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# CONTENTS

## *Research Papers*

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# STRATEGIC ANALYSIS: SUCCESS OF CONVENIENCE STORES OF MEXICAN ECONOMIC AND TRADE PROMOTION

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**ABSTRACT**
*The objective of this research is to identify the various strategies implemented by the convenience store chain that dominates the retail market in the country for which a review will be some of the different scientific approaches available to explain the performance competitive organization. The results allow to conclude that implementation of a strategic framework is what determines the success of modern format stores in the market for retail that were subject this case study.*

*Keywords: Acquisition, alliances, diversification, corporate strategy, vertical integration.*

## 1. INTRODUCTION

Businesses today are constantly faced with a globalized and competitive world that demands constant alertness to seize any market opportunity that guarantees their staying and would achieve the objective for which they were created. That is why no company can compete without the necessary strategies to achieve those objectives and it is the task of the owners or managers that such course of action is closely scrutinized. Thus, Leibenstein (1968) pointed entrepreneurship as a scarce resource in terms of being entrepreneurs who perform activities and actions associated with perception and pursuit of business opportunities.

The objective of this research is to identify the various strategies implemented by the convenience store chain that dominates the retail market in the country. Because this business format in the country is in direct competition with the so-called "corner shops" belonging to the group of MSMEs, they areconsidered the engine of the economy for their contribution in generating employment and wealth for the country. This is the main reason why there isa remarkable growth of convenience stores in this sector, which it has been identified as a major threat and they really are. Not because it is increasingly opening more outlets for its more than 12,800 relatively affordable units which are few when compared with 947,248 relating to miscellaneous and grocery stores within the sector (DENUE, 2015), but for the set of strategies to support their competitive behavior and constant expansion.

The approach so far made can highlight how the figure of the manager determines the success of the company, because although in structure and access to resources is not possible to establish points of comparison between a unit of traditional retail trade to a convenience store, both converge on the need to develop strategies being notorious the difference between a company that can reach individually to that supported by a corporate management despite presumably have the same business format. This being the starting point for determining the object of study of this research descriptive of the commercial chain OXXO-FEMSA.

Corporate strategies are formulated by the highest level of the organizational structure and the action plan of a diversified company with all its scope to multi model business (Luna, 2010). Companies engaged in various industries detect expansion opportunities as Peng (2012) points to increase a company's business with different operations to current, facing the decision of how to do it, either through vertical integration by joining with others, establishing strategic alliances or diversifying its products. This combination of strategies is being observed in the competitive behavior that has been detonated in the unquestionable success of the convenience store chain driven by FEMSA among its other business units.

Indicating the importance of the strategic approach for the competitive performance of companies arise the interest to identify which are those that have determined the success of convenience stores which has marked its difference from their direct competition and even traditional trade stores. This being a possible model to follow constrained by the availability of resources and structure that represents a major challenge for those seeking to venture into the retail market. So, the definition of competitive strategies is the key to survival in a globalized environment.

The present study was developed through a descriptive analysis of the strategies adopted by the chain's convenience stores in the country that have allowed them a competitive advantage constantly expanding. To this end, it was made a literature review in strategic management that allowed the theoretical basis of competitive behavior observed from the perspective of agency theory, theory of resources and capabilities and industry-based theory.

ISSN 2394 - 7780

## 2. BACKGROUND OF THE PROBLEM

### A. The retail industry in Mexico

The retail trade is one of the main activities of the country as currently employs over other industrial and services sectors. Currently, the retail trade sector is involved in a fierce competition, because the supply has increased markedly and consumer needs are becoming more complex to meet each day. This has led to companies in this sector to establish various strategies to strengthen their competitive advantage. The convenience store format as derived from a combination of miscellaneous grocery stores format and convenience store originating in the United States, with particular characteristics that have grown and have great importance in the retail industry as what are location, size, service, speed and identification of needs.

Mexico andseveral Latin American countriesthere have been changes inretailer consumerpreferencesbecause after the conceptionrootedin cornerconvenience storethat represents 35% of household consumptionwhile consumptioninconvenience store obtains already 47% of theconsumer spendingaccording to the analysisWorlpanel(Monex, 2014). Thesubsectorofretaildepartment stores and supermarketsis the generatorof 733, 430directjobs with a contribution of2.1% to the national GDP(ANTAD, 2015) through 40,056storesonly.

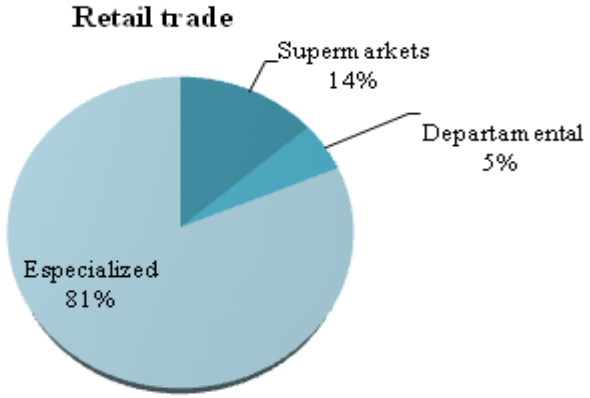
Table 1Retailtaxonomy

| NAICS (SCIAN) classification | Format | Description |
|---|---|---|
| Retailin grocery stores, groceries andsundries | Traditional | It is characterizedby proximity to theconsumer. |
| Supermarketsand department stores. | supermarkets | Integrates supermarkets, hypermarkets and warehouses. |
| | Conveniences stores | Near consumer, extended hoursofserviceand assortment. |
| | Price clubs | Wholesales |
| | Pharmacies | Pharmacies |

Source: Own elaboration based on dataINEGIandANTAD.

The country has a total of 40,056 stores within the classification of supermarkets and department stores, equivalent to 24,864 square meters as a distribution channel. Of which 81% are convenience stores, being the commercial chain of FEMSA the one that represents 53% of the subsector.

**Figure 1: Integration of Retail Market**




Source: Prepared with data from ANTAD (2015).

### B. Features of the structure of retail trade

The characteristics of firms in the retail trade may be defined in terms of structure, size and differentiation of services. This is segmented into traditional trade and modern trade. So that SMEs find their place within the traditional format stores, which in terms of structure are serving the defining characteristics identified by the Bolton Committee for SMEs as companies that have a relatively small market share, have among their managers the owner, with a customized structure and lack of a formal management structure (Curran and Blackburn, 2001). While for modern format stores with outstanding convenience stores, it is observed that these work under the concept of subsidiaries of large firms with different business models or under a franchise scheme.

ISSN 2394 - 7780

So that it is possible to observe differences in the competitive performance between the two types of format to be implementing multiple strategies within the main convenience stores. Its structure serves as the logic of a business model perceived as a set of assets, activities and structure of government assets to create value (Osterwalder, Pigneur, 2010). Have a strategic plan that defines the guidelines on how the business was managed, so that these strategic actions are appropriately selected to enable the use of all their resources in the best way and take advantage of opportunities created by the constant changes of the market that also it allows them to participate in various industries with the same technological base.

These strategic decisions regarding revenues and profits trying to get these companies are made at the corporate level, so a well-defined corporate strategy is the key to creating competitive advantage (McDowell, 1994). This strategy is crucial because it is the way the company creates value through the configuration and coordination of multi-market activities i.e. is formed by measures which allow the position of businesses within various industries (Vargas-Hernandez, Guerra-Garcia,Bojorquez-Gutierrez, Bojorquez-Gutiérrez, 2014), which in turn has enabled them to have horizontal and vertical structures, geographic strategic deployments, diversification, among others that have enabled steady growth.

## 3. DEFINITION OF THE PROBLEM

Through this research, it aims to identify the various strategies implemented by the convenience store chain that dominates the retail market in the country. This from the question arising from the problem that traditional trading companies are facing at the apparent threat of this business format of modern consumer. Thus, this research is trying to answer the question: Is the implementation of multiple strategies together what supports their competitive behavior and constant expansion of the convenience stores in México?

## 4. ASSUMPTION OF RESEARCH

The implementation of a strategic framework determines the success and steady growth of convenience store modern format.

## 5. TARGET

The objective of this research with the support of theories of resources and capabilities, industry-based approach and agency theory is to identify the various strategies implemented by the convenience store chain to dominate the retail market in the country.

## 6. JUSTIFICATION

Perform strategic analysis of the business model followed by convenience stores, in specific at the Oxxo retail chain owned by FEMSA is to allow it to expand the vision of those competing in this sector. In effect, competition represents a powerful threat to those who continue to operate without have defined a business strategy that serves as a guide to direct actions towards a competitive behavior and not in relation to the number of units of this small business format that opens every day. This is a motive why it is highlighted how the figure of the manager determines the key factor to the success of the company, because it is independent of the size and resources available to both store formats thathave a point of convergence in need to establish strategies.

Thus, to identify the key factors that are associated with the implementation of various strategies by the chains of convenience. This allows SMEs involved in the market of retail trade deal, to adopt strategic plans to face the current problems of the growing trend towards consumers by consumption in the modern format.

## 7. CONTEXTUAL FRAMEWORK

### A. History and overview of the company

The objective of FEMSA's is to improve beer sales through outlets owned by the Company and to obtain information about consumer preferences. This was what incentive the entry to the retail industry, giving rise to FEMSA Trade in 1978, when the first two OXXO stores were opened. This strategy was successful in recent years, and since 2010 this chain acted as the main channel of the company, selling about 16% of all beer produced in 2010 and 40% of total sales in its convenience stores. It has also been an effective distribution channel for carbonated beverages fromother major business units of the company.

The main strategy of OXXO retail chain is constantly expanding as it has developed a complex system to evaluate potential new stores, the mixture of suitable products and the most convenient format. This system combines demographics, data from nearby shops and consumer profiles to improve performance of its store by store allowing it to open 1,040, 1,120 and 1,132 new units in the years 2012, 2013 and 2014 respectively. This strategy included opening conveniences stores in non-traditional places such as shopping malls and airports, where they now have high traffic. OXXO stores currently operates 12,853, out of which 12,812 are located

ISSN 2394 - 7780

throughout the country and 41 in Colombia, with a particularly strong presence in Northern Mexico offering about 2,744 products in 31 major categories.

**B. Business strategy**

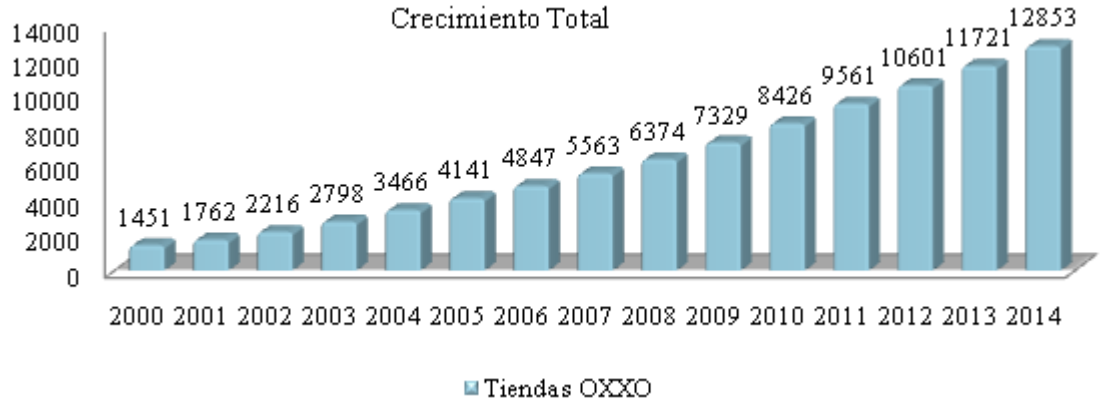
FEMSA's business strategy is to use its trade position in the market for small format stores to grow profitably and efficiently. As the market leader, it has a deep knowledge of their markets and considerable experience in the operation of a chain of stores with a national presence allowing it to continue capitalizing on the market knowledge it has acquired through its existing stores. This has allowed it to develop its own business model with the advantage to identify optimal store locations.

Market segmentation is an important strategic tool allows the firm to improve the operating efficiency of each location and the overall profitability of the chain. In addition to making substantial investments in IT to improve its ability to capture customer information and improve its overall operating performance through the integration of such systems within a network that enables communication across the company. As a strategy for revenue management, product categorization was implemented so that information was more efficient.

The success of OXXO's promotional strategies can be attributed to its ability to work together with its suppliers that has allowed it to developcapability to executing differentiated promotions, mixed and aimed at attracting new customer segments. Additionally, it has also developed the capability to offer more services to its consumers, such as payment services and other basic transactions. In addition to the strategy of strategic location of stores where from a thorough study of convenience turns to credit providers that enable it to fund its initial inventories to promoting rapid growth.

The scale of operationsofthe retail chainis a competitive advantagethat allowsrealizing strategic alliancesswith suppliersasone of thegoals is thatconsumersfind what they want.This is toensurethatthe chainhas 16CEDISwhereprovidersarelimitedin resourcesto distribute itsproducts throughthis chain.Since the mainstrategyis theconstantexpansion,much of investmentof FEMSAon the chaingoes tothe construction and openingofnew stores.During2014, it opened 1,132new stores. The amount investedby the companyin 2014was5,191 millionmnx, which wentto the addition ofnew stores,warehouses and improvementsto leased properties.

**Figure 2: Total Growths by Opening Stores**




Source: Compiled fromdataFEMSA2014Annual Report.

As part of OXXO's management strategies that contribute to its competitive advantage is investment in staff training in order to promote loyalty, customer service and maintain a low staff turnover. Thus,its operation strategy for approximately 59% of the stores is operated by independent managers responsible for all aspects of the operation of the stores. The managers are commission agents and are not employees of the company. Each store manager is the legal employer of staff thereof; which in turn enableshim to maintain full control of operations and maintain out of the franchise scheme.

The great expansion of chain stores is also due to it being only 11.2% of owners of business premises. The strategy of establishing long term leases with third parties gives it the opportunity to create flows for the start of operations of each point.

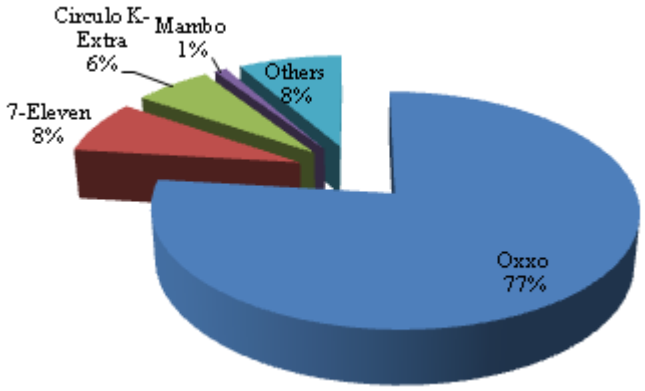
**C. Competition**

The retail market is highly competitive in the format of convenience stores. The OXXO´s chain faces competition from small format stores like 7-Eleven, Super Extra, Super City, Circle-K, as well as numerous other retail chains around Mexico, other regional stores as well as traditional format stores (Miscellaneous). This competition is therefore for consumers and new locations for stores as well as for the managers to operate

ISSN 2394 - 7780

them. The average store size is about 104 square meters, according to all accompanying structures and the number of units inside the market; they participate by 77% in the market share of the trade sector in retail convenience stores nationwide.

**Figure 3: Market Share of the Convenience Store.**




Source: Prepared by Euromonitor International data

**D. Vertical integration**

This retail chain also operates following vertical integration strategies because it has a wide range of private label products which is growing both in size and in sales. This in turn also has allowed it take convenience stores to displace and move to other brands available on shelf space and compete on price, giving them the opportunity to offer lower prices than the competition. They are Andatti, Bitz, Chevere, Del Marqués, Azalea, Nutradog, among others.

**E. Diversification strategies**

**1). Entry on drug market**

Following a growth strategy maximizing the opportunity, the company entered the market of pharmacies in Mexico since 2013. This was through acquisition of pharmacy YZA operating 330 stores at the date of acquisition. Later this transaction provided the opportunity to acquire Modern Pharmacy (Farmacias Modernas). In 2014 it agreed to acquire 100% Pharmacy pharmakon (Farmacias Farmacon), which highlights the capacity and ability of these shops to venture into different markets.

**2). Entry into the sector Quick Service Restaurants of fast food**.

Within the guidelines of its growth strategy opens a new route expansion within the quick service restaurant sector. Through the acquisition of 80% of Doña Tota chain leader in the industry in the Northeast country.

**3). Entry on Gas Sector.**

OXXO enter this sector since 1995 working through agreements with third parties that have franchises of PEMEX created the brand OXXO Gas. Given the chance that changes in the Energy Reform in Mexico, it opens the way for free foray into the sector so within the next expansion plans include the acquisition of other stations.The content of this section has as a source of information the 2014 Annual Report available on its website FEMSA (2014).

**8. THEORETICAL FRAMEWORK**

**A. Theory of resources and capabilities**

The company is a collection of productive resources physical, human and intangible, where the growth of the company is defined by how are managed the same (Penrose, 1959). The overall purpose of the company is to combine equity of own resources with other resources acquired abroad so that generate profits. However, under this approach, the company growth is limited by the capacity of management, market uncertainty and risk. A company is successful to the extent that its combined resources will allow it to generate income and be able to respond to market changes (Wernerfelt, 1984). An advantage of resource management is that the company has an infinite number of combinations that can be developed to specialize or diversify.

In the search for diversification coupled with the rivalry of the companies they pursue perfection of their organizational capacities generating continued growth of their companies. These capabilities include the skills of middle and upper management, the lower management and workforce (Chandler, 1990). A company with a competitive advantage that achieves superior results to that of their competitors' positions, it is credited with the protection of a number of scarce resources that makes it impossible for competitors to imitate or substitute, which expresses the opportunity cost of having them.

ISSN 2394 - 7780

These necessary resources to implement a strategy can be purchased at the market factors (Barney, 1986). This market has an imperfect competition, since companies can only get a yield above normal only if it has superior information, luck or both. An acquisition strategy based on resources according to Salter and Weinhold (1980) can focus on getting more of these resources that already has and get those that combine effectively with it already.

This relationship product-resource opens the possibility of considering the different ways in which the company can develop a growth strategy. However, until now the theory considers only the resources that occur in conjunction with products and how to exploit this condition to generate a competitive advantage. More recent research has focused on developing a theory of resources and capabilities, which proposes that the success of the organization is based on the income generated by especially valuable resources where these capabilities result in the ability of the company to integrate and build new combinations of resources that result in innovative competitive advantages that enable the firm to adapt the changing environment.

**B. Agency theory**

This approach is part of noting that all individuals have definite preferences about risk, i.e.there are those who are lovers or adverse to situations with high uncertainty. Agency theory is a condition for cooperation between owner-agent to achieve a common purpose. The problem arises when owner-agent diverge in their interests and have different attitudes towards risk which hampers the condition thus raising agency costs. Therefore as this is the one in charge to solve the problems that may occur in the relationship between owner-agent attempts to describe this relationship use the contract as a means of solution and cost reduction (Jensen and Meckling, 1976) determining who is more efficient.

One of the tasks of the agency theory is to create a system of incentives to mitigate the opportunism of the agents so that personal interests are aligned with the interests of the principal and the conflict is minor so in turn agency costs are smaller too. Although the Director is of the kind that cares about being efficient and low opportunism resists certain conditions, it cannot expected to always he is acting in good faith. He somehow expects his reward either recognition or money.

Agency theory has been developed along two lines: positivist and principal-agent (Jensen, 1983). Both share as unit of analysis the contract between director and principal given certain assumptions about people, organizations and information. On this basis there are different situations to be assessed to determine what type of contract is the optimum between principal-agent according to the propositions of Eisenhardt (1989):The performance contract is optimal when there is a low risk aversion of the principal, and he does not be afraid to delegate risky tasks to the administrator and he is limited to get results, or when there is a conflict of interest as the two converge in oneself or when the expected results are easy to measure. In such cases for the owner is better to define what is the incentive on the results expected for the agent to align his behavior to achieve the results and therefore he can receive his benefits.

On the other hand, the contract behavior is most effective when the outcome depends on the development of certain behaviors for which the owner develops information systems directing to whatmust do exactly the agent and will ensure what he is waiting, or when he works in environment of high uncertainty where it is difficult for the owner to delegate situations of high risk. Therefore, the principal opts for monitoring the behavior of the agent to ensure that his goal is achieved.

Also the owner considers the fact that the administrator tasks are not something programmable which always will generate the same result by implying decisions that must be monitored to avoid opportunism. Therefore,it should be monitored his behavior. And finally, when the relationship is expected to be long term it is preferable to have such contracts because they allow the owner to learn from the agent and generate a view that allows more objectively evaluate his behavior.

An analyst should also take into account that, while the agency theory studies the relationship between owners and agents, this theory should not be seen as isolated issue that has similarities with other currents of organizational knowledge to help us understand human behavior and its impact on the business performance. Well aware that the incentives are the best way to achieve cooperative behavior and opportunism will always be present given the limited rationality of people. Moreover, it can be said that the contributions of agency theory are information processing, which has a cost, and can be purchased, and the implication that companies can invest in information systems with the end to control the agent opportunism.

Agency theory takes as its starting point the assertion of Peng (2010) on the firm requires governance which is possible through the corporate governance tripod, pointing to it as a possible tool of competitive advantage for

ISSN 2394 - 7780

the company. It is making it the agency theory in charge of studying the corporate governance in the management of the company, arising from the need from the owner to delegate on an agent power and management functions for strategic decision making. This it is not easy because as Berle and Means (1932) point to the separation of ownership and control creates a conflict of divergent interests between owners and managers.

**C. Industry based approach**

The traditional paradigm of industrial organization is to provide a model for the formulation of strategy. And from this, it is defined the strategy by how a company tries to compete with its environment by choosing key goals (Andrews, 1971). A formulation of effective strategy according to the model involves the relationship of fourth key elements: company, industry, implementations of key value for the company and the expectations of society. That is, the success of the company depends on the right combination of internal skills and values of its external environment. Itself implies that the performance of the company's market depends mainly on the characteristics of the industry environment where competes withwhat determines the behavior of the company, whose behavior then determine the collective market performance (Bain, 1968: Mason, 1953).

The industrial organization model proposes that the performance of the company measured on profitability and cost minimization depends on the decision of the individual firm of where to orient objectives and these in turn are defined by the structure of the industry to which it belongs considering to the context in which competition is generated. So, this will allowpredicting performance under these circumstances that can be expected in the market.

This explains the importance indicated by Porter (1981) to generate a perspective of industrial organization that provides a methodology for formulating strategy focused on measuring the performance of the company in a competitive environment. The firm takes the necessary decisions for its behavior oriented to properly allocate its resources and develop a competitive advantage allowing facilitating its interaction in the market.

Corporate strategies are formulated by the highest level of the organizational structure and the action plan of a diversified firm reaches its full multi-business model (Luna, 2010). Companies engaged in various industries are created when a company in one country detects industry and expansion opportunities in other industries and countries. As Peng (2012) points out,to increase a company's business operations with other different to the current ones, facing the decision of how to do it if through vertical integration by joining with other companies or diversifying their products.

To implement its strategies, a firm should adapt a multidivisional structure, design an effective control system in all industries and create corporate culture. This is important to ensure that the company make proper use of its resources and capabilities, control costs and achieve its growth target.

**1). Strategic alliances**

Strategic alliances are voluntary agreements to share exchange and develop knowledge and information together so that businesses can obtain resources and capabilities that they are scarce and they cannot acquire on their own. This gives them the opportunity to gain mutual benefits that allow them to sustain their competitive advantage. Generally the strategic alliances generated between companies to compete together and reduce costs, risks and uncertainty. An important feature is that in the authentic alliance the companies involved in it keep its structure of independent government and autonomous capacity of government decisions but this autonomy is limited by its commitments to the alliance partners. Usually partnerships are possible through contracts and agreements where control and autonomy are limited only (Sainz, 2014).

An alliance within the considerations based on the industry approach through the five forces model of Porter (1981), which include among them as relevant to the partnership strategy or strategic alliance helps to mitigate the effects of the barriers to entry to new markets and possibility of vertical alliances bottom-up and top-down. For example, alliances with suppliers to ensure quality or other companies in the same market and compete with heterogeneous products together generating products through a combination of technologies.

The focus of resources and capabilities that indicates the formation of a partnership or alliance within the framework VRIO, because as mentioned before, one of the objectives of the companies is the complementarity of resources, so it should look for the creation of value allowing to be obtained at lower costs. Rarity is related to the characteristics of the partner with the attributes required to establish a transfer of information on those capabilities that can also be imitated by the partner company. Thus, it can establish a form of organization that the rest of the competition not may have, allowing partner companies to position with a competitive advantage (Peng, 2010).

ISSN 2394 - 7780

As can be seen up to now, strategic alliances concentrate on teamwork so as the same with people, to select the partnerindicated requires some degree of affinity for a partnership to work; it also requires a certain degree of confidence. Finally, partnerships and alliances are efficient in the extent to which produce mutual benefits such as access to new markets, diversification of product lines that create value to the company and contribute to its competitive advantage through this as internal and external a processes (Navas, Guerras, 2002).

**2). Acquisitions**

An acquisition is the transfer of control of the operations and management of a company to another so that the latter becomes part of the first. That is, the purchase is made by one company over another, without the latter losing its characteristics but in which their owners no longer have full control of it (Pérez, 2013). A common feature is that the bidding company is larger than the target company and even getting to pay a higher value than the market value of its shares. The effect caused by the non-existence of profit by taking control of a company through corporate acquisitions, is explained by the hypothesis of arrogance that predicts an increase in the market value of the target firm which exceeds the average decline in the value of the bidding company (Roll, 1986).

Although the situation described in the preceding paragraph may occur, this is not exactly the way the acquisitions operates, which shows that the market is acting inefficiently occasionally because of the irrational actions of some economic agents. On the other hand, the actual motivation for the company to make an acquisition is more related to corporate control structure between the companies involved (Vasco, Cortés, Gait an& Duran, 2014), as for a corporate is easier to integrate the company in structure to work on a scheme of merger or alliance that may involve a number of unnecessary transaction costs.

**3). Vertical integration**

Vertical integration strategies are those courses of action that allow the company to make decisions about their value chain, focusing especially on the importance that plays its suppliers in its ultimate purpose. So, the measures that can be considered by the company are focused on the possibility of acquiring suppliers or distributors, or improve buyer-supplier relationship to exert a degree of bargaining power.

Vertical integration is the acquisition by the company of suppliers or distributors. So the company can acquire a manufacturer supplying a wide range of products, or a key product allowing it to develop its own brand products which in turn gives new options of products and cost savings (Susan, 1994). This is a very common practice in companies with a strategy of expansion and constant growth. Another way that can arise is through the centralized physical distribution centers serving largely to strengthen the negotiating position of the company with suppliers, improve operating efficiency and supply to the end of the chain that result in improvement customer service (Fernie, and McKinnon, 1991).

A change in buyer-supplier relationship is also a viable strategy of vertical integration when the company in his role as purchaser has the capability to exercise power over the provider controlling prices, products and even about the innovations of products that his provides you. The bargaining power of the company is determined by its size, so if this is big enough and the supplier is vulnerable to the company, it is possible that this change of relationship can be generated (Grant, 1987).

## 9. METHOD

For the preparation of this research, it was applied an exploratory qualitative analysis approach. The research was turned to review literature sources, in addition to foundations and public information statistics from annual reports issued by the organization. This was collected and only was considered those that will bring and allow makinginferences to answer research questions were considered. This through a descriptive study, that is, analyzing how it is and the phenomenon observed in the study (Hernandez-Sampieri, 1991) manifests. They are considered as dependent variable of convenience stores in the retail market and corporate strategies as independent variables (Vargas-Hernández, et. 2014).

