a result, the government also seeks to appease the general populace, who believe that good governance is a necessary complement to effective economic policies and can help build an atmosphere that promotes strong and equitable development. In addition, our current Prime Minister Narendra Modi makes every effort to develop good administration at the federal level as well as in the states. The word "governance" refers to all governing activities carried out by both governmental and non-governmental entities, including families. The act or duty of exercising power to control human affairs within a particular territory is a processor. Both normative and participative governance are possible. Whereas the normative definition of governance is "value loaded" and places emphasis on the idea of "Good Governance," the former places weight on citizen participation in the process of managing the state. This essay aims to analyze the idea of good governance and how it is applied to the nation's current administrative structure.

**Keywords:** Governance; Relationship; Development; Sustainable; Perception**Introduction**

Although not a novel idea, governance has existed since the dawn of human society.<sup>1</sup> Generally speaking, the idea of governance has existed in human civilization ever since people first learned how to live in a single community or society by making decisions and putting into practice specific laws, rules, and policies to maintain order and harmony in a single setting. To assure participatory democracy, human development, and the achievement of globalization goals, the phrase "good governance" has gained importance in the context of the restoration of democratic institutions (what may be referred to as the third wave of democracy). In the early years of the post-second world, economic growth and excellent governance were closely related.

As a result, the fundamental components of good governance in the political environment, such as responsibility, the rule of law, public engagement, respect for human rights, and



democratization, were frequently neglected. The term was primarily used by aid providers to assess how well third-world nations performing in need of economic assistance were doing. Because the World Bank was prohibited by its articles of agreement from taking non-economic political concerns into account when evaluating loan applications until the 1980s, the focus remained on economics. In due course, non-economic aspects like the environment began to be taken into account when the World Bank signalled a change in its definition of good governance in its World Development Report, 1999. The fact that economic factors alone are not the primary causes of human deprivation is now widely acknowledged. Poor governance is rooted in social and political concerns as well. The idea of good governance, its numerous issues, and possible solutions to these issues will all be covered in this essay.

## **II. Objectives of the Study:**

**The main objectives of this paper are:**

1. To know about good governance
2. To comprehend what makes for good government.
3. To learn about the difficulties with good administration.
4. To offer solutions to these issues with good governance.

## **Research Techniques**

The study is based on a review of the available literature and will use a qualitative methodology. An attempt has been made to gather information from a variety of sources while keeping in mind the nature of the problem and subject being researched. As a result, primary and secondary sources are combined. Documents from International agencies organizations, books, journals, speeches, remarks, and official announcements and communications have all been used to gather and transfer information. Interacting with other academics at international seminars, conferences, and workshops has helped me to think more clearly about different aspects of the subject. This study mostly used a descriptive methodology.

## **Significance of the Study**

This theoretical research work is divided into four sections based on the literature review. The study's goals, methodology, and research challenges are covered in the first section. The brief but thorough background of the research problem is the subject of the second section. In the third segment, an effort is made to emphasize the need for effective governance. The final component of the study would discuss a summary of the findings. It should be made apparent right away that it does not offer a thorough examination of all

relevant variables and circumstances. presents an overview of the many concerns and issues associated with good governance, instead. The outcomes of this work are anticipated to be extremely beneficial for both students and policymakers in the subject of development studies, in addition to scholars and professionals in politics and civil society action.

### **An analytical viewpoint on good governance**

The definitions of governance and good governance vary, however, they are not all consistent. These definitions are founded on normative presumptions regarding the implementation of new decisions inside organizations and the operation of formal and informal structures. The concept of governance is intricate and multifaceted, making it challenging to describe precisely. They are still unable to agree on its exact meaning with any degree of clarity. Scholars have used a variety of definitions to describe government. However, in a nutshell, governance is the process of making decisions and the method by which those decisions are carried out (or not carried out). Tahir Naveed describes governance as the use of social, political, administrative, and economic methods to manage resources and organize people into official and informal bodies, institutions, and companies. The World Bank has two linked but slightly different perspectives on governance. The emphasis is mostly placed on "how political power is used to manage a nation's affairs." In the second instance, the World Bank gives a more expansive definition of the term. The "use of power in the management of a country's economic and social resources for development" is how it defines governance. The United Nations Human Development Report from 2002 gave governance a new perspective by referring to it as democratic governance, which is crucial for improved human development. Respecting people's human rights and freedom to participate in decisions that affect their lives as well as keeping decision-makers responsible are all parts of democratic governance. It makes an effort to increase the responsiveness of social and economic policies to the needs of the populace.

