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## **Folkloric Narrative: A New Historic Reading of Sara Joseph's *Gift in Green*.**

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### **ABSTRACT**

The paper is an attempt to explore the potential of folkloric legends and stories to capture the attention of the modern world to an issue of current relevance. Folk behaviour and folk communal structures among the first settlers in the fiction is read from a new historic theoretical stand point which further analyses the deepest layers of stories embedded in any folk community. The impact of modernism on nature and modern man's alienation from it is kept in contrast with the folk community's extreme sense of interconnectedness towards nature.

**Key words:** Folklore, new historicism, nature and modernism.

Cheryll Goltfelty, in her introduction to *The Ecocriticism Reader* insists that "all ecological criticism share the fundamental premise that human culture is connected to the physical world, affecting it and affected by it. Ecocriticism takes as its subject the interconnectedness between nature and culture, specifically the cultural artefacts of language and literature" (xix). This paper explores Sara Joseph's novel *Gift in Green* and discusses the interconnectedness that the writer successfully established between the reader and the people of Aathi, the first settlers of the island. The writer attains this through the profuse employment of folklore in the narrative. Filled with mystical and mythical stories, the novel explores the potential of folklore to connect the past with the present. The land of Aathi and the people in it acquire larger than

life proportions when the folkloric background is fore-grounded. Threats to such pristine relationship intimidate the modern readers who blissfully enjoy the fruits of modernization and urbanization. The novel challenges the predominant beliefs, values and cultural assumptions of the anthropocentric world view. The primeval purity of Aathi and the struggle of the settlers are rendered easefully through the folkloric narrative and we are thus sensitized to the pains of nature which we suffocate. The provocative narrative structure of the novel offers sustained scope for the delight of discovery to a discerning reader. The constant interrogation and informing of the present and the past in the novel can fruitfully be established through a new historic reading. This paper is an attempt to delve deep into that layers of stories embedded in the narrative structure of the novel.

*Aathi* is a passionate utterance on the value of environment. The work foresees a time when the last pristine landscape disappear from the face of the earth due to our materialistic attitudes and modernisation. This indiscriminate advancement of the modern world is swallowing every bit of land and water, destroying its purity and serenity. The writer in the 'Introduction' to her novel describes Aathi as the pure 'fountain spring of life' (The Making of *Aathi*) which will protect her from the lethal radiation produced by the modern world. (*Aathi*,V) The ecocentric life of the settlers in Aathi is threatened when Kumaran lured the youngsters of Aathi to a colourful external world. Manifesting the interconnectedness of natural and human world the anthropocentric world views are questioned in Aathi.

The novel progresses through the stories of the seven story tellers who visit Aathi. The interrelatedness of the stories and life in Aathi is established in the first story. The biblical character Hagar is presented as being abandoned by her master and the father of her only child Ishmael. Sara Joseph improvises the story and makes Hagar the owner and protector of water. She thus becomes the mother of the civilization that grew around it. She who was once cast away in the

desert has now been transformed into a queen for her realisation of the value of water. The first drop of water is equal to her son's life. (*Aathi*, 20) Sara Joseph relies on the folk narrative pattern to construct her story and thereby the lives of people in Aathi. Expansions and alterations of this type can be seen in any folk story. Variations of the same story will be available in each folk group. According to the customs and practices of the narrating folk group the story will be altered without destroying the real spirit of it. Biblical Hagar returned to her master Abraham's house as instructed by the angel. She who was promised of countless descendants remained the same in Noor Muhammed's story. (Genesis 16:10). The story and the story teller's question connected the people of Aathi with the present. The improvisations done are a method of identity –making which assures the ultimate success of the people of Aathi. While discussing the purpose of folklore Dr. Raghavan Payyanad quotes William. R. Bascom. "Mirroring and providing a creative outlet to the suppressed desires and feelings of a community is the primary function of Folklore." (*Folklore*, 18) Folklore is considered as the medium for instructing the new generation of the older set of values and practices in an illiterate community. It creates an awareness of the collective past to the younger generations.

*Illustrated Oxford Dictionary* defines folklore as "the traditional beliefs and stories of a people; the study of these."(312) The bondage between the members of the community who share the same beliefs and terrain is crucial to the development of a folk culture. Revisiting the people of Aathi, the only description that completely contains their life is the term folk. They are the first settlers of the lagoon. Escaping from the torture in a caste ridden society they ended up in an island, not knowing how to make a living in a watery land. They learned fishing and learned even to cultivate in the salt waters. Like any folk community the natural world and the human world remain in complete harmony in Aathi. This extreme state of bliss is celebrated in the stories of the seven story

tellers. Though the lagoon creates an impression of a never- ever land the author reiterates the fact that 'it is neither a Utopia nor an escapist world of make-belief'. ('The Making of *Aathi*') The writer highlights along with the ecologists the importance of these 'lagoon of primeval, inviolate purity' ('The Making of *Aathi*')

Gregory Bateson, a U. S anthropologist, whose primary aim was to discover the principles of organization in all phenomena, states that relationship should be the basis of all definitions. He believed that stories provided a language of relationships and sought to develop a web of formal relations by means of a collection of stories. Folk communities are identified for its bond between people of its clan and to their homeland. If to destroy them it is this that is to be destroyed first. One cannot overlook Kumaran's attempt to destroy this. Different means are adopted by Kumaran for this. Injecting the dream of a luxurious future he confused the young minds in Aathi and the second step is to take away their deity from them. As the final step the lagoon is filled with the waste from the modern world. People are divided as they had difference of opinion when Kumaran promised a better life outside of Aathi.

It is the twin identity of Kumaran that traps the settlers. Their extreme sense of togetherness betrays them in identifying the uncanny desires which have brought back Kumaran to them. But the coming of the storytellers brought them back the true understanding of the character Kumaran. From the depth of this understanding Ponmani discerns that the story of Mukhtar is the story of the present times. The deities of a folk community have evolved from the interconnected web of their geographical and productive behaviour. (" Va Mozhi Vazakkatile Kolathunadu") Aathi's deity and the related celebrations are a leading force in their life. Thus when Kumaran offered to renovate the temple they failed to deny it. The temple is renovated and even the deity is replaced destroying the strong holds that the people of Aathi once had. Successfully

undoing the close-knit bondage of the community with their deity and fellow beings Kumaran turns to the land which is his target. He is aware of the strong association of people of Aathi with their water source and he attempts to destroy its purity. Aathi is converted into a barren land. Godforsaken, the settlers lost their direction for the time being. It is this chaos that Kumaran has desired.

But before Kumaran could enjoy the fruit of his labour Kunjimathu, his old beloved turns the course of events. Her resistance to Kumaran's motives has started in an earlier past when she decided to buy back the field sold by Kumaran. His parents considered her as a saviour. Further analysis of Kunjimatu's life reveals a purity equalling the heroines of Vadakkan Pattu. Aarcha's bravery and Iruvanattu Pattiyamma's constancy is woven into her characterisation. ('Va Mozhi Vazhakkathile Sthree.') The women of Aathi began to see a parallel between the devaluation of women and devaluation of land. This knowledge is the strong unifying force that prepares them for the final act of healing the land. When men head to the reconstructed temple of Aathi for the sacrifice, women join hands to begin cultivation in the last piece of uninfected field. (*Aathi*, 289). This final move by the women of Aathi to protect the land and water of Aathi is an eye opener to the modern reader. Nature signals a new beginning and birds arrive.

Final sign of the ultimate victory of the people of Aathi is reinforced by the heavy down pour. Washing away all the dirt dumped by the cruel modern world it reclaimed once again its territories and Aathi got its water back. All that has been destroyed takes a rebirth and Aathi got its 'Thampuran' back when Dinakaran's corpse is washed ashore. He is the saviour and protector, the archetypal hero. The sacrifice has taken place and it is the indicator of a new beginning.

Sara Joseph's novel is sensitive to nature. It is a canvas in which the life and struggles of the first settlers are painted in bright colours. The author criss-

crosses time zones to create a sense of the consequences of man's cruelty to nature. Challenging the reader, folklore is used with mastery to reinstate man's relationship with nature. New historicism implicates the textuality of history. The equipment of the folk stories, characterisation and narrative techniques enables the text to be read under the light of new historicism. The cruel character in the story of Kaliyappooppan is presented with the typical behaviour of any oppressor. A modern version of this character is Kumaran. But he is more tactful. He permits the people of Aathi to resist the advancement of his team. This absence of resistance is the modus operandi of any dominant group, protecting their corrupt motives. ('New Historicism and Cultural Materialism'). But the reader is guaranteed of the ultimate victory of the people of Aathi through the sequential folk stories that the writer inserts in the novel. This re-presentation of a folk behaviour is done to retain the scope of discovery of the interconnectedness of the natural world and the human world. Inspiring the reader Aathi is regenerated like a phoenix bird. The reader discerns the underlying patterns of meaning of every activity through the stories. The artistic and mythical expressions collectively lead the reader to a transformation which is in favour of nature. Thus it apt to conclude with the opening lines of the novel.

Darkness sat brooding over the abyss.

The earth was formless and void,

Not a soul or fowl was upon it.

The dark and selfish inner space in every mind is enlightened with the reading of this novel. Enriching our affection for nature and renewing our awareness of the inviolability of creation the novel deserves a place in the canon of environmental studies. ('Translating Aathi').

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## Self-actualising Womanhood: Transgressing Patriarchal Normality in Jaishree Misra's *Ancient Promises*

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### ABSTRACT

*India's burgeoning post-independence progress permeating in multiple domains however raises sincere concern over the socio-cultural sphere which remains gripped in the circumscribing patriarchal norms. This paper essentially attempts to unpack how the novel succinctly explores the predicament of a woman caught between the worlds of tradition and modernity, her endeavours to thwart male-centred bounds, the legitimisation of paternal/patriarchal authority and the issues pertaining to conflicting sexual identities and subjectivities. Janaki, the protagonist of the bildungsroman *Ancient Promises*, presents her life in two halves: first as an obedient daughter and a subordinate wife; thereafter a transformed assertive woman avowed to challenge socially constructed norms. In short, the novel attempts to contextualise the rampant changes manifested in the socio-cultural psyche in ushering the 'New Indian Woman'.*

Indo-English Literature since 1980s emerged pre-eminent owing to multiple variables among which the profusion of literary output and the abundance of women novelists remain far-reaching. These factors conjointly led to the substantial growth of Indian novel. Varying in theme, style and form, women novelists rendered an inimitable canvas of literary explorations infusing overarching interest and offering renewed impetus for critical enquiry. Devising realism in accentuating issues of femininity in general, they visibilised the lived experiences of Indian women by articulating vivid characters enduring patriarchal predominance, gender essentialism, isolation, alienation, celebration of body, rebellion against patriarchy and the quest for identity.

Falling on a similar vein, Jaishree Misra in *Ancient Promises* forcefully draws a strong willed woman who impudently defied the patriarchally legitimised patterns that oppressed and even threatened her life. Misra through a confessional, one-dimensional narrative with an emotional fervency, also attempts to explore how the asymmetrical male dominance is interpellated through the institutions of family and marriage. In brief, the novel centres the transformation of an adolescent girl of sixteen Janaki (Janu) who helplessly succumbs to her family's marriage proposal to an un-

protective, non possessive husband Suresh Maraar, to a resilient woman determined to challenge the patriarchally structured norms.

The novel opens up by highlighting opposing anxieties, co created by the relentless cloudburst. The three females captured in a single frame are on their way back home from the small court room securing a marriage divorce. While sadness preoccupies the face of the mother, her daughter Janu conspicuously demonstrates much cosiness. She gestures comfort having relieved from the traumatic marital life earning the passport for owning her much loved child Riya and a prospective second marriage with her ex-lover Arjun. The third member Riya, Janu's daughter who is least aware of the emotional doldrums in her mother and her grandmother slips into repose.

Aligning literally with Janu's words "endings were really only beginnings" (3) the novel unwinds itself nine years backwards. Interestingly, subverting the ritualistic linear narrative, the novel initially paces forward and backward, but then to proceed further. There are five major decisive incidents in the life of Janu that rope in the story into a unitary whole. They include; the vibrant early adolescent school life of a Delhi bred girl Janaki; the entry of a boy Arjun into her life, first as a casual friend but soon a lover; her unhappy marital life emanating from the compelling marriage with Suresh Maraar and; the unexpected reunion of two lovers and finally the much awaited divorce from her husband.

As the plot unveils, Janaki born and brought up as the daughter of Delhi and having been sent to an Irish convent school with a prioritised intention of learning English and sophisticated manners enters the story with Leena as her close friend and classmate. It was through Leena and her boyfriend Jai that Janu and Arjun became familiar. Janu remembers; "And in that careless, unthinking way, and in the space of a few weeks, Arjun and I became friends" (22). These casual every day meetings and awkward "See you tomorrows" (23) gradually progressed into an affair: "I'm not sure exactly when I began to fall in love" (23) confesses Janu regarding her closeness with Arjun and then a few lines down she says "He occupied a great deal of my thoughts and his was the company I desired more than anyone else's." (23)

Within a close bond of family ties, the patriarchal powers of the father for the first time surface when Janu places a request to her mother whether she could invite her friends (girls) along with Arjun (an exception) to her home for having *dosas*. Instantly the mother replies, "I'll ask your father, no promises. Certainly no *dosas*." (25) Arguably, this immediate perhaps naturally accustomed reply raises an array of doubts about the mother's space in the family. If the mother disapproves her daughter's proposal, why can't she forthrightly assert it? Why should she recline the power of decision making to her husband saying "I'll ask your father"? Doesn't she possess the agency to make decision in her own home? In that case what identity is she endowed with being a mother in an urban family, geographically positioned in the capital city?

In another instance, while Janu's marriage was duly fixed with Suresh Maraar, notwithstanding her disapproval, but decided according to her father's wishes, it explicitly demonstrates the grasp of patriarchal predominance in her family. Janu's father, Unni by such decision making establishes himself as the unopposed master of the house. Vitaly, one of the major issues that surfaces here is the installation of the culturally conditioned family as a patriarchal institution that legitimises, the power which establishes his decision. His paternal authority (undeniably embalmed with love and care) was falling in lines with the society's normative conception that arranged marriages decided by the family are the best alliances girls can ever have. And the supporting rationalisation that is attached therewith runs; as the brides are young, they will easily adapt with the strange new environment and relations.

Patriarchally conditioned temperament of the family is further demonstrated when the marriage was fixed after the meeting of the boy and the girl and their families. Janu recounts; despite her weak disapproval and the already disclosed affair with Arjun, "No one bothered me in the car. The talk was still predominantly about how nice the Maraars seemed and how lucky we were" (61). The members of her family were conferring on how lucky they were to have such an alliance, for; firstly, the Maraars were wealthy business people who ran motel business in Kerala from Kovalam to Calicut; secondly, the advantageous social leverage occupied by the Maraars and finally their mildness towards dowry.

Gerda Lerner writes, Patriarchy in its wider definition entails, "the manifestation and institutionalisation of male dominance over women and children in the family and the extension of male dominance over women in society in general" (239). Here the agency of the father to take decision is legitimised and manifested through the institution of family and the abiding attitude of the mother who says; "I'll ask your father". This is further illustrated when Janu thanks Ma for preparing delicious dosas better than Indian Coffee House ones, she instantly replies "Okay, okay, enough said! Only I know how long it took to persuade your father . . . But never again, okay?" (26). Such articulated patriarchal powers of the father is institutionalised through the mother figure and the social institution called family. In the case of Janu's marriage proposal too, though it was primarily initiated by her grandmother, it is the father's strong decision not to think of Arjun but to decide things in consultation with the family that stood unaltered. Notably, on the other side, it was Mr. Maraar and his son Suresh Maraar who against Mrs. Maraar's wishes finally decides on Janu's proposal. Plausibly, such male dominance is undeniably co-opted by female participation in the family that fosters the furthering of patriarchy in the society in general.

Prior to the auspicious wedding day and the wedding ceremony, Janu's complaint about her blouse that "its tight and uncomfortable" prophesied the impending incompactability of her marital life. In contrast to the customary pleasant experience of the first night, she felt the early moments of

her marital life intensely frightening. She recounts how painful and traumatising was her first night experience. She confides:

*My back was getting stiff as I tried to keep from rolling on to the man next to me who wasn't giving me my rightful share of sheet. The injustice of it was making my eyes smart. Tears that I'd managed to stave off all day, in some desperate bid to seem in control were now rolling down the sides of my face, making the insides of my ears go squishy wet. I desperately needed to see my parents and tell them their dream wasn't panning out too well for me. To ask them to get me out, to take me back." (16-17)*

Not only her new strange husband but even the new residence at Valapadu with the equally strange in-laws was presumably a place of neglect and insult for Janaki. Kerala in fact was never strange to Janu. From her childhood she was mystified by the enchanting backwaters and the boat journey to Alleppey and the sandalwood smelt body of her grandfather which invariably transpired every summer vacation. "It's true, I was enthralled and converted in one magical instant into a gurgling blissful baby" (11) recounts Janu about her first journey to Alleppey as a relentless screaming baby. But Valapadu opened up a new world of strangeness. She was deprived of her rightful happiness and protection due from her husband. Her sociability in the family was marred partly by her Amma (Mother-in-law) who possessed a sharp tongue and Sathi, her elder sister-in-law who hurled offending remarks about her father and grandparents. Markedly different from others, Gouri her younger sister-in-law remained innocently indifferent. Suresh Maraar's priority disappointingly rested on his business and distant business tours unaccompanied by his wife that afforded him a source of escape from the dominating father and complaining wife. These circumstances undoubtedly alienated herself from the Maraars.

She was rootless and singled out in her new house. The realm of family business remained the sole domain of the male members. Her husband neither shared the business affairs with Janu nor informed about its well being despite she being a rightful business partner. Not only Janu but even Amma was hardly entertained in the business meetings. Janu points ". . . post lunch verandah sessions were all-male affairs . . . while the women cleaned away the plates and dishes indoors. (164). Despite the regular pre-breakfast and occasional post-lunch business discussions, the realm of business remained solely within the bounds of Mr. Maraar. Janu being invisible in the world of Suresh, was concurrently unwelcomed in the Kitchen either by Amma who reigned supreme there with her servants.

This paper also attempts to argue that patriarchal dominance endures primarily because women fosters their own oppression and unconsciously or unwittingly complicit the process. In general, women hardly claim to participate or cooperate with men in the 'important' domains of the family, instead they customarily confine themselves in their mundane sphere of domesticity. They compartmentalise their world of activities "home making" that is in short institutionalised over

centuries through socialisation and perpetrated to the posterity. Why shouldn't a woman embrace a participatory role in the family, sharing the business issues with men, and why shouldn't she urge men to participate in their household affairs? Conversely, women co-opt in the constructed knowledge structures, and in turn self-effaces themselves in the process and transform themselves as perpetrators of oppression because "the patriarchal socialisation of women has conditioned them to think, act, behave and react as second-class members" (O'Connor and Drury 6).

Needless to say, such avoidance and studied indifference on the side of Maraars finally bundled up Janaki with homesickness and loneliness. She compares her reception at Valapadu, the home of Maraars vis-à-vis her aunt Vijimami, how she was welcomed in her family. While Vijimami "soon became a valued member of my family" and became "an ever-present and welcome appendage to Ramama, Ammumma's faithful lieutenant, and Appuppa's favourite person" (39) Janu in the house of Maraars felt least attached to anyone even to her own husband. Finally she regrets: "I needed to put down roots and attempt to survive, whatever it took. But I hadn't bargained for the fact that the soil I had been replanted in would be so hard and unyielding. (95)

Marrying girls at an early age under the pretext that it helps them to adjust with the new environment easily is a clear instance of patriarchally constituted socialisation process. Socialisation is a discursive process through which boys and girls appropriate gendered behavioural patterns desired by the society. "Masculinity entails assertiveness, being active, lively, and quick to take the initiative. Femininity entails cooperativeness, passivity, gentleness and emotionality" (Walby 91). Such ordering of gender attributes is a discursively structured process that psychologically conditions girls how to adjust with new environments and circumscribe their world to domesticity without making much fuss but accepting everything in passivity.