## 10. CONCLUSIONS

Regarding the research assumption on the implementation of a strategic framework is what determines the success of modern format stores in the market for retail. It can be inferred that there is evidence of wellbeing because the achievementsof convenience stores after a review of the number of strategies that the company subject of the case study implemented.The OXXO-FEMSA finds its livelihood within the framework of some of the different scientific approaches available to explain its competitive performance of the organization and that is one of the purposes of the strategic management theories.

ISSN 2394 - 7780

The focus of resources and capabilities can explain some of the behaviors of the conveniences stores are oriented toward a vision of alert to changes in the environment to adapt the internal processes and respond in the best way available. In addition to much of their competitive advantage that is determined by making optimal use of their resources and capabilities acquired throughout their history that allowstaking every opportunity to reach the market. On the other hand, the main strategy of OXXO-FEMSA has to be distinguished from the rest through the implementation of strategies that seek to optimize its most valuable resources being the reputation of its brands and the knowledge gained through experience. Within the framework of theories also they have shown how the convenience stores have always gone to the complementarity of resources.

Agency theory can explain how the company strategically manages this problem of asymmetric information between owner-agent through independent agents working on commission contract where disclaims without losing control over this responsibility. This reduces the chances of opportunism and ensures their commitment to obtaining the results expected by the company. This allows it to operate under a degree of certainty and better control over the operations, resulting in the possibility of opening its 1000 annual point sales that has been set as a goal.

Finally,industry-basedapproachexplains howin findingto maintainitscompetitive advantage andmarket positiontobe detected inthisnewopportunitythe companyfocuses itseffortstoseize, through variousstrategiessuch asvertical integration.Even,it was that gaverise to thischain of storeswhose initial objectivewas to providethe ownerof aneffectivedistributionchannel.Now, itmakespossible to haveits own brands, Strategic alliances largelyexpressedwith its supplierstobethisoneimportantstrategy toprovidefundingin itsinitial inventoriesper store. Also,to partakeof itskeypromotion strategiesandacquisitionsthroughnewbusiness formatshave allowedit to expandand compete inniche markets.

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ISSN 2394 - 7780

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# A STUDY OF CUSTOMER'S USAGE PATTERN ABOUT ICT TRENDS IN BANKING W.R.T. MUMBAI AND THANE REGION

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## INTRODUCTION

The adoption of ICT in banks has improved customer services, facilitated accurate records, provides for Home and Office Banking services, ensures convenient business hour, prompt and fair attention, and enhances faster services. The adoption of ICT improves the banks' image and leads to a wider, faster and more efficient market. It has also made work easier and more interesting, improves the competitive edge of banks, improves relationship with customers and assists in solving basic operational and planning problems. This paper work analyses the impacts made by the Information and Communication Technology in the Banking Industry. The application of information and communication technology concepts, techniques, policies and implementation strategies to banking services has become a subject of fundamental importance and concerns to all banks and indeed a pre-requisite for local and global competitiveness. ICT directly affects how managers decide, how they plan and what products and services are offered in the banking industry. It has continued to change the way banks and their corporate relationships are organized worldwide and the variety of innovative devices available to enhance the speed and quality of service delivery.

## REVIEW OF LITERATURE

1. **Moghadam, Baytollah Akbari; Behboudi, Mehdi; Jafari, Farzaneh(Dec 2012)** in their research say that customers are encouraged to utilize ICT banking as first priority. Increasing the customer's arousal by ICT advertisements to use ICT banking creates a positive attitude toward bank's brand, which in-turn is the key factors in ICT banking effectiveness.
2. **Jahangir, Nadim; Parvez, Noorjahan(Dec 2012)** research states that ICT banking needs, compatibility, convenience, and communication on customer adaptation. In the context of private commercial banks in order to attract more users to ICT banking, it is not going to be enough only to introduce an ICT banking system, but they need to develop the belief of usefulness of the system among their users. The importance of ICT banking needs and the ease of using it should be acknowledged by demonstration on trial basis.
3. **Munusamy, Jayaraman; De Run, Ernest Cyril; Chelliah, Shankar; Annamalah, Sanmugam(Dec 2012)** in their research found that younger consumers are more likely to adopt ICT banking. The study states that consumers in the age group below 25 years old are the major contributor to ICT banking.
4. **Kesharwani, Ankit; Bisht, Shailendra Singh(2012) s**tated in their study that the main purpose was to extend the technology acceptance model (TAM) in the context of ICT banking adoption in India under security and privacy threat. The researchers have incorporated various inhibitors of ICT banking which restrict the use of ICT banking adoption under "perceived risk", and also consider the role of the bank web site as a key determinant of perceived risk and of perceived ease of use in the context of ICT banking services. The paper reveals that perceived risk has a negative impact on 11ehavioural intention of ICT banking adoption and trust has a negative impact on perceived risk. A well-designed web site was also found to be helpful in facilitating easier use and also minimizing perceived risk concerns regarding ICT banking usage.
5. **Patsiotis, Athanasios G; Webber, Don J; Hughes, Tim (Dec 2013)** found that personal capacity is an important determinant of ICT banking. Use of it in a standard, non-sequential approach has no significant effect when the model is sequential. Results suggest that policymakers should emphasize useful attributes of ICT banking when attempting to increase its usage by people who already use the ICT.

## OBJECTIVE OF THE STUDY

1. To examine the awareness of ICT banking among customers w.r.t. Gender and Occupation.
2. To analyze the usage of ICT in banking by respondent customers.
3. To suggest measures for effective utilization of ICT banking.

ISSN 2394 - 7780

**RESEARCH METHODOLOGY**

| | |
|---|---|
| RESEARCH UNIVERSE | MUMBAI AND THANE COMMERCIAL BANKS |
| SAMPLE SIZE | 25 |
| DATA COLLECTION | STRUCTURED QUESTIONNAIRE |
| DATA | PRIMARY AND SECONDARY DATA |
| DATA ANALYSIS TOOLS | PERCENTAGE TECHNIQUE , CHI-SQUARE TEST, MEAN, KRUSKAL WALLIS TEST, MANN-WHITNEY U TEST RESULT |

**HYPOTHESIS OF STUDY**

1. **$H_{o1}$:** All the reasons for usage of ICT in banking are equally preferred.
   **$H_{11}$:** All the reasons for usage of ICT in banking are not preferred equally.
2. **$H_{o2}$:** There is no significance of difference between the average preference by male and female.
   **$H_{12}$:** There is significance of difference between the average preference by male and female.
3. **$H_{o3}$:** There is no significance of difference between the average preference by graduate and post-graduate.
   **$H_{13}$:** There is significance of difference between the average preference by graduate and post-graduate.

**ANALYSIS AND INTERPRETATION OF DATA**

1. **$H_{o1}$: All the reasons for usage of ICT in banking are equally preferred.**
   **$H_{11}$: All the reasons for usage of ICT in banking are not preferred equally.**

**TABLE 1: MEAN RANK TABLE**

| Reasons | N | Mean Rank |
|---|---|---|
| **Curiosity** | 25 | 90.66 |
| **Inconvenient bank Time (24X7 service)** | 25 | 70.58 |
| **Inconvenient Branch location** | 25 | 79.08 |
| **Faster Transaction / information** | 25 | 71.84 |
| **Safe and secure** | 25 | 82.08 |
| **Low service charge** | 25 | 99.84 |
| **Online shopping** | 25 | 121.92 |

Source: Primary Data

**TABLE 2: KRUSKAL WALLIS TEST**

| **Test Statistics[a,b]** | |
|---|---|
| | Curiosity |
| Chi-Square | 19.587 |
| Df | 6 |
| p-value | .003 |
| a. Kruskal Wallis Test | |
| b. Grouping Variable: Index1 | |

**INTERPRETATION**

Since p-value for the Kruskal-Wallis test is less than that of 0.05 indicates that there is significance of difference between the average rankings for reasons. SO we reject null hypothesis and conclude that some of the reasons are preferred more than some others. From mean ranks table we can conclude that **online shopping is the highest preferred reason for internet banking.**

ISSN 2394 - 7780

**$H_{o2}$: There is no significance of difference between the average preference by male and female.**
**$H_{12}$: There is significance of difference between the average preference by male and female.**

**TABLE 3: AVERAGE RANKING WITH RESPECT TO GENDER**

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **gender** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| Curiosity | Male | 11 | 2.73 | 2.284 | .689 |
| | Female | 14 | 3.79 | 2.694 | .720 |
| Inconvenient bank Time (24X7 service) | Male | 11 | 2.36 | 1.120 | .338 |
| | Female | 14 | 2.36 | 2.240 | .599 |
| Inconvenient Branch location | Male | 11 | 2.73 | 2.054 | .619 |
| | Female | 14 | 2.71 | 2.301 | .615 |
| Faster Transaction / information | Male | 11 | 2.27 | 1.737 | .524 |
| | Female | 14 | 2.50 | 1.605 | .429 |
| Safe and secure | Male | 11 | 3.27 | 2.240 | .675 |
| | Female | 14 | 2.50 | 1.605 | .429 |
| Low service charge | Male | 11 | 3.64 | 2.693 | .812 |
| | Female | 14 | 3.64 | 1.737 | .464 |
| Online shopping | Male | 11 | 5.45 | 2.207 | .666 |
| | Female | 14 | 4.14 | 2.507 | .670 |

**TABLE 4: Mann-Whitney U test result**

| Test Statistics[b] | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Curiosity** | **Inconvenient bank Time (24X7 service)** | **Inconvenient Branch location** | **Faster Transaction / information** | **Safe and secure** | **Low service charge** | **Online shopping** |
| Mann-Whitney U | 61.500 | 64.000 | 76.000 | 67.500 | 59.500 | 72.000 | 48.000 |
| Wilcoxon W | 127.500 | 169.000 | 142.000 | 133.500 | 164.500 | 177.000 | 153.000 |
| Z | -.866 | -.740 | -.057 | -.546 | -.980 | -.278 | -1.622 |
| p-value | .387 | .459 | .955 | .585 | .327 | .781 | .105 |
| a. Not corrected for ties. | | | | | | | |
| b. Grouping Variable: gender | | | | | | | |

**INTERPRETATION**
Since p-value for Mann-Whitney U test is greater than that of 0.05 indicates **no significant difference between the average rankings for when compared between male and female for each of reason for respondent to open an Internet bank account.**

**$H_{o3}$: There is no significance of difference between the average preferences by graduate and post-graduate.**
**$H_{13}$: There is significance of difference between the average preferences by graduate and post-graduate.**

**TABLE 5: AVERAGE RANKING WITH RESPECT TO EDUCATION**

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **Education** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| Curiosity | Graduate | 15 | 2.93 | 2.712 | .700 |
| | Post graduate | 10 | 3.90 | 2.234 | .706 |
| Inconvenient bank Time (24X7 service) | Graduate | 15 | 2.20 | 1.781 | .460 |
| | Post graduate | 10 | 2.60 | 1.897 | .600 |

ISSN 2394 - 7780

| | | | | | |
|---|---|---|---|---|---|
| Inconvenient Branch location | Graduate | 15 | 2.67 | 2.350 | .607 |
| | Post graduate | 10 | 2.80 | 1.932 | .611 |
| Faster Transaction / information | Graduate | 15 | 2.40 | 1.682 | .434 |
| | Post graduate | 10 | 2.40 | 1.647 | .521 |
| Safe and secure | Graduate | 15 | 2.40 | 1.765 | .456 |
| | Post graduate | 10 | 3.50 | 2.014 | .637 |
| Low service charge | Graduate | 15 | 3.53 | 2.386 | .616 |
| | Post graduate | 10 | 3.80 | 1.874 | .593 |
| Online shopping | Graduate | 15 | 4.20 | 2.859 | .738 |
| | Post graduate | 10 | 5.50 | 1.354 | .428 |

**Mann-Whitney U test result:**

| **Test Statistics[b]** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Curiosity** | **Inconvenient bank Time (24X7 service)** | **Inconvenient Branch location** | **Faster Transaction / information** | **Safe and secure** | **Low service charge** | **Online shopping** |
| Mann-Whitney U | 56.000 | 65.000 | 73.500 | 73.500 | 53.500 | 71.500 | 61.000 |
| Wilcoxon W | 176.000 | 185.000 | 193.500 | 193.500 | 173.500 | 191.500 | 181.000 |
| Z | -1.075 | -.577 | -.086 | -.087 | -1.220 | -.197 | -.793 |
| p-value | .282 | .564 | .932 | .930 | .222 | .844 | .428 |
| a. Not corrected for ties. | | | | | | | |
| b. Grouping Variable: education | | | | | | | |

**INTERPRETATION**

Since p-value for Mann-Whitney U test is greater than that of 0.05 indicates **no significant difference between the average rankings for when compared between graduate and post-graduate for each of reason for respondent to open an Internet bank account.**

**FINDINGS AND CONCLUSION**

- ✓ There is significance of difference between the average rankings for reasons. SO we reject null hypothesis and conclude that some of the reasons are preferred more than some others. From mean ranks table we can conclude that online shopping is the highest preferred reason for internet banking.
- ✓ There is no significant difference between the average rankings for when compared between male and female for each of reason for respondent to open an Internet bank account.
- ✓ There is no significant difference between the average rankings for when compared between graduate and post-graduate for each of reason for respondent to open an Internet bank account.

**SUGGESTIONS**

- Banks should create awareness among the customers about use of ICT in banking apart from online shopping.
- They should take awareness programmes very often to educate customers.

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# CONFLICT MANAGEMENT: A TOOL FOR TEAM BUILDING

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**ABSTRACT**
*Any organization is having people working in different departments and at different levels with different responsibility. Most of the roles and responsibilities are inter dependent among group of people. Conflict is an inevitable situation in any group of people; be it a family, society or any organization working for commercial or non-commercial goals. There is a conflict even between parents & children, husband & wife, brothers & sisters, and any other group. Thus conflict is a common phenomenon at any workplace. However Conflict Management can be used as a tool for improving overall performance of an organization.*

*This paper deals with two types of conflicts namely Defensive Blame Game and Offensive Blame Game. Then it tries to find out why conflicts arise. The authors firmly believe that it is important to know the reasons or root cause of the problem before efforts can be made for finding solutions. This paper deals with using conflict management for improving performance of an individual or group or an organization.*

*Keywords: Conflict, people, organization, blame game*

## INTRODUCTION

Before we discuss on conflict management, we need to address some basic questions in very brief such as:

What is a conflict?

Why there is a conflict?

Can we avoid conflict?

Can we use conflict for organizational gains?

What is a conflict? Conflict can be explained as clash of interests, values, actions, views or directions. Conflict is an inevitable situation where the interests, needs, goals or values of involved parties interfere with one another. Conflicts are barriers for smooth working, decision making process, or create competing coalitions or reduce productivity. Conflict is a clash of interests, values, actions, views or directions (De Bono, 1985). Conflict refers to the existence of that clash. Conflict is initiated the instant clash occurs. Generally, there are diverse interests and contrary views behind a conflict, which are revealed when people look at a problem from their viewpoint alone. Conflict is an outcome of organizational intricacies, interactions and disagreements. It can be settled by identifying and neutralizing the etiological factors. Once conflict is concluded it can provoke a positive change in the organization. When we recognize the potential for conflict, we implicitly indicate that there is already a conflict of direction, even though it may not have yet manifested itself as a clash. Confliction is the process of setting up, promoting, encouraging or designing conflict. It is a wilful process and refers to the real effort put into generating and instituting conflict. Deconfliction is the annihilation of conflict. It does not refer to negotiation or bargaining, or even to resolution of conflict: it is the effort required to eliminate the conflict.

Why there is a conflict? Root cause of conflict is disagreement among people. People disagree because they see things differently, want different things, have different thinking styles which encourage them to disagree, or are predisposed to disagree. Conflicting situations arise because of fear, force, fair practices or limited funds. Fear is an imaginary concern for future. Force of any kind initiates and concludes conflicts. Fair practice is the sense of fairness, which determines the moral values of an individual. Tangible as well as intangible costs may provoke conflict during availability of limited funds.

Interpersonal conflicts arise because of differences in personality, perceptions, status and ideological and philosophical outlooks. Other causes of conflict can be communication gaps; personality differences; substandard performance; disputes over approaches, responsibility and authority; lack of cooperation; or competition for limited resources.

Can we avoid conflict? Conflicting situations are very often unavoidable but effects can be easily changed towards win-win situation for all. Also, it may be possible to minimize the impact of conflicts on the performance of any group of people.

ISSN 2394 - 7780

Can we use conflicts for organizational gains? Conflicting situations result in negative and positive effects. This situation helps us in deciding strategies for reducing negative impacts and increasing the positive atmosphere. This approach should help in diffusing more serious conflicts.

**RESEARCH METHODOLOGY**

The authors have tried to use Causal Research in this paper as this paper tries to find out the relationship between the Conflict and the cause for this conflict.

**WHAT CAUSES CONFLICT?**

Aforesaid deliberations leads to a situation that conflicts are inevitable and therefore there has to be some reason or cause for the conflicts and conflicting situations. There can be two types of conflicting situations as under:

1. Blame Game – Defence: Here all blame one scapegoat.

2. Blame Game –Offence – Here every one blames all others.

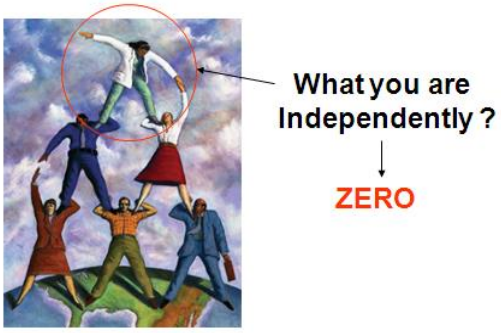
Both the above types of conflicts are harmful for individuals as well as organisations. We need to analyze the causes for both the types of conflicts. One common cause identified in this paper is that everyone thinks he/she is right and the other one is wrong.

Above picture depicts very popular principle of "Right Hand Rule". It has been used to explain the effect of blame game. One must realize that when we show o one finger towards someone the other three fingers are pointing towards us.

There appears to be only one way for following i.e the direction of thumb. We have to withdraw first finger from pointing towards others (blaming others) and unite to form a team. Thus "I" has to be replaced with "we".

ISSN 2394 - 7780

It results in either we win or we lose. Nobody would like to be a loser. Therefore, perforce, all will work together for a win-win situation. In the author's view, solutions for managing conflicts should start from top because one reaches the top only because of its team members. If the team members below him are not performing then the day will not be far when the person at the top will also fall off as is depicted in the picture below:




As is the human body, so is the cosmic body.
As is the human mind, so is the cosmic mind.
As is the microcosm, so is the macrocosm.
As is the atom, so is the universe.
- The Upanishads

**WHY CONFLICTS ARISE?**

In most organizations, conflicts increase as employees assert their demands for an increased share in organizational rewards, such as position, acknowledgment, appreciation, monetary benefits and independence. Even management faces conflicts with many forces from outside the organization, such as government, unions and other coercive groups which may impose restrictions on managerial activities. Conflicts emanate from more than one source, and so their true origin may be hard to identify. Important initiators of conflict situations include:

- *People disagree.* People disagree for a number of reasons (De Bono, 1985).

(a) They see things differently because of differences in understanding and viewpoint. Most of these differences are usually not important. Personality differences or clashes in emotional needs may cause conflicts. Conflicts arise when two groups or individuals interacting in the same situation see the situation differently because of different sets of settings, information pertaining to the universe, awareness, background, disposition, reason or outlook. In a particular mood, individuals think and perceive in a certain manner. For example, the half-full glass of one individual can be half-empty to another. Obviously both individuals convey the same thing, but they do so differently owing to contrasting perceptions and dispositions.

(b) People have different styles, principles, values, beliefs and slogans which determine their choices and objectives. When choices contradict, people want different things and that can create conflict situations. For example, a risk-taking manager would be in conflict with a risk-minimizing supervisor who believes in firm control and a well-kept routine.

(c) People have different ideological and philosophical outlooks, as in the case of different political parties. Their concepts, objectives and ways of reacting to various situations are different. This often creates conflicts among them.

(d) Conflict situations can arise because people have different status. When people at higher levels in the organization feel indignant about suggestions for change put forward from their subordinates or associates, it provokes conflict. By tolerating and allowing such suggestions, potential conflict can be prevented.

(e) People have different thinking styles, which encourage them to disagree, leading to conflict situations. Certain thinking styles may be useful for certain purposes, but ineffectual or even perilous in other situations (De Bono, 1985).

(f) People are supposed to disagree under particular circumstances, such as in sports. Here conflict is necessary, and even pleasurable.

ISSN 2394 - 7780

- People are concerned with fear, force, fairness or funds (De Bono, 1985).

(a) Fear relates to imaginary concern about something which might happen in the future. One may fear setbacks, disgrace, reprisal or hindrances, which can lead to conflict situations.

(b) Force is a necessary ingredient of any conflict situation. Force may be ethical or emotional. It could be withdrawal of cooperation or approval. These forces are instrumental in generating, strengthening and terminating conflicts.

(c) Fairness refers to an individual's sense of what is right and what is not right, a fundamental factor learnt in early childhood. This sense of fairness determines the moral values of an individual. People have different moral values and accordingly appreciate a situation in different ways, creating conflict situations.

(d) Funds or costs can cause conflict, but can also force a conclusion through acceptable to the conflicting parties. The cost of being in conflict may be measurable (in money terms) or immeasurable, being expressed in terms of human lives, suffering, diversion of skilled labour, neglect or loss of morale and self esteem. (De Bono, 1985).

Conditions creating conflict situations
According to Kirchoff and Adams (1982), there are four distinct conflict conditions, i.e., high stress environments, ambiguous roles and responsibilities, multiple boss situations, and prevalence of advanced technology.

Filley (1975) identified nine main conditions which could initiate conflict situations in an organization. These are:

(i) *Ambiguous jurisdiction,* which occurs when two individuals have responsibilities which are interdependent but whose work boundaries and role definitions are not clearly specified.

(ii) *Goal incompatibility and conflict of interest* refer to accomplishment of different but mutually conflicting goals by two individuals working together in an organization. Obstructions in accomplishing goals and lack of clarity on how to do a job may initiate conflicts. Barriers to goal accomplishment arise when goal attainment by an individual or group is seen as preventing another party achieving their goal.

(iii). *Communication barriers,* as difficulties in communicating can cause misunderstanding, which can then create conflict situations.

(iv) *Dependence on one party* by another group or individual.

(v) *Differentiation in organization,* where, within an organization, sub-units are made responsible for different, specialized tasks. This creates separation and introduces differentiation. Conflict situations could arise when actions of sub-units are not properly coordinated and integrated.

(vi) *Association of the parties and specialization.* When individuals specialized in different areas work in a group, they may disagree amongst themselves because they have different goals, views and methodologies owing to their various backgrounds, training and experiences.

(vii) *Behaviour regulation.* Organizations have to have firm regulations for individual behaviour to ensure protection and safety. Individuals may perceive these regulations differently, which can cause conflict and negatively affect output.

(viii) *Unresolved prior conflicts* which remain unsettled over time create anxiety and stress, which can further intensify existing conflicts. A manager's most important function is to avoid potential harmful results of conflict by regulating and directing it into areas beneficial for the organization.

**EFFECTS OF CONFLICTS**

Conflict situations should be either resolved or used beneficially. Conflicts can have positive or negative effects for the organization, depending upon the environment created by the manager as she or he manages and regulates the conflict situation.

**POSITIVE EFFECTS OF CONFLICTS**

Some of the positive effects of conflict situations are (Filley, 1975):

- **Diffusion of more serious conflicts**. Games can be used to moderate the attitudes of people by providing a competitive situation which can liberate tension in the conflicting parties, as well as having some entertainment value. In organizations where members participate in decision making, disputes are usually minor and not acute as the closeness of members moderates belligerent and assertive behaviour into minor disagreements, which minimizes the likelihood of major fights.

ISSN 2394 - 7780

- **Stimulation of a search for new facts or resolutions.** When two parties who respect each other face a conflict situation, the conflict resolution process may help in clarifying the facts and stimulating a search for mutually acceptable solutions.
- **Increase in group cohesion and performance.** When two or more parties are in conflict, the performance and cohesion of each party is likely to improve. In a conflict situation, an opponent's position is evaluated negatively, and group allegiance is strongly reinforced, leading to increased group effort and cohesion.
- **Assessment of power or ability:** In a conflict situation, the relative ability or power of the parties involved can be identified and measured.

**NEGATIVE EFFECTS OF CONFLICTS**

Destructive effects of conflicts include:

- Impediments to smooth working,
- Diminishing output,
- Obstructions in the decision making process, and
- Formation of competing affiliations within the organization.

The overall result of such negative effects is to reduce employees' commitment to organizational goals and organizational efficiency (Kirchoff and Adams, 1982).

**HOW TO SOLVE CONFLICT???**

Realize that some conflicts are inevitable at work. Whenever people are committed and fired up, or change and new ideas are emerging, conflict and disagreement are bound to happen. This does not mean you have to revel in conflict or create trouble just for the heck of it, but it does mean that when conflict happens, it's not the end of the world. It can be the beginning of an interesting learning process. Conflicts mean that people care enough to disagree strongly. But care should be taken that the conflict does not go on forever. One can follow the given ways to solve conflict:

**Handle conflicts sooner rather than later:** Resolve a conflict when it starts, as it only gets worse with time. Conflicts at work arise not from something that *was* said, but from something that *wasn't* said! Everyone's waiting for the other to admit he's wrong and gets more unpleasant after the conflict has stewed for a while. It's essential to interrupt the "waiting game" before it gets to that point.

**Ask Nicely:** If somebody has done something that made you angry, or if you don't understand their viewpoint or actions, simply *asking* about it can make a world of difference. Never assume that people do what they do to annoy you. Sometimes there's good reason why that person does what he or she does (even the things that really get on your nerves), and a potential conflict evaporates right there. Make your inquiry just that--an inquiry, not an accusation of any sort: "Say, I was wondering why you did 'X' yesterday" or "I've noticed that you often do 'Y'. Why is that?" are good examples. "Why the hell do you always have to 'Z'!" is less constructive.

**Invite the other person to talk about the situation:** A hurried conversation at your desk between emails and phone calls won't solve anything. You need an undisturbed location and time to address the issue.

**Observe:** Identify what you see in neutral, objective terms. This is where you describe the facts of the situation as objectively as possible. What is actually happening? When and how is it happening? What is the other person doing and, not least, what are you doing? You're only allowed to cite observable facts and not allowed to assume or guess at what the other person is thinking or doing. You can say, "I've noticed that you're always criticizing me at our meetings" because that's a verifiable fact. You can't say "I've noticed that you've stopped respecting my ideas" because that assumes something about the other person.

**Apologize:** Apologize for your part in the conflict. Usually everyone involved has done something to create and sustain the conflict. Remember: You're not accepting the entire blame; you're taking responsibility for your contribution to the situation.

**Appreciate:** Praise the other part in the conflict. Tell them why it's worth it for you to solve the conflict. This can be difficult as few people find it easy to praise and appreciate a person they disagree strongly with, but it's a great way to move forward.

ISSN 2394 - 7780

**Identify the consequences:** What has the conflict led to for you and for the company? Why is it a problem? Outlining the consequences of the conflict shows why it's necessary to resolve it. It also helps participants to look beyond themselves and see the conflict "from the outside."

**Define an objective:** What would be a good outcome? It's essential to set a goal so both parties know the outcome they're aiming for. That makes reaching the outcome a lot more likely.