Five factors must be present for governance to be effective. Political freedom, judicial and constitutional protection of individual rights, a stable currency, universal access to education and healthcare, and executive responsibility to a freely chosen legislature are among them. Good governance is a process that promotes "staff incentives, training of civil servants, administrative and fiscal decentralization, and dialogue between governments and civil society," according to the United Nations Development Programme (UNDP).<sup>10</sup> The UNDP has also emphasized the following characteristics of good governance:



**Political Legitimacy And Responsibility; An Impartial Judiciary**

Bureaucratic accountability, freedom of speech and information, effective and infectious public sector management, and collaboration with civil society organizations.

**The Fundamentals Of Good Governance**

Based on the definitions provided above, the following characteristics of good governance have been determined. In addition to being accountable, transparent, responsive, effective, and efficient, the government should also be inclusive and equitable while upholding the rule of law. More importantly, it assures the populace that corruption-free governance will be practised. In addition, when making decisions, the government should prioritize the opinions of minorities and pay attention to the voices of the most vulnerable members of society.

**Civil Society and Democratization**

Good government is essentially impossible without democracy. A crisis of governability could potentially affect a democratic government. To promote the principles of economic and political freedom and development for people, as well as to boost mass participation—features of good governance—a democratic system is necessary. When both the government and the citizens share trust, this is considered to be excellent governance. In this context, it has been argued that the only tenable normative ambition for modern politics is to make states more dependable to everyone who must live under them by improving their grace and civility in interactions with both their citizenry and one another. In this context, it is crucial to emphasize the democratic system of government. The populace must participate in government; both men and women in society should engage in a range of initiatives and groups inside the executive and legislative branches. One of the most crucial fundamental tenets upon which the modern system is built is the idea of equality. This means that everyone will be able to enjoy the concept of equality contained in each community without regard to their colour, background, or religious beliefs in terms of rights, obligations, or public duties. Some scholars, such as Nasir Islam and David R. Morrison, hold the view that democratization, civil society, and human rights are crucial elements of sound government. Some academics have also backed up Mustafa Kamal's claim that establishing a civil society is essential to effective government. A prerequisite for good governance, political and economic reforms are thought to be driven in large part by civil society. Excellent governance has been regarded as the distinguishing feature of a civil society—that is, a society that upholds a democratic political culture with accountability and broad public involvement in policymaking. Modern times have seen a



rise in the demand for civil society and human rights due to the process of the globalized market that has been brought about by globalization and liberalization. It refers to giving the people more authority, which is only achievable with effective government.

### **Accountability**

One of the pillars of good governance is accountability, which refers to the government's obligation to the people it governs as well as how those people can exert influence on the government. The concept of accountability is intricate and multifaceted, making it challenging to describe precisely. However, in general, accountability refers to the procedure by which a person or group can be made to answer for their actions. Accountability is typically used by political and civil executives (public officers) who must account for the people. In the case of political accountability, people hold their representatives accountable through the election. They carry out their duties in the name and best interests of the people.

Political, social, and horizontal mechanisms can all be used to define accountability. Horizontal accountability is a strategy or capacity for structuring accountability that relies on the judiciary, the legislature (i.e., the Congress), or other independent institutions that have the authority to investigate and ultimately punish any public official for improperly carrying out their assigned duties. Horizontal accountability typically refers to internal procedures in the executive branch. It consists of official interactions with the state and the government. It focuses on internal oversight and check processes. Immediately, the executive must inform the legislature of their choice. In other terms, horizontal accountability refers to the capacity of state institutions or the government to hold other public officials, agencies, or parts of government accountable for their actions. Elections at the local and federal levels are the most evident formal instruments used in vertical accountability (also known as "social accountability") to connect the public and the state. Vertical types of accountability involve citizens, the media, NGOs, and Civil Society Groups (CSG) participating directly or indirectly in the process of holding the powerful accountable. Accountability, in short, is one of the cornerstones of effective government. Both forms of accountability are crucial to achieving the objective of good government.