This invisibility and marginality Janu had to succumb failed to cultivate a healthy marital life between the couple. Instead it reduced itself into a kind of 'Companionship'. Janu discloses that "Companionship' was probably the last word either of us would have chosen to describe our relationship." (114). Her subordinate and relatively invisible position in family conclusively objectified Janu as an unwanted appendage, marginalised and neglected in the house of Maraars forcing her to believe:

*Home, for virtually all my life, had been Delhi. Big, busy, bustling New Delhi. Two thousand miles away from Kerala . . . This, I suppose, had always been the chief paradox in my life.(18)*

Situating the predicament of Janu's fluidity of existence in the family, belonging neither to her husband nor to her in-laws, yet virtually visible in the house subtly points to a different face of patriarchy. By declining a space for Janu in the business or private spheres of Suresh Maraar, she is

neither dominated nor physically oppressed, but deprived of her visibility in the family. She is set aside dependent and hence relegated to a state of “mental unworthiness”. (O’Connor and Drury 7).

Janu having failed to generate more closeness between the husband and wife, eventually conceived the idea of parenthood. She removed the Copper-T that had been fixed on the advice of Amma for priorities unknown that so long blocked her potential motherhood. However, instead of a proud boy child, she gave birth to a baby girl, Riya. Riya was expected to be a “transformer of Bad Things to Good” (116), perhaps her potential best friend. But, to take matters from bad to worse, the initial doubts raised by Amma turned right when the famous paediatrician Dr. Vijaya declared “This child is *deffinitely* mentally handicapped” (127).

This conversely kept Suresh more aloof and detached. Not only Suresh, rest of the family members ignored the presence of the new entrant who indeed claimed more care and concern. A complaining wife and a disabled baby kept Suresh escaping from Janaki by finding recluse in long business tours and bottles of whisky. Janu narrates: “. . . Suresh was very practised at the art of escape. There would never be any unseemingly rows, or loud arguments. Just escape in different forms. Work, business tours, company guests . . . there would be no dearth either of plausible excuses (98). Failing to converse openly with Suresh and debilitating her talk as mere prattling, forced Janu to stop talking to her husband “. . . for the rest of our life together. Unless it was to ask for money to pay for Riya’s clothes or to say that dinner was served.” (163)

Suresh apparently could least be equated with a conventionally, generalised oppressor. He had never been rude, but his modality of domination is illustrated differently. His disregard for the genuine complaints of Janu as unworthy, his unwillingness to accommodate or cooperate her in his sphere of activities, his unarguable yet diverse modes of escapism such as deserting the room amidst a conversation or engaging in long business trips implicitly demonstrate his unyielding power relationships that tacitly unveils his essentialities of male domination.

The capacity to oppress writes O’Connor and Drury is not a male characteristic. Rather it is a power characteristic (28). The tide of inadvertent indifferences and neglect transposed Janu from a traditional Indian woman conditioned as a submissive silent victim and an upholder of traditional values of society and family into a New Woman who resolutely and boldly transgressed patriarchal thresholds. She confesses, “My stubbornness to disprove them had been turned quite easily into a kind of heroism . . . (147)

Janu finally realised the best way to escape from Valapadu is through education. She successfully completed her Masters in English literature and mean while continued relentless correspondence with British Council and USIS in Delhi seeking information on Universities offering courses on Special Education along with foreign scholarships.

Finally the much awaited letter arrived and Janu had to attend an interview in Delhi for her scholarship. In Delhi she met Leena her old friend and as intensely dreamt her ex-lover Arjun with whom she reunited and made love. Winning the scholarship, Janu accepted Arjun's wish to join him in England for studies though she got admission at the University of Arizona, United States. Thus her first effort to escape from the Maraars materialised through the scholarship and short course in England.

Securing divorce from Suresh, as a permeant ticket to England and from the Maraars was her next major attempt. Brushing aside the "fear, confusion, anger, disbelief" (213) that arose from the quarters of her mother and grandmother on breaking this news, she remained self-reliant in her decision. Certainly, there was uncertainty about the future. But the idea of divorce was intensely born out of neglect, and alienation which she and her daughter underwent at Valapadu. Nonetheless, Janu at last let the cat out; "Suresh I want a divorce" (217) and then, at a convenient space she disclosed about Arjun. He was shocked, a gamut of emotions "hurt, horror and sorrow" marched across his face and pleadingly asks "Janu, you can't mean it . . . Why, why?"(217).

Janu knew that "No one in the family had ever been divorced before. It just didn't happen in decent families like ours, which was why poor Suma chechi put up with her beatings about twice a month, turning up at family functions looking tired and defeated, but married" (238). In order to save the inflated family honour, women had been socialised to undergo every torment without voiced complaints. Conversely, through such forbearing ordeals, women are legitimising the construct of patriarchally defined institution called family.

Heedless of Suresh's persuasion, a combined effort of the Maraars contrived a scheme to taint Janu mentally ill. As part of the conspiracy they confiscated all correspondence related to her scholarship which were kept in her drawer and finally admitted her in Trivandrum Medical College. In fact it was not a Maraar conspiracy rather Suresh sold the idea at the pretext "that family honour would be better served by a daughter-in-law who went mad than one who had run away with another man" (229).

Suresh Maraar's plans to stigmatise her as mad and keep her in persistent state of mental illness failed as she recuperated soon after discontinuing the drugs at her home. Suresh thenceforth attempted another bid to save their marriage, that was through persuasion and forgiveness, first by himself and then with his parents several times. Persuasion eventually changed to coercion and finally to threatening. Riya was forcefully taken from Janu. But Janu's temerity in holding her decisions, to withstand hindrances from various quarters earned her the most needed divorce from the unfulfilled marriage and her child back that made her life conspicuously full. Undoubtedly it was the passport for her to give Riya the best possible education and a re-marriage with Arjun.



Janu's courage to subvert discursively constructed patriarchal essentialities, and discard the culturally gendered roles consequently earned her an identity and a life that is independent and visible. Janu emerges as a New Woman cross-cutting two patriarchally structured practices such as divorcing the arranged marriage forced upon her and choosing a re-marriage with an ex-lover which the social norms desist to accept.

Her power got issued from one source-Education. Despite being the daughter of an Indian Airforce Commodore, she hardly inherited any wealth. Hadn't she secured a good education and the resulting scholarship, and an admission at England, her identity would have remained marginalised, devalued and invisible. But the circumscribing bounds of socially legitimised patriarchy were forcefully challenged by the empowering education she gained that in short drew a link between self-actualisation and modernity that conclusively set in motion for Janu a bright vista of opportunities.

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## Mythopoesis in Girish Karnad's *Nagamandala*

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### ABSTRACT

*The aim of the researcher is to identify the mythical patterns in theme and treatment of Girish Karnad's dramaturgy Nagamandala: Play with a Cobra. The thematic portrayal contributes the mythopoetic reality and loyalty in self-sufficient character analysis through the treatment of mythopoesis. The concept of Kannada Yakshagana tradition and Folkloric convention are blended with Indian Classical Drama, and represented with a pinch of modern contemporary narrative and Alienation-effect. Nagamandala ensures an exposure towards different realms of Hindu mythology and a penetrative study of snake worship with magical symbolic approach.*

**Key words:** Nagamandala, Myth, Mythopoesis, Folklore

Girish Raghunath Karnad, the bilingual Indian playwright, operates within a complex framework of myth and legend, eastern and western dramaturgy, classical and folk convention, archetypal and real pattern, mystery and fable, and traditional and contemporary voice. He synthesizes two kinds of

drama - the *Company Natak Plays* and the *Yakshagana* performances. He exposes humanistic expression through compulsive re-interpretation of mythical past and oral tradition, and determined demystification of dominant beliefs and practices. He employs Indian narratives and performances in modern urban theatre, and unravels through Indian folklore. He develops credible style of social realism, magical realism, and surrealism. Karnad observes:

*The energy of folk theatre comes from the fact that although it seems to uphold traditional values, it also has the means of questioning these values, of making them literally stand on their head. The various conventions - the chorus, the masks, and the seemingly unrelated comic episodes, the mixing of human and non-human worlds - permit the simultaneous presentation of alternative points of view, of alternative attitudes to the central problem. They allow for, borrowing a phrase from Bertolt Brecht, 'complex seeing.'*

Karnad's *Nagamandala* weaves two Kannada folktales together. The first tale, about the lamp flames that gather in a village temple to exchange gossip about the households they inhabit, is part of the play. It gives an imaginative expression to the idea of community life. The second tale, about Rani, who has visited by a King Cobra in the form of her husband, is personified in the play as a beautiful woman in a sari, serves as an inner play for the audience. It is an amalgamation of the human, the abstract, and the magical elements with perfect synthesis and synchronization. The first tale comments on the paradoxical nature of oral tales with self-existence, uniqueness, and identity. Rani's story is embedded within another story. Her predicament poignantly reflects the human need to live by fictions and half-truths.

*Nagamandala* returns to the rich traditions of folk theatre and exploits the device of the frame-story in the *Arabian Nights*, the works of Boccaccio and Chaucer, and the ancient Sanskrit *Vetalpanchavimsati*. The form retains the oral

tradition from which the theme has derived, two Kannada oral folktales by Professor A.K. Ramanujan. Karnad explores various conventions like the chorus, the song, and the dance. M. Sharat Babu says:

*The playwright has modified the traditional Yakshagana to suit his purpose. The play is cast in the Brechtian mould and uses non-naturalistic techniques to distance the spectator from the world of emotions and traditional values. He does not want to enforce an ending to the play as he wishes. Therefore, he provides multiple endings to the play. Nagamandala makes a penetrative study of the woman's feelings and expectations in contrast with the reality of her situation. It offers a solid dose of realism. Karnad stresses the living texture of myth, history and legend in contemporary culture that constitutes a healthy bond between the author and the audience, and his objective as a playwright is to share his own interest and excitement in these narratives with the audience at large. He uses an amalgam of the Kannada Yakshagana and Indian Classical Drama in his plays. Nagamandala contains a modified and simplified form of art but never retains the folk atmosphere with songs and dances, colour and spectacle.*

Folk Theatre strategies are accommodated in the scenario for multiple purposes. Primarily, it helps to build a drama which is Indian in story, character conception, and form. Secondly, it enables a simultaneous presentation of divergent points of view, and a fact that stimulates the intellect of the audience along with their emotions. The folk form exploited by Karnad is the Yakshagana Bayalatha of Karnataka since he blends classical tradition with folklore, which remains the most viable in all folk forms with innovations and adaptations of the elite classical art. He incorporates traditional features like the Prologue and the Play-within-a-Play, but he has derived more from the Western Theatre than the Indian model. He adapts the classical mode of stylization, and accommodates songs of a symbolic nature with ornamented equivocations and allusions. He uses

the Alienation-effect unobtrusively with folk design, and transplants audience from the world of illusion to the practical world of reality.

Karnad's dramaturgy appears to be mixed with multiple ingredients drawn from varied sources and traditions. His theatrical achievement lies in the new channels of untried permutations and combinations which inspire as models to aspiring dramatists. Makarand Paranjape says:

*Girish Karnad makes this folk tale (Naga-Mandala) stand on its head, letting it unfold dramatically...This is a fine play, powerful, gripping, and exciting...It uses tradition creatively and sensitively...It is fast-paced, well-plotted, coherent, and controlled. The central conflict is sharply defined and brilliantly executed.*

Mythopoesis has originated from the Greek 'poiein,' meaning 'to make' or 'to create.' It recreates ancient stories and transposes them to symbolic meanings. It arises in periods of crisis, of cultural transition, waning faith with original structure. In the mythopoetic work *Nagamandala*, myths have seized the imagination of Karnad by transforming various mythological accounts into a single, unified work of art. A writer is an artist who redeems the values of past and present in symbolic form, and transposes its historicity or transitoriness into permanent promises.

The modern revival of myth begins in the nineteenth century when technology has threatened to wipe out ancient folkways. It penetrates the cultural areas from anthropology, philosophy, and religion to criticism and psychology. The revival of myth is an attempt to satisfy human need of relatedness to fellow-travelers in common journey. The myth addresses the problem of identity, asking "Who am I?" And it proceeds to examine three questions that are organically related: "Where do I come from?" "Where am I found?" and "What must I do

now to get there?" In mythical language, the problems deal with Creation, Destiny and Quest.

*Coleridge used myths in a sense which has become common: a particular imaginative construction (plot in the most extending sense)...But several new intellectual approaches were now defined. Myths were related to a 'disease of language' (Max Muller) in which a confusion of names led to personifications; to an animistic stage of human culture (Lang); and to specific rituals, which the myths gave access to (Frazer, Harrison; the popular association of 'myth and ritual')...With the development of anthropology, both this last sense, of account of rituals, and a different sense, in which myth, as an account of origins, was an active form of social organization, were strongly developed.*

Mythology draws in oldest memories, and it has always fascinated the common man and artist, writer and thinker; in the form of a picture, story, song, or destiny. It touches man's basic relation to his world and fellow men, with his original roots and future possibilities. It supplies

*a symbolic memory and a symbolic hope, and an allegorized account of the perils of the way. It unfolds the living chain which connects the recurrent recognition scenes of the human drama. It organizes the values of its epoch. The literary form of the myth preserves its symbolic values which transcend the drossy historical surface. The old myths are the almost forgotten myths of antiquity were stories we can no longer believe, as stories, but we may still discover in these ancient intuitions the thread of an undying vision...in these days of crumbling institutional forms and beliefs, and in the agony of a desperation which finds no peace or promise of peace in the world we know, we may begin to hear our own voices as almost the cry of disembodied intelligence, demanding its spiritual rights. And then, perhaps, we shall begin to make a new sort of alliance*

*with the world, on terms which acknowledge and declare, first of all, the humanity of the human race. Freud regarded the mythological view of the world as 'nothing other than psychological processes projected into the other world.'*

Myth has been held to be a truer (deeper) version of reality than (secular) history, realistic description, or scientific explanation. This view ranges from simple irrationalism and supernaturalism to more sophisticated accounts, in which myths are held to be fundamental expressions of certain properties of the human mind, and of even basic mental or psychological human organization. These expressions are 'timeless' (permanent) or fundamental to particular periods as cultures. The resulting internal or external controversies are exceptionally intricate, and myth is both a very significant and difficult word.

George Santayana, in *Life of Reason*, makes the pithy observation that those who "cannot remember the past are condemned to repeat it." The living myth would not restore the dead past, but would redeem its living heritage. The myth contains the tradition of recreation. The culture hero in mythopoesis chooses his tradition, rejects the stultified in favour of creative roots in the past. His choice of tradition is a recollection of man's native genius. By past, man gains the dignity of belonging without becoming depersonalized. The myth offers basic motif for the artist to return his world-wide audience. Mythic symbols can represent an ideal or an ideology. The fateful import of the myth for our day stems for the fact that it is pivotal to the idea of One World. It can determine whether this world is to be one of unity and totality, or one of uniformity and totalitarianism, whether the powers of man are to be freed or shackled. The living, humanized myth is not given, but must be won: "What from your father's heritage is lent? Earn it a new, to really possess it" (Goethe, *Faust I*).

This depends partly on historic pressures which can question or drain a myth, and on the vision and the will to realize it. At this moment, we seem to be

rushing towards an abyss. Yet, we can draw comfort from the story of mythopoesis, from its long range perspective which enable us to see beneath and beyond the dust of the hour.

'*Nagamandala*' is a very elaborate and spectacular variety of serpent worship practised in the Northern part of Tulunadu. It is called 'hudiseve,' 'mandalabhooga,' or 'mandlaseve' by the Vaidyas. 'Naga' means the serpent and 'Mandala' implies the decorative pictorial drawings on the floor. Naga or the Cobra is a symbol of *Kundalini* power, cosmic energy coiled, and slumbering within man. It inspires seekers to overcome misdeeds and suffering by lifting the serpent power up the spine into God – realization. Nagamandala depicts the divine union of male and female snakes. It is performed by two priests: the first priest 'patri' inhales the areca flower and becomes the male snake, and the second priest '*Naga-kannika*' dances and sings around an elaborate serpent design drawn with natural colours on the sacred ground.

Nagamandala is performed in three forms: the Quarter Nagamandala, the Half Nagamandala and the Full Nagamandala. In the Quarter Nagamandala, the drawing contains four *pavitragranthis* with figures of five hoods in quadrangle shape. In the Half Nagamandala, there are eight *pavitragranthis* with figures of seven hoods in octagonal shape. The Full Nagamandala contains sixteen hexagonal shapes, and the gaps between the lines are filled with *panchavarnas* with coloured powders: Red, Yellow, White, Black and Green. The outer line is primary and very important. It is filled with yellow colour to represent the golden lustre of the serpent, the eye of the serpent figure is filled with red colour. On the yellow colour, white dots are put so that it gets the appearance of the body of the serpent. Similarly, other colours are used to fill proper spaces on the pictorial drawing. For the main hood of the serpent figure, all the five colours are used



appropriately. Tender coconuts, areca flowers, areca nuts, betel leaves, flowers, sixteen oil lamps etc. are placed around the drawing at different places.

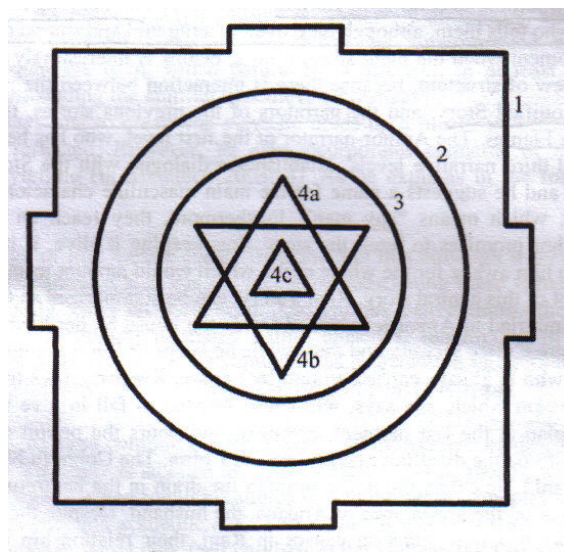
The impersonator is a Brahmin who dances according to the tune and steps of the person belonging to Vaidya community. The Naga impersonator wears a red silk dhoti, with dis-heveled hair and granules of areca flowers sticking all over the face as he rubs stands of areca flowers on his face in the process of getting into the trance, and frequently hissing like a cobra. He produces the veritable impression of a Serpent God, and takes a ritual bath with the concerned participants, and does the nearby *nagabana* where he initially gets possessed by the naga deity. Then they proceed to the decorated arena or altar where the ritual of nagamandala performance takes place. In the performing place, the Vaidya and the accompanying singers sing different songs in Sanskrit or Kannada beating drums called *Dakke* and cymbals. The songs are in praise of the Serpent God.

The *Ardhanari* performer puts different rhythmic steps while beating his bronze drum in front of the Naga impersonator to provoke him through words and actions. While dancing, he moves around the drawing either clockwise or anti-clockwise. His dancing or the method of putting steps is in the form of entwining initially and finally untwisting. Simultaneously, he expresses different feelings of quarrel, friendship, humbleness, fury etc. In this way, the total performance lasts for about six or seven hours in the night up to the dawn. Finally, Naga impersonator blesses the devotees with the *prasaadam*. *Annadaana* is a very important part of nagamandala. The ultimate results of 'Nagamandala' is *Naada Mandala*, that is prosperity of the village, prosperity of the town, prosperity of the nation, Eternal Bliss for all living beings.