**Get mediation:** Some conflicts cannot be solved by the participants alone, and mediators can help. Mediation involves a neutral third party who has been trained in mediation principles, who is experienced in mediation, and who is trusted by the people involved in the conflict. A good mediator will help the disputants find their own solution, not provide advice or push them toward any particular solution.

Take care when selecting a mediator. The mediator (or mediators) should only be someone who has undergone formal mediation training, has extensive mediation experience, and has mediated under supervision. Otherwise, he or she may do more harm than good.

## CONCLUSION

Handling and resolving conflicts that arise in the workplace is one of the biggest challenges managers and employees face. Typically there are two responses to conflict: run away (avoidance) or 'battle it out'. In either case, we often feel uncomfortable or dissatisfied with the results because no resolution has been achieved. By learning to constructively resolve conflict, we can turn a potentially destructive situation into an opportunity for creativity and enhanced performance. Arriving at a positive resolution of conflict is always the ultimate goal. In resolving conflict one has to clearly articulate the causes of the conflict It is always better to address the issues face-to-face (notes, email correspondence, memos are not a productive way to resolve differences). Last but not the least; if the top management wants the conflict to be resolved in an amicable way, then it has to join hands with its employees. Conflicts if not solved can break an organization. So, it's the duty of the top management to take an immediate call to resolve the conflict by making its employees realize jointly they can work towards their mutual benefits.

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# INDIAN JUDICIARY AND CRIMINALIZATION OF POLITICS IN INDIA: A STUDY

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## ABSTRACT
*The Indian judiciary has always been in the epic of its stature. The role of Indian judiciary can never be denied of, ever since the independence of India the judiciary has always stood the test of time. The Judiciary being the guardian of the Constitution is entrusted with the responsibility of safekeeping of the Constitutional ideals, and as such the Judiciary has on different times showed great concern over the issues and problem concerning the rights of common men and society including criminalisation of politics. In the present article an attempt has been made to examine the various judicial pronouncements and the role of Judiciary concerning criminalisation of politics in India.*

*Key words: Criminalization, Politics, Law, Judiciary*

## OBJECTIVE OF THE STUDY
(1) To find out the role played by the Indian Judiciary to curb the menace of criminalization of politics through the study of various judicial pronouncements.

(2) To access the impact of these judgments on the Indian political system and on society.

## METHODOLOGY
The present paper is primarily based on secondary sources like law Reports, Books, Journals and online database. The methods used are historical, Narrative and analytical.

## INTRODUCTION
There is a crisis of legitimacy in our political system. While we have outstanding men and women in public life, a flawed electoral process is increasingly alienating public-spirited citizen from the political and electoral arena. The persons best equipped to represent people find it impossible to be elected by adhering to law propriety. On the other hand, a person with a criminal and corrupt record getting elected to legislatures seems to have become the norm. The problem of criminalization goes well beyond the political fate of few individuals.

The impact of criminalization of politics in India has reached such an alarming stage that if it continues in such an unprecedented way then in the near future the entire governmental machinery will collapse.

Under the Indian legal system there are various laws, which directly or indirectly deal with the entire political process of the country. The Constitution of India also contains various provisions relating to the conduct of electoral process in the country. India has a comprehensive structure of laws to administer and conduct its elections. The formal legal framework for all these elections rests on certain provisions of the Constitution, The Representation of the People's Act 1950, The Representation of the People's Act 1951, and the various rules and regulations framed and orders issued under these statutes largely control the electoral poll process of the country. In addition, certain provisions of the Indian Penal Code and a few other Acts are relied upon to provide for punishment as well as disqualification of candidates and members of the two Houses of Parliament of India and State Legislatures.

The Supreme Court of India has shown great concern over the growing problem of crminalisation of politics, the Court replying to a writ petition filed by the *Association for Democratic Reforms*[1] took note of the increased criminalisation of politics in India, has held that the voter has every right to know the social, economical and educational background of a candidate in an election to Parliament or State Legislature. Further, the Supreme Court of India directed the Election Commission of India to issue a notification to all the aspiring candidates to make available information's regarding education, assets, liabilities and criminal antecedents for the benefit of the voter.

But the Parliament of India in order to negatived the order of the Court and notification of the Election Commission of India amended the electoral law (Representation of People's Act) against this amendment the *Peoples Union for civil liberties*[2] filed a writ petition in the Supreme Court of India alleging that the amendment

[1] AIR (2002) SC 2112

[2] PUCL v. Union of India op.cit

ISSN 2394 - 7780

is violative of people's right to know under Article 19(1) (a) of the Constitution of India.[3] The amended Representation of People's Act provided that only candidates who are elected were required to give details of their assets and liabilities to the concerned presiding officers of the Houses, and not the MPs who are not elected. The Supreme Court of India reacting to the amendment has held that the Parliament cannot declare the law declared by the Court is not binding. The court further said that the amended Representation of People's Act was a 'half hearted attempt' by the government to fight the use of money and muscle power in elections.[4]

The Supreme Court of India has also affirmed this view in the case of *Common Cause a registered Society v Union of India*[5] wherein the court explaining the power of the Election Commission has said that The Commission has under Article 324(1) of the Constitution of India to ask for details of expenses incurred by the candidate in an election in order to bring more transparency, accountability and to avoid involvement of black money in elections.[6]

Time and again the Supreme Court drew the attention of Parliament to damage done to the purity of the process of elections by this atrocious piece of legislation. In *G.Y. Kanakkarrao*[7] the Supreme Court observed: "The prescription on the ceiling on expenditure by a candidate is a more eyewash. This lacuna in the law is, however, for the Parliament to fill, lest the impression is reinforced that its retention is deliberate for the convenience of everyone. If this is not feasible, it may be advisable to omit the provision to prevent the resort to indirect methods for its circumvention and subversion of the law. This provision has ceased to be even a fig leaf to hide the reality."

Again, in *C. Narayanaswamy vs. Jaffer Sharief* [8] the Supreme Court recorded its dissatisfaction : "As the law stands today, anybody including a smuggler, criminal or any other anti-social element may spend any amount over the election of any candidate to whom such person is interested, for which no account is to be maintained or to be furnished and any such expenditure shall not be deemed to have been expenditure in connection with the election under Section 77(1), so as to amount to corruption.

In *Jawahar Singh v. Election Commission of India & Others*[9] the Supreme Court of India dealt with the issue of participation of criminals in elections and whereas a person can contest an election who is released on bail in a criminal offence pending appeal section 8(3) of the Representation of People's Act deals with disqualification of a candidate pending an appeal in a criminal offence. The Supreme Court while dealing with this issue has in the case of *Sharat Chandra Rabha v Khagendra Nath*[10] has held that suspension of sentence does not wipe out the conviction and sentence. It was held that a reprieve is a temporary suspension of sentence. The effect of remission is to wipe out the remaining part of the sentence, which has not been served, and thus in practice, the sentence is reduced to that which is already undergone. In law, remission does not touch the order of conviction by the court and the sentence passed by the court. If suspension of sentence during the pendency of an appeal does not have the effect of wiping it out, it is difficult to accept the contention that the disqualification U/S 8 (2) remains arrested or in abeyance during the operation of the suspension order pending appeal against the conviction and sentence. This is more so when in section 8 (3) gives contrary indication. Thus in the instant case, the sentence of three years imprisonment is not affected and the appellant remains disqualified although he may not have to undergo the full sentence. The Hon'ble High Court of Allahabad also took the similar view in the case of *Sachindra Nath Tripathi v. Doodnath*[11] while declaring the election as void of Shri Doodnath who

[3] For detail concerning this point see Article 19(1) of the Constitution of India.

[4] J.N Pandey, *Constitutional Law of India*, Allahabad Law Agency, Allahabad,p-170

[5] [(1996) 2 SCC 752].

[6] For detail concerning this point see Article 324(1) of Indian Constitution.

[7] AIR (1994) SC 678.

[8] [( 1994) 3SCC 170].

[9] AIR (1999) ALL 1821.

[10] AIR (1961) SC 334.

[11] 84th Election Law Reports, p 46.

ISSN 2394 - 7780

stood convicted by the trial for the offence u/s 302 and 307 I.P.C and who stood released on bail on the election period, held that – "the disqualification which is a automatic effect of conviction, springs up right at the time of pronounce of conviction, which findings is yet to be reserved or set aside.[12]

Again the Supreme Court of India in *Y.K Gadakh v. Balasaheb Vikhe Patil*[13] has laid down certain guidelines relating to disqualification of person from contesting the election, which the person has to follow. The obvious intention of the courts in India is to prevent a person who is accused of serious crimes and a court is prima facie satisfied about his involvement in the crime, he should be kept out of the electoral arena as it would be a reasonable restriction in the interest of the public.

The recent judgement of the Supreme Court in *Lily Thomas* v. *Union of India*[14] changed the above mentioned position the Supreme Court of India in this case has held that if a sitting MP or MLA is convicted (not only charged), he/ she would be immediately disqualified and the seat declared vacant. This judgement has also clarified another issue relating to disqualification by affirming that if certain criteria stop a person from contesting in elections, then the same criteria also hold for sitting MPs and MLAs hence they cannot continued to be a member of the Parliament or State Legislature. The Court has also said that the Parliament does not have powers to make different laws for the disqualification of a person based on whether he is a contesting candidate or a sitting member of the Parliament and State Assemblies as it is against the provisions of the Constitution. The above mentioned judgment has raised a lot of debates among the politicians, administrators, statesmen and the common people alike. It also creates again a controversy to clip the power of the legislators by the judiciary.[15]

It is clear that the observations of the Supreme Court are genuinely meant to protect the conduct of elections from the evils of money power and criminalization. The court fully recognized its own limitation and left it to Parliament to make suitable legislation. It will be unfair to raise the bogey of usurpation of legislative power by the court.

Although there are laws to regulate these unlawful Activities and from time to time various recommendations were made by the various commissions, but still there has no worth noticing work has been done by the Parliament till date. A comparison with American Constitution will show us that the American law on corrupt practices is the presence of broad rules in the Constitution of many states that elections must be free and equal which not only means free exercise of right to vote but also the equal influence of each and every vote. This prevents the legislature to pass laws, which violate free and fair elections. If purity of election is the essence of democracy and providing for invalidation of an election on the ground of commission of any corrupt practice is the object of enacting these provisions, it cannot be accepted that the election scene having degenerated over the years, appreciation of evidence for determining the commission of a corrupt practice must be made liberally. If the rule of law has to be preserved as the essence of the democracy of which purity of election is a necessary concomitant, it is the duty of the Courts to appreciate the evidence and construe the law in a manner which would sub serve this higher purpose and not even imperceptibly facilitate acceptance, much less affirmance, of the falling electoral standards. For democracy to survive, rule of law must prevail, and it is necessary that the best available men should be chosen as people's representatives for proper governance of the country. This can be best achieved through men of high moral and ethical values who win the elections on a positive vote obtained on their own merit and not by the negative process of vote of elimination based on comparative demerits of the candidates. It is also necessary that the impact of money power should also be minimized from electoral contest otherwise many men of undoubted ability and credibility for want of requisite financial support should be able to re-enter the field to make the people's choice meaningful. This can be achieved only if elections are contested on a positive vote and the comparison between the merits and abilities of the contestants without the influence of power and pelf and not between their comparative demerits and the support of money

[12] Refer to, Indian Penal Code, section 302 & 307.

[13] AIR ( 678), SC, 1994.

[14] Writ Petition (CIVIL) NO. 490 of 2005, Supreme Court of India.

[15] "Parties rue erosion of Parliamentary Democracy" The Assam Tribune, 1st August 2013.

ISSN 2394 - 7780

power. Apart from the other adverse consequences, the growing influence of money power has also the effect of promoting criminalization of politics.

Real education of the electorate contemplates informing them of the past achievements and future plans of the political party on a positive note and its candidate's qualifications to serve that purpose compared with those of the other political parties and their candidates and not a projection of the comparative greater demerits of the opponents. This is with a view to emphasize that the functioning of the democracy depends on the quality of the men chosen for the governance of the country. This is the need, which the election campaign is meant to serve in an election based on party lines, the qualifications of the candidates being material for this purpose.[16] The right to education act can make a vital contribution in this regard by making the illiterate voter literate so that the voter can exercise his astuteness more effectively while exercising his right to vote because he will be in a much better position to understand the power and the value of his vote.

The duty at the top echelons of leadership at the state and national levels of all political parties is to set the trend for giving the needed information to the electorate by adopting desirable standard so that it percolates to the lower levels and provides a congenial atmosphere for a free and fair poll. A contrary trend of speeches by the top leaders tends to degenerate the election campaign as it descends to the lower levels and at time promotes even violence leading to criminalisation of politics. The growth of this unhealthy trend is a cause for serious concern for the proper functioning of the democracy and it is the duty of the top leaders of all political parties to reverse this trend to enable movement of the functioning democracy in the proper direction.

[16] Cf para 18, Manu/SC/0599/1994.

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# ECONOMIC DETERMINANTS AND IMPACT OF FOREIGN DIRECT INVESTMENT IN INDIA: AN EMPIRICAL AND THEORETICAL REVIEW IN PRESENT GLOBALIZATION SCENARIO

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## ABSTRACT
*Foreign direct investment (FDI) is considered to be one of the important factors, which leads to the globalization of an economy. The globalization over the last two decades has been hailed as a major development, which result in economic prosperity in developing countries. In this paper, we have attempted to identify the Determinants , impact and problems associated with India's current foreign direct investment regime, and more importantly the other associated factors responsible for India's unattractiveness as an investment location. The presence of large domestic market, fairly well developed financial architecture and skilled human resources, it can attract much larger foreign investments than it has done in the past. India's present international investment regime facilitates easy entry of foreign capital in almost all areas subject to specific limits on foreign ownership. Entry options have not only become procedurally simpler, but prospects for higher yields from investment have also become brighter. But further boost to Foreign Direct Investment (FDI) will depend significantly on further liberalization of its foreign investment regime. The paper provides the brief synthesis of the regime and analyzes the economic and policy variables as the important determinants of FDI inflows to India.*

*Key Words: Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI), Gross Domestic Product (GDP), Economic Policy Reform*

## I. INTRODUCTION
India is the largest democracy and fourth largest economy in terms GDP in the world. With its consistent growth performance and high-skilled manpower, India provides enormous opportunities for foreign investment. Since the beginning of economic reforms in 1991, major reform initiatives have been taken up in the field of investment, trade and financial sector. Enactment of Competition Act, liberalization of Foreign Exchange Management Act (FEMA), and amendments in Intellectual Property Right laws and many other initiatives make India attractive for business. India is the second most attractive foreign Direct Investment destination (A.T. Kearney 2007). Also it is the second most attractive destination among transnational Corporations for FDI 2007-09 (UNCTAD's World Investment Report, 2007). Though FDI inflows have responded positively to policy changes by increasing from US$ 165 million in 1990-1991 to US$ 90 billion in 2008-2009, there might have been much more had foreign investment not been regulated in some key areas. Till the 1990s the policy was heavily restrictive with majority foreign equity permitted only in a handful export- oriented, high technology industries. Initiated reforms changed the perceptions of foreign investors with foreign investment policy becoming progressively liberal following steady withdrawal of external capital controls and simplification of procedures. While India has an overall market-friendly and liberal policy towards foreign investment, foreign capital still does not enjoy equally easy access in all parts of the economy. The manufacturing sector is still untapped accompanied by lack of access in certain services and agriculture. India's future foreign investment policy faces the critical challenge of increasing access of foreign capital to these segments.

## DEFINITION OF FDI
Foreign Direct Investment (FDI) is now recognized as an important driver of growth in the country. Government is , therefore, making all efforts to attract and facilitate FDI and investment from Non Resident (NRIs) including Overseas Corporate Bodies (OCBs), that are predominantly owned by them, to complement and supplement domestic investment

According to the International Monetary Fund (IMF), a FDI has three components, namely equity capital, reinvested earnings and other direct capital. A large number of countries, including several developing countries, report FDI inflows in accordance with the IMF definition. However, the Reserve Bank of India (RBI) reports FDI inflows only on the basis of investments received from non-residents on equity and preference share capital under the FDI scheme. As the data released by the RBI does not capture reinvested earnings and other capital, these inflows to India do not fully comply with standard international coverage and are, therefore, not directly comparable with the FDI data released by other countries Keeping in mind the issues relating to foreign investment, the study aims to achieve the following objectives:

1) To study the existing policy framework of International Investments
2) To examine the economic policy determinants of FDI

ISSN 2394 - 7780

3) To suggest the improvements that can be made in the current policy framework.
4) To access the sector-wise foreign direct investment in India.
5) To analyze the trends, growth and patterns of FDI inflows into India with Special focus on the post-liberalization periods;

**HYPOTHESIS**

To achieve the objectives, an attempt has been made to test the following hypothesis:

***H1****: There is no effect of GDP on the inflows of FDI in India.*

***H2****: There is no significant effect of openness (exports and imports) on the inflows of FDI.*

***H3****: Debt/GDP ratio is not the cause of FDI inflows in India*

***H4****: There is no effect of legal rights enforcement in attracting FDI inflows in India.*

***H5****: There is no effect of business start up procedures required in attracting FDI inflows in India.*

***H6****: There is no effect of tax policies on FDI inflows in India.*

***H7****: There is no effect of Forex reserves on FDI Inflows*

The rest of the paper is divided into four sections.
Section II presents the literature review on policy regime as a determinant of FDI
Section III represents the brief outline of the International Investment Regime i.e. FDI policy.
Section IV represents the relationship between FDI and economic policy variables taking following factors into consideration namely, market size, openness (exports and imports), lending rates, debt service ability, strength of legal rights and tax structure followed by the concluding remarks.

**DATA AND METHODOLOGY**

To understand the relationship between FDI and economic policy variables multiple correlation and step wise regression is used. Multiple correlations explain the relationship between FDI and its various independent variables. The step wise regression is used because the independent variables are also correlated to each other and effect of one on FDI can be interpreted in better way. The effect of one on multi collinearity, is measured by Darwin Watson test. The data is taken for a period of 9 years from 2006-2014. The data used for analysis is secondary data taken from the following sources

- World Development Indicators published by World Bank.
- FDI Fact Sheet published by Department of Industrial Policy & Promotion. Ministry of Finance

## II. LITERATURE REVIEW

### FDI Defined

In the present era of liberalization, role played by growth of international trade have increasingly influenced FDI and FPI into developing countries. FDI is the largest component of long-term capital flows to developing countries and is expected to remain their dominant source of external finance.

Danziger (1997) defines FDI broadly as an investment made by a foreign investor in order to acquire an ongoing interest in an enterprise operating in a country other than the investor's home country. The foreign investor intends to exercise some control over the management of the direct investment enterprise. It is a Greenfield investment if the foreign investor establishes a new venture in the host country. It is merger & acquisition if the foreign investor makes an acquisition of the whole or part of an existing firm or project in the host country is purchased. International Monetary Fund (1996) maintains that foreign direct investment (FDI) is a category of international investment in which a resident entity in one economy (the direct or foreign investor) acquires a lasting interest in an enterprise resident in another economy (the direct investment enterprise). Whether the lasting interest is related to a controlling interest or to potential control is immaterial. It is constituted that the foreign investor should own at least 10% of on overseas direct investment enterprise to control and influence the management of the investment (IMF FDI in India means investment by non-resident entity/person resident outside India in the capital of the Indian company under Schedule 1 of FEM (Transfer or Issue of Security by a Person Resident outside India) Regulations 2000 (Consolidated FDI Policy Circular, DIPP, 2010).

**Foreign portfolio investment (FPI)**, on the other hand, is a financial investment made by an investor from one country in the securities markets of another country, seeking purely financial gains in the form of income or capital.

ISSN 2394 - 7780

Generally, this is a short - term investment in shares, bonds, notes, money market instruments and financial derivatives, and does not imply significant control over or a lasting interest in the enterprises concerned.

**FDI DETERMINANTS**

According to the OLI paradigm of Dunning , the presence of ownership-specific competitive (O) advantages in a transnational corporation, the presence of locational advantages (L) in a host country, and the presence of superior commercial benefits internally in a firm (I) are three important set of determinants which influence the FDI inflows

**Table 1: Select Studies on the Determinants of FDI**

| Author (Year) | Country/Sector | Key Findings |
|---|---|---|
| Moosa, Imad A, Cardak, Buly A(2006) | 138 countries | Countries with high degree of openness and low country risk attract more FDI. |
| Kok, Reap, Ersoy Bernur A(2009) | Developing countries | Countries should develop policies particular to their own economic structure depending on the FDI determinant. |
| Neumayer, Eric, Spess, Laura(2005) | Developing countries | Higher number of Bilateral Investment Treaties(BITs) results in more inflows of FDI |
| Zheng, Ping(2009) | India and China | Inward FDI is influenced by economic growth, exports, country and political risks/policy liberalization. |
| Sahoo, Pravakar(2006) | South Asia | Major determinants of FDI in South Asia are market size, labor force growth, infrastructure index and trade openness. |
| Peter Montiel, Carmen M. Reinhart(1999) | Emerging Economies | Sterlized intervention in policies increases the capital flows in the form of portfolio investment than FDI. Reduced capital controls increases FDI. |
| Sung-Hoon Lim(2008) | China | Investment promotion positively affects the attraction of FDI. |
| Qian Sun , Wilson Tong, Qiao Yu(2002) | China | FDI determinants move through time. Labor quality and infrastructure are important determinants of the distribution of FDI. High labor quality and good infrastructure attract foreign investors. For the country as a whole, political stability and its openness to the foreign world add another important dimension to drawing in foreign capital. |
| Douglas E. Thomas, Robert Grosse(2001) | Mexico | Economic, socio-political, and geographic factors are hypothesized to be important country-of-origin determinants of FDI into Mexico. |
| Singh Harinder, Jun, Kwang W (1995) | Developing countries | Political risk, business conditions and macroeconomic policies matter for FDI. |

## III. CURRENT SCENARIO OF FDI INFLOW IN INDIA

Since economic reforms initiated in 1991, Government of India has taken many programs to magnetize FDI inflows, to improve the Indian economy. An important objective of promoting FDI in India and other developing countries has been to promote efficiency in production and increase exports. However, any increase in equity stake of the foreign investors in existing joint ventures or purchase of a share of equity by them in domestic firms would not automatically change the orientation of the firm. That is, "the aim of FDI investors would be to benefit from the profit earned in the Indian market. As, a result, in such cases FDI inflows need not be accompanied by any substantial increase in exports, whether such investment leads to modernization of domestic capacity or not". Therefore, it is a challenge for a developing country like India to channelize its capital inflow through FDI into a potential source of productivity gain for domestic firms. As a result, India has received total FDI of US$ 180,034 million from the year 1990-91 to 2009-10 which is due to the initiatives taken by the Government of India in attracting FDI inflows in India. The FDI inflows have shown a rising trend from 1991-92 to 1997-98 owing to the sincere programmes of structural liberalization and open market reforms. The rise in flows of FDI till 1997 was due to not only of the liberalization policy but also due to the sharp expansion in the global scale of FDI outflows during the 1990s. Another causal factor may have been the recovery of the Latin American economies, which had begun to emerge from the Debt Crisis of the 1980s. Then after during 1998-99 and 1999-00 there was decline in FDI inflow which was due to the decline in industrial growth rate in the economy and also due to the result of the East Asian Financial Crisis. But again in the next following year, foreign investment started to bounce back. During 2002-03 and 2003-04, again there was fall in flow of foreign direct investment which was due to the cast of Global Recession on the Indian economy. The FDI Equity inflows during the five years 2005-06 to 2009-10 showed a massive increase of more than seven times than those of the previous years 1991-92 to 1999-00 and 2000-01 to 2004- 05. This increase was due to the revised FDI Policy in March 2005, an important element of the policy was to allow FDI up to 100% foreign

ISSN 2394 - 7780

equity under the automatic route in townships, housing, built-up infrastructure and construction-development projects

## IV. MAJOR ECONOMIC DETERMINANTS IN INDIA

### 1. Restrictive FDI regime

The FDI regime in India is still quite restrictive. As a consequence, with regard to cross border ventures, India ranks 57th in the GCR 1999. Foreign ownership of between 51 and 100 percent of equity still requires a long procedure of governmental approval. In our view, there does not seem to be any justification for continuing with this rule. This rule should be scrapped in favor of automatic approval for 100-percent foreign ownership except on a small list of sectors that may continue to require government authorization. The banking sector, for example, would be an area where India would like to negotiate reciprocal investment rights. Besides, the government also needs to ease the restrictions on FDI outflows by non-financial Indian enterprises so as to allow these enterprises to enter into joint ventures and FDI arrangements in other countries. Further deregulation of FDI in industry and simplification of FDI procedures in infrastructure is called for.

### 2. Lack of clear cut and transparent sectoral policies for FDI

Expeditious translation of approved FDI into actual investment would require more transparent sectoral policies, and a drastic reduction in time-consuming red-tapism.

### 3. High tariff rates by international standards

India's tariff rates are still among the highest in the world, and continue to block India's attractiveness as an export platform for labor-intensive manufacturing production. On tariffs and quotas, India is ranked 52nd in the 1999 GCR, and on average tariff rate, India is ranked 59th out of 59 countries being ranked. Much greater openness is required which among other things would include further reductions of tariff rates to averages in East Asia (between zero and 20 percent). Most importantly, tariff rates on imported capital goods used for export, and on imported inputs into export production, should be duty free, as has been true for decades in the successful exporting countries of East Asia.

### 4. Lack of decision-making authority with the state governments

The reform process so far has mainly concentrated at the central level. India has yet to free up its state governments sufficiently so that they can add much greater dynamism to the reforms. In most key infrastructure areas, the central government remains in control, or at least with veto over state actions. Greater freedom to the states will help foster greater competition among themselves. The state governments in India need to be viewed as potential agents of rapid and salutary change. Brazil, China, and Russia are examples where regional governments take the lead in pushing reforms and prompting further actions by the central government. In Brazil, it is São Paulo and Minais Gerais which are the reform leaders at the regional level; in China, it is the coastal provinces, and the provinces farthest from Beijing, in the lead; in Russia, reform leaders in Nizhny Novgorod and in the Russian Far East have been major spurs to reforms at the central level.

### 5. Limited scale of export processing zones

The very modest contributions of India's export processing zones to attracting FDI and overall export development call for a revision of policy. India's export processing zones have lacked dynamism because of several reasons, such as their relatively limited scale the Government's general ambivalence about attracting FDI; the unclear and changing incentive packages attached to the zones; and the power of the central government in the regulation of the zones, in comparison with the major responsibility of local and provincial government in China. Ironically, while India established her first EPZ in 19654 compared with China's initial efforts in 1980, the Indian EPZs never seemed to take off -- either in attracting investment or in promoting exports.

### 6. No liberalization in exit barriers

While the reforms implemented so far have helped remove the entry barriers, the liberalization of exit barriers has yet to take place. In our view, this is a major deterrent to large volumes of FDI flowing to India. An exit policy needs to be formulated such that firms can enter and exit freely from the market. While it would be incorrect to ignore the need and potential merit of certain safeguards, it is also important to recognize that safeguards if wrongly designed and/or poorly enforced would turn into barriers that may adversely affect the health of the firm. The regulatory framework, which is in place, does not allow the firms to undertake restructuring.

### 7. Stringent labor laws

Large firms in India are not allowed to retrench or layoff any workers, or close down the unit without the permission of the state government. While the law was enacted with a view to monitor unfair retrenchment and

ISSN 2394 - 7780

layoff, in effect it has turned out to be a provision for job security in privately owned large firms. This is very much in line with the job security provided to public sector employees. Most importantly, the continuing barrier to the dismissal of unwanted workers in Indian establishments with 100 or more employees paralyzes firms in hiring new workers. With regard to labor regulations and hiring and firing practices, India is ranked 55th and 56th respectively in the GCR 1999. Labor-intensive manufacturing exports require competitive and flexible enterprises that can vary their employment according to changes in market demand and changes in technology, so India remains an unattractive base for such production in part because of the continuing obstacles to flexible management of the labor force.