### **Law and order**

There is broad political agreement that the rule of law is a prerequisite for efforts to realize the objective of good government. Justice is regarded as being essential to good governance. As a result, it considers justice to be of utmost importance in creating a just society where people of diverse backgrounds and beliefs can coexist peacefully and

without fear of persecution. Equally crucial is the need for a just legal framework that must be enforced impartially to fully protect everyone's human rights, including those of minorities. For this to be implemented successfully, laws that call for an independent court and an impartial, corrupt-free police force must be implemented impartially.

### **Transparency**

The provision of transparency enables the public to learn about how the government makes decisions. It is one of the key components of excellent governance as well. Transparency or openness in governance is important in today's development process. Government decision-making must be entirely transparent, and laws and policies must be implemented in a way that is consistent with the principles of good governance. All information must also be simple for both the media and regular folks to obtain and understand. By doing this, it would be simple for the entire populace to monitor and comprehend the critical information being disseminated regarding the operations and true state of the government.

### **Merit-Based Systems And A Lack Of Corruption**

The most important player in successful governance is the government. Every state must have merit-based appointments for public positions to survive. Similar to this, a system of stringent accountability should be in place to check their performance to ensure that they stay on course and do not stray from their primary purpose as defined by the state constitution. Sadly, corruption is now so commonplace that it almost seems normal. Inflating contracts in exchange for kickbacks, falsifying accounting in the public sector, collecting bribes, and perverting justice and fairness at many levels are only a few examples of its aspects. Corruption makes good government extremely difficult.

### **Focused On Consensus**

There are many different stakeholders in society. In the event of a conflict of interest, mediation between these many stakeholder groups with varied interest bases is essential for successful governance. The government must make decisions that are based on consensus. Today, "governance" refers to a set of connections where mutual interaction takes place to produce decisions that are desirable for all stakeholders, as opposed to a style of relationship where a small number of people have the ultimate ability to rule others. It involves the systems, procedures, and organizations that people, businesses, organizations, groups, and societies rely on for collaborative decision-making, implementation among social actors, and conflict resolution.



### **Efficiency and Effectiveness**

When institutions and processes work well together, they yield outcomes that satisfy societal needs while maximizing the use of available resources. The efficient use of resources and environmental preservation are also included in the definition of efficiency in the context of good governance. To improve governance and assure ongoing economic and social progress, decision-makers should have a comprehensive and long-term perspective. To ensure the most effective use of resources, a process must be in place.

### **Fairness And Inclusivity**

The right of every person to opportunity to preserve or improve their well-being in an equal and inclusive manner is a requirement of good governance. The requirement that all organizational decisions be made within a framework that is outward-looking and future-oriented makes this last point the most crucial good governance premise.

### **How Important Is Good Governance?**

The decision-making and implementation procedures are what constitutes good governance. Making the optimal decision-making process is more important than making the 'right' choice. The study of good governance has grown significantly in importance in the literature of political science, administrative sciences, and development studies because of this. For several advantages, good governance is crucial. First and foremost, the effectiveness of the relevant institution must be used to evaluate the quality of governance. As a result, the institution's mission must be made clear. Then, to move in that direction, it is necessary to specify decision rights and processes as well as to set up a feedback loop to monitor and manage performance. Governance refers to the methods used to exercise authority, responsibilities, and controls inside an entity. Any institution, no matter how big or small, profitable or not, from a single family to the major international organizations that affect our daily lives, governance is important. Governance is therefore important to humanity's quality of life today and to its long-term sustainability. Everyone agrees that lasting socioeconomic progress is impossible without democracy, peace, and decent administration.