Naga-mandala is a macro-religious ritual involving naga, the snake-god of Hindus who grants wishes for the devotees, especially the wish for fertility and

progeny. Rani is cured of her frigidity, and Appanna with affection and satisfaction for family life. Naga represents the cultural leader who is instrumental in bringing about socio-cultural reform. The snake-lover's story has become a "vrat-kadha," a cobra worship recited in cobra festival to propitiate snake, to ensure safety and progeny for couples. Snakes are symbols of human maleness and strength, nagas are personified as handsome men, or half-man and half-snake with the top half a torso of man and lower half a coiled snake. Karnad's *Nagamandala* probes into male and female growth onto selfhood and maturity adjustment with social roles by traditional society.

Graphical Representation of Mythic Structure of Girish Karnad's *Nagamandala*



1. Square Base: Ruined Temple, 2. First Circle: Ring of the Flames, 3. The Second Circle: Acoustic Wave of the Song, 4a. The Upward Triangle: Kurudavva-Rani-Appanna, 4b. The Downward Triangle: Appanna-Rani-Cobra, and 4c. Inner Triangle: The triple Ending of the Play are the different narrative levels and mythical nature of the play. The graphic Mandala represents the spiritual unity and psychic integration of the play.

Karnad symbolically reconstructs the ruined Indian temple with broken idol (antiquity), the man with mortal fear (dejection), the flames with feminine voices (village women). In the backdrop of a couple of folk tales, the dramatist has included flames, snake, avatars, performance of impressive ordeals, cremation rite of a dead snake, and the background chorus, that comprise elements of the mythical tradition of South India either directly or indirectly. He contributes meta-fictional myth as it mixes fact and fiction that shows author's meta-fictional quality in which the author offers a theory that art as art that delight audience. In India, myths are born out of popular belief and the immediate response to a myth is of disbelief. But as time passes on, the myth slowly gets accepted as a belief. Using local myths, the complexity of human life is unraveled in the play. Among them, man-woman intimacy under wedlock, question of chastity imposed on woman, married woman's craving for the warmth of her husband, Naga's mysterious end, the son lighting the funeral pyre of Naga are of great significance. Karnad's real churning provides umpteen myths and becomes an integral part of the fabric of the new text.

A myth is a way of making sense in a senseless world. Myths are narrative patterns that give significance to our existence. Whether the meaning of existence is only what we put into life by our individual fortitude, as Sartre would hold, or whether there is a meaning we need to discover, as Kierkegaard would state, the result is the same: myths are our way of finding this meaning and significance. Myths can no longer serve their function of making sense of existence, the citizens of our day are left without direction of purpose in life, and people are at a loss to control their anxiety and excessive guilt feeling. Hence, the psychologist Jerome Bruner writes when the prevailing myths fail to fit the varieties of man's plight, frustration expresses itself first in mythoclasm and then in the lonely search for an internal identity.

A student of mythopoesis approaches the play from two basic perspectives: the historic and the recurrent perspective. On the historical level, each mythopoeic work serves as the centre which unifies multiple forces of concerned era, organizes its art, psychology, religion, and social currents. Myth making is essential in gaining mental health, and the compassionate therapist will not discourage it. Indeed, the very birth and proliferation of psychotherapy in our contemporary age are called forth by the disintegration of our myths. Through its myths, a healthy society gives its members relief from neurotic guilt and excessive anxiety. As it is told with the knowledge and awareness of classical myths, the psychological insights of the cobra- Naga- Appanna (the three in one) with a mythopoeic background are necessary to know the play. Religion in Karnataka has a lot of impact on the people there, especially in the worship of the snakes.

Myths are self-interpretations of our inner-selves in relation to the outside world. Only on the strength of the powerful myths employed in the play, the concept of beauty and love are enjoyed by the heroine. Myths are essential in keeping the souls alive and bringing new meaning in difficult and meaningless world. Such aspects of eternity as beauty, love, and great ideas, appear in the language of myth. Myths of “snake-bite test,” “disguised husband,” strange bed sharing of Naga and Rani,” the “odd conception” of Rani from Naga, and the “final reconciliation” lead to psychic correction achieved through myths. Myth making is central in psychotherapy in free association with dream or fantasy. Hannah Green says: myths are “sharers of our loneliness.” In *Pyramids of Sacrifice*, Peter Berger says that it is through myths that men are lifted above their captivity in the ordinary, attain powerful visions of the future, and realize such visions.

The myth is a drama which begins as a historical event and takes on its special character as a way of orienting people to reality. The myth, or story, carries the values of the society: by the myth of the individual finds his sense of identity. But when myths start exerting their impact on Rani and Appanna, both of them join individually and together start understanding the language of myth. The narration always points toward totality rather than specificity; it is chiefly a right brain function. By their myths, we could say, we shall know them. The myth unites the antinomies of life: conscious and unconscious, historical and present, individual and social. These are found into a narration which is passed down from age to age. Whereas empirical language refers to objective facts, “myth refers to the quintessence of human experience, the meaning and significance of human life. The whole person speaks to us, not just to our brain.”

Nagamandala is a drama representing eternal truth. Eternal truth is sometimes above rational justification. Here, against empirical truth, eternal truth wins victory through the use of myth. Thomas Mann says, myth is an eternal truth in contrast to an empirical truth, the latter can change with every morning newspaper when we read of the latest discoveries in our laboratories. But the myth transcends time. It does not matter in the slightest whether a man named Adam and a woman named Eve ever actually existed or not; the myth about them in Genesis still – presents a picture of the birth and development of human consciousness which is applicable to all people of all ages and religions.

Myth is not an art, but is a form of expression that reveals the process of thought and feeling- man’s awareness of and response to the universe, fellow men, and desperate being. It is a projection in concrete and dramatic form of fears and desires undiscoverable and inexpressible in any other way. Myths are like the beams in a house: not exposed to outside view, and the structure that holds the house together where people can live in it. *Nagamandala* is like a

house built on the strength of the strong beams of myths, is a well constructed drama churned out through the process of mythopoesis by the accomplished writer Karnad.

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**Mirroring the Self: J.M. Coetzee's**  
***In the Heart of the Country***

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**ABSTRACT**

*The nature of identity is even now as intriguing as it has been since the Platonic days. The dichotomy between 'self' and 'other' focussing on the power relations shows that identity and alterity are inextricable as the confirmation of the existence of self customarily entails the process of othering. Against this backdrop the white South African writer J.M.Coetzee calls for attention as his oeuvre depicts the nuances of subject construction and subtleties of alterity sizing up variables like class, gender, race, ethnicity and culture. His novel *In the Heart of the Country*, published in 1977, deals with, in the main, the identity crisis of an Afrikaner woman, her attempt to grapple with the same.*

**Keywords:** self/other, identity, postcolonialism, othering

In Coetzee's opinion, "the notion of personal identity has dramatically narrowed in our times. Identity has become in the first place a matter of group identification: of claiming membership of a group, or being claimed by a group" (*Stranger Shores* 200). No other authorial statement throws better light on the root cause of the identity crisis that Magda, the lead character of Coetzee's *In the Heart of the Country* (1977), experiences as a result of her isolated existence, of



her being “in the heart of nowhere”, which is the leitmotif of the text( *IHC* 4). Offering an engaging read, the novel, through Magda’s predicament, explores the psychic struggle of the divisive colonial mind as her desperate quest for a pure identity/self ends only in a nostalgic lament for a long lost idyllic colonial/pastoral past that, to her chagrin, proves to be irretrievable. In its stead she sees, though fails to accept, a world of hybridity shaping up, diminishing all differences.

The novel has striking parallels with *Dusklands* (1974) with the protagonists being representatives of colonialism/imperialism. Allegorically, as Dominic Head avers, the novel like *Dusklands* makes “implicit connections between historical Afrikaner identity and the contemporary situation in South Africa” (51). Nevertheless, what comes to the forefront in comparison is the pattern of madness/psychological breakdown in the looming presence of alterity. Not unlike Eugene Dawn and Jacobus Coetzee, Magda too falters when she confronts otherness, giving rise to a situation fraught with her meaningless attempts at communicating with the other, and mostly at restoring the old order. Steeped in allegory, the novel is highly suggestive of the ambivalent position of white writer in South Africa. As a settler novel *In the Heart of the Country* “depicts a failing settler experience, ... a most unsettling settler experience” (Lopez 43). The ambivalence in Magda consists in her dual role as both the perpetrator and victim of the colonial order, an ambivalence that accounts for the discrepancies in her narrative as well.

As Magda describes herself on one occasion as a “monologue moving through time” (*IHC* 68), the novel is in itself a lengthy monologue of Magda, the narrator, numbered into two hundred and sixty-six sections through which the author takes us into the inner recesses of the character, offering an imaginary flight of an unprecedented kind. The delusional nature of the narrative confuses

the readers as the drifting consciousness of the narrator blurs the thin line between the happenings and imagination. No sooner do the readers come to the grip of the facts than do they realize that it is Magda's flight of fancy. The absence of dialogue reveals the solipsistic nature of the narrator and her narrative, which, characterized by a criss-cross pattern of time, unravels before us the life of Magda, spinster-daughter of the lonely sheep farmer, Johannes. In her variegated responses to the patriarchal Afrikaner culture and colonial South Africa, Magda emerges as a complex figure as she is at once, a true representative of Anglo-American feminism in resisting patriarchy, resisting oppression and a pro-nationalist, exhibiting her misgivings about transgressing the boundaries marked by the epidermal schema of racism. Both positions manifest itself in the act of parricide she commits.

Two sequences describe parricide, of which the first happens only in Magda's imagination and the second for real. In the first, Magda recounts her father bringing home a bride, the tragic fate her mother suffered at the hands of her father, a true Afrikaner patriarch, and her brutal murder of her father and stepmother, after which she contemplates suicide. At the end of the scenario, which gives glimpses of Afrikaner family life as one rooted in patriarchy, Magda states that her father has not remarried, highlighting the inconsistency and incredibility of her narrative, which, focuses less on reality than on the construction of identity as Magda puts it, "I make it all up in order that it shall make me up" (*IHC* 79). Shortly after, she indulges in narrating the incidents since the arrival of Klein-Anna at their farm as the wife of their black servant, Hendrik. Seeking refuge from his loneliness, Johannes finds solace in the arms of Klein-Anna, and it is when, ashamed by her father's act, Magda plans revenge that her life takes a pivotal turn.

When Johannes takes a liking to Klein-Anna, it instils a sense of shame and insecurity in Magda as her relationship with her father is replete with Freudian overtones. Desire and need lock horns here: *When the desire for the other mutates into the need to deny the other, to destroy the object of desire in a doomed attempt to eradicate the vulnerability desire itself entails, the metaphysical schema resurrected by such repression creates violence – often physical – in its wake. (Jolly 96)*

Moreover, the colonial psyche lets her not approve the proximity of ‘others’ closing in on the differences. To maintain the distance between her ‘self’ and ‘others’, in which she has been successful until the arrival of Klein-Anna, Magda shoots her father whom she considers responsible for transgressing the boundaries. Ever since the murder, Magda assumes the authoritarian stance in her interactions with Hendrik and Anna whose help she seeks to bury the corpse of her father. In Magda’s reign, the farm turns out to be a chaos and she ends up not paying the servants. An enraged Hendrik rapes Magda - an act, which she considers as retribution and which, Attwell feels, is a “colonial fantasy on Magda’s part,” owing to its different versions (67). In Patrick Hayes’ opinion, “this bodily encounter...brings about a process of rupture with Magda’s solipsistic Beckettian self-consciousness” (58-59). The consequent relationship between Hendrik and Magda highlights the irony that the daughter who could not tolerate the sight of her father in the arms of a black concubine, turns a white concubine of a black servant - a transformation/transgression that serves as a revelation to Magda who desperately tries to maintain good ties with Hendrik and Anna, who, without paying heed to Magda’s efforts desert her in the end on the farm, leaving her to fend for herself. Towards the end, Magda is an “old woman with knobby fingers” conversing in Spanish, a language unknown and unfamiliar to her, with the machines flying above her, in an attempt to communicate with the world outside (IHC 135).

Centring on Magda's anti-patriarchal stance, the text probes the status of woman in Afrikaner societies. In Magda's words her mother *was a frail gentle loving woman who lived and died under her husband's thumb. Her husband never forgave her for failing to bear him a son. His relentless sexual demands led to her death in childbirth. She was too frail and gentle to give birth to the rough rude boy-heir my father wanted, therefore she died. (IHC 2)*

Magda too is no less than an absent presence, "a zero, null, [and] a vacuum" in her father's life. When she says, "I live, I suffer.... I fight against becoming one of the forgotten ones of history" it is her urge to resist the conventional norms of the society that comes to light (IHC 2, 4). Magda owes the society her uneasy consciousness for having locked her into the role of a spinster on account of her physical features, having denigrated her status as a woman to that of "a hole with a body draped around it, ... crying to be whole", having tried to impose on her the belief "that if only I had a good man to sleep at my side, and give me babies, all would be well..." (IHC 44, 45). Occasionally mulling over, "where does this power end?" Magda fulfils her yearning for an act of liberation in parricide (IHC 39).

Yet, a conflict of interests characterises Magda's resistance against oppression as revealed in her attitude towards Hendrik and Anna after her father's murder. She remains in restraints in terms of racial divide thus being complicit with the colonial structure. What she craves is the identity of a liberated woman without a compromise on racial purity (IHC 43). Her relationship with Hendrik has always been in terms of 'station' and 'distance':

*I know nothing of Hendrik. The reason for this is that in all our years together on the farm he has kept his station while I have kept my distance; and the combination of the two, the station and the distance, has ensured that my gaze*

*falling on him, his gaze falling on me, have remained kindly, incurious, remote.  
(IHC 27)*

Magda believes in the feudal order of the past, reminiscent of white superiority, where, “we have our places, Hendrik and I, in an old, old code” (IHC 27). The illicit relationship of her father with Klein-Anna unsettles Magda as she fears it might affect her as well, narrowing the much preferred distance between herself and her others. She comments on her father’s heinous act in despair: *He believes that he and she can choose their words and make a private language, with an I and you and here and now of their own. But there can be no private language. Their intimate you is my you too.... How can I speak to Hendrik as before when they corrupt my speech? How do I speak to them?* (IHC 39)

For Magda who is “a conserver than a destroyer, who would not be herself if she did not “feel the seductions of the cool stone house, the comfortable old ways, the antique feudal language”, her father’s liaison is too condescending to be approved of (IHC 47). Like Poyner says, “transgression in the context of Boer cultural history threatened the limits of Boer identity and was to be guarded at all costs” (36). Magda envisions herself in the role of Klein-Anna, of that of a servant/slave and recoils at the thought. Insulted and outraged she pulls the trigger twice to avenge her father’s folly and delays not in assuming the role of the mistress with a view to asserting her racial superiority and thereby her identity as evident in the verbal abuse directed against Hendrik and Anna at the time of burial: “You damned hotnot, it’s all your fault, you and your whore!...Filth! Coward!”(IHC 99) It is an attempt at stereotyping - characteristic of colonial discourse - on the part of Magda, imposing otherness on her servants. Bhabha’s words prove relevant here: *The subjects of the discourse are constructed within an apparatus of power which contains, in both senses of the word, an ‘other’ knowledge – a knowledge that is arrested and fetishistic and*

*circulates through colonial discourse as that limited form of otherness that [is] called the stereotype. (111)*

Quite ironically, Magda proves to be the target of the very same colonial order that she tries to carry out as she continually fails in the role of mistress, surfacing as an insignificant, incapable woman- a total ignoramus- having been kept out of the economic sphere by the patriarchal power structures. Head substantiates this point of view when he comments on Magda's ambivalence that she "is obliged to support a hierarchical system not of her own devising, to which her own identity must be subordinate" (J.M. Coetzee 55). She is the epitome of doubling – differently put, of aggressivity and narcissism; of desire and fear; of domination over others and anxiety about the self. In her interactions with Hendrik, Magda realises that "the language that should pass between [herself] and these people was subverted by [her] father and cannot be recovered" (IHC 106). The impending disaster, the sense of which Magda has with the arrival of Klein-Anna, soon befalls her as Hendrik rapes her in a rage, effecting an inversion of master/slave relationship, an inversion which, seemingly portentous, allegorically suggests that "South Africa is on the brink of [a] revolution" (Head 52). This exactly is what Magda fears the most – a new world where identities merge and are as diverse as dispersed, threatening the binary of self and other. Her anxieties as regards pure identity prove to be out of place as Magda realizes the nature of her predicament as both victim and perpetrator of colonial power structure, which she tries to subvert as an Afrikaner woman, when the same entraps her with Hendrik's requisition of power.

Solemnly witnessing the narrowing gap between the master and the servant, Magda tries to establish rapport with Hendrik and Anna, aiming at a peaceful coexistence: "In the heart of nowhere, in this dead place, I am making a start; or, if not that, making a gesture" (IHC 120). What she has in return is a

humiliating existence in which, cutting across gender and race, she identifies with Klein-Anna in a state of oppression/victimhood, being women, the subjugated race: “Must she be the one who keeps the house shining or must I, while she watches? Must we kneel and polish together, servitors of a domestic ideal?” (*IHC* 122-123) All her pleas go unheard and she hears only a voice of hatred in the non-reciprocal stance of her black servants who fear the societal response to the fraternal existence that Magda proposes: “one of these days they will be back, sooner than you think, along with other people, all the other farmers! Then they will see that you are living with the servants in the big house. Then *we* will be the ones to suffer not you she and I!” (*IHC* 127) Eventually, when her lone companions get stalked and driven away from her by the society/community of which she is a part, though only metaphorically, Magda, the sole learner of the worthlessness of the inessential determinants of identity, is all alone on the farm coping with her isolated existence as she grows into an old mad woman who hears voices occasionally.

However, her ambivalence is clear in the way she mirrors her split self in her responses to the messages from the sky-gods whose appearance heralds the dawn of a postcolonial era. She has a vision of the inevitable future, a clear understanding of the nature of identity when she laments, “The medium, the median – that is what I wanted to be! Neither master nor slave, neither parent nor child, but the bridge between, so that in me the contraries should be reconciled!” (*IHC* 145), yet, having failed to grasp the political significance of her transformation, Magda still clings on to the idyllic white supremacy expressing the truth that she “never wanted to fly away with the sky-gods” (*IHC* 151). It allegorically suggests the white dilemma in settler nations like South Africa to which Dominic Head sees Magda’s withdrawal into an independent rural existence as a pastoral resolution (61). Maria Lopez opines that in the novel “unequal power relations with the Hottentots are seen as a fundamental aspect of

Afrikaner (anti)pastoral experience” (43). The portrayal of Magda as a failure in all sense of the term suggests that South Africa as a nation is in a state of entrapment and there is a long way to go before Coetzee’s foresight of a hybrid world, which exists beyond the “elementary relations of contestation, domination and subjugation” and of which he gives glimpses through Magda’s thought processes, materialises in its entirety (*Doubling the Point* 98).

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## ON SOME PROPERTIES OF WING GRAPHS

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### ABSTRACT

*The study of Graph operators began with Harary's, Norman's and Ore's study on 'Line Graphs' in the 1960s and it has multiplied to a vast area today. In this article, we study some properties of a special graph operator known as the 'Wing Graph'.*

**Key Words:** graph, wing graph, radius of a graph, the complete graph.

### Introduction

Definition 1.1: A *graph*  $G = (V, E)$  is a pair consisting of some finite set 'V', the 'vertex set' and some subset 'E' of the set of all two element subsets of V, the 'edge set'.

We only consider graphs without multiple edges and loops. If there is an edge between vertices  $x$  and  $y$ , then the vertices are called *adjacent*.