**8. Financial sector reforms**

Reform of India's financial sector is crucial for large FDI flows into India. However, only some partial steps have been undertaken and these are by no means going to make any meaningful changes to the existing system. India's banking and insurance companies were nationalized more than two decades ago. While a number of countries had undertaken such actions in the 1970s and early 1980s, for instance Mexico, France, and Chile, however, they have almost completely reversed this policy by now. Be that as it may, India still continues to rely on a state-owned, state-run banking system and the insurance sector till very recently remained a government monopoly. This as one would expect has had highly adverse results, both in terms of availability of funds for investment and a negligible presence of foreign banks and no presence of foreign insurance companies in the country.

**9. High corporate tax rates**

Corporate tax rates in East Asia are generally in the range of 15 to 30 percent, compared with a rate of 48 percent for foreign companies in India. High corporate tax rate is definitely a major disincentive to foreign corporate investment in India. With respect to tax evasion, India is ranked 48th in the GCR 1999.

## V. CONCLUDING REMARKS

The present study analysis the policy related variables like openness of the economy, foreign exchange reserves, debtservice ratio, strength of legal rights, tax policies and economic determinant, that is, GDP to throw light at the possible variables influencing the foreign direct investment inflows in India. The analysis shows that independent variables including GDP, Openness and LR affect the inflows of FDI to India. Among the major reasons which discourage the international investors from investing in India despite of its consistent economic growth includes:

1) Inadequate Legal system
2) Maturity of the financial markets
3) Politics and corruption
4) Lack of infrastructure
5) Instability of Indian Social and Political environment practices

All in all a more open policy frame is required which can be integrated with developing economies policy frame so that India becomes the most attractive destination and actually receive Foreign Direct Investment in the sectors which has potential to grow from foreign capital. Further more the integration at National level is required as sectors which are covered under automatic route are subject to other caveats imposed by State and respective Ministry.

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# ETHICAL ISSUES IN MARKETING RESEARCH: AN INSIGHT

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## ABSTRACT

*Ethics focuses on standards, rules and code of conduct governing the behavior of individuals and groups of individuals. Ethico-Moral human actions are closely and basically related to varying human thoughts initiated, implemented and dominated by the human character which is exhibited through social behavior. Ethics is not only personal but also relative concept. Overall adoption of ethics is a matter of concern, although they are partially followed by some business houses.*

*Especially after the year 1980, because of emergence of Customer-oriented Approach resulting in increasing competition and also emergence of Consumerism as a dynamic concept, in India, the culture to conduct Marketing Research gained a wide and broad recognition, particularly, as a vital tool of Marketing Management. The manufactures of consumer goods and the marketers dealing in service sector have realized the significance of Marketing Research, at present.*

*As per the findings of a recent survey, the cost of the Market Research conducted in India in recent past was over 800 Crores. It can be predicted that Research Culture would be an Integral Part of Marketing Activity in 21st Century in India.*

*Privacy, Intrusion, Deception through Misrepresentation and Misleading Practices are some selected Ethical Issues in Marketing Research in India. All these issues are dealt with in this paper,*

*Key Words: Privacy, Confidentiality, Intrusion, Deception and Misleading Practices.*

## INTRODUCTION

The English word 'Ethics' has originated from the Greek word 'Ethos' which literally means the manners or the character. Moreover, in Latin it is called as 'Ethicus.' Also, in one restrictive sense, it is interpreted as a synonym of the word 'Morality', in the sense that it is that branch of philosophy which deals with Moral Principles. However, strictly technically speaking, the two words namely 'Ethics' and 'Morality' have different meanings especially in respect of their Practical Scope as well as Social Applicability. Fundamentally, **Ethics focuses on standards, rules and code of conduct governing the behavior of individuals and groups of individuals**. Morality is primarily concerned with relative good or bad and right or wrong human behavior in a given situation. In other words, ***Ethico-Moral human actions are closely and basically related to varying human thoughts initiated, implemented and dominated by the human character which is exhibited through social behavior.***

Really, Marketing Research played a minor role under Sales-oriented Marketing Approach in India, especially prior to the year 1980; however, thereafter ***because of emergence of Customer-oriented Approach resulting in increasing competition and Consumerism as a dynamic concept, in India, the culture of conduct of Marketing Research did gain a very wide and broad recognition particularly as a vital tool of Marketing Management.*** Furthermore, after getting feedback from Consumer Satisfaction Surveys, today's' smart marketers are observed taking a wise second look towards the target customer through conduct of Marketing Research, in order to corroborate customer information prior to finalization of a decision.

In other words, the ***overall frequency of Marketing Research in India has rapidly increased in last thirty five years (1980 -2015) as it has now become an on-going activity exactly against past, not only to discover but also to re-discover the real or the interested consumer***. As a result, many Companies are employing Marketing Research Consultancies who, in turn, have set up specialized cells, just, to cater to the growing needs of the Companies investigating Consumer Satisfaction through Marketing Research. Not only the manufactures engaged in the production of consumer goods but also the marketers dealing in service sector have rightly realized the practical significance of Marketing Research, at present.

## RATIONALE OF THE PAPER IN THE PRESENT MARKET SCENARIO

As per the findings of a recent Market Survey, India is one of the fastest growing markets for Marketing Research amongst some other countries. Also, ***the cost of the Market Research conducted in India in recent past was over 800 Crores. Besides, this cost is likely to increase even more, in the years to come.*** Especially because of ever increasing demand and size of Marketing Research, some advertising agencies also are

ISSN 2394 - 7780

observed diversifying in to the field of Marketing Research. It may necessarily not be out of place to predict over here that ***Research Culture would be an Integral Part of Marketing Activity in 21st Century in India.***

On this background of the Marketing Research in India, as on today, along ***with the increase in its demand and the size, a number of Ethical issues also started emerging in the marketing sphere.*** Unless such issues are checked and controlled in reasonable time, right now, the number of such undesirable but inevitable issues would go on rising with the passage of time.

Moreover, as this is a very hot topic of curiosity arousing and debate, at present, it is loudly commented in several guest lectures, seminars, workshops and conferences of not only National but also International levels. Thus, ***it is the right time to study, quite critically, Ethical issues in Marketing Research in India.***

**OBJECTIVES**

The following are the Objectives of this Paper.

1. To develop conceptual Understanding about Ethics
2. To Study the Ethical Issues in Marketing Research in India

**SCOPE** .

The Scope of this Paper extends to the development of conceptual understanding about Ethics. The paper further throws some light on some selected Ethical Issues in marketing Research in India.

**METHODOLOGY**

The following Methodology was adopted for writing this Paper.

1. The review of literature was done through several books and significant websites (Secondary Data) in order to learn

   (a) The overall concept of Ethics and

   (b) Ethical Issues in Marketing Research in India.

2. The paper is based on Secondary Data.

**SOURCES OF SECONDARY DATA**

The Sources of Secondary Data include Books and Websites, related to Marketing Research, the details of which are given in the Section, of Categorized Bibliography, which is located at the end of this Paper.

**ETHICS**

The Oxford dictionary defines the word 'Ethics' as the ***'Moral Principles that govern or influence a person's behavior'.*** The word 'Moral' is concerned with the principles of right or good and wrong or bad human behavior. After learning the definition of the word 'Ethics' , as mentioned above, some unanswered and unavoidable questions do crop up. ***What is right? What is wrong? What is good? What is bad? Who would decide as to what is good or bad or right or wrong?*** Therefore, it is not only personal but also relative concept. Furthermore, what is right is good, always. But, what is not right which may be bad may not be wrong, always, as it may be right in some situation. Value system of right and wrong or good or bad, honesty or dishonesty, just or unjust, equitable or inequitable is, in fact, the real or actual practical base for smooth and satisfactory working of a business. Overall adoption of ethics is, indeed, a matter of great concern although they are partially followed by some of the reputed business houses.

Prof. Arun Monappa has quoted some of the references from the book 'Ethics in Business' authored by T. Baumhart. In this book it is stated that Ethical means confirming to the principles of human conduct, or it also means according to common usage. Moreover, the words like just or honest are interpreted synonymous with the word 'Ethical.' Ethical standards are basically the ideals or the guiding principles of human conduct. Every society, religion or Institution has its own Ethical standards or Moral values. ***As per the Vendantic outline of Ethical vision given by Prof. S. K. Chakraborty – one of the recognized authorities on the topics of Ethics and Management, in Vedas, Upanishads, Smrutis, Ramayana Mahabharata and Kautilya's Arthaashastra, there are references to the different diversions of individual and social norms and ethical behavior at appropriate places.***

In order to understand standard Ethical Practices, Ethical Codes like ***Marketing Research Association Code (MRAC), Advertising Standards Council of India (ASCI), American Marketing Association's Codes of Ethics, American Sociological Association's Codes of Ethics, American Psychological Association's Code of Ethics,*** to mention a few, can be referred to. Furthermore, the Marketing Research Association Code in respect

ISSN 2394 - 7780

of Marketing Research Standards is basically designed with the prime objective to promote an Ethical Culture in the profession of Marketing Research where the principles of Honesty, Professionalism, Fairness and Confidentiality combine to support the success of the profession.

**ETHICAL ISSUES IN MARKETING RESEARCH IN INDIA**

The following few are the selected Ethical Issues in Marketing Research in India.

**(a) Privacy and Confidentiality**
**(b) Intrusion**
**(c) Deception through Misrepresentation**
**(d) Undesirable Practices**

Let s discuss each of these issues in detail, one by one, in the following lines.

(a) **Privacy and Confidentiality**

While collecting Primary Data, many a time, the field investigators ***encroach the privacy*** of a respondent by asking very ***personal or highly Confidential Questions*** or detail Information related to ***Secret Matters,*** either related to the individual respondent or the Company itself. (It may necessarily not be out of place to point out over here that Secret Matters include those maters, the sharing of which with the field investigator may endanger the Unique Selling Proposition or the Brand Name or the Image of the Company in the contemplation, especially, of the External People.)

Furthermore, some field investigators use ***hidden cameras,*** some of them study as to ***how the credit cards or ATM cards are used by the consumers*** for purchases, some of them ***misuse the private information*** obtained from the customer databases of different companies, etc.

(b) **Intrusion**

Not only personal but also the telephonic or mobile interviews are experienced ***annoying and intruding*** by the respondents. Some such questions are asked by the interviewers which ***make the position of the respondent, quite awkward,*** at times.

Moreover, instead to take care of the convenience of the respondent, the interviewers, in general, tend to take care of their self convenience. In the process, they comfortably forget that ***they get their convenience caused at the cost of the inconvenience of the respondents***. When the same interviewing trend continues, over a period, in respect of the same respondent, the respondent tends to be reluctant to cooperate for the subsequent interview.

**(**c**) Deception through Misrepresentation**

The Market Researchers, more often than not, ***deceive the respondents, quite tactfully***. In order to collect data, especially from the competitor, the researchers send ***dummy customers to the key persons and places*** where required data can really and readily be available. Moreover, some researchers ***pretend themselves to be the shoppers*** and thereafter ***conduct an Opinion Survey*** about different products, services or the brands.

(d) **Undesirable Practices**

Besides, Marketing Researchers indulge in some undesirable practices like ***Sugging*** (Selling under the guise of Research) or ***Frugging*** (Fund Raising under the guise of Research). However, these kinds of activities on the part of ***Fake Researchers***, no doubt, tarnish the image of the ***Genuine Researchers*** who conduct it sincerely and seriously.

**RESEARCH PAPER LIMITATIONS**

Like every other Paper, this Paper also proceeds with the following limitations.

1. As the present Study is strictly of Academic Orientation, some sort of adaptation to prevailing market conditions is naturally necessary prior to practical application. .
2. As this study is based on Secondary Data, all the limitations of Secondary Data have direct and deep impact on the Researcher's Views and Opinions.
3. The narration about different Codes of Ethics is covered in brief for want of length of the paper.
4. Only a few Selected, Repetitive and leading Ethical Issues related to Marketing Research in India are covered in this paper for want of length of the paper.

**SCOPE FOR FUTURE RESEARCH**

During the course of the study of this Paper, the researcher found out that there is an ample scope and adequate potential for research in future for the following topics related to Ethical Issues in Marketing Research in India.

ISSN 2394 - 7780

1. A Contemporary Study to improve the Level of Ethical Marketing Research Practices in India
2. A Critical Study of Perspectives of Ethical Issues in Marketing Research in India
3. A Critical Study of Ethical Issues in Presenting a Report of Marketing Research in India

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# EVOLUTION OF THE REGIONAL RURAL BANKSIN INDIA

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## ABSTRACT
*The present study focuses on the amalgamation pattern of the fifty six (56) Regional Rural Banks (RRBs) of India,state wise. The paper gives an idea about the status of the RRBs starting from the date of their formation till date. The changes occurred in their organisational structure due to amalgamation and their present financial condition. The study is exploratory in nature and is totally based on secondary data published in the individual website of the banks, website of RBI and NABARD, and different journals.*

*Key Words: Regional Rural Banks, Amalgamation, Performance, India, States*

## INTRODUCTION
The Gramin banks or the Regional Rural Banks (RRBs)in India have been established in the year 1975, has travelled a long journey. In a developing country like India, rural development is a matter of big concern, and these RRBs were formed with the intension of developing the rural sector of the country, by providing bank finance / loans to the small and marginal farmers, agricultural labourers, artisans and small entrepreneurs in rural areas, as well as encourage them to earn on their own. The RRBs have passed through critical periods, by incurring losses, which resulted in theirdoubtful survival, sooner the Government of India, took a decision of merging these banks with their sponsor banks, to encourage their revival process.Though majority of these banks have improved a lot and has proved to be financially viable, some of them are still perpetually sick.

The Amalgamation process of the gramin banks has been initiated, with an objective of enlarging the operational areas of these banks. As some of these RRBswere confined to one or two districts of a state, this caused hindrance towards the growth of these banks geographically.As per the recent list published in the year 2014, in the month of August, out of originally one ninety six (196) only fifty six (56) RRBs are operating in our country, with a network of 19,082 branches and covering 642 districts in 27 states (including Puducherry). The fifty six (56) RRBs include, Five (5) in Andhra Pradesh, One (1) in Arunachal Pradesh, Uttarakhand, Chhattisgarh, Himachal Pradesh, Kerala, Tripura, Meghalaya, Mizoram, Nagaland, Manipur, Puducherry and Haryana, Seven (7) in Uttar Pradesh, Two (2) in Assam, Odisha, Tamil Nadu, Rajasthan, Maharashtra, Jharkhand, and Jammu and Kashmir, and Three (3) in West Bengal, Gujarat, Bihar, Madhya Pradesh, Karnataka and Punjab, under the twenty (20) sponsored commercial banks namely State Bank of India, Bank of Baroda, Bank of India, Allahabad Bank, Indian Bank, Indian Overseas Bank, Punjab National Bank, United Commercial Bank, United Bank of India, Union bank of India, Central Bank of India, Syndicate Bank, State Bank of Hyderabad, Andhra Bank, Dena Bank, Jammu & Kashmir Bank, State Bank of Mysore, Canara Bank, Bank of Maharashtra, and State Bank of Bikaner andJaipur. The process of mergers initiated by the Indian Government has been put on hold, as per the reports of June, 2014, no fresh proposal for amalgamation will be taken further, as the Government of India will focus on improving the performance as well as the profitability of these newly formed banks, by increasing the pool of investors to tap capital for these RRBs. The Government of India has been making various efforts in making these RRBs a profitable organisation by recapitalisation, by allowing the RRBs lend in consortium finance, foreign markets, and commercial projects. The RRBs have been moving forwards towards the core banking solution for effective operation and to increase customer base, and according to the recent reports, 20 RRBs has reached the CBS platform.

There are still unresolved cases of single gramin banks covering few states of the country, namely Arunachal Pradesh, Meghalaya, Manipur, Nagaland Mizoram and Tripura. The RRBs of these states are having limitations in their operations, which adversely affect their performance and profitability and this is a great matter of concern for these banks, as well as to the country's developing economy. A detailed analysis of the constraints as well as a solution to these is an urgent need.

**Performance of the RRBsin India collectively as on 2013-14:** There were fifty seven(57) RRBs, {now fifty six (56), as on August, 2014} covering 642 districts, which 19,082 number of branches as on 31st March, 2014. As per the reports the aggregate deposits grew 13%, investments grew 2%, borrowings grew 34% and outstanding loans and advances grew 17%. All the fifty seven (57) RRBs have earned profit of Rs.2, 833 crores. Forty nine (49) out of fifty seven (57) RRBs are financially and sustainably viable as there is an increasing percentage (89%) of earning profit and carrying no accumulated loss, the remaining 11% that is eight (8) RRBs with accumulated losses, had gone down to 17% as on 31st march, 2014. The reserve increased to Rs. 15,736

ISSN 2394 - 7780

crores and net worth increased to Rs. 21,199 crores. The recovery percentage has gone up to 81.9% as on 30th June, 2013. The gross NPA percentage has declined to 4.4% as on 31st March, 2014.(Nabard, n.d.)

## OBJECTIVES

1. To understand the merging pattern of the RRBs in all the states of India.
2. To analyse if all the states encouraged and accepted the merger process of the RRBs
3. To analyse the past and the present situation of the RRBs based on each state
4. To compare between the RRBs of different states

## SCOPE OF THE STUDY

The study is restricted to the RRBs operating in all the twenty seven (27) states of India. Namely Andhra Pradesh, Arunachal Pradesh, Assam, Rajasthan, Gujarat, Bihar, Jharkhand, Odisha, West Bengal, Haryana, Madhya Pradesh, Uttar Pradesh, Tamil Nadu, Punjab, Puducherry, Kerala, Karnataka, Manipur, Meghalaya, Nagaland, Tripura, Mizoram, Jammu and Kashmir, Himachal Pradesh, Maharashtra, Chhattisgarh, and Uttarakhand.

## RESEARCH METHODOLOGY

The study is fully based on the secondary data that are collected from published reports and financial statements as well as from individual website of the RRBs, Nabard and Reserve Bank of India. In this direction various research papers, authentic journals and websites have been considered.

Twenty Seven states of our country Indiahave been studied individually based on the status of the RRBsthat are operating presently in that particular state, as well as the number of RRBs that were operating previous to the amalgamation process, that started in 2004-05. In the study it has been also considered, the districts as well as the number of branches these new amalgamated banks are having, their financial status as on 2013-14 financial year.

## STUDY STATE WISE IN DETAILS

**Andhra Pradesh:**The RRBs of Andhra Pradesh participatemore cooperatively and more energetically, to uplift the status of the rural sector by developingthe rural farm and non-farm sector, and focusing on the deprived section of the society and encouraging rural business and rural crafts by amalgamation process of the RRBs.Presently five RRBs are operating in the state of Andhra Pradesh. Namely Andhra Pradesh Gramin Vikash Bank, Andhra Pragati Gramin Bank, Chaitanya Godavari Gramin Bank, Deccan Gramin Bank, now known as Telengana Gramin Bank and Saptagiri Grameena Bank. These five banks are in their amalgamated form, and the details of the amalgamation can be seen in Table1.

**Table 1: Status of Amalgamation in Andhra Pradesh**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Andhra Pradesh | Andhra Bank | Chaitanya Godavari Grameena Bank | Chaitanya Grameena Bank<br>Godavari Grameena Bank | 1st March, 2006, Guntur | Guntur, East and West Godavari district, around 87 branches |
| | Indian Bank | Saptagiri Grameena Bank | Kanakdurga Grameena Bank<br>Shri Venkateswara Grameena Bank | 29th June, 2006 Naidu Buildings, Chittoor | Over and across Chittoor and Krishna district, with 168 branches, |
| | State Bank of Hyderabad | Deccan Grameena Bank/ Now Telengana Grameena Bank | Golconda Grameena Bank<br>Sri Rama Grameena Bank<br>Sri Saraswathi Grameena Bank<br>Sri Sathavahana Grameena Bank | 24th March, 2006 Nallakunta, Hyderabad | 5 districts of Telangana With a network of 300 branches |
| | State Bank of India | Andhra Pradesh Grameena Vikas Bank | Kakathiya Grameena Bank<br>Manjira Grameena Bank<br>Nagarjuna Grameena Bank<br>Sangameshwara Grameena Bank<br>Sri Visakha Grameena Bank | 31st March, 2006, Kanamkonda, Warangal | 10 districts with 704 Branches and 488 Ultra Small Branches |
| | Syndicate Bank | Andhra Pragathi Grameena Bank | Pinakini Grameena Bank<br>Rayalseema Grameena Bank<br>Sree Anantha Grameena Bank | 1st June, 2006, Kadapa, Ydr | 5 districts with 450 branches |

Source: Computed

ISSN 2394 - 7780

**Performance of the RRBs in Andhra Pradesh:** All these banks are in the profitable position as on the financial year 2013-14. Telengana Gramin bank has a net worth of Rs.369.23 Croreas on 31.03.2014, with a customer base of over 23.98 lakh, and is capable of extending personalized & satisfactory services to all its customers. These RRBs are more focused on 'customer centric' products, and is also offering higher rates of interest on term deposits in comparison to the commercial banks. Andhra Pradesh Gramin Vikash Bank started from only Rs 4001 Crore of total business as on 31.3.2006 and reached to Rs 15173 Crore as on 31.8.2014 with a 279% growth, which indicates they are gaining public confidence day by day. Chaitanya Godavari Gramin Bank as on 31.03.2014had a net worth of Rs.146.51 crore and their aggregate business stood at 3391.37crore. Andhra Pragathi Grameena Bank has been adjudged as the best bank, with a total business of Rs.13262.17 Crore and net profit of Rs.160.37 Cr as on 31.03.2014. Lastly Saptagiri Grameena Bank had a total business of Rs.4800 crores as on 31.03.2014, which grew 19.07% over previous year.(Official Website, n.d.)

**Assam:** The main intension behind the formation of these RRBs in Assam was to develop and uplift the rural sector of the state. From its inception till date two banks are operating for the same cause, previously there were few more numbers of these banks, but in the year 2006, four of these RRBs were merged to form Assam Gramin Vikash Bank. The full details are available in Table2. On the other hand, LangpiDehangi Rural Bank has been operating since its inception in 1982, with 57 branches in the two hilly districts of Assam.

**Table 2: Status of Amalgamation in Assam**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Assam | United Bank of India | Assam Gramin Vikash Bank | Cachar Grameena Bank | 12th January, 2006 Guwahati | The bank covers 25 out of 27 districts of Assam, through its strong network of 355 branches. |
| | | | Lakhimi Gaonlia Grameena Bank | | |
| | | | Pragjyotish Gaonlia Grameena Bank | | |
| | | | Subansiri Gaonlia Grameena Bank | | |
| | State Bank of India | Langpi Dehangi Rural Bank (LDRB) | No amalgamation has taken place for this bank. LDRB was established on 27th January 1982. It is operating for 32-33 Years. | Head Office is at Diphu | It operates in the hilly districts of Karbi Anglong and Dima Hasao, with 57 branches |

Source: Computed

**Performance of the RRBs in Assam:** Both the RRBs of Assam are having profitable situation.Thetotal business of Assam Gramin Vikash Bank has been growing since 2006, from Rs. 2565 crores, to Rs.10098 crores as on 31st March,2014.LangpiDehangi Rural Bank has a credit deposit (CD) ratio of 42% as on 21.03.2014 and the total income earned for the year 2013-14 was Rs. 4395.82 lacks an increase of 7.54% over the previous year, net profit was 603.28 lacks, and CAR was 12.86%.(Official Website, n.d.)

**Bihar:** The main objective of the RRBs of Bihar is to develop the rural sector by financing the farm& non-farm sectors, generate other employment programs for the rural mass, to deliver the best possible customer service to its customer, as well as generate income and profit for the each of the business centres.There were two phases of amalgamation of the RRBs in Bihar, in the first phase out of 16 gramin banks, 15 were merged,seven (7) banks were merged to form Uttar Bihar Kshetriya Grameena Bank, and three (3) banks were merged to form Bihar Kshetriya Grameena Bank. The number of banks decreased to five (5) after the first phase. In the second phase again Uttar Bihar Kshetriya Grameena Bank got merged with Kosi Kshetriya Grameena Bank to form Uttar Bihar Grameena Bank, and Bihar Kshetriya Grameena Bank got merged with Samastipur Kshetriya Grameena Bank to form Bihar Gramin bank. The details can be seen in table3.

**Table 3: Status of Amalgamation in Bihar**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Bihar | Central Bank of India | Uttar Bihar Kshetriya Grameena Bank | Champaran Kshetriya Grameena Bank | 1st March, 2006 (1st Phase of amalgamation) | |
| | | | Gopalganj Kshetriya Grameena Bank | | |
| | | | Madhubani Kshetriya Grameena Bank | | |
| | | | Mithila Kshetriya Grameena Bank | | |
| | | | Saran Kshetriya Grameena Bank | | |
| | | | Siwan Kshetriya Grameena Bank | | |
| | | | Vaishali Kshetriya Grameena Bank | | |

ISSN 2394 - 7780

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|---|---|---|---|---|---|
| | Punjab National Bank | Madhya Bihar Grameena Bank | Bhojpur Rohtas Grameena Bank<br>Magadh Grameena Bank<br>Nalanda Grameena Bank<br>Patliputra Grameena Bank | 10th February, 2006, Head Office at Patna | 4 districts, with 95 branches |
| | Uco Bank | Bihar Kshetriya Grameena Bank | Begusarai Kshetriya Grameena Bank<br>Bhagalpur-Banka Kshetriya Grameena Bank<br>Monghyr Kshetriya Grameena Bank | 12.09.05 (1st phase of amalgamation) | |
| | Central Bank of India | Uttar Bihar Grameena Bank | Kosi Kshetriya Grameena Bank<br>Uttar Bihar Kshetriya Grameena Bank | 1st May, 2008 Muzaffarpur (2nd phase of amalgamation) | 18 districts with1020 Branches, and 3430 BC outlets |
| | State Bank of India<br>Uco Bank | Bihar GraminBank | Samastipur Kshetriya Grameena Bank<br>Bihar Kshetriya Grameena Bank | 15th October,2012, Begusarai (2nd phase of amalgamation) | 9 districts with 318 branches |

**Source: Computed**

**Performance of the RRBs in Bihar:** Bihar Gramin Bank is sponsored by United Commercial Bank, had a total business of Rs. 5095 crore and Uttar Bihar Gramin Bank on the other hand had a profit of around 243 croreas on 31st March, 2014.(Official Website, n.d.)

**Chhattisgarh:**Two phases of amalgamation took place in Chhattisgarh, first one was in 2006 and the second one was in September 2013. Presently only one bank operates in the state. The detail has been given in table number 4.

**Table 4: Status of Amalgamation in Chhattisgarh**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/Head-Office | Operating Areas/Districts /Branches |
|---|---|---|---|---|---|
| Chhattisgarh | State Bank of India | Chhattisgarh Grameena Bank | BastarKshetriya Grameena Bank<br>Bilaspur Raipur Grameena Bank<br>RaigarhKshetriya Grameena Bank | 30th June, 2006 (1st phase of amalgamation) | |
| | Dena Bank | Chhattisgarh Rajya Grameena Bank | Chhattisgarh Grameena Bank<br>Surguja Kshetriya Grameena Bank<br>Durg Rajnandgaon Grameena Bank | 2nd September, 2013 (2nd phase) Sundar Nagar, Raipur | 27 districtsand 584 branches |

Source: Computed

**Performance of the RRBs in Chhattisgarh**: The only Regional Rural Bank of Chhattisgarh was in a profitable condition as of March, 2014.