Recent years have seen a greater emphasis placed on human development in the context of developing civilizations. Development of human potential is what it refers to. Good governance is a requirement for human growth, and it would guarantee that human development is accompanied by human governance. Nowadays, it is commonly

acknowledged that economic factors alone are not the primary causes of human deprivation. Poor governance is also influenced by social and political forces. Thus, it is evident that the central emphasis of the debate on good governance is the interdependence of political and socioeconomic growth. It has been correctly noted that successful governance entails political plurality with free and fair elections, spending far less on military infrastructure and war preparation and much more on fundamental necessities like healthcare, education, and amenities. Fighting graft and nepotism is necessary. This argues that good governance should focus more on creating a political environment that is conducive to social and economic progress. Additionally, effective governance must make sure that state resources are spent on the growth of populated and productive areas rather than arid and unproductive ones.

Governance essentially revolves around performance. Therefore, the goal of governance in every community is to uphold transparency through the use of economic, political, and administrative power. In essence, it works to build strong bonds between the rulers and the ruled. To assist people in realizing their potential for enhancing the quality of their lives, governance in this context refers to the nature of reciprocal interaction between social actors as well as between social actors and public administration.

### **India's Challenges To Good Governance**

Through diverse goals like swaraj, ahimsa, and Satyagraha, our leaders sought to establish good governance in India during the time of its independence. Following independence, the preamble to India's constitution placed a strong emphasis on moral and human principles as well as the inclusion of everyone in the nation's government. The sixth and seventh schedules of the constitution additionally contained other provisions for equity and inclusivity in addition to these guiding principles of state policy. The 73rd and 74th Constitution Amendment Acts reversed the trend by giving grassroots democracy constitutional status and enacting several substantial modifications, such as the reservation of seats for women. The second Administrative Reform Commission emphasized the creation of an organization akin to an ombudsman to increase the administration's accountability to the people. The Right to Information Act, which was passed by the parliament on June 15, 2005, increased transparency and accountability in government. Additionally, Narendra Modi, the current prime minister, emphasized the need for inclusion, openness, and responsiveness in good administration. However, during the past



few decades, the process of modernization and socioeconomic development has given rise to a new set of issues about public policy and administration.

Even the best-laid plans have failed due to factors such as corrupt officials, needless delays in the administration of justice, societal attitudes, complicated administrative procedures, rigidities, and an overly centralized administrative system. A good government's "engine" is bureaucracy. The government put into effect a variety of welfare programs, including PDS, NRHM, MGNREGA, and the Prime Minister's JAN DHAN YOJANA. can have a significant impact on effective governance. However, due to the corruption that exists among our officials, our government is unable to successfully implement these programs.

### **Suggestion**

The rules should be followed when making decisions and enforcing them. In a democracy, each government shouldn't prioritize party goals over the demands of the populace. Therefore, choices made by the government should be made public.

Social media can also support the effective operation of good government.

All men and women should have a voice in decision-making, from the lowest levels to the highest, to enable participation from people from all walks of life.

The public should be involved in the budget preparation process. The finances of the various departments should be continuously monitored by the government.

Public servants should constantly strive to do better.

People can discuss a variety of governmental issues and offer solutions through open Internet forums, which will be advantageous for the gov't itself.

The government should be willing to test out new initiatives. Officials should always make an effort to learn from others' experiences.

All decision-makers should accept accountability for their actions, both individually and collectively.

Fair election procedures are crucial for effective government.

Requests and complaints should be addressed as soon as possible.

### **Conclusion**

'Good governance' is a multifaceted concept that plays a major role in the conversation about development. It is regarded as the essential component that must be included in the development strategy. However, in recent years, "good governance" has been emphasized by development experts as a requirement for progress. According to the explanation above,