Definition 1.2: A *walk* in a graph  $G$  is a sequence of vertices  $v_0, v_1, v_2, \dots, v_l$  such that the  $v_i$ s are distinct and  $v_i$  and  $v_{i+1}$  are adjacent for every 'i' in  $\{0, 1, \dots, l-1\}$ . The number 'l' is called the *length* of the path. The path is called a cycle if  $v_0 = v_l$  and it is denoted by  $C_{l+1}$ . A graph is said to be *connected* if there is a path between any pair of vertices in it.

Definition 1.3: The *distance*  $d_G(x, y)$  of two vertices 'x' and 'y' in a connected graph G is the length of a shortest path between them.

Definition 1.4: The *eccentricity* of a vertex 'x' of a graph G is given by  $e_G(x) = \text{Sup}\{d_G(x, y)/y \in V(G)\}$ . The *radius*  $r(G)$  is the minimum eccentricity of a vertex in G and the *diameter*  $d(G)$  is the supremum of the set of all eccentricities appearing in G.

Definition 1.5: A *graph dynamical system* is a pair  $(\Gamma, \Phi)$  where  $\Gamma$  is a set of graphs and  $\Phi: \Gamma \rightarrow \Gamma$  is a mapping called an 'operator'.

Definition 1.6: The *complete bipartite* graph  $K_{m,n}$  has a partition of the vertex set into two sets  $V_1$  and  $V_2$  of cardinality m and n respectively with vertices x and y adjacent whenever x is in  $V_1$  and y is in  $V_2$  and vice versa.

In this paper, some results on a graph operator known as the 'wing graph' are presented. It is defined as follows:

Definition 1.7: The *Wing Graph*  $W(G)$  of a graph G has all its edges as vertices. Two edges of G are adjacent vertices in  $W(G)$  if they are non incident edges of some induced 4-vertex path in G.

For example,  $W(C_{2k+1}) = C_{2k+1}$

Wing Graphs were primarily studied in the quest to crack the Perfect Graph Conjecture. They can, however, be studied for several interesting properties of their own.  $W(C_{2n})$ ,  $n \geq 3$ , consists of exactly two disconnected components, each of which is  $C_n$ . Also, if a graph G is of radius  $r(G) \leq 2$ , then  $d(u, v) \leq 2$  for every  $u, v$  in  $V(G)$ . Then there is no induced  $P_4$  in G. Such a G will have  $W(G)$  with no edges.

In all the following results, we assume that G is connected with  $r(G) > 2$ . The terms and definitions not defined here are taken from (3).

**Some properties of the Wing Graph:**

Theorem 1: For any graph  $G$ ,  $W(G)$  will never be isomorphic to  $K_{m,n}$

Proof: Suppose  $W(G)$  is isomorphic to  $K_{m,n}$ . Let the two sets of vertices of  $K_{m,n}$  be  $v_0, v_1, v_2, \dots, v_m$  and  $w_0, w_1, w_2, \dots, w_n$ . Consider  $v_1$  adjacent to  $w_1$ . Then they correspond to non adjacent edges of an induced  $P_4$  in  $G$ . Let 'e' be the third edge in that  $P_4$ . Then 'e' cannot be any of the  $v_i$ s,  $i \neq 1$ , since that would make it adjacent to  $w_1$  in  $W(G)$ , which is not possible. Similarly, 'e' cannot be any of the  $w_i$ s,  $i \neq 1$ . This means e cannot be in either set of the bipartition, a contradiction. Hence the theorem.

Remark 1: The wing graph is non isomorphic to the complete graph on 2 or more vertices. This is because two adjacent edges in  $G$  can never be adjacent in  $W(G)$ .

Theorem 2: Given any connected graph  $H$ , there exists a connected graph  $G$  such that  $H$  is an induced subgraph of  $W(G)$ .

Proof: Let the vertices of  $H$  be  $v_0, v_1, v_2, \dots, v_n$ . Consider the graph  $G$  constructed as follows: To each vertex  $v_i$  in  $H$ , attach a pendant vertex  $w_i$ , forming an edge  $e_i$ .

Claim: The subgraph  $G'$  of  $W(G)$  induced by  $e_1, e_2, \dots, e_n$  is isomorphic to  $H$ .

$|G'| = n = |H|$ .  $e_i$  adjacent to  $e_j$  in  $G'$  implies that they are non adjacent edges of an induced  $P_4$  in  $G$ . This in turn implies that  $v_i$  is adjacent to  $v_j$  in  $H$ . Conversely, if  $v_i - v_j$  is an edge in  $H$ , then  $w_i - v_i - v_j - w_j$  is an induced  $P_4$  in  $G$ . This implies  $e_i - e_j$  is an edge in  $G'$ , where  $e_i$  is  $w_i - v_i$  and  $e_j$  is  $v_j - w_j$ . Thus  $G'$  is isomorphic to  $H$ .

Remark 2: The above result shows that there does not exist a forbidden subgraph characterization for wing graphs.

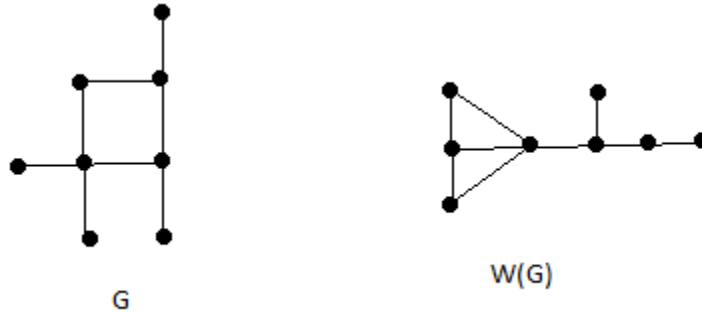
Remark 3:  $G'$  in the above theorem is not a unique construction. For example, both the following graphs have wing graphs with induced  $P_5$  :



Remark 4: For any graph  $G$ , the number of induced  $P_4$ s in  $G$  is the same as the number of induced  $P_4$ s in the complement of  $G$ . So the order of  $W(G)$  and order of  $W(G^c)$  are the same.

Remark 5:  $G$  is  $H$ -free does not imply that  $W(G)$  is  $H$ -free.

For example, consider the triangle free graph  $G$  whose wing graph has induced triangles:



Theorem 3: Given any number ' $a$ '  $> 1$ , there exists  $G$  such that  $r(G) = r[W(G)] = a$ .

Proof: Consider the odd cycle  $C_{2a+1}$ . Construct  $G$  as follows: Introduce a vertex ' $v$ ' adjacent to two adjacent vertices of  $C_{2a+1}$ . Then  $r(G) = a$ . Now,  $W(G)$  is  $C_{2a+1}$  with two pendant vertices attached to the end vertices of an induced  $P_3$ . Then  $r[W(G)] = a$ .

Theorem 4: If  $W(G)$  is isomorphic to  $P_n$ , then  $n = 5, 6$  or  $7$ . In other words, if  $P_n$  is the wing graph of some graph  $G$ , then it is  $P_5, P_6$  or  $P_7$ .

Proof: Suppose  $W(G)$  is isomorphic to  $P_n$ . Obviously, it has to be connected. Further,  $G$  must not contain any induced cycles, so that  $W(G)$  is cycle free. Hence  $G$  is a tree on  $n+1$  vertex. Further, every vertex ' $u$ ' in  $G$  must be such that  $e(u) \geq 3$ . This makes sure there are no isolated vertices in  $W(G)$ . Now, when  $e(u) \geq 3$

$= 3$  ,  $\deg(u) > 3$  would imply the existence of a vertex in  $W(G)$  of degree  $\geq 3$ , which means  $W(G)$  is not a path. So  $e(u) = 3$  implies  $\deg(u) \leq 3$ .

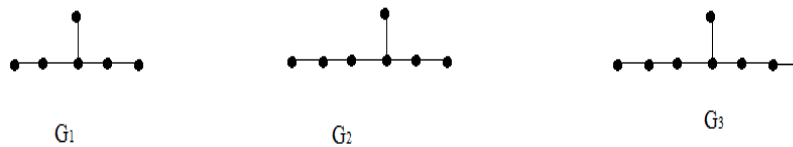
Similarly, when  $e(u) > 3$ ,  $\deg(u) > 2$  would imply the existence of a vertex in  $W(G)$  of degree  $\geq 3$ , which means  $W(G)$  is not a path. So  $e(u) > 3$  implies  $\deg(u) \leq 2$ .

So all vertices in  $G$  are of degree 1, 2 or 3 only. Next, we see that if there were no vertices of degree 3 in  $G$ ,  $G$  would be a path and hence  $W(G)$  would be disconnected. So there is at least one vertex of degree 3 in  $G$ . Next, if there were more than one vertex of degree 3 in  $G$ , say  $u$  and  $v$ , there would be a unique path between them. This would lead to a disconnection in  $W(G)$ . Hence there is exactly one vertex of degree 3 in  $G$ . The remaining  $n$  vertices are of degree 2 or 1.

Let  $n_1$  be the number of vertices of degree 1 in  $G$  and  $n_2$  is the number of vertices of degree 2 in  $G$ . Then by the Fundamental Theorem of Graph Theory,

$$n_1 + n_2 + 3 = 2n \text{ and } n_1 + n_2 = n. \text{ Solving these equations, } n_1 = 3 \text{ and } n_2 = n - 3.$$

We see that  $G$  is a tree on  $n+1$  vertices with 3 pendant vertices, one vertex of degree 3 and  $n-3$  vertices of degree 2. So  $G$  can be constructed for  $n = 5, 6$ , and  $7$ , keeping  $W(G)$  a path, as follows:



These graphs have wing graphs  $P_5$ ,  $P_6$  and  $P_7$  respectively. For  $n = 9$ , onwards, there appears an edge lying in 3 or more induced  $P_4$ s. This edge corresponds to a

vertex of degree  $\geq 3$  in  $W(G)$ , preventing it from being a path. Hence the only possible values of  $n$  are 5, 6 or 7.

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## Effect of spray rate on the opto-electronic properties of spray pyrolysed $\text{Cu}_2\text{ZnSnS}_4$ thin films

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### ABSTRACT

*Polycrystalline  $\text{Cu}_2\text{ZnSnS}_4$  (CZTS) thin films were prepared using chemical spray pyrolysis. We examined the influence of spray rate on the properties of the films. Spray rate has crucial role in adjusting properties like band gap of the films. Higher spray rates resulted in rougher films with secondary phases of copper sulfide. Secondary phases were also observed at low spray of 2ml/min. Good films without any secondary phases and having band gap of 1.5eV were obtained at the spray rate of 6ml/min.*

**Keywords:** Thin films, Solar cell, Spray rate, CZTS

### 1. Introduction

Recently considerable work is being carried out on the quaternary compound semiconductor  $\text{Cu}_2\text{ZnSnS}_4$  (CZTS) so as to optimize its opto-electronic properties for using as absorber layer of thin film solar cells [1]. This is mainly due to its direct band gap, high optical absorption coefficient, intrinsic p-type conductivity as well as nontoxicity [2]. Moreover all the constituents of CZTS are abundant in the earth's crust reducing concerns of material cost. CZTS is derived from the CIGS structure by the isoelectronic substitution of two In (or



Ga, respectively) atoms by one Zn and one Sn atom. As a consequence, CZTS has some similar properties as CIGS [3].

There is a variety of techniques reported for the deposition of CZTS thin films like vacuum techniques involving sequential deposition of constituent metallic layers followed by sulfurization [4], Sputtering [5], PLD [6] and non-vacuum techniques like electrochemical deposition [7], Sol-gel [8], spray pyrolysis [9] or deposition based on nano particle solutions [10]. CZTS thin films deposited using spray pyrolysis has been of increased interest these days as the method is simple with the potential for large-area deposition with fine control over elemental stoichiometry and thickness; this enables significant cost reduction compared to other techniques [11]. In spray deposition, properties of the deposited films depend on several parameters of which the major ones are substrate temperature, spray rate and concentration of precursors. In our previous work, we reported the effect of precursor solution on the properties of spray pyrolysed CZTS films [9]. The right choice of tin precursor was found to be stannic chloride. Present report details the effect of variation in spray rate on the properties of spray pyrolysed CZTS thin films.

## 2. Experimental

CZTS film deposition was carried out using an indigenously developed chemical spray pyrolysis unit [12]. Precursors used were copper chloride ( $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ ), zinc chloride ( $\text{ZnCl}_2$ ), stannic chloride ( $\text{SnCl}_4 \cdot 5\text{H}_2\text{O}$ ) and thiourea ( $\text{CS}(\text{NH}_2)_2$ ) which were dissolved in water and sprayed on to the preheated soda lime glass (SLG) substrates. To study the effect of spray rate, substrate temperature and volume of solution were fixed at  $350^\circ\text{C}$  and 140ml respectively, while the spray rate alone was varied in steps of 2ml/min (from 2 to 10ml/min). Cu:Zn:Sn:S ratio in the precursor solution is taken as 1.5:1:1:12. These samples were named as C2, C4, C6, C8 and C10 respectively. Film thickness was

measured using Dektak-6M stylus profilometer. X-ray diffraction (XRD) was carried out using Rigaku (D.Max.C) X-ray diffractometer (having  $\text{CuK}\alpha$  ( $\lambda=1.5405 \text{ \AA}$ ) radiation and Ni filter operated at 30 kV and 20 mA). Optical absorption studies were carried out using a UV–Vis–NIR Spectrophotometer (JASCO V-570 model). Resistivity of the films was measured using the two probe method employing Keithley Source Measure Unit (SMU, K236).

### 3. Results and Discussion

#### 3.1 Structural characterization

X-ray diffraction patterns of the CZTS films deposited at different spray rates were shown in figure 1. For Sample C2 in addition to peaks corresponding to CZTS phase there are peaks corresponding to secondary phases such as  $\text{Cu}_{1.8}\text{S}$  (JCPDS card no. 47-1748) and  $\text{Cu}_x\text{S}$  (JCPDS card no. 42-0564).

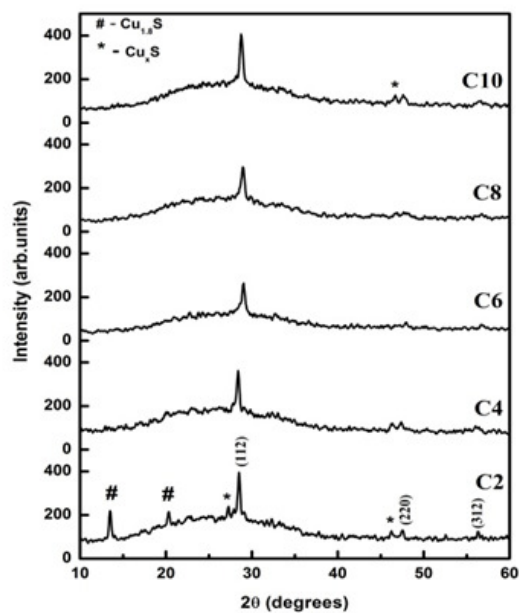


Figure 1 X-ray diffractograms of samples prepared at different spray rates

Also for high spray rate (sample C10) there is formation of  $\text{Cu}_x\text{S}$  phase as indicated by the peak at  $46.2^\circ$ . Sample C6 is devoid of any secondary phases.

Grain size of the films decreased as the spray rate increased up to 8 ml/min and then slightly increases. Similar decrease in grain size with increase in spray rate is observed in the case of sprayed  $\text{CuInS}_2$  films also [13].

Table 1. XRD data of CZTS samples prepared by varying the spray rate

Sample	Preferential orientation	$2\theta$ (degrees)	$d$ -value ( $\text{\AA}$ )	FWHM (degrees)	Crystallite size (nm)	Secondary phases observed
C2	112	28.50	3.129	0.23	35.3	$\text{Cu}_{1.8}\text{S}$ , $\text{Cu}_x\text{S}$
C4	112	28.46	3.133	0.23	35.1	$\text{Cu}_x\text{S}$
C6	112	28.64	3.114	0.25	33.3	Nil
C8	112	28.58	3.120	0.24	34.8	$\text{Cu}_x\text{S}$
C10	112	28.60	3.118	0.23	35	$\text{Cu}_x\text{S}$
Standard values (JCPDS Card No. 26-0575)		28.53	3.126	----	----	----

## 3.2 Optical studies

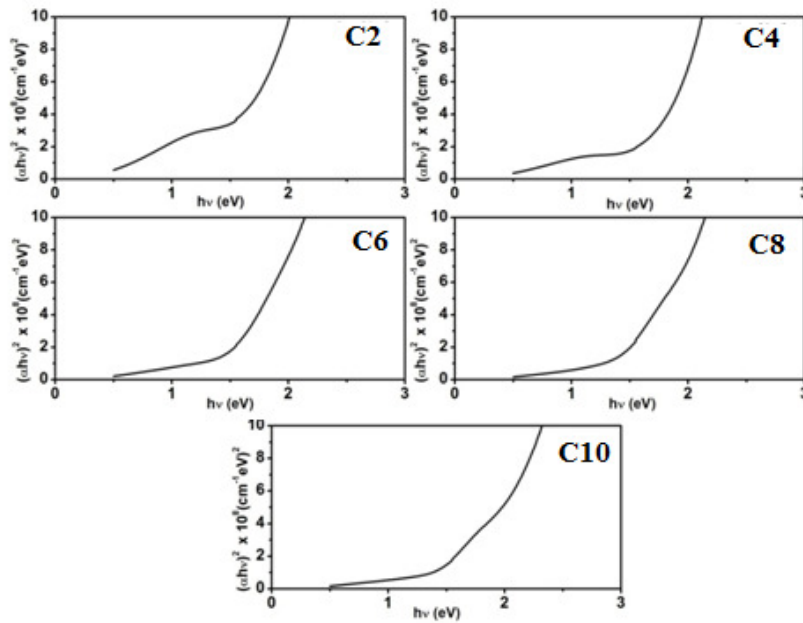


Figure 2.  $(\alpha hv)^2$  vs.  $h\nu$  graph of CZTS samples prepared at different spray rates

$(\alpha hv)^2$  versus  $h\nu$  plot of CZTS films deposited at different spray rates is shown in figure 2. For C2, the band gap obtained is 1.6 eV and the absorption in the tail region was extremely elevated. As the spray rate increases band gap decreased and the elevation of absorption tail also decreased. At the spray rate of 6ml/min (sample C6) the band gap was 1.5 eV, suitable for photovoltaic energy conversion. Beyond 6ml/min there are two linear portions in the  $\alpha hv^2$  versus  $h\nu$  plot, which indicates two band gaps, one due to the CZTS phase (at ~1.4 eV) other due to  $Cu_xS$  phase (~ 1.8 eV). The (direct) optical band gap of  $Cu_xS$  reported earlier in literature is in the range 1.7-2.16 eV based on the value of 'x' [14].

Table 2. Thickness, Roughness and Resistivity of the samples prepared at different spray rates.

Sample name	Thickness (nm)	Roughness (nm)	Resistivity ( $\Omega$ .cm)
C2	650	152	$4.6 \times 10^{-3}$
C4	690	164	$4.4 \times 10^{-3}$
C6	775	171	$1.8 \times 10^{-2}$
C8	820	186	$2.2 \times 10^{-2}$
C10	880	195	$4.6 \times 10^{-2}$

### 3.3 Electrical studies

Resistivity of the films was calculated from sheet resistance and thickness. Thickness of the samples was increased from 650 nm to 880 nm when the spray rate increased from 2 ml/min to 10 ml/min. Resistivity values increased steadily up to 6 ml/min and then slightly decreases. This increase in resistance might be due to the decrease in crystallinity with spray rate.

Roughness of the films also increases with spray rate resulting in the surface being uneven. This is usually expected in spray deposited films [13].

## 4. Conclusion

The influence of spray rate on the properties of CZTS thin films deposited through spray pyrolysis was investigated by varying the spray rate from 2 to 10 ml/min in steps of 2 ml/min. Higher spray rates has detrimental effect on the film morphology, making films more rough and uneven. Moreover, secondary phases were also observed at higher spray rates. The analysis of film properties prepared at various spray rates revealed that the spray rate of 6 ml/min is suitable for our deposition conditions.