**Gujarat:**Presently three (3) RRBs are operating in Gujarat, namely Baroda Gujarat Grameena Bank,Dena Gujarat Grameena Bank, and Saurashtra Grameena Bank. The details of their amalgamation has been given in the below table 5.

**Table 5: Status of Amalgamation in Gujarat**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Gujarat | Bank of Baroda | Baroda Gujarat Grameena Bank | Panchmahal Vadodara Grameena Bank<br>Surat Bharuch Grameena Bank<br>Valsad Dangs Grameena Bank | 12th September, 2005 Bharuch | 177 branches in 14- districts |

ISSN 2394 - 7780

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|---|---|---|---|---|---|
| | Dena Bank | Dena Gujarat Grameena Bank | Banaskantha-MehsanaGrameena Bank | 12th September, 2005 Gandhinagar | 179 branches in7districts of Gujarat |
| | | | Kutch Grameena Bank | | |
| | | | Sabarkantha Gandhinagar Grameena Bank | | |
| | State Bank of Saurashtra | SaurashtraGrameena Bank | Jamnagar Rajkot Grameena Bank | 21.12.2005 Rajkot | 11 districts of Gujarat |
| | | | Junagadh Amreli Grameena Bank | | |
| | | | Surendranagar Bhavnagar Grameena Bank | | |

Source:Computed

**Performanceof the RRBs in Gujarat:** Baroda Gujarat Gramin made a rapid growth from total business of Rs.801 Crore in 2005, to Rs.3114 crore, as on 31st march, 2014.Saurashtra Grameena Bank and Dena Gujarat Gramin also incurred profit for the same year.(Official Website, n.d.)

**Haryana:**To serve and develop the rural mass efficiently and earn profit for the bank was the sole intension behind the amalgamation of Sarva Haryana Gramin Bank. The details of amalgamation can be seen from table6.

**Table 6: Status of Amalgamation in Haryana**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Haryana | Punjab National Bank | Haryana Gramin Bank | AmbalaKurukshetriyaGrameena Bank | 12.09.05 1st phase amalgamation | |
| | | | Haryana Kshetriya Grameena Bank | | |
| | | | Hissar-SirsaKshetriya Grameena Bank | | |
| | Syndicate Bank | Gurgaon Gramin Bank | Established in the year 1976 (no amalgamation) | | 163 branches |
| | Punjab National Bank | SarvaHaryana Gramin Bank | Haryana Gramin Bank | 29.11.2013 Rohtak 2nd phase amalgamation | All the 21 Districts of Haryana, 554 Branches |
| | | | Gurgaon Gramin Bank | | |

Source: Computed

**Performance of the RRBs in Haryana:**Total business of the bank as on 30th June, 2014 was Rs.14921.77 crore, total deposits was Rs.8985.55 crore and total advances were Rs.5936.22 Crore. (Official Website, n.d.)

**Himachal Pradesh:**The prime objective behind the establishment was to provide basic banking facilities to the remote rural sectors and rural masses in the form of productive creditfor agriculture, cottage and small scale industries, as well as allowed finance for housing, education, and transport to public under different schemes. Himachal Pradesh Gramin Bank is giving sincere effortto fulfil its obligations. The details of the amalgamation can be seen from table 7.

**Table 7: Status of Amalgamation in Himachal Pradesh**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Himachal Pradesh | Punjab National Bank | Himachal Pradesh Grameena Bank | Himachal Grameena Bank | 15th February 2013 Mandi | 12 districts, with 190 branches |
| | State Bank of India | | Parvatiya Grameena Bank | | |

Source: Computed

ISSN 2394 - 7780

**Performance of the RRBs of Himachal Pradesh:**The bank has shown satisfactory performance in 2014. The total business was Rs.3597.74 crore, which included deposit base of Rs.2649.12 crore and advances Rs.948.62 crore, with a Net worth of Rs.120.02 crore and Reserves to the tune of Rs.104.58 croreas on 30.09.2014. The Gross profit and net profit was Rs. 12.52 crore and Rs. 8.66 crore respectively in September, 2014.(Official Website, n.d.)

**Jammu and Kashmir:**The main objective of the Bank is to improve the economy of rural, semi-urban & urban centres. Table 8 shows the details of amalgamation.

**Table 8: Status of Amalgamation in Jammu and Kashmir**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Jammu and Kashmir | Jammu & Kashmir Bank | J & K Grameena Bank | Kamraz Rural Bank<br>Jammu Rural Bank | 30th June 2009 Jammu | 11 Districts and 203 branches |
| | State Bank of India | EllaquaiDehati Bank | Was established on 16th, July 1979 No amalgamation took place | Kashmir Srinagar | 13 districts with 133 Branches, |

Source: Computed

**Performance of the RRBs of Jammu and Kashmir:**EllaquaiDehati Bank of Jammu and Kashmirhas been doing a great performance by increasing its total business to Rs. 30,37, 235 thousands, as on March, 2014, from Rs. 24,72,608 thousands as on March 2013.(Official Website, n.d.)

**Jharkhand:**The RRBs of Jharkhand has been doing a great job by developing the rural economy and providing finance for the sake of agriculture, trade and commerce, and other productive activities in the rural areas. The details of amalgamation can be seen in table 9.

**Table 9: Status of Amalgamation in Jharkhand**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation / Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Jharkhand | Bank of India | Jharkhand Grameena Bank | Giridih Kshetriya Grameena Bank<br>Hazaribagh Kshetriya Grameena Bank<br>Ranchi Kshetriya Grameena Bank<br>Singhbhum Kshetriya Grameena Bank | 12.06.2006 Ranchi | 15 districts with 239 branches |
| | State Bank of India | Vananchal Grameena Bank | Palamau Kshetriya Grameena Bank<br>Santhal Paraganas Grameena Bank | 30.06.2006 Dumka | 9 districts, with 203 branches |

Source: Computed

**Performance of the RRBs of Jharkhand:**Total profit of Vananchal Gramin Bank and Jharkhand Gramin bank as on March, 2014 was Rs.1590.59 lakhs and Rs. 378574 thousands respectively, and Rs. 973.30 lakhs in the current financial year.(Official Website, n.d.)

**Kerala:**Kerala Gramin Bank has been formed by amalgamation of North and South Malabar Grameena Banks, with the aim of developing the region. The details of the amalgamation process have been given in table10.

**Table 10: Status of Amalgamation in Kerala**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Kerala | Syndicate Bank | Kerala Gramin Bank | North Malabar Grameena Bank | 8th July 2013 Malappuram, Kerala | 14 districts with 542 branches |
| | Canara Bank | | South Malabar Grameena Bank | | |

Source: Computed

ISSN 2394 - 7780

**Performance of the RRBs in Kerala:** Kerala Gramin Bank is the largest RRBs in the country with a total business of above 15,000 Crore as on March, 2014.(Official Website, n.d.)

**Punjab:**Like theRRBs in other states, the RRBs of Punjab were formed for the welfare purpose of the rural mass. The details of the amalgamation have been given in table 11.

**Table 11: Status of Amalgamation in Punjab**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Punjab | Punjab National Bank | Punjab Grameena Bank | Gurdaspur-Amritsar Kshetriya Grameena Bank | 12th September, 2005 Kapurthala | 264 branches across 13 districts |
| | | | Kapurthala-Ferozpur Kshetriya Grameena Bank | | |
| | | | ShivalikKshetriya Grameena Bank | | |
| | State Bank of Patiala | Malwa Gramin Bank | Was established on 27.02.1986, no amalgamation | Sagrur | 68 branches in 5 districts |
| | Punjab and Sindh Bank | Sutlej Gramin Bank | Established on 22.03.1986 | Bathinda | 6 districts with 31 branches |

Source: Computed

**Performance of the RRBs of Punjab:** Punjab Gramin Bank had total business of Rs.6595.88 crores as on 31.01.2015, the total reserves and net worth was Rs. 482 crores and Rs.504 crores respectively. MalwaGramin Bank had a deposit and advance of Rs 879.81 crores and Rs 864.55 crore respectively. It is a profit earning bank and its profit and reserves were Rs 14.53 crores and Rs 125.47 crores respectively as on 31.03.2014.Sutlej Gramin Bank on the other hand had a net profit of Rs. 2.36 crore as on March, 2014.(Official Website, n.d.)

**Karnataka:**The RRBs in Karnataka has been formed, was the amalgamation was done in two phases, to provide financial facilities to the rural people. The details of amalgamation can be seen in table12.

**Table 12: Status of Amalgamation in Karnataka**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts /Branches |
|---|---|---|---|---|---|
| Karnataka | Canara Bank | Pragathi Grameena Bank | Chitradurga Grameena Bank | 12th September, 2005 1st phase of amalgamation | |
| | | | Kolar Grameena Bank | | |
| | | | Sahyadri Grameena Bank | | |
| | | | TungrameenaBankhadra Grameena Bank | | |
| | State Bank of Mysore | Cauvery Kalpatharu Grameena Bank | Cauvery Grameena Bank | 24th May, 2006 1st phase of amalgamation | |
| | | | Kalpatharu Grameena Bank | | |
| | Syndicate Bank | Karnataka Vikas Grameena Bank | Bijapur Grameena Bank | 12th September, 2005 Dharwad | 9 districts with 552 branches |
| | | | Malaprabha Grameena Bank | | |
| | | | Netravati Grameena Bank | | |
| | | | VaradaGrameena Bank | | |
| | Corporation Bank | Kaveri Grameena Bank | Chikmagalur Kodagu Grameena Bank | 01st November, 2012 Mysuru City | 10 southern districts with 400 Branches |
| | Vijaya Bank | | Visveshvaraya Grameena Bank | | |
| | State Bank of Mysore | | Cauvery Kalpataru Grameena Bank | | |
| | Govt. of Karnataka | Pragathi Krishna Grameena Bank | Pragathi Grameena Bank | 23rd August 2013 Gulbarga | 10 districts 625 branches |
| | Canara Bank | | Krishna Grameena Bank | | |

Source: Computed

ISSN 2394 - 7780

**Performance of the RRBs of Karnataka:**Kavery Gramin bank had a registered business growth of 22.49% during the last financial year, reaching a level of Rs.8401.50 crores. The net profit of the Bank has grown by 36.52% registering Rs.44.75 crores. Pragati Krishna Gramin Bank on the other hand had a total business, of over Rs.16697 crores as on March 2014. The bank earned a net profit of Rs.104.70 Crore for the year 2013-14 compared to Rs.78.93 Crore in the year 2012-13, with an increase in the growth rate by 32.65%. (Official Website, n.d.) Total Business of Karnataka Vikas Grameena Bank has crossed ₹16,000 crore as on December, 2014. (Karnataka Vikas Grameena Bank opens 3 lakh accounts,2014)

**Maharashtra:**The RRBs were formed to develop agriculture, trade, commerce, and industry. Presently two RRBs are operating, details of which has been given in table13.

**Table 13: Status of Amalgamation in Maharashtra**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Maharashtra | Central Bank of India | VidharbhaKshetriya Grameena Bank | Akola Kshetriya Grameena Bank | 12th September, 2005 | |
| | | | BuldhanaGrameena Bank | | |
| | | | Yavatmal Kshetriya Grameena Bank | | |
| | Bank of India | Wainganga Kshetriya Grameena Bank | Bhandara Grameena Bank | 1st August, 2006 | |
| | | | Chandrapur GadchiroliGrameena Bank | | |
| | Bank of Maharashtra | Maharashtra Godavari Grameena Bank | Aurangabad Jalna Grameena Bank | 25th March, 2008 | |
| | | | Thane Grameena Bank | | |
| | Bank of India | Wainganga Krishna Grameena Bank | Ratnagiri Sindhudurg Grameena Bank | 15th December, 2008 | |
| | | | Solapur Grameena Bank | | |
| | | | Wainganga Grameena Bank | | |
| | | | Thane Grameena Bank | | |
| | Bank of Maharashtra | Maharashtra Grameena Bank | Marathwada Grameena Bank | 20th July, 2009 ShivajinagarNanded | 16 districts, 348 branches |
| | | | Maharashtra Godavari Grameena Bank | | |
| | Govt. of Maharashtra | VidhrabhaKonkan Grameena Bank | VidhrabhaKshetriya Grameena Bank | 28th February, 2013 Nagpur | 7 districts/ regions |
| | Central Bank of India | | Wainganga Krishna Grameena Bank | | |

Source: Computed

**Performance of the RRBs in Maharashtra:**Net Profit MGB and VKGB are Rs. 355173 thousands, and Rs. 208150 thousands respectively.(Official Website, n.d.)

**Madhya Pradesh:**Three RRBs are operating in the state, details of which can be seen in table 14.

**Table 14: Status of Amalgamation in Madhya Pradesh**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts /Branches |
|---|---|---|---|---|---|
| Madhya Pradesh | Bank of India | Narmada MalwaGrameena Bank | Dewas-Shajapur Grameena Bank | 3rd April, 2006 | |
| | | | Indore-Ujjain Kshetriya Grameena Bank | | |
| | | | NimarKshetriya Grameena Bank | | |
| | | | Rajgarh-SehoreKshetriya Grameena Bank | | |

ISSN 2394 - 7780

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|---|---|---|---|---|---|
| | Central Bank of India | Chambal-Gwalior Kshetriya Grameena Bank | Chambal Kshetriya Grameena Bank | 1st July, 2006 | |
| | | | Gwalior-Datia Kshetriya Grameena Bank | | |
| | Central Bank of India | SatpuraKshetriya Grameena Bank | Chhindwara-Seoni Kshetriya Grameena Bank | 1st June, 2006 | |
| | | | Hoshangabad Kshetriya Grameena Bank | | |
| | | | Mandla-Balaghat Kshetriya Grameena Bank | | |
| | | | Shahdol Kshetriya Grameena Bank | | |
| | Central Bank of India | Satpura Narmada Kshetriya Grameena Bank | Satpura Kshetriya Grameena Bank | 8th April, 2008 | |
| | | | Chambal-Gwalior Kshetriya Grameena Bank | | |
| | | | Ratlam Mandsaur Kshetriya Grameena Bank | | |
| | State Bank of India | Madhya BharathGrameena Bank | Bundelkhand Kshetriya Grameena Bank | 30th June, 2006 | |
| | | | Damoh-Panna Sagar Grameena Bank | | |
| | | | Shivpuri-Guna Kshetriya Grameena Bank | | |
| | State Bank of India | MadhyanchalGrame en Bank | Madhya Bharath Grameena Bank | 30th June, 2006 Sagar | 12 districts with 405 branches |
| | Allahabad Bank | | Sharda Grameena Bank | | |
| | Union Bank of India | | RewaSidhiGrameena Bank | | |
| | State Bank of India | Central Madhya Pradesh Grameena Bank | Satpura Narmada Kshetriya Grameena Bank | 8th October, 2012 Chhindwara | 451 branches in 25 districts |
| | Central Bank of India | | Vidisha Bhopal Kshetriya Grameena Bank | | |
| | Uco Bank | | Mahakaushal Kshetriya Grameena Bank | | |
| | Bank of India | Narmada JhabuaGrameena Bank | Narmada Malwan Grameena Bank | 1st November, 2012 Indore | 12 districts |
| | Bank of Baroda | | Jhabua Dhar Kshetriya Grameena Bank | | |

Source: Computed

**Performance of the RRBs in Madhya Pradesh:**Total profit of Narmada JhabuaGrameen Bank was Rs. 82.85 crore as on 31.03.2014. Total business of Madhyanchal Gramin bank was Rs.7387 crore and net profit was Rs. 23.40 crores as on 31.03.2014.(Official Website, n.d.)

**Uttarakhand:**Uttarakhand Gramin Bank came into existence after amalgamation of Uttaranchal Gramin Bank and NainitalAlmora Kshetriya Gramin Bank. The details can be seen in table 15.

**Table 15: Status of Amalgamation in Uttarakhand**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/Branches |
|---|---|---|---|---|---|
| Uttarakhand | State Bank of India | Uttaranchal Grameena Bank | AlaknandaGrameena Bank | 30th June, 2006 (1st phase) | |
| | | | Ganga-Yamuna Grameena Bank | | |
| | State Bank of India | | Pithoragarh Kshetriya Grameena Bank | | |

ISSN 2394 - 7780

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|---|---|---|---|---|---|
| | Bank of Baroda | Uttarakhand Grameena Bank | Uttaranchal Grameena Bank | 1st November, 2012 Dehradun | 13 districts of Uttarakhand, with 260 branches |
| | | | Nainital Almora Kshetriya Grameena Bank | | |

Source: Computed

**Performance of the RRBs in Uttarakhand:**The total business was Rs. 4243.98 crores, with a growth of 22.28% and a profit of Rs. 11.30 croresas on March, 2014.(Official Website, n.d.)

**Odisha:**Presently there are two banks operating in Odisha. The details of the amalgamation can be seen in table 16.

**Table 16: Status of Amalgamation in Odisha**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts /Branches |
|---|---|---|---|---|---|
| Odisha | Indian Overseas Bank | Neelachal Gramya Bank | Puri Grameena Bank | 31st August, 2007 | |
| | | | Dhenkanal Grameena Bank | | |
| | Uco Bank | KalingaGramya Bank | Balasore Grameena Bank | 2nd January, 2006 | |
| | | | Cuttack Grameena Bank | | |
| | State Bank of India | Utkal Gramya Bank | Bolangir Anchalik Grameena Bank | 31st July, 2006 | |
| | | | Kalahandi Anchalik Grameena Bank | | |
| | | | Koraput Panchabati Grameena Bank | | |
| | State Bank of India | Utkal Grameena Bank | Utkal Gramya Bank | 1st November, 2012 Bolangir | 17 districts with 426 branches |
| | Andhra Bank | | Rushikulaya Grameena Bank | | |
| | Indian Overseas Bank | Odisha Gramya Bank | Baitarani Grameena Bank | 7th January 2013 Bhubaneswar | 525 branches in13 districts |
| | Bank of India | | Kalinga Grameena Bank | | |
| | Uco Bank | | Neelachal Grameena Bank | | |

Source: Computed

**Performance of the RRBs in Odisha:**The profit after tax and total business of Odisha Gramya Bank as on March,2014 are Rs. 1442.24 Lakhs Rs. 1093961.34 lakhs respectively.(Official Website, n.d.)

**West Bengal:**The land ofWest Bengal itself has immense potential both for agriculture and industry. The three RRBs of the state are doing a great job in enhancing agricultural and industrial productivity in the rural areas. Besides, introduction of non-traditional crop cultivation and multi-dimensional approach for rising food production, these banks are also providing microfinance for the upliftment of the state' economy. Details of amalgamation have been given in table17.

**Table 17: Status of Amalgamation in West Bengal**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| West Bengal | Uco Bank | Paschim Banga Grameena Bank | Howrah Grameena Bank | 26th February, 2007 Howrah | 219 branches in 4 districts |
| | | | Bardhaman Grameena Bank | | |
| | | | Mayurakshi Grameena Bank | | |
| | United Bank of India | Bangiya Grameena Vikash Bank | Gaur Grameena Bank | 21st February, 2007 Murshidabad | 11 districts, with 557 branches |
| | | | Mallabhum Grameena Bank | | |
| | | | Murshidabad Grameena Bank | | |
| | | | Nadia Grameena Bank | | |
| | | | Sagar Grameena Bank | | |
| | Central Bank of India | Uttar Banga Kshetriya Grameena Bank | Established in 7th March 1977 | Cooch Behar | 3 districts with 26 branches |

Source: Computed

ISSN 2394 - 7780

**Performance of the RRBs in West Bengal:** Total business of Bangiya Gramin Vikash Bank was Rs. 13375.75 crores, and net profit was Rs. 32.28 crores respectively. Paschim Banga Gramin Bank has also reported a net profit of Rs.19 crores thereby reducing accumulated loss to Rs.98 crore as on 31.03.2014. Total equity and total asset of Uttarbanga Kshetriya Gramin Bank was Rs. 1028.31 million and Rs. 22410.19 million respectively as on March, 2014.(Official Website, n.d.)

**Rajasthan:**Agriculture followed by animal husbandry are the main economic activities of Rajasthan, due to scanty rainfall, they apply artificial ways of irrigation. The two RRBs that are presently operating provide finance for canal projects and agriculture. Details of the amalgamation can be seen in table18.

**Table 18: Status of Amalgamation in Rajasthan**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation /Head-Office | Operating Areas/Districts /Branches |
|---|---|---|---|---|---|
| Rajasthan | Bank of Baroda | Baroda Rajasthan Grameena Bank | Aravali Kshetriya Grameena Bank | 3rd February, 2006 Ajmer | |
| | | | Bhilwara-Ajmer Kshetriya Grameena Bank | | |
| | | | Bundi-Chittorgarh Kshetriya Grameena Bank | | |
| | | | Dungarpur-Banswara Kshetriya Grameena Bank | | |
| | | | Marudhar Kshetriya Grameena Bank | | |
| | Punjab National Bank | Rajasthan Grameena Bank | Alwar Bharatpur Anchalik Grameena Bank | 24th January, 2006 | |
| | | | Shekhawati Grameena Bank | | |
| | State Bank of Bikaner & Jaipur | Marwar Ganganagar Bikaner Grameena Bank | Bikaner Kshetriya Grameena Bank | 12th June, 2006 | |
| | | | Marwar Grameena Bank | | |
| | | | Sriganganagar Kshetriya Grameena Bank | | |
| | Uco Bank | Jaipur TharGrameena Bank | Jaipur Nagaur Anchalik Grameena Bank | 27th January, 2006 | |
| | | | Thar Anchalik Grameena Bank | | |
| | Central Bank of India | Baroda Rajasthan Kshetriya Grameena Bank | Baroda Rajasthan Grameena Bank | 1 January, 2013 Ajmer | 705 branches in 21 districts |
| | Bank of Baroda | | Hadoti Kshetriya Grameena Bank | | |
| | Punjab National Bank | | Rajasthan Grameena Bank | | |
| | State Bank of Bikaner & Jaipur | Marudhara Grameena Bank | Marwar Ganganagar Bikaner Grameena Bank | 25th February, 2013 | 9 districts |
| | UCO Bank | | Jaipur Thar Grameena Bank | | |
| | ICICI Bank | Mewar Anchalik Grameena Bank | Established in 1983 | Udaipur | |
| | State Bank Of Bikaner & Jaipur | Rajasthan MarudharaGrameena Bank | Marudhara Grameena Bank | 1st April, 2014 Jodhpur | 15 Districts with 462 branches |
| | | | Mewar Aanchalik Grameena Bank | | |

Source: Computed

**Performance of RRBs of Rajasthan:**Total Businessof Rajasthan MarudharaGrameen Bank was Rs. 9830.89 crore, the total profit of Baroda Rajasthan Kshetriya Grameena Bank increased from Rs. 1479856 as on March, 2013, to Rs. 2317500 as on March,2014.(Official Website, n.d.)

**Uttar Pradesh:**Amalgamation in Uttar Pradesh has been done in two phases. Presently there are seven (7) RRBs operating in the state. Like other states, the amalgamation process helped the RRBs to increase the

ISSN 2394 - 7780

efficiency in their operations and improve the socio-economic condition of the rural people of the state. The details of amalgamation can be seen in table number 19.

**Table 19: Status of Amalgamation in Uttar Pradesh**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Uttar Pradesh | Allahabad Bank | Lucknow Kshetriya Grameena Bank | Bhagirath Grameena Bank | 1st March, 2006 | |
| | | | Sarayu Grameena Bank | | |
| | | | Shravasti Grameena Bank | | |
| | Allahabad Bank | Triveni Kshetriya Grameena Bank | ChattrasalGrameena Bank | 1st March, 2006 | |
| | | | Tulsi Grameena Bank | | |
| | | | Vindhyavasini Grameena Bank | | |
| | Bank of Baroda | Baroda Eastern Uttar Pradesh Grameena Bank | Allahabad Kshetriya Grameena Bank | 23rd February, 2006 (1st phase) | |
| | | | Faizabad Kshetriya Grameena Bank | | |
| | | | Fatehpur Kshetriya Grameena Bank | | |
| | | | Kanpur Kshetriya Grameena Bank | | |
| | | | Pratapgarh Kshetriya Grameena Bank | | |
| | | | Raebareli Kshetriya Grameena Bank | | |
| | | | Sultanpur Kshetriya Grameena Bank | | |
| | Bank of Baroda | Baroda Western Uttar Pradesh Grameena Bank | Bareilly Kshetriya Grameena Bank | 23rd February, 2006 (1st phase) | |
| | | | Shahjahanpur Kshetriya Grameena Bank | | |
| | Canara Bank | Shreyas Grameena Bank | Aligarh Grameena Bank | 1st June, 2006 | |
| | | | Etah Grameena Bank | | |
| | | | Jamuna Grameena Bank | | |
| | Punjab National Bank | Uttar Pradesh Grameena Bank | Hindon Grameena Bank | 21st December, 2005 | |
| | | | Muzaffarnagar Kshetriya Grameena Bank | | |
| | | | Vidur Grameena Bank | | |
| | State Bankof India | Purvanchal Grameena Bank | Basti Grameena Bank | 12th September, 2005 | |
| | | | Gorakhpur Kshetriya Grameena Bank | | |
| | Union Bank of India | Kashi Gomti Samyut Grameena Bank | Gomti Grameena Bank | 12th September 2005 Varanasi | 7 districts, with nearly 175 branches |
| | | | Kashi Grameena Bank | | |
| | | | Samyut Kshetriya Grameena Bank | | |
| | Punjab National Bank | Sarva U.P. Grameena Bank | Uttar Pradesh Grameena Bank | 30th, November, 2007 Meerut | 17 Districts, With 345 Branches. |
| | | | Rani Lakshimibai Kshetriya Grameena Bank | | |
| | | | Devi Patan Kshetriya Grameena Bank | | |
| | | | Kisan Grameena Bank | | |
| | Bank of India | Aryavart Grameena Bank | Avadh Grameena Bank | 3rdOctober, 2006 (1st phase) | 321 branches |
| | | | Barabanki Grameena Bank | | |
| | | | Farrukhabad Grameena Bank | | |

ISSN 2394 - 7780

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|---|---|---|---|---|---|
| | Bank of Baroda | Baroda Uttar Pradesh Grameena Bank | Baroda Eastern Up Grameena Bank<br>Baroda Western Up Grameena Bank | 31st March 2008 (2nd phase) Raebareli | 895 branches in 14 districts. |
| | Central Bank of India | Ballia – Etawah Grameena Bank | Ballia Kshetriya Grameena Bank<br>Etawah Kshetriya Grameena Bank | 1stJanuary, 2010 (first phase) | 8 districts, 135 branches |
| | Allahabad Bank | Allahabad U.P. Grameena Bank | Triveni Kshetriya Grameena Bank<br>Lucknow Kshetriya Grameena Bank | 2nd March 2010 Banda | 650 branches & 4 extension counters spread over 11 districts of Uttar Pradesh |
| | Bank of India<br>Up State Co-Op. Bank | Aryavart Kshetriya Grameena Bank | Aryavart Grameena Bank<br>Kshetriya Kisan Grameena Bank | 1st Oct, 2012 (2nd phase) Lucknow | 350 branches |
| | Bank of India<br>Canara Bank | Grameena Bank Of Aryavart | Aryavart Kshetriya Grameena Bank<br>Shreyas Grameena Bank | 1st April, 2013 Lucknow (3rd phase) | 15 districts of Uttar Pradesh with a network of 651 branches |
| | State Bank of India<br>Central Bank of India | Purvanchal Bank | Purvanchal Grameena Bank<br>Ballia – Etawah Grameena Bank | 1st April 2013 Gorakhpur | 571 branches in 11 districts |
| | Syndicate Bank | Prathama Bank | established on 2nd October, 1975 | Moradabad | 4 districts with a network of 301 branches |

Source: Computed

**Performance of the RRBs of Uttar Pradesh:** Total Business of Prathama Bank, Purvanchal Bank and Allahabad UP Gramin BankwasRs.8141 Crore, Rs. 10376 crore and Rs.11535.99 crore respectively. The total profit of Purvanchal Bank, Gramin Bank of Aryavart and Baroda UP Gramin Bankwas Rs. 30.02 crore, Rs. 173,14,91,293 and Rs. 4898868 respectively as on 31.03.2014 and total profit of SarvaUP Gramin Bank as on 31.12.2014 was Rs. 25.76 crore.(Official Website, n.d.)