good governance is the art of administration in which all public decisions and other matters are handled transparently, government officials are held accountable for their actions and recruited based on merit, and the divide between the government and the populace is closed. These elements of excellent governance all work well together. The topic of achieving effective governance has received attention from academics and professionals. A democratic government and good governance are frequently associated by scholars. When the people's permission, legitimacy, and accountability are the foundations for the government's decisions and actions, governance becomes excellent. Since the problem of corruption, excessive bureaucracy, and inefficiency has slowly seeped into the country's administrative structure, progress has stalled, and the gap between the rulers and the ruled has grown, good governance has become extremely important in every state. The inability of them to communicate effectively has always prevented the development of a system that upholds the principles of accountability, transparency, and responsiveness. According to the paper's conclusion, good governance promotes human development by ensuring social and economic equality as well as public engagement. The development of a strong civil society must be the ultimate goal of good government. The good is not a static idea, it should also be noted here. For popular aspirations to be realized, good governance must be put to use. The goals must be grounded in a feeling of dynamism and realism. Today, good governance is not only a key topic in discussions about development but is also seen as an essential component in the formation of a country.

proper application of several aspects of governance, such as responsibility, objectivity, openness, responsiveness, and the rule of law. Enhance the standard of governance. It is crucial for the government to continually evaluate its work and make improvements as needed. It is impossible to build good governance in the truest meaning of the term without the "engine of good governance," which is bureaucracy. Bureaucracy should be people-oriented and duty-bound. The concept of good governance would be meaningless without the elimination of corruption at all levels of administration, from the lowest to the highest. The government must put a priority on resolving the states' urgent concerns if it wants to overcome insurgency difficulties, which are a major roadblock to good governance.

## References

1. Govender, I. G., and P. S. Reddy. "Monitoring and evaluation in municipalities." *Administratio Publica* 22.4 (2014): 160-177.

2. Kanyamuna, Vincent, and Million Phiri. "Who said monitoring and evaluation is not rooted in firm theoretical foundations? A review of relevant literature." *International Journal of Humanities, Art and Social Studies* 1.4 (2019): 1-23.
3. Sithomola, Tshilidzi, and Christelle J. Auriacombe. "Developing a monitoring and evaluation (m&e) classification system to improve democratic good governance." *International Journal of Social Sciences and Humanity Studies* 11.2 (2019): 86-101.
4. Mackay, Keith. "Institutionalization of monitoring and evaluation systems to improve public sector management." (2006).
5. Nelson, Chrizelle. *Exploring Monitoring and Evaluation within a Good Governance perspective: A case study of Stellenbosch Municipality*. Diss. Stellenbosch: Stellenbosch University, 2016.
6. Oecd, Dac. "Glossary of key terms in evaluation and results-based management." *DAC Network on Development Evaluation, OECD, Paris* (2002).
7. Naidoo, Indrakumaran Arumugam. "The role of monitoring and evaluation in promoting good governance in South Africa: A case study of the Department of Social Development." *Johannesburg: University of Witwatersrand* (2011).
8. Ojok, James, and Benon C. Basheka. "Measuring the effective role of public sector monitoring and evaluation in promoting good governance in Uganda: Implications from the Ministry of Local Government." *Africa's Public Service Delivery & Performance Review* 4.3 (2016): 410-439.
9. Schoeberlein, Jennifer. *National strategies for advancing good governance in Africa*. Transparency International., 2020.
10. Taufiqi, Dhafin, and Kurnia Rina Ariani. "The Effect Of Good Governance, Accountability, And Transparency Of Village Funds On Public Trust." *Procedia of Social Sciences and Humanities* 3 (2022): 184-191.
11. Siddique, M. N. A. (n.d.). *Reflection of Good Governance in Sustainable Development: The Bangladesh Context*.
12. Hauge, Arild O. "The development of monitoring and evaluation capacities to improve government performance in Uganda." (2003).
13. Ile, Isioma Uregu, Chuks Eresia-Eke, and O. K. Allen-Ile. *Monitoring and evaluation of policies, programmes and projects*. Van Schaik, 2012.





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## CERTIFICATE OF AWARD FOR

The Board of International Journal of Research in Social Sciences (ISSN: 2249-2496) Is Hereby Awarding This Certificate to "Dr. Satbir Singh". In Recognition of the publication of the "An Interdisciplinary View of Governance and Good Governance in India" UGC Approved Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gate as well as in Cabell's Directories of Publishing Opportunities, U.S.A in Vol.13 Issue 1, January 2023. UGC Approved journal and UGC Approved Journal no. 48887

Editor