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# STUDY ON ACIDITY OF MESOPOROUS CERIA ON MODIFICATION WITH CHROMIUM AND MANGANESE

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## ABSTRACT

*Catalysis is a complex surface phenomenon occurring on the surface of a catalyst. The adsorption of the reactant molecules and their interaction to give product on the active phase of the catalyst depend on the nature of sites on the catalyst surface, which determines the quality of the catalyst [1]. Porous materials have attracted the attention of chemists and material scientists due to their application in chemical separations and heterogeneous catalysis. Catalysis and catalytic surfaces are needed to be characterized with reference to their physical properties and thereby investigating their actual performance as catalysts. The most important physical properties are those relating to the surface because catalytic performance is determined by the surface parameters. A complete knowledge on the exact location, structure and electronic ground state of the active site in the catalysts is essential to establish a basic understanding about the structure- activity correlations and to improve the efficiency of the catalyst for higher selectivity and stability*

**Key words:** adsorption, active sites, heterogeneous catalysis, efficiency



## **1. Introduction**

Quantification and characterization of surface acid sites forms an important aspect of characterization of catalysts [2]. The concentration and strength of acid sites in solids cannot readily be measured using the types of basic molecular indicators used in the study of acid solutions because the sites in solids may be inaccessible to these molecules. Consequently, alternative techniques have been developed that are more applicable to solids and that enable their acidity to be compared with that of liquid acids. These include the thermal desorption of basic probe molecules (such as pyridine) coupled with IR spectroscopy. An estimate of the number of acid sites, their types, and their strength can be made in this way. Catalytic test reactions, such as alkane cracking are also widely used to estimate acidity, because the rate and product distribution is indicative of the type and strength of active sites. Several quantitative and qualitative methods have been employed to study surface acid sites. Here we used adsorption technique- Temperature Programmed Desorption (TPD) of ammonia for the measurement of acid amount.

## **2. Materials and Method**

### **2.1. Experimental**

Mesoporous ceria was synthesized, according to literature procedure [3], modified with 3 different compositions of Cr & Mn, by wet impregnation method.

### **2.2. Synthesis and characterization**

Mesoporous ceria was prepared by surfactant assisted method using the neutral surfactant hexadecyl amine as the template. 0.05M cerium nitrate solution was added to a solution of hexadecyl amine in 1:1 water- ethanol mixture with

stirring. A molar ratio of 2 was kept for precursor to the surfactant. The pH of the mixture was maintained above 10. The mixture was stirred for 6 hours and then aged for 3 days at 60°C. The precipitate obtained was washed with ethanol- water mixture several times and then with deionized water and filtered. The dried precipitate is pre-calcined at 250°C for 6 hours. The powdered sample is then calcined at 350°C for 4 hrs. 0.5M solution of the corresponding metals [Cr (NO<sub>3</sub>)<sub>3</sub>.9H<sub>2</sub>O, Mn (AC)<sub>2</sub>.4H<sub>2</sub>O] containing required amount of metal (2, 4 and 10wt% of metal) was added to the previously prepared mesoporous ceria and was mechanically stirred for 6h, kept overnight and dried at 80°C which was further dried at 110°C. It is powdered and calcined at 350°C to obtain metal incorporated cerium oxide.

### 2.3. Adsorption Techniques

The chemisorption of bases such as pyridine, ammonia, and aliphatic amines is frequently used to characterize solid acid catalysts and to correlate their catalytic activity with the concentration of a particular type of acid site. Pyridine and ammonia, because of their capability of interacting with both Brønsted and Lewis sites are widely used to get total acid amount of the systems. Temperature programmed desorption of ammonia can be used to obtain acidity of the samples.

#### 2.3.1 Temperature Programmed Desorption (TPD) of Ammonia

Temperature programmed desorption (TPD) is one of the basic experimental tool in surface science for identifying the desorbing species and hence can obtain their adsorption kinetics. TPD analysis helps us to identify the strength, the number and active sites that are available on the catalyst surface. Determining the quantity and strength of the acid sites on catalyst is crucial to understand and predict performance. The technique consists of adsorption of a reactive gas previously chemisorbed on the surface by a linear temperature rate increases.

Three types of probe molecules are used for TPD studies:  $\text{NH}_3$ , non-reactive vapour and reactive vapours. The probe molecules generally used are ammonia, pyridine and methylamine to identify acid sites and  $\text{CO}_2$  or  $\text{NO}$  to identify the basic sites. As a probe molecule ammonia has its advantages:

- Its molecular size facilitates access into all pores in a solid.
- It is highly basic, hence titrates even weak acid sites. Strongly polar adsorbed  $\text{NH}_3$  also capable of adsorbing additional  $\text{NH}_3$  from gas phase. The rate of adsorption is achieved either by detecting the desorbing species or by monitoring the remaining coverage on the surface.
- When chemisorbed on a surface possessing acid properties, ammonia can interact with the acidic protons, electron acceptor sites and hydrogen from neutral or weakly acidic hydroxyls and thus can detect most of the different type of acid sites [4].
- An ammonia molecule can be retained on the surface of oxides in different modes [5].
- Hydrogen bonding via one of its hydrogen atoms to surface oxygen or to the oxygen of surface hydroxyl group.
- Transfer of proton from surface hydroxyl to the adsorbate.
- Co-ordination to an electron deficient metal atom. It is the strongest mode of interaction.

Thus a fairly reliable interpretation of the TPD pattern of Ammonia from solid acids can be attributed to ammonia chemisorbed on weak, medium and strong acid sites respectively, being not possible to discriminate between Brønsted and Lewis acid sites. In this technique a definite weight of pelletalised activated sample is placed in a specially designed reactor that is heated at linear rate. The sample is preheated at  $300^\circ\text{C}$  for 30 minutes under nitrogen flow. After that, the sample is cooled to room temperature. A definite amount of (20ml) ammonia was injected into the system and was allowed to attain equilibrium. Then excess

physisorbed ammonia is flushed out of the reactor by a current of nitrogen. The temperature is gradually increased and ammonia desorbed at an interval of 100°C is scrubbed into dilute sulphuric acid. The ammonia desorbed at each stage is determined by titrating the unreacted sulphuric acid against standard sodium hydroxide using phenolphthalein indicator. The amount of desorbed ammonia was calculated using the equation,

$$\text{Ammonia desorbed in mmol /g} = (N_{\text{NaOH}} \times V \times 5) / W$$

Where,  $V$  = The difference in titre value between the blank and the scrubbed acid with desorbed  $\text{NH}_3$  at different temperatures,  $W$  = Weight of the sample in gram and  $N$  = Normality. Finally by knowing the correct stoichiometry of the gas/solid reaction, it is possible to quantify the total number of active acid sites that is available on the catalyst surface. The adsorption temperatures indicate the strength of the active sites of the catalyst. The ammonia desorbed in temperature ranges 100-200, 201-400, 401-600°C is considered to represent the surface sites of physisorbed or weakly chemisorbed, medium and strong acid sites respectively.

Metal oxides due to their ability to take part in the exchange of electrons, protons and oxide ions are used as catalysts in the redox and acid-base catalysis. The acid site is due to the charge imbalance arising between host metal ion and doped metal ions and the basic sites are due to the presence of surface lattice oxide ions. The TPD of ammonia was used to characterize the acid site distribution and furthermore to obtain the quantitative amounts of the acid sites in the specified temperature range [6]. Ammonia is an excellent probe molecule as it allows the distribution of both the protonic and cationic acid centers. In this method, the interaction of acid sites and basic probe molecule ( $\text{NH}_3$ ) is studied to determine the amount and strength of the acid sites [7]. The acid site distribution pattern can be classified into weak (desorption at 100-200°C), medium (201-

400°C), and strong (401-600°C) acid sites. The amount of ammonia desorbed at 100°C may contain some amount of physisorbed ammonia too.

### 3. Results and Discussion

Table 1 gives the distribution of acid sites of pure and transition metals incorporated ceria samples. Total acidity is shown as the sum of amount of ammonia desorbed from the entire temperature range. The table indicates that pure ceria possesses low surface acidity. Upon modification with metals, there is

Table 1 Distribution of acid sites of pure ceria and transition metals incorporated ceria.

Sample	Weak [mmol/g] (100- 200°C)	Medium [m mol/g] (201- 400°C)	Strong [mmol/g] (401- 600°C)	Medium + strong	Total [mmol/g] (100- 600°C)
Ce	0.10	0.02	Nil	0.021	0.12
CeCr(2%)	0.11	0.05	0.03	0.09	0.19
CeCr(4%)	0.13	0.02	0.02	0.04	0.17
CeCr(10%)	0.37	0.02	0.01	0.03	0.40
CeMn(2%)	0.07	0.02	0.01	0.03	0.10
CeMn(4%)	0.05	0.01	0.01	0.023	0.07
CeMn(10%)	0.08	0.02	0.01	0.03	0.11

enhancement in the amount of weak, medium and strong acid sites. But within the series as the metal concentration increases though there is a change in the total acidity, for both the metals there is no steady increase in the acidity with increase in the concentration of the metals. Tanabe et al. proposed a mechanism for the generation of acid sites by mixing two oxides [8-9]. They suggested that the acidity generation is caused by an excess of positive charge in a model structure of a binary oxide related to the co-ordination number of a positive element and a negative element.

Here also pure cerium oxide exhibits lowest surface acidity among the different systems. Considerable enhancement of weak, medium, strong acidity is observed after chromium incorporation. Among chromium-modified systems, CeCr (10%) systems have the highest acidity. The TPD data of the chromium oxide doped ceria systems points to an increase of strong acid sites than the simple system. Among the two different metals loaded systems ( Cr & Mn), Cr doped systems have highest acidity. For manganese doped systems, the total acidity decreases with increase of concentration of manganese up to 4% then it increases.

#### **4. Conclusion**

Acidity studies using Temperature programmed desorption of ammonia confirms the enhancement of surface acidity in particular strong acidity, upon modification with transition metals.

#### **Acknowledgement**

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# **PETROLEUM PRICING IN INDIA AND DEMAND RESPONSE AT MICRO LEVEL: SOME EVIDENCES**

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## **ABSTRACT**

*The strategy of energy development is an integral part of the overall economic strategy. India meets nearly 85% of its crude requirements through imports. Over the year's government have not succeeded in bringing a viable sustainable policy towards its pricing and meeting its demand requirements. The article tries to bring out pricing strategies over the years and the effect of a rise in price of petrol on its demand by analyzing the sale of petrol on pumps.*

## **1. INTRODUCTION**

The strategy of energy development is an integral part of the overall economic strategy. Efficient, reliable and competitively priced energy supplies are prerequisite conditions and also the base for accelerating economic growth. India meets nearly 30 percent of its total energy requirements through imports and in which the share of hydrocarbons are considerably high. Among those, petrol is the noted hydrocarbon fuel which is mainly used for transportation and industrial purposes. Unlike other fuels, it has not just an economic dimension, but also has relevance at the political spheres. India meets 85% of its crude oil requirements from imports.

Since it has the import dimension, however the challenge, therefore, is to supply the fuel at the least possible cost. Change of Administered Price



Mechanism (APM) to market oriented price, mainly because of macro-economic challenges, has generated debates in India and the issue has not even settled at the sub national level. Though we have taken several steps to raise the production of crude oil to cop up with the rising demand, we have failed in achieving the required results.

Burden of fuel subsidy and the efficient use of fuel are two broad objectives of market pricing. Under the present pricing system, changes in international petroleum price are immediately passed on to domestic price of oil. However, two issues must be assessed empirically. First, whether the change of pricing has any positive impact on reducing our fiscal burden of fuel subsidy? And second, what is the kind of changes or adaptive mechanism at the local level to cop up with price rise of petrol. The second issue is far more important because the present pricing system is expected to improve the fuel efficiency unlike under the fuel subsidy regime.

The article tries to bring out some of the micro issues underlying the present pricing strategy of petrol such as what is the impact of price rise on the consumption of petrol?. Is there any evidence of fuel substitution? Specifically, it is interesting to observe whether there has been any evidence of switching off their costly private mode to public transport systems. Empirical validation of above issues must be noted, especially because of the nature of the products elasticity and also given the socio economic scenarios. Article is divided into five sections including introduction and conclusion. Second section discusses the brief overview of petroleum pricing in India. Third section discusses data and methodology. Fourth section discusses the analysis and interpretations followed by findings and conclusions

## **2. BRIEF OVERVIEW OF PETROLEUM PRICING IN INDIA**

Our country has adopted different price policies regarding the petroleum products across different time periods. The first systematic attempt to

regulate the prices of petroleum products was based on the recommendations of the Dalme Committee in 1961. Various pricing committees appointed by the Government during the 1960s including the Dalme Committee (1961) and Talukdar Committee (1965) advocated fixing the prices of petroleum products on import parity basis as the bulk of the crude oil and major petroleum products were being imported into the country from West Asia. On 16th March, 1974, the Government appointed Oil Prices Committee (OPC) under the stewardship of Dr. K.S. Krishnaswamy. In November, 1976, OPC recommended Administered Pricing Mechanism (APM). The APM continued through the late 1970s, 1980s and mid-1990s.

With the objective of moving towards market determined prices for petroleum products, government announced dis-mantling of APM effective on 1st April 2002. However, the policy of dismantling could not be implemented and post May 2004, the Government re-started controlling the prices of major petroleum products i.e. Petrol, Diesel, PDS Kerosene and Domestic LPG. High levels of under-recoveries of OMCs in the face of unprecedented, sharp increases in international oil prices coupled with ad-hoc and inadequate increases in the domestic prices of Petrol, Diesel, PDS Kerosene and Domestic LPG have put considerable pressure on the finances of the OMCs, the upstream oil companies and the Government. As a part of first step to strengthen the finance of OMC and thereby the finance of government, prices of petrol was decontrolled with effect from 26th June 2010. Since then the domestic price of petrol has been gradually aligned with the international price.

### 3. DATA AND METHODOLOGY

At microeconomic level, underpricing of energy to the consumer has resulted in fewer incentives for being energy efficient. Therefore, one can assume that when we go for market pricing or 'correct pricing' it leads to efficient use of energy.

Specifically, with the same logic we can expect that when there is price rise in petrol then there could be less inefficient use of petrol basically because of the substitution effect. Hypothesis in this article is whether there has been any reduction of the quantity of petrol because of the price rise under the market oriented pricing. The paper tries to assess this hypothesis with the use of primary survey. In order to assess the quantity reaction of petrol, we take the time series of price and quantity of petrol in seven different petrol pumps in Kerala. Government implemented the petrol price hike of 7 rupees per liter on May 24<sup>th</sup> of 2012 and this was the highest hike under the market pricing era. The hike is sufficient to assess the quantity reaction on petrol and therefore we take it as a reference point. Total amount of petrol sold per day in each pumps is the main variable used in the study. Data was collected across 7 petrol pumps in Kerala, 6 in the Ernakulum district and one in the Thiruvananthapuram district. Coming of regular customers was the main consideration for the selection of pumps. In order to assess the quantity variation of petrol sold, amount of petrol sold in the eight successive working days before and after the price hike was collected. Dates from (15-22) represents sale of petrol before the price rise and (24 -31) represents sale of petrol post price rise. Average amount of petrol sold before and after the price hike, percentage growth of amount of petrol sold, are made use to explore the tentative relation of price and quantity of petrol sold at the micro level.

#### **4. ANALYSIS AND INTERPRETATIONS**

Figure one shows the amount of petrol sold in different pumps during the period of 15<sup>th</sup> to 31<sup>st</sup> of May 2012. Price hike happened on 24<sup>th</sup> of May and announcement came only one day before. All the pumps marked high amount of petrol sale on 23<sup>rd</sup> of May and a dip in the amount sold on 24<sup>th</sup> of May. Announcement of price hike may have turned the regular customer to fill more quantity of petrol than the usual days. Therefore, more quantity of filled petrol may allowed them to keep away from fueling and resulted high amount sold on

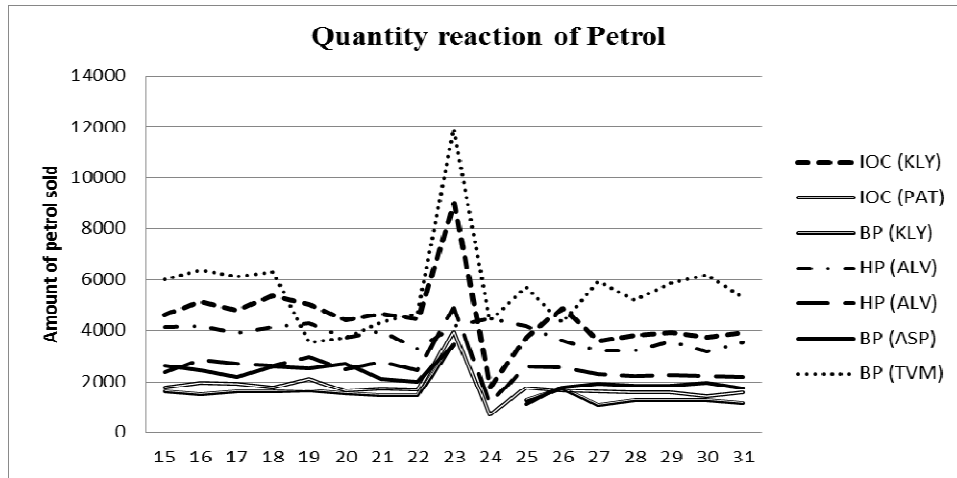


Figure 1

Source: Primary Survey

23<sup>rd</sup> and less on 24<sup>th</sup> of May. From the figure, it is clear that the price hike could be able to make only the immediate impact of keeping away from petrol pump at least for one day. After the hike, it is clear from the figure customers are gradually moving to the pre hike use level of petrol, may be because of the failure to substitute other fuels in the place of petrol. Further hike of petrol may force them to substitute other fuels and uses in the place of petrol. With the use of primary data and observations, we have not found any kind of fuel substitution. Thus we could conclude from the available observations that, price hike has not been able to make the quantity reduction so far and in which price could make only the short term psychological impact. However, the quantity reduction of petrol in response of price gradually reduced and finally reached at the level before price rise. Above evidence shows the people are so accommodative to the level of petrol price even at the hike of seven rupees per liter.

Figure 2 shows the average amount of petrol sold before and after hike. Except a pump at TVM, all pumps witnessed a reduction in the amount of petrol sold. Two factors are mainly responsible for this. First reason could be due to high amount sold on 23<sup>rd</sup> and less on 24<sup>th</sup> of June. Second reason is the

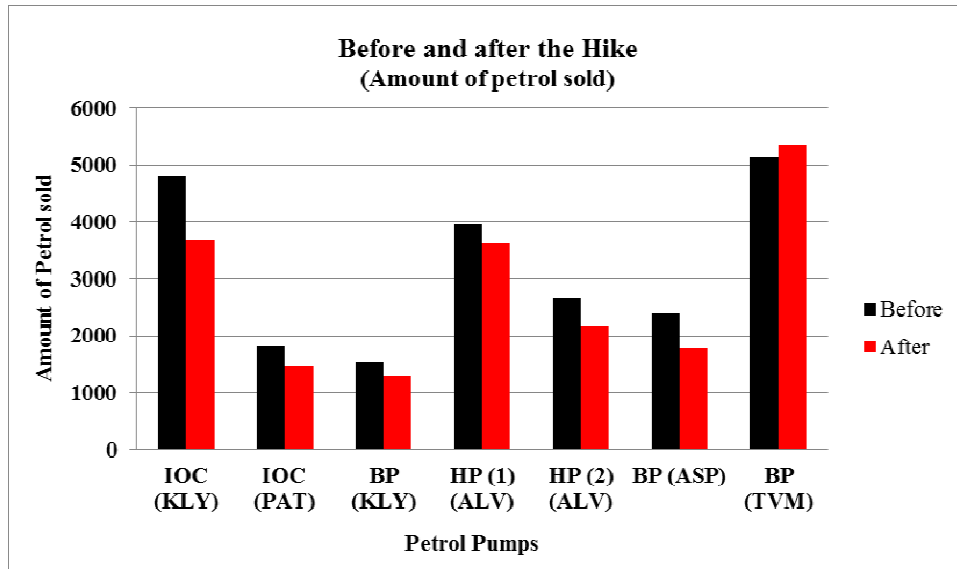


Figure 2

Source: Calculated from Primary Survey

less amount of petrol purchased on the days after the hike. Though, we do find the evidence of reduction in the post price hike period but it is gradually reducing and consumption reaches at the pre hike level a week after the price hike. The average growth of amount sold tells the individual variations in each pump. However, the individual variation of each pump is consistent within the whole discussion we done so far. Growth of reduction in the amount sold is not homogenous across different pumps. One pump has shown a mark of increase in the amount of petrol sold. Proximity of national highway, rural and urban specificities in the respective areas, income level, and attitude of people towards price hike could be the reasons for the individual variations.