**Tamil Nadu:**PallavanGrama Bank and PandyanGrama Bank are the two RRBs operating in Tamil Nadu, which has been formed to improve the socio-economic condition of the rural people of the state. The details of amalgamation can be seen in table number 20.

**Table 20: Status of Amalgamation in Tamil Nadu**

| State | Sponsor Bank | New RRBs | Amalgamated RRBs | Date of Amalgamation/ Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Tamil Nadu | Indian Bank | Pallavan Grama Bank | Adhiyaman Grama Bank<br>Vallar Grama Bank | 31-08-2006 Salem | 15 Districts with 205 branches |
| | Indian Overseas Bank | Pandyan Grama Bank | Established in 9th March 1977 | Virudhunagar | 16 Districts with 246 Branches |

Source: Computed

**Performance of the RRBs in Tamil Nadu:**Pandayan Grama Bank's total business reached Rs. 7089.93 crore, deposits crossed Rs. 3179.97 crore credits crossed Rs. 3909.99 crores and operating profit was Rs. 162.58 crore as on March, 2014.PallavanGramya Bank on the other hand has been aiming to grow from Rs. 2200 crores to Rs.3000 crores by March 2014.(Official Website, n.d.)

**The states with only one state level RRBs:** At present, seven states, of India,that includes, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Puducherry, have state-level RRBs.No amalgamation has taken place for these banks.

**Arunachal Pradesh:** Arunachal PradeshRural Bankwas formed with the sole intension of providing banking services and financial facilities to the people of Arunachal Pradesh. The bank since the year 1983 has been playing a pivotal role in developing the economy of the state Arunachal Pradesh, as well as its people. Under

ISSN 2394 - 7780

the sponsorship of State Bank of India, Government of India, and State Government of Arunachal Pradesh this bank is continuing focusing on the welfare of the state as before. The details can be seen in Table21.

**Table 21: Status of Amalgamation in Arunachal Pradesh**

| State | Sponsor Bank | New RRBs | Date of Establishment | Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Arunachal Pradesh | State Bank of India | Arunachal Pradesh Rural Bank | It was established on 30th November 1983. It is operating for 26 years. | Naharlagun, | 8 districts with 28 branches |

Source: Computed

**Performance of the RRBs in Arunachal Pradesh:** Arunachal Pradesh Rural Bank is in a profitable condition with a total business of 44500.91 lacks as on 31st March, 2014.(Official Website, n.d.)

**Manipur:**The Bank operated with an objective of economic development of the rural people especially the weaker sections of the society, the state, by participating in poverty alleviation programmes organised by Central and State Governments.

**Table 22: Status of Amalgamation in Manipur**

| State | Sponsor Bank | New RRBs | Date of Establishment | Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Manipur | United Bank of India | Manipur Rural Bank | 28th May, 1981 | Manipur | 28 (twenty eight) branches spread over in all the 9 (nine) districts |

Source: Computed

**Performance of the RRBs in Manipur**: Manipur Rural Bank was in a profitable position as on 31st March, 2014.

**Meghalaya:**Meghalaya Rural Bank currently is the major provider of priority sector credit, in the form of crop loans to the small and marginal farmers in the State and nurtures self-help groups The Bank provides utmost support in implementing Swarna-jayanti Gram SwarozgarYojana (SGSY), as well as promotes Financial Inclusion and Financial Literacy among the rural folk. The details of the bank can be seen from table 23.

**Table 23: Status of Amalgamation in Meghalaya**

| State | Sponsor Bank | New RRBs | Date of Establishment | Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Meghalaya | State Bank of India | Meghalaya Rural Bank | 29th December 1981 | Shillong | 7 districts with 87 branches. |

Source:Computed

**Performance of the RRBs in Meghalaya:**The total business of the Bank was Rs. 1544.66 crore, and the net profit was Rs. 31.68 crore as on 31.04.2014. Both the areas showed enormous growth, total business grew more than Rs. 170 crore during the year, and net profit grew 12% over the last year.(Official Website, n.d.)

**Mizoram:**Mizoram rural Bank has been formed for the welfare of the rural massin the state. The details about the bank can be seen in table number 24.

**Table 24: Status of Amalgamation in Mizoram**

| State | Sponsor Bank | New RRBs | Date of Establishment | Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Mizoram | State Bank of India | Mizoram Rural Bank | 27th September, 1983 | Aizawl | 8 Districts, with 78 branches |

Source: Computed

**Performance of the RRBs in Mizoram:**The total business of the Bank has increased from Rs.1694.59 crore in 2012-13 to Rs 1974.90 crore in 2013-14. The profit of the Bank has also increased from Rs.10.58 crore in 2012-13 to Rs.24.78 crore in 2013-14.(Official Website, n.d.)

**Nagaland:**Nagaland rural Bank has been formed to improve the socio-economic condition of the rural people of the state. The details about the bank can be seen in table number 25.

ISSN 2394 - 7780

**Table 25: Status of Amalgamation in Nagaland**

| State | Sponsor Bank | New RRBs | Date of Establishment | Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Nagaland | State Bank of India | Nagaland Rural Bank | | Kohima | All districts of Nagaland With 10 branches |

Source: Computed

**Performance of the RRBs in Nagaland:**Nagaland Rural bank was having a profitable position as on March, 2014.

**Tripura:**Tripura Gramin Bank is dedicated to the amelioration of the socio-economic condition of the rural people of the state. The details about the bank can be seen in table number 26.

**Table 26: Status of Amalgamation in Tripura**

| State | Sponsor Bank | New RRBs | Date of Establishment | Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Tripura | United Bank of India | Tripura Rural Bank | 21st December, 1976 | Agartala | 8 Districts, with 142 branches |

Source: Computed

**Performance of the RRBs in Tripura:** Total profit for March, 2014 was Rs. 8269 lakhs, for September, 2014 was Rs. 5020 lakhs, and for October, 2014 was Rs. 3331 lakhs.(Official Website, n.d.)

**Puducherry:**PuduvaiBharathiarGrama Bank has been formed to improve the socio-economic condition of the rural mass in the state. The details about the bank can be seen in table number 27.

**Table 27: Status of Amalgamation in Puducherry**

| State | Sponsor Bank | New RRBs | Date of Establishment | Head-Office | Operating Areas/Districts/ Branches |
|---|---|---|---|---|---|
| Puducherry | Indian Bank | Puduvai Bharathiar Grama Bank | 26th March, 2008 | Puducherry | four regions with 32 branches |

Source: Computed

**Performance of the RRBs in Puducherry:** The profit before tax earned by the bank was Rs. 800.25 lakhs, against Rs 603.38 lakhs, which was 33% more than the previous year's PBT, the profit after tax on the other hand increased from Rs. 410.82 lakhs to Rs. 528.48 lakhs during the year thus showing a growth rate of 35% as of March, 2014.(Official Website, n.d.)

## COMPARATIVE ANALYSIS BETWEEN THE REGIONAL RURAL BANKS OF DIFFERENT STATES

The RRBs have been doing a greatjob in the development of the rural sector.Especiallyduring thelast financial year 2013-2014, all the RRBs as seen from the study, were in a profitable position, many of them could get over the accumulated losses incurred previously, with the profit they earned. The RRBs of Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Kerala, Punjab, Karnataka, Madhya Pradesh, Uttarakhand, West Bengal, Uttar Pradesh, Tamil Nadu and few of the state level RRBs has been performing well, it was observed that their total business and total profit has reached the 'crores' mark.

As observed Pragati Krishna Gramin Bank was in a leading position with a maximum total business of Rs. 16697 crores, followed by Andhra Pradesh Gramin Vikash Bank, Kerala Gramin Bank, Sarva Haryana Gramin Bank, and Bangiya Gramin Vikash Bank and Andhra Pragathi Grameena Bank in the fifth and sixth position with a total business of Rs. 15173 crores, Rs. 15000 crores, Rs. 14921.77 crores, Rs. 13375.75 crores, andRs.13262.17 crores respectively.

## CONCLUSION

It can be concludedthat every state as noticed has been encouraging the amalgamation process. At present the central and the states prefer state level RRBs in some more states, for creating economies of scale and to push its financial inclusion agenda. States like Bihar, Karnataka and Punjab had given their consent to amalgamate their RRBs, in West Bengal Paschim Banga Gramin Bank and Uttar Banga Kshetriya Bank may get merged, to form a bigger entity in the near future. The objective behind which the amalgamation process was started in 2005, could be achieved, all the fifty six (56) RRBs in today's date are in a profitable position with a CBS (core banking solution) platform.

ISSN 2394 - 7780

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# INSURGENCY AND HUMAN RIGHTS IN NORTH-EAST INDIA

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## ABSTRACT
*Insurgency has become a part of everyday life in the North-East India. Most of the insurgencies in this region are based on ethnicity. Insurgency has become a lucrative business for many. In the name of liberation struggle, many groups are earning easy money and have degenerated into groups of criminals without having any political ideology. Insurgency and counter insurgency measures-all have contributed to violation of human rights of common people. Army was given wide powers under Armed Forces Special Powers Act (AFSPA). Army operations have resulted in gross violations of human rights with torture, fake encounter, forced disappearance, unlawful detention and even rape by armed forces becoming common.*

*Key words : AFSPA, Ethnicity, Forced Disappearance, Political Ideology, Unlawful Detention.*

## OBJECTIVE OF THE PAPER
The paper tries to highlight the problems of Insurgency and its impact on the Human rights Scenario in North East India.

## METHODOLOGY
The paper is primarily based on Secondary Sources like Books, Journals and Articles etc. the methods used are historical, narrative and analytical.

## INTRODUCTION
North east India has been a melting pot of different races since ancient times. It has been considered as the gateway of commerce and culture that linked India overland to east and Southeast Asia. North East India is connected with the rest of India by a narrow strip of land known as the Siliguri Corridor or chicken's Neck. Much of the region is notably ethnically and linguistically different from the rest of India. North-East India shares border with four countries, namely, Bhutan, Bangladesh, China and Myanmar and almost 99% of its boundary is international. The region has immense geo-political significance. Over the years the North-East India has withnessed growth of insurgency and violent conflicts of different magnitude.

## THE PROBLEM OF INSURGENCY IN NORTH-EAST INDIA
India's North-East region is flames of insurgency. Insurgency in this region is as old as the end of colonial rule. According to the Concise Oxford Dictionary, insurgency means rising in active revolt, Obviously against an established Government.

Insurgency is a circuit of reciprocal violence where the main players are the state establishment and the challengers of the same. It is a process of violence where one or more groups aim at overthrowing the existing system in accordance with some ideology. It is an act of resistance and transformation. Actually insurgent movements are an expression of the failure of the process of nation building. The nature of insurgency problem in North-East India vary from secessionism to demands for state or Sub-state within India, or a regional autonomy for ethnic groups within the states, or protection of ethnic interests within the states, or protection of ethnic and cultural identities. Mr. S.K. Sinha (Former Governor of Assam) remarked that so many insurgency outfits have mushroomed in the North-East since independence that almost all the letters of the roman alphabet have been used to name them.

The Political history of North-East India since independence is characterised by the assertion of various ethnic groups. Based on their separate ethnic identity and out of the feeling of deprivations, these groups have resorted to assert their right to secede from India and to form separate sovereign states. Most of the insurgencies in this region are based on ethnicity.

The Nagas were the first to take up arms against the Government soon after independence. The differences between Naga National Council (NNC) and Government of India over their future led to the longest insurgent movement in the Sub-continent. Though some efforts were made to solve the Naga problem in the form of creation of Nagaland in 1963, Shillong Accord (1975) etc. these failed to bore fruit. National Socialist council of Nagaland (NSCN) continued its subversive activities for years.

The Mizos also revolved under the banner of Mizo National Front (MNF) in 1960's. The Mizo Accord of 1987 ended Mizo insurgency and at present Mizoram is one of the most peaceful states of North-East India.

ISSN 2394 - 7780

In Tripura, indigenous Tripuri's became minority in their own state due to migration. It led to a violent insurgent movement by Tripura National Volunteers (TNV) in 1980's. The TNV movement ended with an Accord which provided creation of Tripura Tribal Autonomous District under sixth schedule of the constitution. But soon two other insurgent groups all Tripura Tiger Force (ATTF) and National Liberation Front of tripura (NLFT) emerged with the demand for secession from India.

Manipur has the dubious distinction of being the most violent and troubled state of the region. Its merger with India is viewed as illegal by many and insurgency erupted in Manipur out of this feeling. Several insurgent groups like People's Liberation Army (PLA), United National Liberation Front (UNLF), PREPAK, KCP, KYKL, UPPK, KNF, KNO, UPF, USRA, ZDV, ZRO, KRA, PSG, KLA, KNA etc. are active there.

The birth of the United Liberation Front of Assam (ULFA) in 1979 marked the beginning of insurgency in Assam which aims at establishing a sovereign independent Assam. In addition to the ULFA insurgency, the largest plain tribe in the state, the Bodos started a violent movement to protect their ethnic identity in act 1980's. In 1986.

The National Democratic Front of Bodoland (NDFB) came into existence with an objective of an independent Bodo country. Apart from ULFA and Bodo insurgency, Assam has also affected by insurgent movements initiated by Karbis, Dimasas and Adivasis.

**HUMAN RIGHTS SCENARIO IN THE NORTH-EAST**

The problem of insurgency in Nort-East has resulted in gross human rights violation and human insecurity. National oppression, insurgency, military repression and gross human rights violation for half a century have characterised the society and polity of North-east India. Both insurgency and counter insurgency methods adopted by the state have affected human rights and human security of people in varying degrees. A recent study on 'Maping Human Security in conflict Zones : The case of North-East India' reveals that in the insurgency prone areas, 67.1% of the population is affected by insurgency in different ways. People have to suffer from killing, displacement lose of home and property, family separation, poverty, rape and sexual abuse and many others. Insurgency has affected the lives of the people in their day-to day activities. People are constantly living under fear, anxiety and suspicion.

To deal with armed insurgencies in the North-east, the Government has deployed its armed Forces. But the presence and activities of the armed forces have in no way, improved the situation. It is found that the armed forces often treat the people in human manner. Arbitrary arrest, detention, torture, rape and even killing on mere suspicion by armed forces are very common. But unfortunately such human rights violations are justified on the grounds that some people and groups have taken up arms against the State and its armed forces. It has to be remembered that state terrorism is not and cannot be an answer to insurgency.

Another disturbing aspect of human rights Scenario in the Northeast is the mushrooming of insurgent groups and increase in their activities. These groups also frequently kill those who oppose them, forcibly collect money, kidnap persons for ransom etc. In last few years many groups have resorted to bomb blast in public places, massacres as a means of ethnic cleansing and other brutal techniques to discard the state. All these are also glaring examples of violation of basis human rights of people.

The operation of a number of oppressive lows like National Security Act (NSA), Armed Forces special Powers Act 1958, section 144 of the criminal procedure code have been curtailing the human rights of the people in North-East. AFSPA allows security personnel to arrest anybody on the basis of suspicion and on the other, denies people the space to air their grievances to be heard. Many women are being raped by the army in the name of search operation.

**CAUSES OF INSURGENCY**

There are several reasons like poverty, unemployment, lack of connectivity, inadequate health care and educational facilities, feelings of neglect and non-participation in governing their own affairs etc. which have contributed to the insurgency in the region.

Inadequacies in Governance and administration, public perceptions of widespread corruption and lack of accountability have also contributed in equal measure to the creation of feelings of alienation in large sections of the local population. Policies of the Government often do not reflect the local ground realities and do not adequately address local sensitivities and even the implementation of the policies have not been satisfactory.A proper study of the North-East and its people showed find an important place in the school curriculum. The feelings of alicnation and anger in the region are not just against New Delhi. There are grievances even against

ISSN 2394 - 7780

the local political leadership and administration which are corrupt, inefficient and insensitive to the needs of the people.

**SUGGESTIONS**

After a careful scrutiny of the problem of insurgency in North-East, certain suggestions can be made to deal with the problem.

1. One must expedite the opening-up of the economy of this region. It must be opened up towards the rest of India as well as towards the east of India. The North-East should have an important role in India's look East policy like South India.
2. No doubt central Government has taken some laudable initiatives in recent years and thousands of crores of rupees are annually sanctioned for the North-East now. But due to corruption and lack of transparency, most of such funds are being misused and these do not reach the intended beneficiaries. Administrative accountability and good Governance is a must if insurgency is to be uprooted.
3. For eliminating insurgency we have to check ad-hocism in dealing with matters and problems in the region. There has been lack of consistency in policy-making, whether it relates to counter-insurgency, economic development, redressing of the local grievances etc. such tendencies should be avoided.
4. For elimination of this malady, a holistic and consistent policy is essential. It would be possible only if it is based on national consensus and the leaders and intellectuals of the North-East can play an important role in the formulation and implementation of such a policy.
5. Accelerated economic development and the consequent prosperity is an important antidote to the feelings of alienation. Nagaland returned to relative peace after the conclusion of the Shillong Accord in 1975 though the differences with the National Socialist Council of Nagaland (I-M and Khaplang factions) still remain. Mizoram has remained relatively peaceful since the Government of India and the Mizo National Front reached an agreement in the 1980's.
6. The North-East with its rich bio-diversity and national resources has huge potential for tourism, hydro-power generation, cultural tourism etc. If these opportunities are properly tapped with Government support, there is possibility of turning this region into a developed one.

**CONCLUSION**

The human rights situation in North-East is far for being satisfactory. To improve the situation, there is an urgent need to solve the whole issue of insurgency. The state has to address the root causes of insurgency and offer a political solution. The State must take people into confidence and should try to bridge the huge gap that currently exist between the state and the people. Violation of human rights should be dealt with according to the laws of the country and the spirit of the Human Rights declaration whether such violations are inflicted by the army or by insurgent groups. The protection of Human Rights Act. 1993 should be amended to bring the human rights violations by armed forces under National Human Rights Commissions purview. Serious engagement of both Government and the civil society can offer a lot in terms of creating positive atmosphere of mutual trust, understanding and respect for human rights.

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# GLASS CEILING EFFECTS

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**"As far as glass ceiling, I feel that all you can do is give it your absolute best with whatever gifts the universe has given you. And if you make it in some way that other people can recognize, that's fine. But even if you don't quote or unquote make it, you are fine if you have given it your whole heart and soul."**

## ABSTRACT
*Not all gender or racial inequalities need to be defined as glass ceilings. If the "glass ceiling" is intended merely as a more colorful phrase to describe what we already mean by gender or racial inequality, then we are proliferating concepts that may ease our communication with the public, but do little to advance our work as analysts of the causes of inequality. Therefore, our first goal is to provide a clear content to the glass ceiling concept, deriving our definition from its usage in recent literature. For us, a glass ceiling is a specific type of gender or racial inequality that can be distinguished from other types of inequality. In defining the glass ceiling more precisely, we are not suggesting that this type of inequality is more unjust or larger than other types of inequality; nor do we believe it is necessarily more deserving of policy interventions than other types of inequality. It is merely different, and because it is different, it requires distinction from other inequalities.*

*THE GLASS CEILING……..it is a reflection of gender roles and relation which give rise to and complete inequalities between women and men in all walks of life. The invisible artificial barriers that block women from senior executive's jobs.*

*Key words:-gender, racial, inequalities, glass ceiling, precisely, leadership, organization, artificial barriers.*

## INTRODUCTION OF THE CONCEPT
According to the Federal Glass Ceiling Commission (1995a:iii), the concept glass ceiling refers to "artificial barriers to the advancement of women and minorities." These barriers reflect "discrimination ... a deep line of demarcation between those who prosper and those left behind." The glass ceiling is the "unseen, yet unbreakable barrier that keeps minorities and women from rising to the upper rungs of the corporate ladder regardless of their qualifications or achievements"(Federal Glass Ceiling Commission 1995b:4; emphasis added). This official description suggests that the definition of a glass ceiling must recognize that it reflects a job inequality that is unexplained by a person's past "qualifications or achievements"; it reflects labor market discrimination, not just labor market inequality. The usual, but imperfect, method for detecting discrimination is to look for inequalities that are unexplained by prior characteristics of the employees. Inequalities that derive from past discrimination in education or training or from choices that people make to pursue nonmarket goals such as family, volunteer work or leisure are not generally considered as part of a glass ceiling. Therefore, our first criterion for a glass ceiling is that:

*A glass ceiling inequality represents a gender or racial difference that is not explained by other job-relevant characteristics of the employee***.**

In practice, this means that glass ceilings are measured as the residual differences due to race or gender after controlling for education, experience, abilities, motivation, and other job-relevant characteristics. Several contentious issues have arisen around discrimination research that will also affect glass ceiling research. First, it is impossible to measure and control for all the job-relevant employee characteristics that affect outcomes; some part of the residual difference may reflect true differences in productivity or preferences, not discrimination.

Second, it is possible to control for too many job characteristics since some characteristics of past jobs may explain how discrimination happens, so controlling for them masks rather than detects discrimination. For example, Naff and Thomas (1994) control for "support from a mentor" which could as easily be interpreted as one way in which discrimination occurs to create glass ceilings. Similarly, if earnings or authority is the outcome being studied, controlling for occupation would be inappropriate because occupation changes are a primary way in which careers advance. Do teachers become principals; do principals become school superintendents? Do clerical workers become office managers? Do factory line workers become first-line supervisors; do first-line supervisors become plant managers? Controlling for these occupational changes could potentially eliminate a significant portion of the glass ceiling effect. Finally, there can be reasonable disagreements about what constitutes "job-relevant" characteristics that need to be controlled to establish discrimination. For example, while most would consider family characteristics (e.g., marital status, presence and age of children) illegitimate criteria for promotion and success that should not be controlled in glass ceiling

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studies, others could argue that these are proxies for a family versus career orientation that affects productivity and are therefore job-relevant characteristics that need to be controlled.

This is not an easily resolved empirical issue. We note the problem here, and construct our own empirical analysis around what we see as the predominant position: marriage and family are not factors that should be controlled in studies of discrimination. We will return to this issue in the discussion when we speculate on reasons for a glass ceiling effect.

**CONCEPTUAL FRAMEWORK OF GLASS CEILING EFFECT**

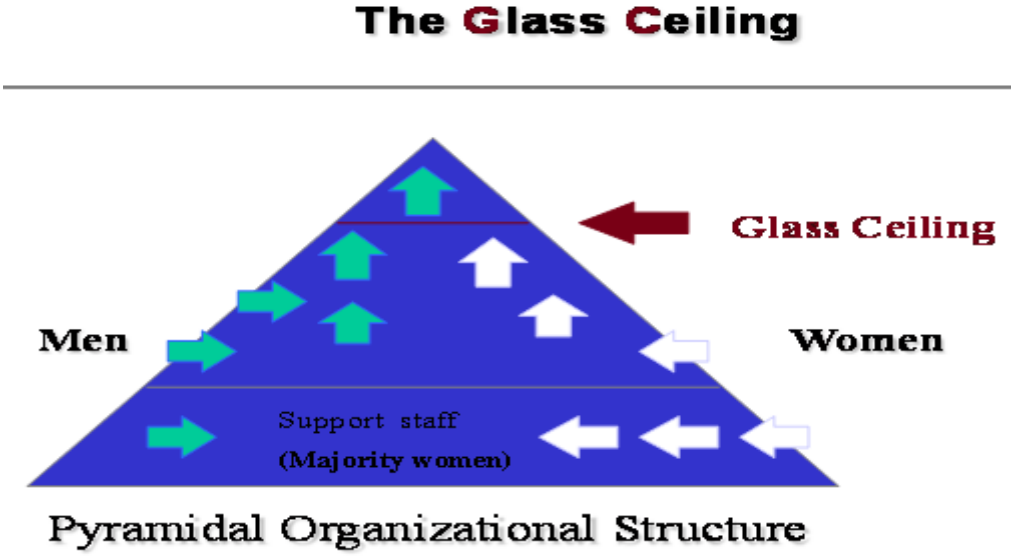
We may quote several women, national and international, in support of the argument that women can excel, a la men. But does it mean women, as a community, are happy? No; right from USA to Africa to China to India, women are still ill treated!

THERE IS much talk about liberation of women, reservation for women and prominence to women. We now talk of many women - Indira Gandhi, Chanda Kochhar, Kiran Mazumdar Shaw,Vinita bali,ekta kapoor,neelam dhawan, Indra Krishnamurthy Nooyi. Benazir Bhutto, Kalpana Chawla, Hillary Clinton,Pratibha Patil and others. There are women astronauts, pilots, office bosses, teachers and whatnot. But this does not mean all women are happy. It is time to deliberate on some issues related to the freedom enjoyed by women and the atrocities committed against women at home in particular and in the worldin general. This presents a dismal picture of the women. When we talk about the glass ceiling every man feels that there is not discrimination.

- No glass ceiling in the corporate world.
- Many incidents where women perform better than their colleagues
- All about passion, fascination and determination for the work
- Many have done it and many are still doing it. But in many these thing are missing and they call it
- Glass Ceiling:-the term glass ceiling is most often applied in the business situation in which women feels that men are very much involved in the usage of power and women find it difficult to or rather impossible to reach to that level or break the glass ceiling. The term was originally used by Carol Hymowitz and Timothy Schellhardt in a March 24,1986 Wall Street Journal article. when Wall Street Journal reporters coined the phrase to describe the invisible barrier that blocks women from advancing to senior leadership positions in organizations. Glass ceiling is an unacknowledged discriminatory barrier that prevents minority from rising to positions of power or responsibility within an organization

The invisible artificial barriers that block women from senior executive jobs It is a reflection of gender roles and relations which give rise to and complete inequalities between women and men in all walks of life 'Sticky floor'- keeping women stuck at the bottom of the economic pyramid An unofficial barrier to opportunities within an organization or company which is perceived to prevent protected classes of workers, particularly women, from advancing to higher positions.

- In this context "Ceiling" is that there is limit to how far someone can climb the hierarchy.
- Whereas "glass" emphasizes on that while everything is very clear, very real, one can see each and every thing very clearly, that is it is transparent and not obvious to the observer.



Pyramidal Organizational Structure

ISSN 2394 - 7780

- This invisible barrier continues to exist, even though there are no explicit obstacles keeping minorities from acquiring advanced job positions – there are no advertisements that specifically say "no minorities hired at this establishment", nor are there any formal orders that say "minorities are not qualified" (largely due to the fact that employment opportunity laws forbid this kind of discrimination, and open admittance of it is career suicide) – but they do lie beneath the surface.
- The "glass ceiling" is distinguished from formal barriers to advancement, such as education or experience requirements. Mainly this invisible barrier seems to exist in more of the developing countries, in whose businesses this effect is highly "visible".

**Does glass ceiling really exists:??????????????????????**

- In ladies perception glass ceiling still exists.
- And if we ask boys about glass ceiling the answer is NO SUCH PHENOMINON EXISTS.
- And one thing I would like to share that when I ask the same question everybody present here would be surprised to know that they denied of the existence of glass ceiling.
- But I feel that it took little extra effort, some compromises and a little bit of support from the family to reach the top.