## 5. FINDINGS AND CONCLUSIONS

Rational energy prices provide the right signals to both the producers and consumers and lead to a demand-supply match, providing incentives for reducing consumption on the one hand and stimulating production on the other. Aligning

Table 1: Average Growth of amount sold

Sl. No.	Name	Average growth rate
1	IOC(KLY)	-23.27
2	IOC(PAT)	-19.53
3	BP(KLY)	-15.39
4	HP(1)(ALV)	-8.34
5	HP(2)(ALV)	-17.68
6	BP(ASP)	-25.35
7	BP(TVM)	4.42

Source: Calculated from primary survey

domestic energy prices with the global prices, especially when large imports are involved, may be ideal option as misalignment could pose both micro- and macro-economic problems. At microeconomic level, underpricing of energy to the consumer not only reduces the incentive for being energy efficient, it also creates fiscal imbalances. Leakages and inappropriate use may be the other implications.

The paper basically probes into the micro aspect of petroleum pricing, about how the price rise affects the quantity demanded of petrol. With the use of survey and primary data, it has been concluded that price can make only short term impact on the quantity demanded of petrol. Therefore, price hike creates only a short term psychological impact. Immediate quantity reduction keeps on falling day by day and consumption reaches at the pre hike level in the end of the same week that witnessed the hike. With the use of available data, it is not possible to comment on whether there has been any improvement in the efficiency of petroleum use or reduction of inappropriate use because of the market oriented price. Efficiency improvement of petrol use or substitution of other fuels in the place of petrol may take place at further hike which may not

only lead to improvement in efficiency but also may lead to the development of alternative energy sources.

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# **THE PERFORMANCE OF INDIAN STOCK MARKET: AN ANALYTICAL STUDY ON IT SECTOR FROM AN INVESTOR'S PERSPECTIVE**

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## **ABSTRACT**

*Demand from emerging countries is expected to show strong growth going forward. IT sector has made significant contributions to India's economic growth in terms of GDP increase, foreign exchange earnings as well as employment generation. Its contribution to GDP has increased almost tenfold in last decade, from 2009-10. The sector has helped India transform from a rural and agriculture-based economy to a knowledge-based economy. Besides this, the lives of people have been positively influenced by direct or indirect contribution of IT sector to various parameters such as employment, standard of living, per-capita income etc.*

*While investing, one must always invest in a company that operates in a sector with bright long-term prospects. Further, the company's future prospects should also be green. Moreover one should invest in these companies at the right price i.e. when the market offers an attractive discount. To find out the right price to invest in with the right companies, financial performance analysis is a*



*must. The present study analysis the prospects of investment in IT sector .The study uses the financial performance results of top four companies in the sector for a period of five years.*

**Keywords:** Indian Stock Market, Information Technology (IT), Investment

*“India best performing equity market in Asia-Pac for 2014”... : Reuters*

## **1. Introduction**

In the last ten years the IT sector in India has grown at an average annual rate of 30%. India has emerged as the preferred destination for IT services owing to the cost advantage and talent pool. The country accounts for almost 50 % of the global sourcing market. Exports contribute around 70 % of the total revenue of the IT sector in India. However due to increased export-orientation and lesser domestic consumption the sector suffered major hit in the recession that shook the globe in 2008-09. From 2010 onwards, different economies began seeing recovery, but at varying pace. Indian companies have subsequently begun tapping other geographical markets and domestic consumption has also relatively increased.

The IT Software segment has seen significant growth and has put India on the global map. It contributes for almost 75% of the total revenues of the sector. Though Hardware enjoys second place in terms of market share in India, it is quite low as compared to global benchmark. The BPO segment has grown well and is expected to make a footprint in the IT Sector in the coming years. According to latest research of NASSCOM, India can reach \$ 130 Billion in IT

revenue by 2015, with CAGR of 14%. With this, it would be contributing to 7% of annual GDP and creating 14.3 million employment opportunities.

The present study is conducted with the objective of analyzing the stock market performance of top four Indian companies in the IT sector from an investor's perspective. The study uses mainly seven indicators for evaluating the performance, for a period of five years. This study is expected to help Indian investor's in making stock market investments and also in understanding the growth possibilities of Indian IT sector over the next few years.

## **2. Indian Stock Market**

Stock markets refer to a market place where investors can buy and sell stocks. The price at which each buying and selling transaction takes place is determined by the market forces. The Indian secondary capital market or the stock market mainly consists of the stock exchanges, Over the Counter Exchange of India and Stock Holding Corporation of India.

Stock Holding Corporation of India Ltd was incorporated in 1986 as a public limited company. It has been jointly promoted and owned by the All India Banks and Financial Institutions, viz., IDBI Bank Ltd, ICICI Bank, Axis bank, IFCI Ltd, LIC, GIC, NIA, NIC, UIC, and TOICL, who are all leaders in their fields of business. SHCIL has been established as a one stop provider of all financial services. It began its operations by offering custodial and post-trading services and later added depository and other services to its business portfolio.

Indian Stock Market is one of the oldest in Asia. Its history dates back to nearly 200 years ago. Over the period, the Indian securities market has become more dynamic, modern, and efficient securities market in Asia. It now conforms

to some of the best international practices and standards, both in terms of structure and operating efficiency. The profile of the investors, issuers and intermediaries approaching Indian markets also has changed significantly.

Technological up gradation and online trading have modernized our stock exchanges. The bullish run of Indian stock market can very well be associated with a steady growth of country's GDP by around 6% and the escalation of many Indian companies as MNCs. Investment in securities is faced with the greatest problem of choosing from among a large number of securities. Decision always depends on the risk-return characteristics of securities. The basic strategy to be followed in these investments are buying the under priced securities and selling the overpriced ones.

### **3. Indian IT Sector-SWOT Analysis**

The Indian software industry is an interesting and captivating choice of study due to many reasons. The industry's success story over the years is the primary reason. It has been recognised as a high growth industry, at over 50 % a year. In 1996 itself it was the source for outsourcing of over 100 Fortune 500 companies and the numbers are increasing constantly. The Indian software industry has impacted the economy far beyond the boundaries of the sector. It has placed the nation on the world map in terms of entrepreneurial and technological capabilities. It has set precedence for other emerging nations who are looking to succeed in this industry. It is an exemplar for other industries in terms of export orientation, strategic alliances and foreign investment. It provides a stiff challenge to many developed nations in terms of quality software service provision and has improved the liberalisation and modernisation processes in the country.

### SWOT – Strength, Weakness, Opportunities and Threats

*Strengths* : Conducive business environment, Highly skilled, English-speaking workforce, Abundant manpower, Cheaper workforce than their Western counterparts, Operational excellence, Lower attrition rates than in the West, Workforce aiming at making a long-term career in the field, Round-the-clock advantage for Western clients due to the huge time difference.

*Weaknesses*: The cost of telecom and network infrastructure is much higher in India than in the other western countries, Poor quality of local infrastructure, Political opposition from developed countries.

*Opportunities*: India portrayed as the most favoured IT destination in the world, India now branded as a quality IT destination rather than a low-cost destination, India can reach \$ 130 Billion in IT revenue by 2015, with CAGR of 14% as per latest reports of NASSCOM.

*Threats*: The anti-outsourcing legislation in the US, Workers in British Telecom have protested against outsourcing of work to Indian BPO companies, Other IT destinations such as China, Philippines and South Africa could have an edge on the cost factor, Slowdown of global demand.

## 4. Analysis of Data

### *Key ratios for used Financial Analysis*

The following are the financial ratios which offer remarkable insights into the financial health of a company and the prospects for a rise in its share price.

*a. Plough back and Reserves*

Net profits of a company after paying all the expenses and taxes (PAT) is normally split into two parts -- dividends and plough back. Dividend is that portion of a company's profits which is distributed to its shareholder. Plough back is the portion that the company retains and is added to its reserves. Plough back is important because it not only increases the reserves of a company but also provides the company with sufficient funds for its growth and expansion. All growth companies maintain a high level of plough back. Soto find a growth company to invest in, one should examine its plough back figures. Companies having no intention of expanding are unlikely to plough back a large portion of their profits. Reserves are the accumulated retained profits of a company. Size of the reserve will indicate whether the company is in a position to issue bonus shares. As a rule-of-thumb, a company whose reserves are double that of its equity capital should be in a position to make a liberal bonus issue. Any addition to the reserves of a company will normally lead to a corresponding increase in the price of your shares due to the fact that reserves belong to shareholders. Therefore the rule can be: Higher the reserves, the greater will be the value of shareholdings.

*b. Book value per share*

Book value per share indicates what each share of a company is worth according to the company's books of accounts. It can be calculated as follows: Total liabilities of a company are subtracted from its total assets, to get shareholders' funds. Shareholders' funds when divided by the total number of equity shares issued by the company, the resultant are the book value per share. 
$$\text{Book Value per share} = \frac{\text{Shareholders' funds}}{\text{Total number of equity shares issued}}$$
 The figure for shareholders' funds can also be obtained by adding the

equity capital and reserves of the company. Book value can, at best, give a rough idea of what a company's shares should at least be worth. The market prices of shares are generally much higher than what their book values indicate. Therefore, if a company has its market price around its book value, the chances are that it is under-priced. Thus book-value also helps to understand whether a particular share is over- priced or under-priced.

*c. Earnings per share (EPS)*

EPS is used as an investment ratio. It is calculated as: Earnings Per Share (EPS) = Profit After Tax / Total number of equity shares issued. This ratio gives the earnings of a company on a per share basis.

*d. Price earnings ratio (P/E)*

The price earnings ratio (P/E) expresses the relationship between the market price of a company's share and its earnings per share: Price/Earnings Ratio (P/E) = Price of the share / Earnings per share. This ratio indicates the extent to which earnings of a share are covered by its price. If P/E is 10, it means that the price of a share is 10 times its earnings. In other words, the company's EPS remaining constant, it will take approximately ten years through dividends plus capital appreciation to recover the cost of buying the share. The lower the P/E, the lesser the time it will take to recover the investment. This ratio is also a reflection of the market's opinion of the earnings capacity and future business prospects of a company. Companies which enjoy the higher market standing usually command high P/E ratios. Companies with high current earnings but weak future prospects often have low P/E ratios.

The answer lies in utilising the P/E ratio in conjunction with your assessment of the future earnings and growth prospects of a company. You have to judge the extent to which its P/E ratio reflects the company's future prospects.

If it is low compared to the future prospects of a company, then the company's shares are good for investment. Therefore, even if you come across a company with a high P/E ratio of 25 or 30, don't summarily reject it because even this level of P/E ratio may actually be low if the company is poised for meteoric future growth. On the other hand, a low P/E ratio of 4 or 5 may actually be high if your assessment of the company's future indicates sharply declining sales and large losses.

*e. Dividend Yield Ratio*

Investors who buy shares with the objective of earning a regular income from their investment are very much interested in dividend distributed by the company. Their primary concern is with the amount that a company gives as dividends and capital appreciation is only a secondary consideration. For such investors, dividends obviously play a crucial role in their investment calculations. However in many cases companies that give high dividends not only have a poor growth record but often also poor future growth prospects.

Investors normally are not interested in dividends alone but in the relationship that dividends bear to the market price of the company's shares. This relationship is best expressed by the ratio called yield or dividend yield:

Yield = (Dividend per share / market price per share) x 100. Yield indicates the percentage of return that an investor can expect by way of dividends on the investments made at the prevailing market price.

*f. Return on Capital Employed (ROCE)*

Return on capital employed (ROCE) is defined as operating profit divided by capital employed (net worth plus debt). The figure for operating profit is arrived at after adding back taxes paid, depreciation, extraordinary one-time

expenses, and deducting extraordinary one-time income and other income not earned through mainline operations, to the net profit figure. The operating profit of a company is a better indicator of the profits earned by it than is the net profit.

*g. Return on Net worth (RONW)*

While analysing the performance of a company, the most important factor which needs consideration is to know whether the company is efficiently using its capital i.e shareholders' funds plus borrowed funds entrusted to it. The return that a company is able to earn on its capital, namely its equity plus debt is very important. A company that earns a higher return on the capital it employs is more valuable than one which earns a lower return on its capital. Return on net worth (RONW) is defined as net profit divided by net worth. It is a basic ratio that tells a shareholder what he is getting out of his investment in the company.

Table 1 INFOSYS TECHNOLOGIES LTD

	Mar '14	Mar '13	Mar '12	Mar '11	Mar '10
Book value per share	736.64	627.95	518.21	426.73	384.02
Earnings per share (EPS)	178.4	158.75	147.5	112.22	101.13
Price earnings ratio (P/E)	18.2	20.4	16.9	29.5	28
Dividend per Share	63	42	47	60	25
Dividend Yield Ratio	1.7	1.7	1.9	2.2	.99
Return on Net Worth (RONW)	24.21	25.05	26.83	26.29	25.89
Source: Dion Global Solutions Limited					



ROCE is a superior measure to get an idea of the overall profitability of the company's operations.

The market prices of shares are generally much higher than what their book values indicating that the existing investors are very optimistic regarding the company performance. Earnings per share are the true indicator of the returns on your share investments. Even though the company's EPS is very attractive when compared with the other leaders under discussion, over the years it can be said that there is a steady growth rather than a steep increase or decrease. Observing the values of price earnings ratio, it can be interpreted that the share prices are traded at an average of twenty times higher than its earnings. This

Table 2 TATA CONSULTANCY SERVICES LTD.

	Mar '14	Mar '13	Mar '12	Mar '11	Mar '10
Book value per share	224.9	165.86	126.49	99.53	76.72
Earnings per share (EPS)	94.17	65.23	55.97	38.62	28.62
Dividend per share	32	22	25	14	20
Price earnings ratio (P/E)	22.4	23.2	22.33	27.6	80.4
Dividend Yield Ratio	1.52	1.5	2	1.3	.87
Return on Capital Employed (ROCE)	53.39	48.07	55.31	44.38	42.46
Return on Net Worth (RONW)	41.87	39.32	44.24	38.8	37.75
Source: Dion Global Solutions Limited					

again portrays a prosperous future for this company. In spite of high volatility in the market Infosys as a global leader was able to offer a steady RONW to its shareholders.

For the financial year ended March 31, 2014, the Company has recorded a strong revenue and margin performance. There was holistic growth across markets and industries during the financial year. On consolidated basis, revenue from operations for the financial year 2013-14 at Rs. 81,809.36 crores was higher by 29.88% over last year (Rs. 62,989.48 crores in 2012-13). Earnings before interest, tax, depreciation and amortisation (EBITDA) at Rs. 25,152.79 crores were higher by 39.43% over last year (Rs. 18,039.91 crores in 2012-13). Profit after tax (PAT) at Rs. 19,163.87 crores was higher by 37.70% over

Table 3 WIPRO LTD.

	Mar '13	Mar '12	Mar '11	Mar '10	Mar '09
Book value per share	98.38	99.04	86.86	120.49	85.42
Earnings per share (EPS)	22.94	19.05	19.73	33.36	20.3
Price earnings ratio (P/E)	19.1	23.1	22.1	13	6.8
Dividend per share	7	6	6	6	4
Dividend Yield Ratio	1.6	1.4	1.4	1.4	3
Return on Capital Employed (ROCE)	26.72	22.04	22.44	23.06	26.77
Return on Net Worth (RONW)	23.31	19.23	22.71	27.68	23.76
Source: Dion Global Solutions Limited					

last year (Rs. 13,917.31 crores in 2012-13). The market prices of shares are much higher than what their book values indicating that the existing investors are very optimistic regarding the company performance (table 2). Earnings per share are increasing at an incremental rate offering good returns to the investors. Price earnings ratio is showing a slight decrease due the current market turbulence. However overall financial health of the company can be rated as excellent. Wipro is a global IT major which offers services in IT services and consulting. The company is the world's first PCMM Level 5 software company. It is among the top four offshore BPO service providers in the world and addressing COO requirements. It is the world's largest independent R&D services provider and No. 2 in Indian Domestic IT Services Provider Market.

Table 4 HCL TECHNOLOGIES LTD.

	Jun '13	Jun '12	Jun '11	Jun '10	Jun '09
Book value per share	146.84	95.25	85.06	72.69	52.04
Earnings per share (EPS)	53.16	28.13	17.4	15.57	14.88
Price earnings ratio (P/E)	14.6	17	25	24	24
Dividend per share	12	12	7.5	4	7
Dividend Yield Ratio	1.5	2.5	1.8	1	2
Return on Capital Employed (ROCE)	41.71	33.64	20.74	20.44	32.39
Return on Net Worth (RONW)	36.2	29.53	20.45	21.41	28.59
Source: Dion Global Solutions Limited					

A five year financial performance analysis results shown in table 3 reveals a consistent performance of the company. The company is also suitable for investors who expects regular dividend. HCL Technologies Limited is a global IT services company headquartered in Noida, India. It offers services including software consulting, enterprise transformation, remote infrastructure management, engineering and R&D services, and business process outsourcing (BPO).HCL Technologies is on the Forbes Global 2000 list and is one of Asia's 50 best companies. The financial health of the company as shown in table 4 exhibits a promising picture especially from 2011 onwards.

Company has transferred to general reserve an amount of 380.00 crores in the financial year 2012-13 as compared with a figure of 195.04 crores in the previous year i.e 2011-12. The sharp increase in ploughing back of profit indicates that the company is having further growth plans in future.

## 5. Conclusion

The results of the study portray a very encouraging future for the Indian software companies due to the good performance of the firms in the Indian capital markets and their continued investment in them. Until the late 1980s firms could not tap the equity market and therefore started with a low capital base. But today the scenario has changed and the industry is well established as a profit maker. New companies can now draw on financial institutions and public for capital. Critical size is seen to have achieved by start-ups in a matter of 1-2 years and they are performing well on the equity market. Another consideration for competition are the many non IT companies that are moving into software to tap the higher return business. For e.g. a tobacco company ITC, a textile company Mafatlal etc. has set up their own software divisions. These have been quite

successful and compose the top few firms in the domestic software market. The lure of big money has always thrown investors in to the lap of stock markets. However making money in equity market is not an easy task. It requires oodles of patience and financial discipline. Success definitely requires continues research and a sound understanding of the market conditions. The present study portrays a promising picture about the future of investments in IT sector. However the results can be used for investments in stock market only after incorporating the recent market changes.

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## INDIAN MUTUAL FUND INDUSTRY

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### ABSTRACT

*The impressive growth in the Indian Mutual fund industry in recent years can largely be attributed to various factors such as rising household savings, comprehensive regulatory framework, favourable tax policies, introduction of several new products, investor education campaign and role of distributors. Besides, SEBI has introduced various regulatory measures in order to protect the interest of small investors that augurs well for the long term growth of the industry. The tax benefits allowed on mutual fund schemes (for example investment made in Equity Linked Saving Scheme (ELSS) is qualified for tax deductions under section 80C of the Income Tax Act) also have helped mutual funds to evolve as the preferred form of investment among the salaried income earners. Equity investments have always returned better over a long period of time. Since it is difficult for lay investors to pick individual stocks, it is better to invest through diversified equity mutual funds via systematic investment plan (SIP). In this way, we can invest a small amount every month for our retirement. At the moment we may not have any significant financial liability. So try to take high equity exposure to maximize your returns. With growing financial liabilities and age, you will gradually need to cut exposure towards equity and shift your wealth towards debt instruments.*

**Key words:** ELSS, SIP, Asset Management Companies, MIP's, NSE, BSE

## 1. INTRODUCTION

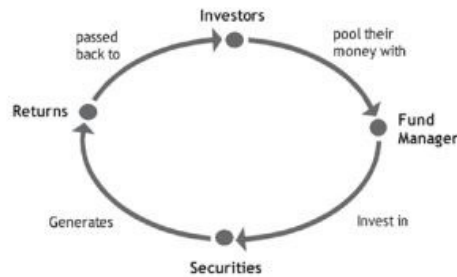
A mutual fund is a type of professionally managed collective investment vehicle that pools money from many investors to purchase securities. Mutual funds can be defined as the money-managing systems that are introduced to professionally invest money collected from the public. The Asset Management Companies (AMCs) manage different types of mutual fund schemes. The AMCs are supported by various financial institutions or companies. Investment in mutual funds in India means pooling money in bonds, short-term money market, financial institutions, stocks and securities and dishing out returns as dividends. In India, Fund Managers manage the mutual funds. They are also referred to as portfolio managers. The mutual funds in India are regulated by the Securities Exchange Board of India. Most mutual funds are "open-ended," meaning investors can buy or sell shares of the fund at any time.

The Indian Mutual fund industry that started with traditional products like equity fund, debt fund and balanced fund has significantly expanded its product portfolio. Today, the industry has introduced an array of products such as liquid/money market funds, sector-specific funds, index funds, gilt funds, capital protection oriented schemes, special category funds, insurance linked funds, exchange traded funds, etc. It also has introduced Gold ETF fund in 2007 with an aim to allow mutual funds to invest in gold or gold related instruments. Further, the industry has launched special schemes to invest in foreign securities. The wide variety of schemes offered by the Indian Mutual fund industry provides multiple options of investment to common man.

The mutual fund industry, today presents a picture of opportunity and challenges. As the industry sensitises itself to the changing regulatory landscape, business strategies are endeavoring to respond to these developments. Amidst

this changing business and regulatory environment, asset management companies and all service providers, including distributors, have to re-examine their business models and embrace the changing business landscape. Gautam Mehra, Leader - Asset Management, PwC India, said, "At present, the Indian mutual fund industry is facing interesting times. The last few years have seen a series of events, both within and outside the Indian economy, which have impacted the industry. Additionally, investors appear to have adopted a more cautious approach. The present scenario demands vigorous innovation and reinvention. Among others, the purpose may be served by adopting a cluster of key initiatives in the areas of cost efficiency, product design and positioning, alternative distribution models, revenue diversification and capacity creation."

Research was based only on Secondary Data but also depended on conversations with a few major investors who are interested in share markets but they were not so responsive to the queries.



**OBJECTIVE :** To study about and procure a deep insight into Mutual Funds, To analyse the mutual fund performance in the present market, To increase the awareness of mutual funds among different groups of investors.

*The key highlights of the reports are:* The mutual fund industry, beset by net redemptions by investors and adverse global and local market conditions, shrank by 1.6% in terms of assets under management during the year FY2011-2012.



The benchmark BSE sensex and the assets under management (AuM) for the mutual fund industry have risen in tandem. Booming markets in 2006 saw increased investor participation in the industry, leading to fund inflows enabling the AuM to grow at a pace greater than the Sensex.

However, volatile market conditions in the last two years have led to net withdrawals by investors to the tune of 49,406 crore INR in FY 2010-11 and 22,023 crore INR in FY 2011-12, leading to a further drop in AuM, in addition to the drop caused by adverse market movements.

The mutual fund industry is primarily debt-oriented with debt funds (including liquid funds) forming 64% of the AuM. As in the past, increased equity participation is the need of the hour for the mutual fund industry.

*TYPES OF MUTUAL FUNDS IN INDIA:* There are different types of Mutual Funds in India available in the market which an investor can choose depending on his profile, risk taking capacity and time horizon.

*Open and Close Ended Mutual Funds:* A mutual fund can be either Open ended or Close ended. Open ended funds can buy and sell its units at any time – so as an investor, you can purchase and sell your holdings in such funds at any time.

*close ended funds:* They can only be bought by investors buying the period they are up for sale – called the New Fund Offer (NFO) period. Investors can sell them either on the stock exchanges where it is listed or during special buy back periods which the AMC (Asset Management Company) schedules.

*Growth and Dividend Mutual Funds :* Funds that make your capital grow over a period of time without giving out profits/dividends to you are called growth funds. In case you received dividends from them, its called a dividend fund.

*Debt Mutual Funds:* These invest in commercial papers, certificates of deposits, treasury bills, corporate bonds, debentures and government bonds among others. There are other classification of such funds, depending on the maturity of the paper held, for eg, short-term and medium-term to long-term funds.

*Equity Mutual Funds:* These invest primarily in stocks of companies – in a sense, you own up ending a part of the company when you buy into these. These are meant for long term investments and carry a great deal of risk. Their purpose is capital appreciation over a long period of time. Diversified Equity funds invest in a wide selection of stocks across different companies and market capitalizations so as to reduce the risk for the investor.

*Index funds:* They invest in companies that comprise the benchmark index (say NSE or BSE) and in the same proportion as the index itself. So the returns of these are in line with the index. ELSS (equity linked savings schemes) or tax saving mutual funds provide tax benefit to investors under section 80(C) and also have a lock-in period of 3 years – this means that as an investor, you cannot redeem(sell) your holdings before three years of buying the mutual fund.

*Sector or Thematic funds:* They invest in a particular sector eg, there could be a fund investing in only the banking sector. Similarly, there could be thematic funds investing in a particular theme, example, infrastructure.

*Large-cap mutual funds:* Investments are made in large market capitalization companies.

*Mid-cap and small-cap mutual funds :* Those which invest in medium market capitalization companies and small market capitalization companies respectively. Among these, large-cap carries the lowest risk while the small cap carries the most risk.

*Balanced Mutual Funds* invest in at least 65% equities and the rest 35% in debt. The debt portion provides stability while the equity portion provides capital appreciation.

Monthly Income Plans (MIPs) are plans which invest around 15%-25% in equities and the rest in debt and money market instruments.

*Other Types:* Gold Mutual Funds are those that invest in gold as the underlying assets. International Funds invest in companies outside India. Exchange Traded Funds(ETFs) are those that are traded on the stock exchange on a real time basis. Socially responsible mutual funds invest in companies that have social, environmental or moral beliefs and promote the same. Fund of Funds do not invest in any companies – instead they put in their money into other AMC's mutual funds. Real Estate Mutual Funds invest in real estate or lend money to real estate developers.

## **2. Investment Strategies**

*a. Systematic Investment Plan:* Under this a fixed sum is invested each month on a fixed date of a month. Payment is made through post dated cheques or direct debit facilities. The investor gets fewer units when the NAV is high and more units when the NAV is low. This is called as the benefit of Rupee Cost Averaging (RCA)

*b. Systematic Transfer Plan:* Under this an investor invest in debt oriented fund and give instructions to transfer a fixed sum, at a fixed interval, to an equity scheme of the same mutual fund.

*c. Systematic Withdrawal Plan:* If someone wishes to withdraw from a mutual fund then he can withdraw a fixed amount each month.

### ***BENEFITS OF INVESTING IN MUTUAL FUND***

*Low Risk:* Owning stocks of only 2-3 companies could be risky. If one of them goes bankrupt, or is involved in a fraud, a large sum of your money would go

down the drain. A mutual funds provides diversification by holding stocks of 30 or more stocks and is much much safer than holding just a couple of stocks.

*Higher Return:* In long term, equity or stock market grows much higher compared to the FD rates or a guaranteed insurance plan. As we have seen in last few years, the FD rates might be actually lower than the inflation. This means that even after investing your money in FDs, the amount you get back is lower than the original amount, in real terms. Hence equity mutual funds should be a part of your portfolio if you want higher growth over long term.

*Low Taxes:* Interest income earned on regular FDs would attract income taxes up to 30%. On the other hand, if you hold mutual funds for more than 1 year, you'll only have to pay long term capital gains taxes. These taxes are ZERO on equity funds, and 10% or less on debt funds.

*Liquidity:* FDs and insurance-cum-investment plans usually have a lock-in of a few years, and you have to pay a significant penalty to withdraw your money before the period . Mutual funds, apart from ELSS, do not have any lock-in period and you can withdraw your money any time.

*Professional Management:* Choosing stocks is a very risky and complex task. Apart from reading the company balance-sheets and statements, you need to have views on company, industry and economy as well.

Mutual funds are preferred for their cost-effectiveness and easy investment process. By investing all the money in a mutual fund, investors can buy stocks or bonds at lower trading charges. This is indeed one of the main benefits, which is not available otherwise. You don't need to see which stock or bond would be better to buy. Another advantage is diversification. Diversification stands for diffusing money across various different categories of investments. There is every possibility that when one investment is down, the other can be up. In

simple terms, this is helpful in reducing risks. Transparency, flexibility, professional investment management, variety and liquidity are some of the other benefits of the mutual funds, which are not found in case of other investments to such an extent.

Category-wise returns generated by mutual funds across time frames

	3 Years (%)	5 Years (%)	7 Years (%)	10 Years (%)
Equity Funds	23.80	8.19	18.93	25.46
Balance Funds	23.69	10.02	17.26	20.87
Income Funds	8.86	7.76	7.10	7.41
GILT Funds	4.65	5.99	5.83	7.25

*Returns are AUM weighted returns as of November 11, 2011*

### 3. Risk versus Reward

Volatility in the market activity can be referred to as the risk in the mutual fund investment. The sudden upward and downward sentiments of the markets and individual issues can be attributed to several key factors. These factors comprise: Interest rate changes, Inflation, General economic scenario The aforementioned factors are the main cause of worry amongst the investors. Most of the investors fear that the value of the stock they have invested will fall considerably. However, it is here one can notice its reward angle. It is this element of volatility that can also bring them substantial long-term return in comparison to a savings account.

#### *List of Mutual Funds Companies in India*

Some of the popular firms that deal in mutual funds in India are: Reliance Mutual Funds, HDFC, ABN Amro, AIG, Bank of Baroda, Canara Bank, Birla Sun Life, DSP, errill Lynch, DBS Chola Mandalam AMC, Escorts Mutual, Deutsche Bank, ING, HSBC, ICICI Prudential, LIC, JP Morgan, Kotak Mahindra, Lotus

India, JM Financial, Morgan Stanley, State Bank of India (SBI), Sahara Mutual funds, Sundaram BNP Paribas, Taurus Mutual Funds, Tata, UTI, Standard Chartered.

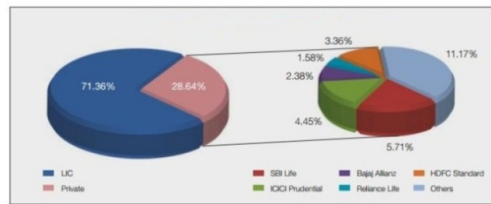
*Top Mutual Funds in India:* Reliance Mutual Fund, The DSP ML Tiger Fund, SBI Magnum Contra Fund, HDFC Equity Fund, Prudential ICICI Dynamic Fund SBI Mutual Fund.

**4. SWOT ANALYSIS**

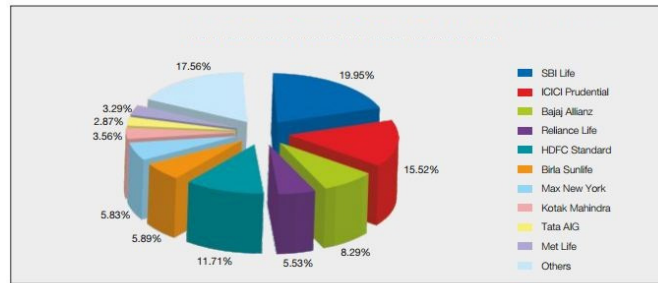
Strength	Weakness	Opportunity	Threats
Liquidity, Transparency, Affordability, Diversification, Government support by way of tax concessions, Volatility of bank interest.	Poor participation of retail investors, Distribution is confined only to metro cities, Cost pressures, Lack of financial literacy.	Huge untapped market, High level of savings among people, Using on online mode of trading system, Fund houses should emphasize on off shore segment.	Increasing competition. High level of volatility in stock market. Possibility of more stringent regulations by SEBI, RBI, AMFI in future.

**5. Market Share Statistics**

a. Total Market Share



b. Private Market Shares



Source: IRDA New Business Report FY 2011-12

c. *Performance of Mutual Funds: Unit Trust of India:* Unit Trust of India Mutual Funds governed the Indian mutual fund market for about 50 years. It had no competitors till the year 1988. It is only in 1988 that few mutual fund companies were set up to compete the Unit Trust of India. Despite the emergence of various Mutual Fund companies in 1988, UTI Mutual Fund remained in the topmost position. UTI Mutual Funds consistently exhibited excellence in this field, and this contributed to the performance of Mutual Funds in India . Back in 1992, 24 million UTI Mutual Fund shareholders were promised high returns. UTI Mutual Funds schemes sold the thought of gaining profits by investing in mutual funds to Indian people. This happened to be an extremely helpful measure in drawing more and more investors. Moreover, there was no risk in investing in mutual funds.

d. *Performance of Mutual Funds: Current Scenario:* Different Indian mutual fund companies have plans of introducing pension schemes. They are also planning to introduce open-ended mutual funds. According to experts, if certain restrictions are removed, the system will become more beneficial and flexible.

*e. Pros and Cons of MUTUAL FUND*

Advantages	Disadvantage
Portfolio Diversification, Professional management, Reduction / Diversification of Risk, Liquidity, Flexibility & Convenience, Reduction in Transaction cost, Safety of regulated environment, Choice of schemes, Transparency	No control over Cost in the Hands of an Investor, No tailor-made Portfolios, Managing a Portfolio Funds, Difficulty in selecting a Suitable Fund Scheme.

**6. Findings & Recommendations**

Stock mutual funds are not designed for such short term investment. Investing in funds can have a few bad years in a row and you could lose much of your investment. If you are going to need the money in 2 or 3 years you are better off with short term bond funds or bank CD's. There is a little more risk in bond funds, even short term ones since interest rates are so low. As you may know if interest rates rise the value of your bond fund will go down. If you were investing for a longer term e.g. more than 5 years I would suggest that first you educate yourself. You can easily lose your shirt if you don't know what you are doing. I suggest the *Bogleheads* guide to Investing. It is written in an easy to understand manner. You will find educating yourself about investing to be valuable for the rest of your life - so do yourself a favor.

Mutual Funds industry is penetrating into rural & semi urban areas, Growth Rate of MF was 100% in the last 6 yrs & is expected to grow even more, It has been predicted that by March-end of 2012, the MF Industry of India will reach Rs 99,90,000 crore, taking into account the total assets of the Indian



commercial banks, Product innovation, Distribution channel innovation, Quality Financial Planning.

## 7. CONCLUSION

Running a successful Mutual Fund requires complete understanding of the peculiarities of the Indian Stock Market and also the psyche of the small investors. This study has made an attempt to understand the financial behavior of Mutual Fund investors in connection with the preferences of Brand (AMC), Products, Channels etc. I observed that many of people have fear of Mutual Fund. They have a notion that money is not secure in the mutual fund front. They need to be educated more on Mutual fund only then knowledge of Mutual Fund and its related terms can be attained. Many people have not invested in mutual fund due to lack of awareness although they have money to invest. As the awareness and income is growing the number of mutual fund investors are also growing. “Brand” plays important role for the investment. People invest in those Companies where they have faith or they are well known with them. There are many AMCs in Cochin but only some are performing well due to Brand awareness.

Some AMCs are not performing well although some of the schemes of them are giving good return because of not awareness about Brand. Reliance, SBIMF, ICICI Prudential etc. they are well known brands and are performing well and their Assets Under Management is larger than others whose Brand name are not well known. Financial Advisors are the most preferred channel for the investment in mutual fund. They can change investors’ mind from one investment option to others. Many of investors directly invest their money through AMC because they do not have to pay entry load. Only those people invest directly who know well about mutual fund and its operations.

The study conducted shows clearly that UTI is more preferred by individuals also the LIC has been able to capture majority of the Total share market. When taking a look into the review conducted it is seen that and it's hard to ignore that the domestic market was up about 33%, or about 10 point better than most international markets. Expect that trend to continue, even as investors throw the bulk of their dollars into domestic issues.

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## **A STUDY ON INVESTORS' AWARENESS AND PREFERENCE ON VARIOUS INVESTMENT AVENUES**

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### **ABSTRACT**

*Investment refers to acquisition of some assets. It means use of funds for productive purposes, for securing some objectives like income, capital appreciation or for further production of goods and services with the objective of securing returns. The dynamics of economic growth of the country provides various opportunities for investors to invest their money in different types of securities. There are many alternative investments for investors viz. direct investment and indirect investment. The direct investment can be classified as fixed principal investments like cash, savings account, saving certificates, government bonds, and corporate bonds, variable principal investments like preference shares, equity shares and convertible debentures and non-security investment like real estate, mortgages, commodities and business ventures. Indirect investments are pension funds, provident funds, insurance policies, unit trust and other trust funds. So investors should have awareness on all the avenues of investments to optimize return and minimize risk. All investments are subject to risk that means there is a possibility of incurring loss in future. The*

*ultimate objective of the investor is to derive a variety of investment opportunities that meet his/her preference of risk and expected return. The investor will select the portfolio which will maximize his/her profitability or minimize loss. The present paper tries to study on investors' awareness and preference on various investment avenues.*

**Key Words:** Investment, Investors, Investment Avenues, Awareness and Preferences

## 1. INTRODUCTION

Investment refers to acquisition of some assets. It means use of funds for productive purposes, for securing some objectives like income, capital appreciation or for further production of goods and services with the objective of securing returns. The role of savings and investments has been given paramount importance in promoting economic growth of India since Independence. With the advent of Liberalisation, Privatisation and Globalisation, the Indian economy has been opened up and many developments have been taking place, especially in capital and money markets. The revolution in the development of communication technology has become so advanced and that also helped to link the issuers of financial instruments with the investors in the global financial market without any difficulty. All these developments lead to economic growth and the dynamics of economic growth provide various opportunities not only in the Indian market but also in the global market for investors to invest their savings in different attractive avenues of investments with various features matching with their financial goals. The selection of an appropriate type of investment among the various investment avenues is predominantly determined by the financial goal of the investors. The main concern for investors is optimum allocation of available

funds among different avenues of investments. The investor will select the portfolio which will maximize his/her profitability or minimize loss. Securities present a wide range of risks, from risk free instruments to highly risk speculative shares and debentures. There are many alternative investments for investors viz. direct investment and indirect investment. The direct investment can be classified as fixed principal investments like cash, savings account, saving certificates, government bonds, and corporate bonds, variable principal investments like preference shares, equity shares and convertible debentures and non-security investment like real estate, mortgages, commodities and business ventures. Indirect investments are pension funds, provident funds, insurance policies, unit trust and other trust funds. So investors should have awareness and preference on all the avenues of investments to optimize return and minimize risk. In this context, it is felt necessary to undertake a study on this aspect. Hence, the present study, 'A study on investors' Awareness and Preference on various Investment Avenues' is undertaken.