***But still the debate is on between the feminists and analysts……***

- The glass ceiling exists in India as it does the world over. Women managers, despite being highly educated often remain in lower positions with little access to challenging assignments and power. Women are often promoted to senior positions but the job content and compensation remain lower than those offered to males in similar positions. Women often remain unaware or rather do not make it an issue.
- However, this glass ceiling tends to affect working women the most. It's the barrier that prevents large numbers of women from obtaining and securing that most powerful, prestigious, and highest – grossing jobs in the workforce. This barrier makes many women feel they are not worthy enough to have these high – ranking positions, but also they feel as if their bosses do not take them seriously or actually see them as potential candidates.
- The glass ceiling is a barrier not only to individuals but to society as a whole. This barrier reduces the potential pool of corporate leaders by ignoring, or worse, discriminating against over one – half of the ceiling.

**REASONS WHY FEMINISTS FEEL THAT GLASS CEILING EXISTS**

- Male dominated management, which made all the decisions for the company.
- Lack of proper anti discrimination law and government action on discrimination
- Men's attitude towards problems faced by women
- Preference of men over women of same educational qualification and caliber.
- Sexual harassment was seen as another major obstacle in the women's career.

*After this debate women still feel the existence of glass ceiling. And analysts on the other hand argued upon the nonexistence of glass ceiling. They feel there are some major reasons because of that woman could not reach the higher position in the organization.*

**The reasons quoted were**

- *Women left their jobs midway due to personal problems (like marriage and raising family)*
- *In order to get into top management it requires commitment, dedication and determination which was lacking.*
- *Less paid because they worked for lesser time and joined low risk jobs.*
  *Debate still goes on……*

**GLASS CEILING EFFECTS – WORKING WOMEN**

- Glass ceiling tends to affect working women the most. An unofficial barrier to workplace advancement, usually in regard to women or an invisible upper limit in corporations and other organizations, above which it is difficult or impossible for women to raise in the ranks.

ISSN 2394 - 7780

- This phenomenon exists even in the 21st century when globalization and technological advances have brought about 360 degree changes in all walks of life. Through women are being included in the workforce to add diversity in the work culture, the evil is still prevalent manifold. The lion's share of leadership positions throughout the world remain a male preserve as an invisible barrier Prevents women from reaching the highest corporate levels. "There is a glass ceiling in the middle of the ladder leading to the top, and it can't be seen, but when women run into the bump their heads and can't move beyond it.

**ASIAN perspective**

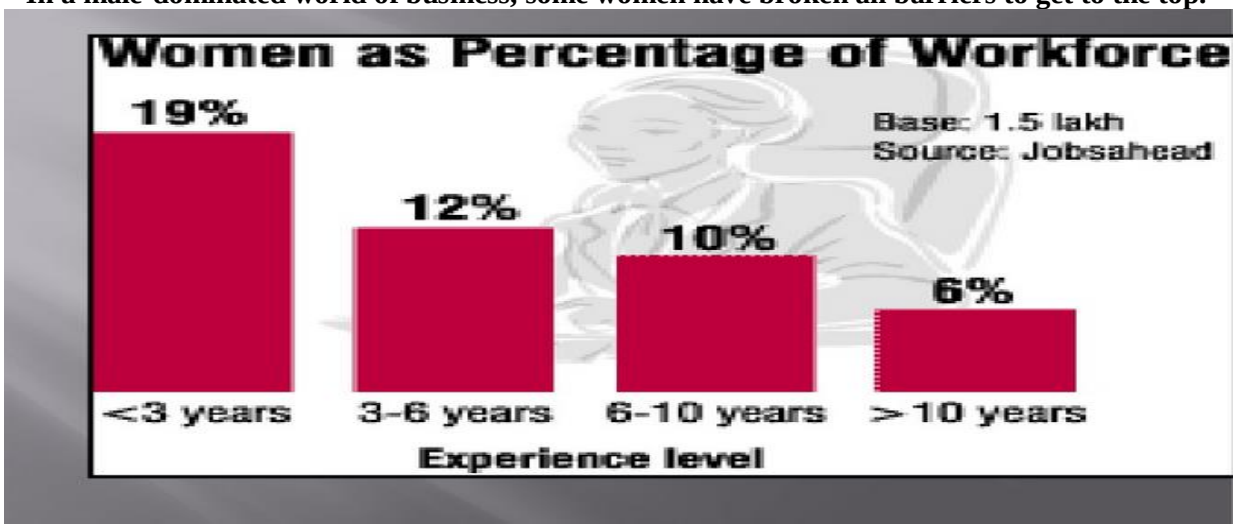
- Women are better seen as a homemaker
- So the corporate organization in these countries did not seem to favor women
- It was a matter of a policy for not hiring women.

**Some Asian examples**

- Videocon international –"we are from an orthodox family"
- Tata motors "no women rule"
- Many other companies hire ladies for their work and not for the corporate work

➢ **On the other hand company hire only ladies because of their inter-personal skills**

**In a male-dominated world of business, some women have broken all barriers to get to the top.**




**INDIA'S MOST POWERFUL BUSINESSWOMEN**

**1.Chanda Kochhar** is the Managing Director and Chief Executive Officer of ICICI Bank Limited. She began her career with ICICI as a Management Trainee in 1984 and has thereon successfully risen through the ranks by handling multidimensional assignments and heading all the major functions in the Bank at various points in time.

**2. Vinita Bali**, Managing Director, Britannia Industries, has always made unconventional decisions. Rising prices of wheat, sugar and dairy products affect her as much as they do every housewife.

**3.Kalpana Morparia**, former Joint Managing Director of ICICI Bank, and currently CEO of JPMorgan gives complete credit for her transformation from a corporate lawyer to a corporate leader to K.V. Kamath.

**4. Kiran Mazumdar Shaw**, Chairman and Managing Director of Biocon, is India's bio-tech queen. She says in an interview to Forbes India that she learnt the importance of self-reliance and personal re-invention at an early age. From starting off with Rs 10,000 in a garage her company Biocon is today worth Rs. 1,511 crore.

**5. Mallika Srinivasan**, the Chairman and CEO of TAFE, believes in a no-frills working style. She has risen to become India's tractor woman making an indelible impression in a heavily male-dominated industry. TAFE's turnover, a mere Rs86 crore in 1985 - the year she joined - had risen to Rs5, 800 crore by 2010/11

**6. Ekta Kapoor** has created a niche for herself as the queen of the silver screen soaps. As the Joint Managing Director and Creative Director of Balaji Telefilms, her production company, she rules almost every television network.

ISSN 2394 - 7780

**7. Neelam Dhawan** is the Managing Director of Hewlett-Packard India. She has been an icon for women in the IT industry. There were just handful women in the industry way back in the early 80s when she began her career accidentally at HCL.

**8. Preetha Reddy** the managing director of India's largest healthcare company, Apollo hospitals. Ms Reddy has been instrumental in the group's quality certification process (ISO 14001 and 9001). As a trailblazer, she ensured the JCI accreditation process in five of the group hospitals in Delhi, Chennai, Hyderabad, Ludhiana and Dhaka.

9. A nominated member of the Rajya Sabha, Shobhana Bhartia also runs one of India's largest media houses. She is Chairperson and Editorial Director of HT Media which had revenues of Rs 1,815 crore in 2010/11.


**SOME STATISTICS RELATED TO WOMEN**

- Women hold 1 to 3 per cent of top executive jobs in the largest corporations worldwide.
- Only 12 countries have a women head of state
- Only 14 % of the world's Parliamentarians are women
- Only 1 per cent of trade union leaders are women
- *Top jobs* *1-5 percent of executive jobs occupied by women.*
- *Senior management* *10-20 percent.*
- *Managerial jobs* *6-30 percent.*
- *Administrative and managerial* *10-43 percent.*
- *Professional and technical* *20-60 percent.*

**CONCLUSION**

- Many people believe that women are making less for performing the same jobs as men The "glass ceiling" is a controversial subject that's constantly in hot pursuit. There are many statistics and theories that come into play; in fact, that people may find it difficult to reach a solid conclusion. Does the glass ceiling really exist, or is it all a matter of how the facts are skewed either for or against it?
- Glass Ceiling underwent several variations as the problem grew and became more and more pronounced. It was soon seen that discrimination was not only towards stopping the women from reaching greater heights, but also creating circumstances wherein she by herself felt week unsuitable. Hence both vertical and horizontal aspects of glass ceiling became important.

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# TOP SOCIAL MEDIA UPDATES 2015: A REVIEW OF POPULAR GLOBAL SOCIAL PLATFORMS

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## ABSTRACT
*Social media assumed its importance especially in last 10 years and changed its forms and ways to connect with the ultimate audiences. Era of technological revolution is going on and with each passing new technological revolution social media platforms are changing with the preferences of users. The role of each social media platform is unique on their own designed accessibility and approach towards their end audiences. In this article the usage popularity of these various media platforms are analyzed and reasons for their wide acceptance among audiences is also viewed. The social media platforms which are popular among audiences are Facebook, Twitter, LinkedIn, Instagram, Pinterest, Google+, YouTube and Snapchat. So, if marketers and businesses really need their existence and popularity to maintain equitably throughout they must update themselves about the latest popular media platforms.*

*Keywords: - Facebook, Twitter, LinkedIn, Instagram, Pinterest, Google+, YouTube, Snapchat and Year2015.*

## INTRODUCTION
The latest fact about the market is that it is summed up in to one channel that is "mobile". The penetration of Smartphone and other latest handy devices have become affordable and the wireless connections are ubiquitous and faster. Here are some interesting statistical facts like:

- 7.2 billion People on planet and following numbers behind them are quite surprising.
- Out of that 3 billion people are active internet users.
- 2.1 billion People approximately are having social media accounts.
- 3.65 billions are using internet through their ipads and Smartphone.
- 1.7 billion People are having active social media accounts.

Now after seeing this it is worth interesting to know about some statistical facts about the various social media platforms for the year 2015.

## FACEBOOK
Facebook is a pioneer in social media platforms and it is 11 years old now heading towards puberty but still the leader in this social media market. Facebook has reached 1.44 billion active users monthly and 47% of all internet users are on Facebook. As per to statistics 936 million people log onto Facebook daily (DAU) for March 2015, which represents a 17% increase year over year. From this it is clearly predictable that number of active users are continuously increasing on Facebook and providing promising audience for marketing efforts. 29.7% users are from age of 25 to 34 years, and the next 25% of age group of users are aging from 16 to 24 years and these are the main demographic profiles of Facebook users clearly indicating the prime target audiences for the marketers. Nearly 75% of the revenue comes from mobile advertising and 4.75 billion of content shared daily on Facebook. Furthermore statistics say that everyday 798 million of Facebook users are using their accounts from their mobile phones. Amazingly, approximate 82.8% of the daily active users are from outside the USA and Canada. India is on the second place regarding the number of users, with approximate 109 million persons registered, and followed by Brazil (70.5 million users) and Indonesia (60.3 million users).

## TWITTER
Twitter is totally different form of social networking, it is called real time social networking site. A place where information is being shared when it actually happens for connecting with other in real time which often results into long-lasting contacts and friendship. Twitter has 302 million monthly active users and yes this is a small number when compare it to Facebook. Out of all the accounts, 77% are outside the USA. Language barrier is not a problem – the website supports more than 35 languages. Twitter is most used in Asia and Pacific area (35%), North America (22%) and Western Europe (15.9%). 88% of Twitter users tweet through mobile and 500 million tweets per day are send. 58 % of the top brands in the world have over 100,000 Twitter followers and 92% of international brands tweet more than once daily, 36% of which are link-containing tweets. About 34% of marketers are able to successfully generate leads through Tweeter and Tweets containing image links have 5x higher engagement rate.

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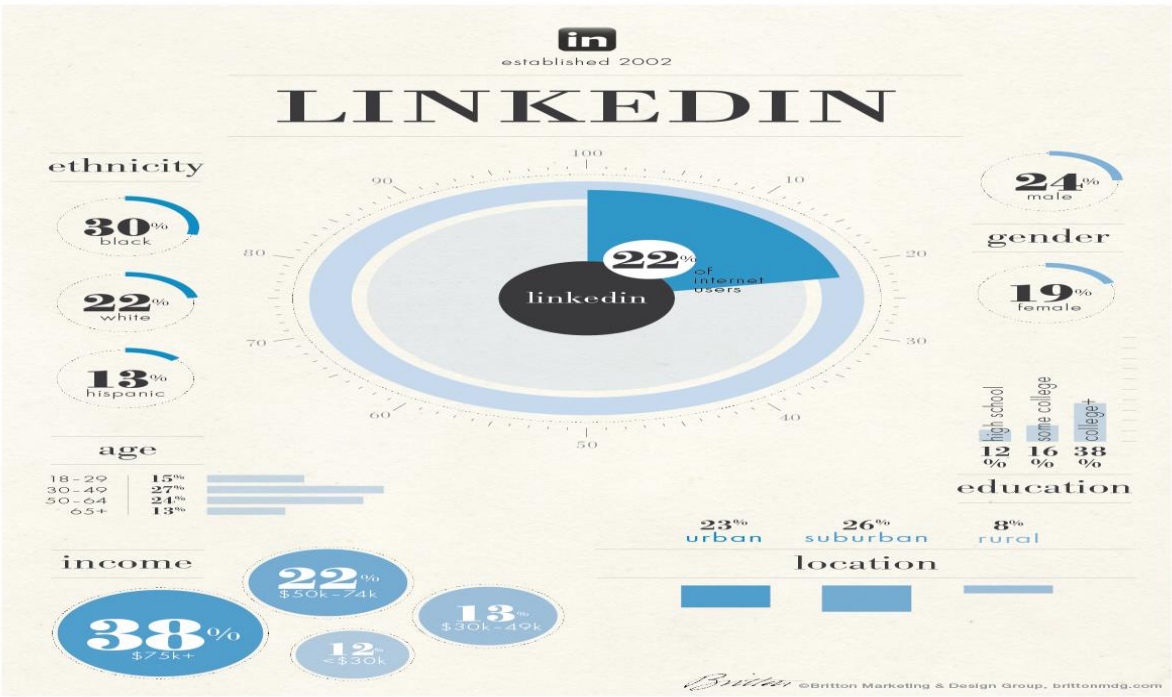
Even business-to-business (B2B) marketers are on Twitter, 2nd most used social network (85 percent) by B2B marketers.

**LINKEDIN**

LinkedIn is world's largest professional social networking platform and it's fighting the tough demographic and numerous challenges along the way. LinkedIn always incorporated the latest challenges to give fresh and new look to their website recently they introduced new look to feel fresh with the home page and profile page for their users. LinkedIn is a business, and its runners are always seeking ways to maximize the profit bottom line for their business. Users and end audiences presence and engagement translate into value for LinkedIn. LinkedIn is always in the fast lane, moving from an online website and virtual networking tool to a comprehensive career management and personal branding platform. Right at the top of the profile page, LinkedIn posts status so users can see how they are doing. It's a great way to measure the brand impact. LinkedIn has made it easier to stay connected to with the various network members. As per to the statistics over 332 million members are registered under LinkedIn and most of them are from U.S.A. Over 39 million of college graduates and professional are registered on the website. 44% of females are there on website and average monthly time spends on the site by users is approximately 17 minutes. Through the website 1 billion endorsements has been done and 13% minimals (15-34years) are using LinkedIn website regularly.




**INSTAGRAM**

Instagram is very new in the field of social media networking but due to the popularity the media has gained made it to influence marketers and users to great extent. Instagram established in the year 2010 and grown over the years and reached 300 million monthly active users. It has become one of the most engaging visual platforms and product promotion is key on this platform. Instagram emerges as an important tool for galleries to sell their artwork and it is one the best tool present in the market along with Facebook as per 2015 Online Art Trade Report by Hiscox, the London-based fine-art insurers.

According to this survey, 69% of 519 respondents said they use Instagram for art-related purposes. Out this 75 million are those who use Instagram every day and 30% of teenagers consider that Instagram is the most important social network. 20% of US adult females use Instagram in comparison to 15% of US adult men. Internet users aged between 16 and 64 years have an Instagram account which is 20% of the total users on the Instagram and 41% of audience are aged between 16 and 24years. One shocking fact is that

51% of Instagram's users are male and 49% is female. Ireland is lagging behind when it comes to Instagram only 18% of internet users have an account. Norway is one of the fastest growing countries, with 26% of internet users are having Instagram account and 22% of internet users in the Middle East and North Africa use Instagram. The greatest traffic on the website is registered in USA (28.5%), Brazil (6.5%) and Russia (5.7%). Over 20 billion photos shared on the website and Instagramers shares 70 million (plus) photos and videos each day.

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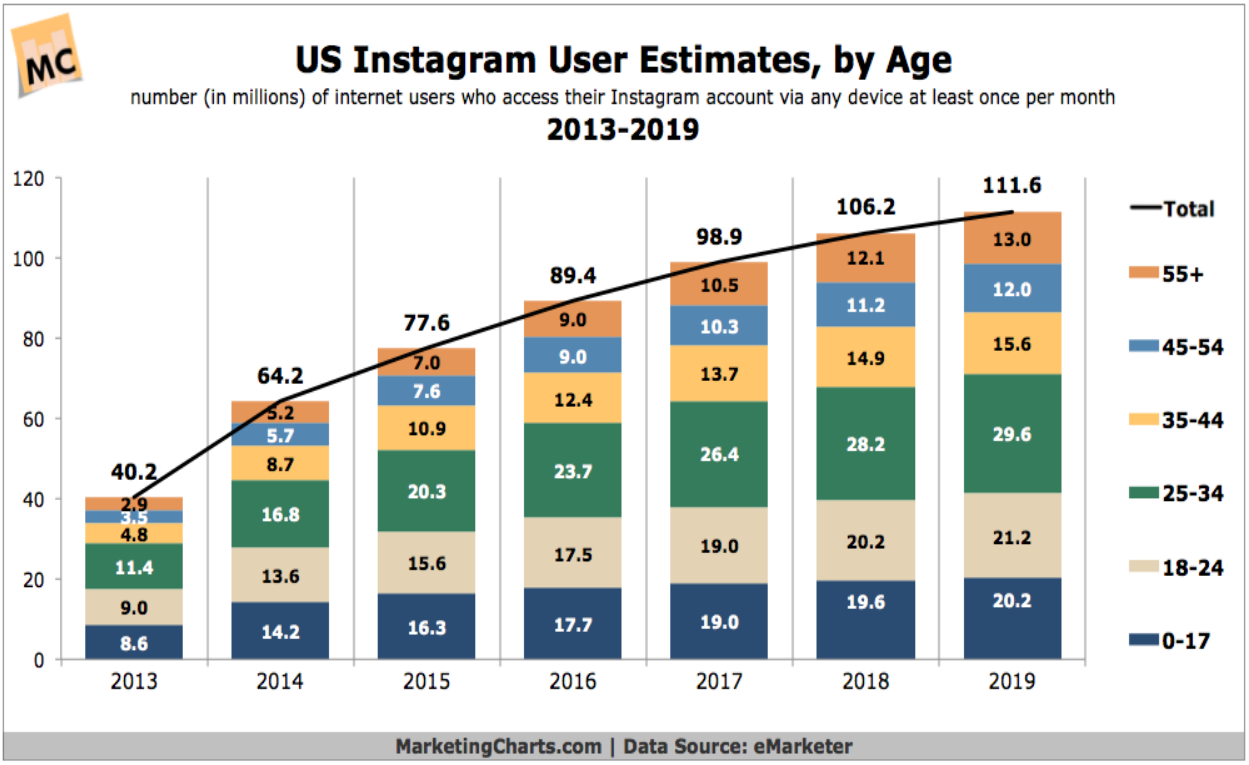
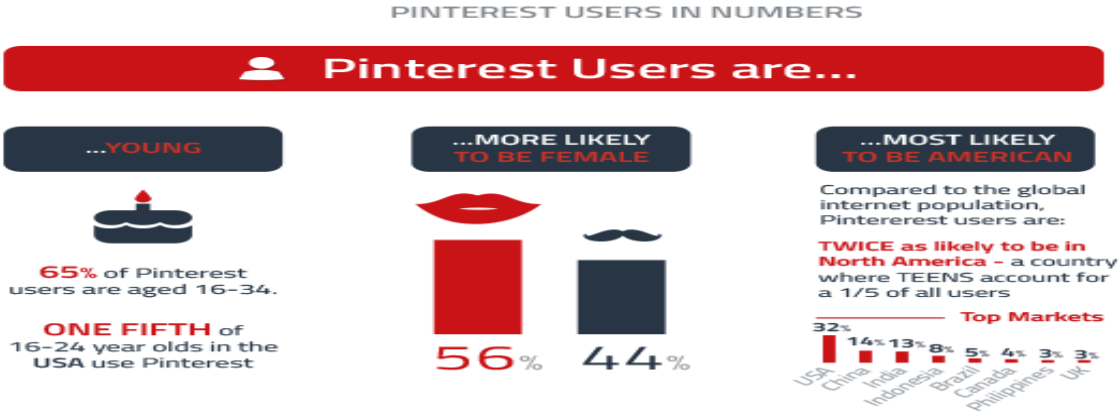



**PINTEREST**

Pinterest is totally different form of social media tool it helps people to discover and share amazing interesting pictures. This is place for all and in fact businesses can also find their potential consumers by promoting their brands through dynamic product images and inspirational quotes and content. Pinterest provides various marketing platforms tools to create images, inspirational visual content for campaign managers to run their product campaign in the most innovative way. Pinterest offers promoted pins in beta to its certain businesses on a cost per click basis. It has also introduced some rich pins that include extra information on the pin itself. The categories for which rich pins are provided are recipe, article, movie, product, and place. One important element of Pinterest is Pinterest analytics that helps to understand how users are getting engaged with your content and pins. On Pinterest under the third party tools Piqora is provided by which businesses can get access to visual marketing platform for pin scheduling, analytics and promotion tools. Now looking to the statistics 2015 for Pinterest has about 70 million users. And out this number 56% are females and rest 44% are males. The average time spent on Pinterest is 98 minutes per month. Pinterest website is mostly accessed in North America (33% of internet users), Middle East and Africa (25% of internet users) and Latin America (18% of internet users). Over 30 billion pins are received on this website and the largest audiences of the site have been registered in USA (32%), China (14%) and India (13%).

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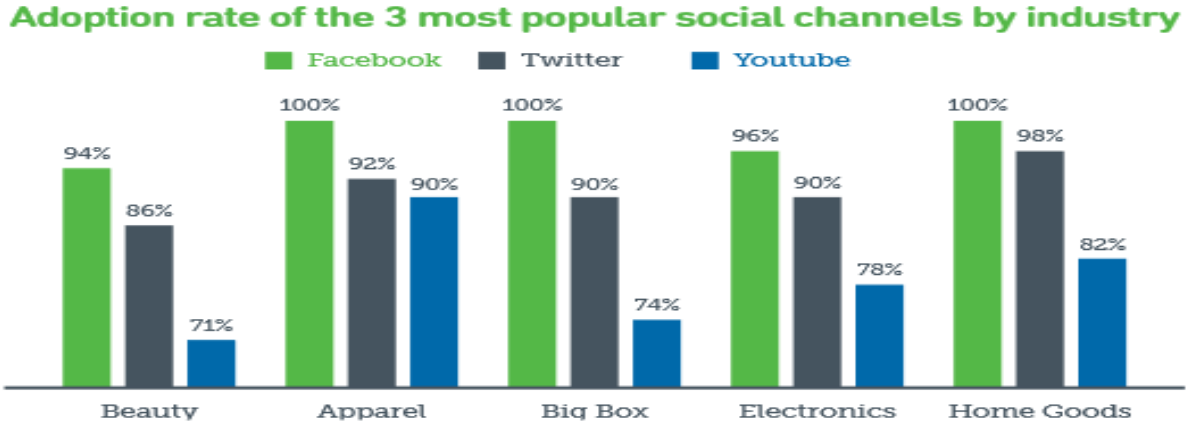
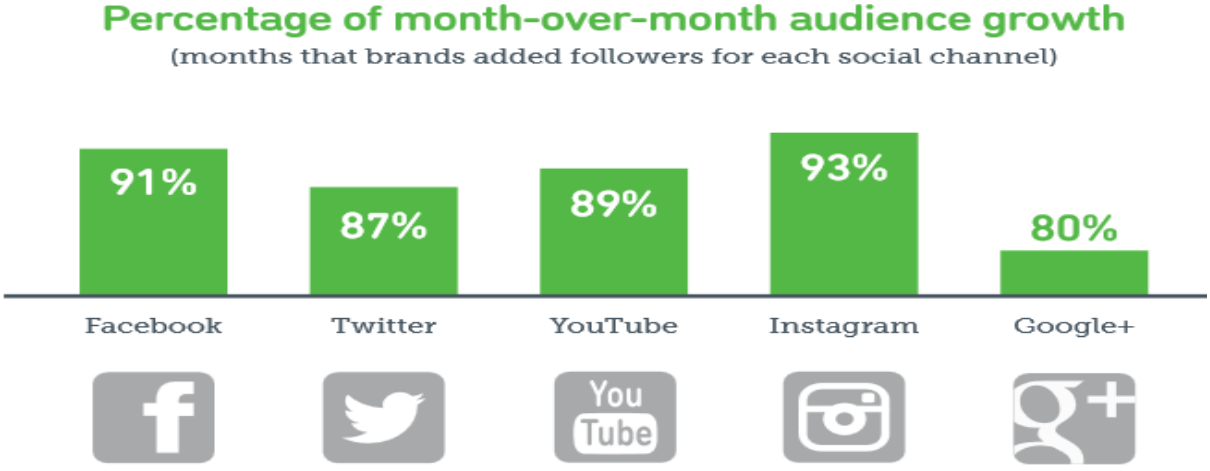
**GOOGLE+**

We have talked about the statistics of and demographic information for Facebook, Twitter, Pinterest and Instagram, but Google+ is a newer network and very unique on its own due to its features and usage. The end audience under Google+ is entirely different from Facebook and other social networks and it is paving the way for the companies who are looking to reach a new and tech-savvy audience. It was launched in the year 2011 with an objective of providing users with a hub for social networking, sharing pictures, video messaging and more. Google+ is unique from other networks reason being it provides circles users which can easily be use to group contacts by relationship, for easy sharing and more control over privacy. Google+ provides a great platform for companies because their audience can easily categorize through updates and separate personal interactions from their business. On Google+ there are about 2.2 billion Google Plus profiles online, but not all of them represent active users. 90% of the people who create a Google profile have never posted publicly on Google+. The Smartphone penetration for Google+ among 18-34 years in U.S is 18%.This website is mostly used in Indonesia (83% of the online population), India (82% of the online population) and Vietnam (80% of internet users).

**YOUTUBE**

For every marketer understanding of good social media platform is essential so that they can increase the effectiveness of their business and product. Now when we are talking about the effective social media platform we cannot forget YouTube which is widely acceptable by mass of audiences. Businesses can focus on this channel to boost up their sales and revenue by making effective and creative videos for their end audiences. The year 2015 is the year of video and YouTube is the king for providing the videos to their audiences. It's not just a video platform. It's the second biggest search engine. Marketers can augment the content with a video version and enhance their presentations, to show end customers how to use the products, and the special factors can also be added. Talking on the basis of statistics for YouTube then it has 1 billion active users, 4 billion approximate revenue, 4 billion videos are watched on YouTube per day.100 hours of video uploaded every minute and 40% of mobile are being used to watch video content on YouTube specifically. 85% of adults are regular visitors of YouTube excluding China. 9% of all 18-34 year-old visitors to YouTube share or comment on videos each month. YouTube influences purchase intent and decisions among more than half of consumers and 54% of consumers in the U.S are under this influence in comparison with other traditional social media tools.