## **2. LITERATURE REVIEW**

Some of the literatures pertaining to the study are:

*NCAER- SEBI (2000)* carried out a survey to estimate the number of householders and the population of individual investors, their economic and demographic profile, portfolio size, and investment preference for equity as well as other saving instruments. This was a unique and comprehensive study of Indian investors.

*Bandagar (2000)* conducted a study to know the preference of investors in Greater Bombay on financial instruments. This study throws an interesting light on trends in investment preferences of the middle class investor in that time as well as their future behavior. The study reveals that most of the investors were

highly educated and they took their own decisions regarding their investments. They lack the skill and knowledge of investing. The investors have large amount of monthly income and they prefer to invest in risky securities.

*Mukhopadhyay (2004)* investigated the basic factors responsible for choice of financial assets for investment. The findings suggest that life insurance policy is the most popular investment avenue. Indian stock market is devoid of investors' educational infrastructure; people are unaware of the existence and functioning of mutual funds which do have tremendous future prospects, provided it is groomed up properly. The overall result revealed that the investment behavior of investors reflected underdeveloped nature of Indian financial market.

*Shanmugasundaram and Balakrishnan (2010)* found out that investors frequently make poor decisions caused by psychological bias and emotion. Investments were made with an avowed objective of maximizing the wealth. Investors were needed to make rational decisions for maximizing their returns based on the information available by making judgments free from emotions. Researchers have found that investors often make errors - like failing to react quickly enough to new information that challenges their existing options. Investor behavior was characterized by overexcitement and over reaction in both rising and falling stock markets. This research investigated how investors interpret and act on information to make informed investment decisions and also tried to understand and predict systematic financial market implications of psychological decision making processes. Empirical evidence suggested that demographic factors influence investors' investment decision.

Chaturvedi and Khare (2012) examined the investment pattern and awareness of the Indian Investors about different investment instruments such as bank deposits, real estate, small savings, life insurance schemes, bullions, commercial

deposits, corporate security- bonds, mutual funds, and equity and preference shares. The research found the impact of age, education, occupation and income level of the individual on investment. The objectives of the study were to study the awareness and preferences of investors for different investment option available to them and to analyze the factors influencing their perception and preferences. More especially, an attempt has been made in this study to measure the level of awareness of investors about several pre-identified investment products; to rank the investment products in terms of awareness; to analyze the relation between awareness and socio-economic factors relating to the investors; to study the preferences of investors for different investment products; and finally to identify the factors influencing investor awareness and preferences.

From the above review there is clear that there is no detailed study is undertaken in this aspect.

### **3. OBJECTIVE**

To ascertain the preference of mutual fund investors in respect of various investment avenues.

### **4. HYPOTHESIS**

H0: There does not exists significant association between selected demographic variables of investors such as gender and age and their preferences for various avenues of investments.

H1. There exists significant association between selected demographic variables of investors such as gender and age and their preferences for various avenues of investments.

## 5. METHODOLOGY

The present study is descriptive and explanatory in nature. Both secondary and primary data were collected and used for the study. Primary data required for the study were collected from 900 individual investors in Kerala who have investments in mutual funds. Multi-stage sampling was adopted for selection of respondents for the study. In order to achieve the objectives of the study, a well-structured questionnaire was developed. The collected data were tabulated and analysed with the help of SPSS. The statistical tools used for analysis include Standard Deviation, Co-efficient of Variation Weighted Average Mean, Friedman Repeated Measures on Rank, Wilcoxon Signed Rank Test.

## 6. Analysis and Interpretation

### *Investment Avenues and Investment Decisions*

#### *5.1. Awareness on Investment Avenues*

Investment refers to acquisition of some assets. It means use of funds for productive purposes, for securing some objectives like income, capital appreciation or for further production of goods and services with the objective of securing returns. The dynamics of economic growth of the country provides various opportunities for investors to invest their money in different types of securities. All investments are subject to risk that means there is a possibility of incurring loss in future. The ultimate objective of the investor is to derive a variety of investment opportunities that meet his/her preference of risk and expected return. The investor will select the portfolio which will maximize his/her profitability or minimize loss. Securities present a wide range of risks, from risk free instruments to highly risk speculative shares and debentures. There are many alternative investments for investors viz. direct investment and indirect investment. The direct investment can be classified as fixed principal



investments like cash, savings account, saving certificates, government bonds, and corporate bonds, variable principal investments like preference shares, equity shares and convertible debentures and non-security investment like real estate, mortgages, commodities and business ventures. Indirect investments are pension funds, provident funds, insurance policies, unit trust and other trust funds. So investors should have awareness on all the avenues of investments to optimize return and minimize risk.

In the present study thirteen investment avenues which are commonly knowledgeable to the investors are considered. Reliability was tested using Cronbach's alpha and it was found to be 0.834 which is sufficient for conducting a study.

Table 1. Investors' Awareness on Investment Avenues

Saving Avenues	Mean	Std. Deviation	CV	Rank
Bank Deposits	4.63	0.62	13.35	1
Life Insurance	4.49	0.71	15.81	2
Chits	4.48	0.84	18.78	3
Mutual Funds	4.37	0.87	19.81	4
Gold and Stones	4.21	0.82	19.51	5
Shares	4.11	0.96	23.25	6
Postal Deposits	4.00	0.79	19.81	7
Real Estate	3.78	1.07	28.24	8
Bonds and Debentures	3.67	0.92	25.13	9
Pension and PF	3.47	0.91	26.22	10
Small Savings	3.27	1	30.72	11
Company Deposits	2.9	0.93	32.09	12
Arts Fund	1.72	0.98	57.23	13

*Source: Field Survey.*

The respondents won a five point scale. If their awareness level was high for an investment avenue, they had to mark 5 as the rank of which is high and so on. The data collected are tabulated and weighted mean scores are calculated. Based on the mean score ranks were assigned, the result thus obtained are presented in Table 1.

From the above Table, it is clear that the awareness of mutual fund investors among various investment avenues varies. They are mostly aware about bank deposits, followed by life insurance, chits, mutual funds, gold and stones, shares, postal deposits, real estate, bonds and debentures, pension and PF, small savings of government, company deposits and arts fund. From this, it is clear that, the mutual fund investors' awareness on mutual funds is only in the fourth position.

Table. 2. Investors' Preference on Investment Avenues

Investment Avenues	Mean	Rank
Bank Deposit	12.224	1
Life Insurance	10.605	2
Mutual Funds	10.511	3
Chits	9.274	4
Shares	9.207	5
Postal Deposits	8.819	6
Gold and Precious Stone	8.139	7
Pension and PF	7.879	8
Real Estate	7.804	9
Bonds and Debentures	7.502	10
Company Deposits	7.012	11
Small Saving Scheme	6.959	12
Art Fund	4.092	13

Source: Field Survey.

### 5.2 Preference of Investment Avenues

After considering the awareness of mutual fund investors on various investment avenues, they were asked to rank at least eight of these avenues according to their order of preference as 1 for most preferred, 2 for next preferred and so on to know their preference in choosing investors on these saving avenues. Table 2 shows the preference of investors on various avenues of investments. From the analysis of the Table 2 given above, it can be understood that the most preferred investment avenue of the mutual fund investor is bank deposits, followed by life insurance. Mutual Fund comes in the third position. The least preferred avenue is art fund which may be due to lack of awareness on this type of saving avenues.

Table 3 Investors' Preference on Investment Avenues-Gender wise Analysis

Saving Avenues	Gender					
	Male			Female		
	Mean	Rank	N	Mean	Rank	N
Bank Deposit	12.291	1	736	11.919	1	161
Life Insurance	10.510	3	730	11.037	2	161
Shares	9.264	5	647	8.875	6	112
Pension and PF	7.739	9	299	8.395	8	81
Bonds and Debentures	7.597	10	236	7.215	9	79
Mutual Funds	10.678	2	727	9.731	3	156
Company Deposits	7.043	11	186	6.912	11	57
Postal Deposits	8.656	6	518	9.469	4	130
Chits	9.275	4	684	9.268	5	138
Small Saving Scheme	6.959	12	245	6.957	10	69
Gold and Precious Stone	7.980	8	643	8.837	7	147
Real Estate	7.994	7	467	6.735	12	83
Art Fund	4.453	13	106	2.500	13	24
Z = 3.180**; p<0.001						

\*\* significant at 0.01 levels; Source: Field Survey.

To know whether there exists any significant difference in the preference on various saving avenues on gender, age and income analysis was conducted. The data collected from mutual fund investors on their preference among various saving avenues were cross tabulated with gender and presented in Table 3.

Table 4 Investors' Preference on Investment Avenues - Age- wise Analysis

Investment Avenues	Age							
	Below 20		20-40		40-60		60andabove	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Bank Deposit	12	1	12.122	1	12.383	1	12.278	1
Life Insurance	11.5	2	10.682	2	10.547	3	9.111	3
Shares	6	10	9.236	5	9.207	5	8.111	7
Pension and PF	9	5	7.82	8	8.000	8	7.545	10
Bonds and Debentures	6.5	9	7.628	9	7.278	10	8.25	6
Mutual Funds	9	5	10.519	3	10.615	2	8.722	4
Company Deposits	8	8	6.98	11	7.105	11	6.2	11
Postal Deposits	9.167	4	8.841	6	8.671	6	10.111	2
Chits	10.833	3	9.256	4	9.304	4	8.722	4
Small Saving Scheme	8.8	6	6.827	12	6.967	12	7.923	8
Gold and Precious Stone	8.5	7	8.229	7	7.963	9	8.588	5
Real Estate			7.585	10	8.13	7	7.889	9
Art Fund			3.89	13	4.705	13	1.5	12

$\chi^2 = 8.145^{**}$ ; df = 3; p < 0.05

\*\* significant at 0.01 levels; Source: Field Survey

From the Table given above it can be noted that the first preference for saving avenue for both the males and females are the same, bank deposits. The order of preference of saving avenues for male are mutual funds, life insurance, chits, shares, postal deposits, real estate, gold and precious stones, pension and PF, bonds and debentures, company deposits, small saving scheme and art fund respectively. The order of preference of saving avenues for female are life insurance, mutual funds, postal deposits, chits, shares, gold and precious stones, pension and PF, small saving schemes of the government, company deposits, real estate and arts fund respectively. From this it is clear that the preference for real estate funds for both male and female are in the same order. This may be because both of them are lacking awareness on this saving avenue. From the analysis it can be understood that except for the first, eleven and thirteenth choice the order of preference varies according to the gender. Wilcoxon Signed Rank Test was conducted to test the differences in the preferences among male and female respondents. It was found to be significant. This indicates that there exists significant difference in the preferences of male and female respondents on various investment avenues.

The response of mutual fund investors on the preference of various saving avenues also cross-tabulated with their age and the result obtained is exhibited in Table 4. From Table 4, it can be noted that, irrespective of the age groups, all investors' most preferred saving avenue is bank deposits. The order of preference of below 20 age group was life insurance, chits, postal deposits, mutual funds, small saving schemes, gold and precious stones, company deposits, bonds and debentures and shares. For the respondents in the age group 20-40, the order of preference was life insurance, mutual funds, chits, shares, postal deposits, gold and precious stones, pension and PF, bonds and debentures, real estate, company deposits, small saving schemes and arts fund respectively. For the age group 40-60, the saving avenue preference is in the order, mutual funds, life insurance,

chits, shares, postal deposits, gold and precious stones, bonds and debentures, company deposits, small savings schemes and arts funds respectively. Postal deposits, life insurance, mutual funds and chits (each got fourth rank), gold and precious stones, bonds and debentures, shares, small saving scheme, real estate, pension and PF, company deposits and arts fund are the order of preference of the age group of 60 and above. From the Table it is clear that the preference of saving avenues differ according to the various age groups. Difference in the preferences among different age groups was tested by using Friedman test and the significant Chi square reveals that age has influence on the preferences of the respondents on various avenues of investments.

The data (Tables 3 & 4) analysed with the help of Wilcoxon signed rank test at one per cent level of significance and Friedman test at one per cent level of significance to test the association of selected demographic variables of investors and their preference on various investment avenues, supported and proved the hypothesis stated: *There exists significant association between selected demographic variables of investors such as gender and age and their preferences for various avenues of investments.*

## 7. CONCLUSION

The revolution in the development of communication technology has become so advanced and that also helped to link the issuers of financial instruments with the investors in the global financial market without any difficulty. All these developments lead to economic growth and the dynamics of economic growth provide various opportunities not only in the Indian market but also in the global market for investors to invest their savings in different attractive avenues of investments with various features matching with their financial goals. The selection of an appropriate type of investment among the

various investment avenues is predominantly determined by the financial goal of the investors. So it is advisable for the issuers of financial instruments to know the awareness and preference of investors on various avenues and their risk – return trade-off.

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# **ONLINE BANKING - RISK FACTORS AND SAFETY MEASURES**

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In olden days you need to go to the bank for every banking transaction. Sometimes you may find that the banks are closed or the banking hours are not suitable to you or location of the bank is not convenient to you. There are many difficulties you face when you go to your bank personally. To avoid these difficulties the only one solution is online banking.

With the development of technology and the internet particularly you do not have to visit the bank personally, you can access your bank account via internet by registering yourself with your bank for online banking. Through online banking you can make deposits, withdrawals and even pay your bills by just clicking the mouse, the only thing you need is a computer with an internet access. By using online banking you can avoid the queue and the make transactions from the convenience of your home or office. You can check your bank balance and transactions and pay your bills online by typing the instructions on the internet. The fee for online banking is very low and this service worth every rupee spent on it. Another advantage is that there is no waste of paper and time. The bank in the ordinary course prints your bank account statement and then posts it, this process used to take a lot of time and money; this is avoided by online banking.



Online banking is a new concept of banking. It means a self service method of banking. Banking itself was never wrong but our dependence on banking was too much and that is why we faced many disappointments. In online banking the customer is the sole financial controller of his on finance. The customer performs his on banking transactions by using the internet. We can book tickets of railways, buses, airlines to any place in the world; we can shop anything and everything with online banking and also make payment online. All banking transactions can be carried out with online banking. This online service is provided by almost all the banks, twenty four hours a day and seven days a week. This service gives the customer the freedom of timings. You can pay your bills or even make purchases at any point of time and day at your convenience.

There are many banks and financial institutions that provide internet services of banking. The best part of online banking is that these services are provided at no extra cost. In fact we save lot of money on postal charges and also we do not have to travel all the way to the bank, thus our traveling expense is also saved. Banks also profit by providing these services because they do not need huge staff and do not have to pay huge salaries. This savings of banks are transferred to customers by providing them high interest rates.

### **Advantages of Online Banking**

Online banking services give more interest rates than any other form of banking and also save lot of expenses. We can carry out all banking transactions at our own convenience and do not have to depend on normal bank timings. Lot of precious time is saved because of online banking, as transactions are carried out in seconds and we can see the updates immediately. Since everything is computerized, we save all the paper work and we save the trouble of maintaining physical records. There is nothing manual hence the records are perfect and

accurate. Bank also provides balance alerts if our balance reduces and alerts the customers in case of due dates of our bills occurs. There are no extra charges and these online banking services are absolutely free. Previously banks used to charge heavily for all these services. There is improvement in customers' access, since the bank can access more customers within a short time through the internet. The customers can be offered more services through online banking.

**Risk Factors of online banking which restricts people to use this service**

Online banking has reduced the customer's personal interaction, since all the transactions are handled by the customers through the internet account. There is no personalized banking service which reduces customer to bank interaction.

When you are entering online banking information there is always a chance that the information may be leaked or your account can be hacked and all your confidential information is leaked. There are many banks that have good security systems to guard such thefts.

You can access your online banking account by entering your personal identification and your password. This password can be used by anyone to access your account and transfer funds or cause financial problems. Whereas when you visit the bank personally your account is handled by the bank staff and therefore your confidential information cannot be viewed by anyone. Also all your instructions are given in writing with your signature, therefore there are less chances of fraud and information leak.

When you are using internet banking the internet security is a big problem faced by many banks. So the customers must be aware of the security issues and protect their identity and other personal details from hackers.

### **Safety measures**

Avoid accessing your account from a cyber café or shared computer. If you happen to do so then change your password as soon as you finish your banking transaction. Every time you finish using your online banking session then sign out from the site rather than just closing the browser. Change your internet banking password after your first login and thereafter regularly. Use complex and difficult password and make it difficult for others to guess. Use different ID and password for different internet accounts. Never share your passwords or login details with anybody. View your account daily and check it with your transactions, if there is anything which does not tally with your instructions then inform your bank immediately

High-tech technological advancements in the form of intrusion detection systems to virus control equipments have made online banking system fool proof and hazard free. However, regardless of the fact it is vital on the part of every customer to undertake precautionary measures while transacting online. The advantages of online banking out number its disadvantages and therefore this form of banking has become very popular with the customers. In this modern age of banking, online banking or net banking has made things easier for people and saves lot of time. Though internet banking is the need of every customer, some banks are still not having advance features like transferring money to any bank across the country or easy registration for net banking; this is because some banks are situated in the rural areas where the use of computer is not common. All customers of all banks can be linked by net banking only if technology reaches even the most remote areas of the country.

**Online banking in India**

Most of the big names in the global banking industry succumbed to the recent financial turmoil and subprime crisis. The Indian banking sector however stood firm holding its ground. When most of the global banks were being written off due to bankruptcy, it was the Indian banks that were sailing through with ease. The Indian banking sector has witnessed phenomenal growth over the last few years mostly because of the introduction of the latest banking techniques and online banking services.

The Indian banking industry has undergone unprecedented rivalry among unconventional banking organizations ever since they have pioneered banking and fiscal services over the internet. The introduction of latest technologies along with the deregulation of the banking sector has attracted new players to make a foray into the industry rapidly and competently.

Considering the rate at which the Indian economy is developing, the introduction of online banking has made things much easier for the fast moving lives that the current Indian is living. The best thing about internet banking is that it saves time. Gone are the days of standing in long queues and filling up large forms. Transactions with banks can now be done just with the clicking of some buttons. Once you register with your bank for internet banking you can carry out all you're banking transactions from anywhere in the world visiting the bank is no more a compulsion.

**Online banking- convenient method of banking**

In this fast developing world everybody wants things to happen in no time. Internet and modern communication methods and devices allow you to get all information and reduce the distance from one place to another. Earlier there

were joint families and now the family is not living jointly together and scattered around the world. Yes we are ready to accept the universal family with the communication methods which allow them to be together easily and conveniently. At this scenario the traditional banking method also going to history. Online banking facilitates are everywhere. You can handle all your financial transactions through a few mouse clicks.

One of the important and popular advantages of online banking is that you can know your banking transactions easily and at any time from your home or office with the help of a computer and internet. Earlier you had to stand the long queue to update your passbook or should wait for the mercy of banking clerk to know whether your cheques are cleared or not or the status of any other transactions.

You can pay your utility bills and credit card bills easily with online banking service and can avoid the fear of dishonor of cheques which you deposited after standing a long queue. If one of your cheques is dishonored, you may have loss of money and some other type of losses including loss of faith, bad credit report etc.

You can get your bank statement online whenever you need and can check all your transactions. You can provide the hard copy of your bank statement to any agencies etc, without visiting your bank.

Internet banking in India is a welcome change for the customers and a money-spinning delivery network for the financial institutions. Mentioned below are some of the advantages of internet banking in India.

The customers can access his account anytime and from any part of the world.

No monthly payments are required to forfeit for availing this service. Free of charge bill imbursement and refunds on ATM surcharges. Attractive interest rates on CDs, savings, etc. Credit card service at minimum charges. Simple online submissions for personal accounts, loans and credits.

In the present scenario almost every bank in the country offers online banking facility. The banks in India are also planning to extend their online banking services to the rural areas of the country in order to educate the customers and also point out the benefits of internet banking.