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**SNAPCHAT**

For successful online market strategy every marketer must keep pace with rapidly changing technology which the demand of today else they can lose their potential customers. In social media tools Snapchat has emerged as one of the leading photos sharing and messaging application in today's market place. It allows users to share videos and photographs with their friends which are referred as "snaps". Snapchat as a growing social media network currently has 500 million videos and photos being shared on the channel each day. The proof of the platform's potential value can be viewed when Facebook offered $3 billion for the platform in November 2013. As a business tool business persons can find out their potential customers on this platform where they all are exchanging and participating maximum time. If businesses are making their social media strategy then under that Snapchat will be a very powerful tool, where they can share their products pictures and videos to the ultimate consumers. By using the feature called geofilters, businesses can add a customized sticker to photographs that can only be seen by people within a specific geographic area. Snapchat was launched in 2011 and now it has 100 million daily active users. Out of all social media percentage 18% of people in US use Snapchat as social media tool. 400 million snaps per day are registered and 70% of Snapchat users are females. In US 30% millennial use this platform, 71% users are below 25 years. 25% in UK and 22% in Ireland users are using this social media. In the last year the estimated growth of Snapchat recorded 57% with value of 15 billion dollars.

**CONCLUSION**

Social media education and regular updates on it is now more important than ever required, if businesses really want to generate the revenue for their business. These social media updates and education can bring smart moves and avenues for social media managers. Organizations can work on broader strategies and tactics revolving around these social media and can gain market leadership for their brands. The demand for these social media and their effectiveness is need for all those businesses who want to dig bigger in the year 2015.A challenge for every business professional has been generated that how to intelligently integrate the fast moving developments in the area of internet and technology. The major players in the market have realized the importance of these social media platforms for their successful goals and targets accomplishments. Hence, we can say if right social media is hit then right customers and right brand image for the business will be gained in the market else you will be dumped out of the market.

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# PREDICTING THE FINANCIAL EFFICIENCY OF PUBLIC SECTOR TELECOM COMPANIES BSNL AND MTNL USING Z-SCORE

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## ABSTRACT
*Business enterprises work on going concern concept. It is important to predict the financial soundness of a business. That can be done through ratio analysis. Financial ratios are a key pointer of financial reliability of a business. Financial ratios are a tool to determine the operational & financial effectiveness of company. A single ratio cannot effectively assess the overall strength or weakness in a company. Altman developed a z-score model using ratios as its foundation. With the help of the Z- Score model, Altman could predict financial efficiency Bankruptcy up to 2-3 years in advance. The following research paper studies the financial health of BSNL and MTNL by using Altman Z score to predict, analyze the financial health of the sample companies. The paper finally offers suggestions for improving the solvency position of the companies.*

*Key words: Altman's Z score, financial performance, financial health.*

## INTRODUCTION
Business enterprises work on going concern concept. Financial soundness of the business is very important. Long term solvency is measured by the equity debt mix and earning power of the company. Many models have been formulated to predict the financial health of the company and to assess about the financial distress. One of the models to know the financial health of the company is developed by Edward Altman. He was the one who framed the model and tested its accuracy. Since than many research has been carried to improve it. Applying a model to analyze the nancial condition of a company may help the management to predict its future and take corrective actions. After the establishment of Altman's Z score model, abundant studies have done further research on the Z score model, including Deakin(1972), Taf er (1983), Goudie (1987), Agarwal and Taf er (2007), Sandin and Porporato (2007). Of these researches Edward Altman's Z score is popular even after 40 years of its formulations.

Z score is a multidiscriminate analysis. While doing the review of literature, it was found that very limited studies are conducted using Z score in a developing country like India. Frequent analysis of nancial statements and the company's position will give the real picture of its nancial status. Applying a model to analyze the nancial condition of a company may help the management to predict its future and take corrective actions. It may reduce the chances of bankruptcy. A predictive model may warn an auditor of company's vulnerability and help to protect them against charges of negligence of duties in not disclosing the possibility of corporate failure (Jones, 1987). The creditor, the shareholders, and regulatory agencies will be curious to nd the nancial status of a company. Therefore this study focuses on measuring the nancial health of public sector owned telecom Company which is listed in National Stock Exchange

## REVIEW OF LITERATURE
Chang(2008) studied the corporate governance characteristics of financially distressed rms in Taiwan.(Moyer, 2005) Altman's Z is one of the best known, statistically derived predictive models used to forecast a firm's impending bankruptcy. Mansur A. Mulla (2002) made a study in textile mill with the help of Z score model for evaluating the financial health with have weighted financial ratios. Altman's *Z*-Score formula is a multivariate formula used to measure the financial health of a company and to diagnose the probability that a company will go bankrupt within a two-year period. Studies of Altman's *Z* have yielded mixed results, and recent literature questions whether or not the formula, tested in the mid-twentieth century on manufacturing firms, is useful in today's marketplace.

(Moriarty, 1979)The *Z*-Score uses various accounting ratios and market-derived price data to predict financial distress and future bankruptcy. The original formula was developed on a sample of 66 manufacturing firms. Firms with assets of less than $1 million were eliminated from the sample. (Moriarty, 1979) The Altman's *Z* formula works well provided the scores fall within the "in the tails," meaning that low and high scores may more accurately predict financial distress than scores that fall in the gray area. Almilia (2006) studied three financial ratios: profit margin, financial leverage and liquidity ratio (current assets to current liabilities) which affected corporate financial distress in Jakarta Stock Exchange during 1998 – 2001, when many companies faced financial difficulties following Asian Financial Crisis in 1997- 1998.Sukana(2006) studied financial ratios of manufacturing companies in Indonesia Stock Exchange (IDX) to predict bankruptcy.

ISSN 2394 - 7780

There are also a number of research studies, using data from companies in India that provide various methods to identify failing firms. But the research in telecom sector has not been conducted so far.

**OBJECTIVES OF THE STUDY**

1. To study the overall financial performance of the telecom industry.

2. To predict the financial performance of public sector telecom companies in India.

3. To know the efficiency of financial operations using Z Score.

**CURRENT SCENARIO OF TELECOM INDUSTRY**

The telecom industry has been divided into two major segments, that is, fixed and wireless cellular services. In today's information age, the telecommunication industry has a vital role to play. Considered as the backbone of industrial and economic development, the industry has been aiding delivery of voice and data services at rapidly increasing speeds, and thus, has been revolutionizing human communication. Although the Indian telecom industry is one of the fastest-growing industries in the world, the current teledensity or telecom penetration is extremely low when compared with global standards. India's teledensity of 36.98% in FY09 is amongst the lowest in the world. Further, the urban teledensity is over 80%, while rural teledensity is less than 20%, and this gap is increasing. As majority of the population resides in rural areas, it is important that the government takes steps to improve rural teledensity. No doubt the government has taken certain policy initiatives, which include the creation of the Universal Service Obligation Fund, for improving rural telephony. These measures are expected to improve the rural teledensity and bridge the rural-urban gap in teledensity.

Indian telecom sector is more than 165 years old. Telecommunications was first introduced in India in 1851 when the first operational land lines were laid by the government near Kolkata (then Calcutta), although telephone services were formally introduced in India much later in 1881. Further, in 1883, telephone services were merged with the postal system. In 1947, after India attained independence, all foreign telecommunication companies were nationalized to form the Posts, Telephone and Telegraph (PTT), a body that was governed by the Ministry of Communication. The Indian telecom sector was entirely under government ownership until 1984, when the private sector was allowed in telecommunication equipment manufacturing only. The government concretized its earlier efforts towards developing R&D in the sector by setting up an autonomous body – Centre for Development of Telematics (C-DOT) in 1984 to develop state-of-the-art telecommunication technology to meet the growing needs of the Indian telecommunication network. The actual evolution of the industry started after the Government separated the Department of Post and Telegraph in 1985 by setting up the Department of Posts and the Department of Telecommunications (DoT). The entire evolution of the telecom industry can be classified into three distinct phases.

- Phase I- Pre-Libralisation Era (1980-89)
- Phase II- Post Libralisation Era (1990-99)
- Phase III- Post 2000

Until the late 90s the Government of India held a monopoly on all types of communications – as a result of the Telegraph Act of 1885. As mentioned earlier in the chapter, until the industry was liberalised in the early nineties, it was a heavily government-controlled and small-sized market, Government policies have played a key role in shaping the structure and size of the Telecom industry in India. As a result, the Indian telecom market is one of the most liberalised markets in the world with private participation in almost all of its segments. The New Telecom Policy (NTP-99) provided the much needed impetus to the growth of this industry and set the trend for libralisation in the industry.

Globalisation has made telecommunication an integral part of the infrastructure of the Indian economy. The telecom sector in India has developed as a result of progressive regulatory regime. The Total Revenue of Telecom Service Sector went up from Rs. 1,95,442 crore in 2011-12 to Rs. 2,12,592 crore in 2012-13 indicating a growth of 8.77%. The corresponding figure of revenue after adjustment of intra operator interconnection charges, comes to Rs. 1,85,930 crore in 2011-12 and Rs. 2,02,074 crore in 2012-13, showing a growth of 8.68% over the previous year.

**MARKET PLAYERS**

As on 31st October, 2014 the private access service providers held 90.55% market share of wireless subscribers where as BSNL and MTNL, the two PSU access service providers, held only9.45% market share.

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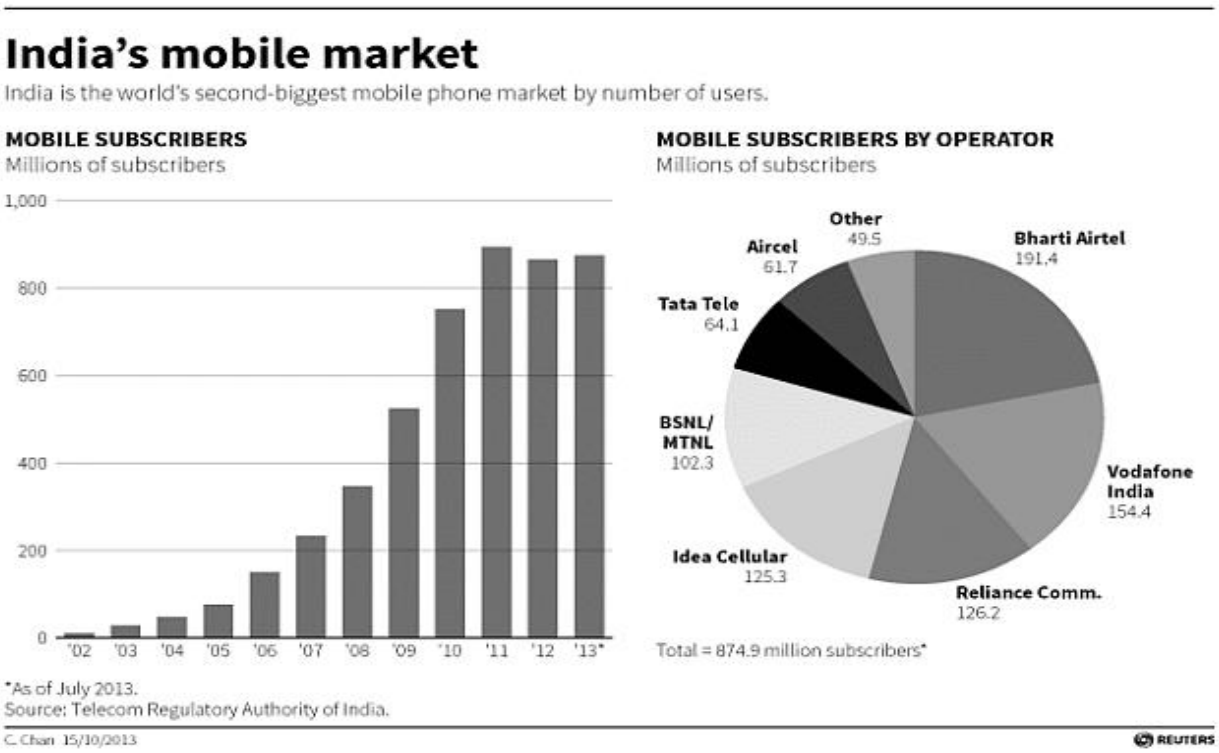


## RESEARCH DESIGN

### Data collection

Secondary data is used for the study. Published financial statements are used for analysis. The period for which the study is done is 5 years, starting from 2009 to 2014. The data required for calculating Z score is obtained from NSE and money control website. The company information is collected from their official website and NSE.

### Sampling Design

This research focuses on a analysis of financial performance of public sector telecom companies.

### Method of Analysis

Quantitative analysis is done using Multi discriminate data analysis. Altman's Z score is used to analyze the financial statements of the companies.

## AN OVERVIEW OF THE COMPANIES SELECTED FOR STUDY

This research focuses on analysis of financial performance of two major telecom companies namely: BSNL and MTNL.

**Bharat Sanchar Nigam Limited** (abbreviated **BSNL**) is an Indian state-owned telecommunications company headquartered in New Delhi, India. It was incorporated on 15 September 2000 and took over the business of providing of telecom services and network management from the erstwhile Central Government Departments of Telecom Services (DTS) and Telecom Operations (DTO), with effect from 1 October 2000 on a going concern basis. It is the largest provider of fixed telephony, largest broadband services provider with more than 60% Market share, and fourth largest mobile telephony provider in India. However, in recent years the company's revenues and market share have plummeted into heavy losses due to intense competition in the Indian telecommunications sector.

BSNL is India's oldest and largest communication service provider (CSP). It had a customer base of 117 million as of January 2014. It has footprints throughout India except for the metropolitan cities of Mumbai and New Delhi, which are managed by Mahanagar Telephone Nigam (MTNL).BSNL provides almost every telecom service in India. Following are the main telecom services provided by BSNL.

As of 30 November 2013, BSNL had 12.9% market share in India and stands as 5th Telecom Operator in India and 67% market share in ADSL Services. Managed Network Services: BSNL is providing complete Telecom Services Solution to the Enterprise Customers i.e. MPLS Connectivity, Point to Point Leased lines and Internet Leased Lines.Universal Telecom Services: Fixed wireline services and landline in local loop (WLL) using

ISSN 2394 - 7780

CDMA Technology called bfone and Tarang respectively. As of 30 June 2010, BSNL had 75% market share of fixed lines.

BSNL is major provider of Cellular Mobile Telephone services using GSM platform under the brand name Cellone & Excel (BSNL Mobile). As of 30 June 2010 BSNL has 13.50% share of mobile telephony in the country. It has 95.54 million customers using BSNL mobile.WLL-CDMA Telephone Services: BSNL's WLL (Wireless in Local Loop) service is a service giving both fixed line telephony & Mobile telephony. BSNL provides Internet access services through dial-up connection (as Sancharnet through 2009) as Prepaid, NetOne as Postpaid and ADSL broadband as BSNL Broadband BSNL held 55.76% of the market share with reported subscriber base of 9.19 million Internet subscribers with 7.79% of growth at the end of March 2010. Intelligent Network (IN): BSNL offers value-added services, such as Free Phone Service (FPH), India Telephone Card (Prepaid card), Account Card Calling (ACC), Virtual Private Network (VPN), Tele-voting, Premium Rate Service (PRM), Universal Access Number (UAN).

BSNL offers the '3G' or the'3rd Generation' services which includes facilities like video calling, mobile broadband, live TV, 3G Video portal, streaming services like online full-length movies and video on demand etc. IPTV: BSNL also offers the 'Internet Protocol Television' facility which enables customers to watch television through internet.FTTH: Fibre to the Home facility that offers a higher bandwidth for data transfer. This idea was proposed on post-December 2009.Helpdesk: BSNL's Helpdesk (Helpdesk) provide help desk support to their customers for their services.

BSNL, along with Sai Infosystem - an Information and Communication Technologies (ICTs) provider has launched Voice and Video over Internet Protocol (VVoIP). This will allow making audio as well as video calls to any landline, mobile, or IP phone anywhere in the world, provided that the requisite video phone equipment is available at both ends. BSNL Landline: BSNL Landline is a major role in India.Its numbers start with the prefix "2".

**Mahanagar Telephone Nigam Limited** (**MTNL**) is a state-owned telecommunications service provider in the metro cities of Mumbai and New Delhi in India and in the island nation of Mauritius in Africa. The company had a monopoly in Mumbai and New Delhi until 1992, when the telecom sector was opened to other service providers. "Transparency makes us different" is the motto of the company. The Government of India currently holds 100% stake in the company. In recent years, MTNL has been losing revenue and market share heavily due immense competition in the Indian telecom sector.

**ALTMAN'S Z SCORE**

The Z score, developed by Professor Edward I. Altman, is perhaps the most widely recognized and applied model for predicting nancial distress (Bemmann, 2005). Altman developed this intuitively appealing scoring method at a time when traditional ratio analysis was losing favor with academics (Altman, 1968). Altman Z scores model requires a rm to have a publicly traded equity and be a manufacturer. Altman (1968) collected data from 33 bankruptcies and 33 non-bankruptcies, during the period 1946-1965, to nd discriminating variables for bankruptcy prediction. In his seminal paper, Altman evaluated 22 potentially signi cant variables of the 66 rms by using multiple discriminant analysis to build the discriminant function with ve variables. This model was later modi ed to Altman model (1993) that uses the same variables multiplied by different factors. Individual nancial ratio to predict the nancial performance of an enterprise may only provide caution when it is too late to take a corrective action. Further, a single ratio does not convey much of the sense. There is no internationally accepted standard for nancial ratios against which the result can be compared. Edwin Altman, therefore, combines a number of accounting ratios (liquidity, leverage, activity and pro tability) to form an index of the probability, which was effective indicator of corporate performance in predicting bankruptcy. The Z score is a set of nancial ratios in a multivariate context, based on a multiple discriminated model for the rms,where a single measure is unlikely to predict the complexity of their decision making.

Altman Z-Score is a quantitative balance-sheet method of determining a company's nancial health. “Safe” companies, i.e. companies that have a low probability of bankruptcy; have an Altman Z-Score greater than 3.0.

The Altman Z-Score is a measure of a company's health and likelihood of bankruptcy. Several key ratios are used in the formulation of an Altman Z-Score Value. The Z-Score model is the 1960's brainchild of Professor Edward Altman of NYU. The Z score consists of 5 variables:

X1 = Working Capital / Total Assets
X2 = Retained Earnings / Total Assets
X3 = EBIT / Total Assets

ISSN 2394 - 7780

X4 = Market Value of Equity / Total Liabilities
X5 = Net Sales / Total Assets
Original Altman Z Score for Public Companies
The original model to calculate the Z score for public manufacturing companies is as follows
Z = 1.2*X1 + 1.4*X2 + 3.3*X3 + 0.6*X4 + 1.0*X5
When Z is 3.0 or more, the rm is most likely safe based on the financial data. However, be careful to double check as fraud, economic downturns and other factors could cause unexpected reversals.

When Z is 2.7 to 3.0, the company is probably safe from bankruptcy, but this is in the grey area and caution should be taken.

When Z is 1.8 to 2.7, the company is likely to be bankrupt within 2 years. This is the lower portion of the grey area and a dramatic turnaround of the company is needed.

When Z is below 1.8, the company is highly likely to be bankrupt. If a company is generating lower than 1.8, serious studies must be performed to ensure the company can survive.

The Z-score formula may be used to predict the probability that a rm will go into bankruptcy within two years.

Z-scores are used to predict corporate defaults and an easy-to-calculate control measure for the nancial distress status of companies in academic studies. The Z-score uses multiple corporate income and balance sheet values to measure the nancial health of a company. Eidleman (1995) de nes each of the above ratios as follows:

X1 is a liquidity ratio , the purpose of which is to measure the liquidity of the assets 'in relation to rm's size' .It is the measure of net liquid asset of a concern to the total capitalization which measures the rm's ability to meet its maturing short-term obligations.

X2 is an indicator of the 'cumulative pro tability' of the rm over time which indicates the ef ciency of the management in manufacturing, sales, administration and other activities.

X3 is a measure of rm's productivity which is crucial for the long-term survival of the company. It is a measure of productivity of an asset employed in an enterprise. The ultimate existence of an enterprise is based on earning power. It measures how effectively a rm is using its resources. It measures the management's overall effectiveness as shown by the returns generated on sales and investments.

X4 de nes the market views the company. The assumption is that with information being transmitted to the market on a constant basis, the market is able to determine the worth of the company. This is then compared to rm's debt. It is reciprocal of familiar debt equity ratio. Equity is measured by the combined market value of all shares, while debt includes both current and long term liabilities. This measure shows how much of an asset can decline in values before liabilities exceed the assets and the concerns become insolvent. It measures the extent to which the rm has been nanced by debt. Creditors look to the equity to provide the margin of safety, but by raising fund through debt, owners gain the bene t of marinating control of the rm with limited investment.

X5 is de ned as a 'measure of management ability to compete'. The capital turnover ratio is the standard nancial measure for illustrating the sales generating capacity of the assets.

**INTERPRETATION OF RESULTS**

**Table 1: Computation of Z score for BSNL**

| Ratio/year | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** |
|---|---|---|---|---|---|---|
| Current Assets | 5,497,179 | 5497179 | 2,555,149 | 2,267,653 | 1,643,158 | 2,122,331 |
| Current liabilities | 4,835,244 | 4835244 | 1,954,910 | 1,929,361 | 1,980,444 | 1,994,332 |
| Net Working Capital | 661,935 | 661935 | 600,239 | 338,292 | -337,286 | 127,999 |
| Total Assets | 13,509,631 | 13509631 | 11,095,806 | 10,199,019 | 9,555,527 | 8,933,344 |
| X1=Net working capital/Total assets | 0.048997267 | 0.0489973 | 0.054096025 | 0.03316907 | -0.035297478 | 0.01432823 |
| Retained earnings | -182,265 | -182265 | -638,426 | -885,070 | -788,444 | -701,976 |

ISSN 2394 - 7780

| | | | | | | |
|---|---|---|---|---|---|---|
| Total Assets | 13,509,631 | 13509631 | 11,095,806 | 10,199,019 | 9,555,527 | 8,933,344 |
| X2=Retained Earnings/Total assets | -0.013491486 | -0.013491 | -0.057537596 | -0.0867799 | -0.082511828 | -0.07857931 |
| EBIT | -219,748 | -219748 | -657,979 | -882,093 | -795,536 | -712,419 |
| Total Assets | 13,509,631 | 13509631 | 11,095,806 | 10,199,019 | 9,555,527 | 8,933,344 |
| X3=EBIT/Total Assets | -0.016266025 | -0.016266 | -0.059299793 | -0.086488 | -0.083254016 | -0.0797483 |
| Market Value of Equity | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| Total Liabilities | 5000998 | 3023846 | 3088931 | 3081917 | 3191654 | 3180012 |
| X4=Market value of equity/total liabilities | 0.24995011 | 0.4133808 | 0.404670742 | 0.40559171 | 0.391646463 | 0.39308028 |
| Net sales | 2,791,344 | 2791344 | 2,704,471 | 2,599,850 | 2,565,481 | 2,615,326 |
| Total assets | 13509631 | 13509631 | 11,095,806 | 10,199,019 | 9,555,527 | 8,933,344 |
| X5=Net sales/Total assets | 0.206618819 | 0.2066188 | 0.24373813 | 0.25491177 | 0.268481372 | 0.29276002 |
| Z score | 0.342819641 | 0.4408781 | 0.275213854 | 0.13116733 | 0.070857464 | 0.17262164 |

X1 measures the company's ability to pay short term debts. It shows the liquidity of the company. A very low ratio indicates that working capital is funded by its debts. This is due to increase in current liabilities.

X2 measures efficiency of the company to accumulate its profits to finance its total assets. The above table 1 shows that BSNL is able to not able to finance its assets only in three years that too at very low percentage. The balance is procured through long term debts.

X3 indicates the company's ability to utilise its fixed assets to earn profits. The ratio has been very low.

X4 shows a low performance. Market value has increased for the three years and than declined.

It has performed below the normal standards of this ratio. This shows the financial strength and popularity is low.

X5 indicates the company's ability to utilise its assets to generate sales. The ratio is ideally expected to be 2:1. During the study period on an average the results are below the standards.

The result of Z score is below 1.8, the company is highly likely to be bankrupt. If a company is generating lower than 1.8, serious studies must be performed to ensure the company can survive.

**Table 2: Computation of Z score for MTNL**

| Ratio/year | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| Current Assets | 16,565.54 | 10,366.61 | 9,757.98 | 10,297.11 | 15,630.78 |
| Current liabilities | 25,359.62 | 14,252.38 | 14,722.95 | 17,596.25 | 8,275.15 |
| Net Working Capital | -8,794.08 | -3,886 | -4,965 | -7,299 | 7,356 |
| Total Assets | 34808.02 | 28,355 | 26,907 | 26,351 | 27,436 |
| X1=Net working capital/Total assets | -0.252645224 | -0.1370422 | -0.1845224 | -0.27700174 | 0.2680987 |
| Retained earnings | **-3,063.79** | **-2,801.92** | **-4,109.78** | **-5,321.12** | **7,825.13** |
| Total Assets | 34808.02 | 28,355 | 26,907 | 26,351 | 27,436 |
| X2=Retained Earnings/Total assets | -0.088019658 | -0.0988173 | -0.1527394 | -0.20193605 | 0.285211 |
| EBIT | -2,961.99 | -2,795.37 | -4,109.80 | -5,321.13 | 8,322.32 |
| Total Assets | 34808.02 | 28,355 | 26,907 | 26,351 | 27,436 |
| X3=EBIT/Total Assets | -0.085095044 | -0.0985863 | -0.1527401 | -0.20193643 | 0.3033327 |

ISSN 2394 - 7780

| | | | | | |
|---|---|---|---|---|---|
| Market Value of Equity | 46,116 | 28,571 | 17,262 | 11,592 | 9,494 |
| Total Liabilities | 25359.62 | 21708.06 | 24370.9 | 29134.94 | 22395.59 |
| X4=Market value of equity/total liabilities | 1.818481507 | 1.31612406 | 0.7083038 | 0.397872795 | 0.4239227 |
| Net sales | 3,657.75 | 3,675.51 | 3,373.25 | 3,428.66 | 3,391.74 |
| Total assets | 34808.02 | 28,355 | 26,907 | 26,351 | 27,436 |
| X5=Net sales/Total assets | 0.105083541 | 0.12962681 | 0.1253664 | 0.130117356 | 0.1236224 |
| Z score | 0.488957011 | -0.077781 | -0.3889558 | -0.91266176 | 2.0999877 |

X1 measures the company's ability to pay short term debts. It shows the liquidity of the company. A negative ratio indicates that working capital being funded by debts.

X2 measures efficiency of the company to accumulate its profits to finance its total assets. The above table 2 shows that MTNL is not able to finance assets. It is procured through long term debts except in last year.

X3 indicates the company's ability to utilise its fixed assets to earn profits. The ratio has been negative except in last year.

X4 shows a very poor result. Market value has decreased in the subsequent years. It has performed below the normal standards of this ratio i.e. 2.

X5 indicates the company's ability to utilise its assets to generate sales. The ratio is ideally expected to be 2:1. During the study period on an average the results are below the standards.

The Z score is less than 1.8. The company is likely to be bankrupt within 2 years as per interpretation of this model. This is the lower portion of the grey area and a dramatic turnaround of the company is needed.

**RESEARCH SHORTCOMINGS**

The study is done for public sector telecom companies. The results are applicable only for the period chosen. Only a small sample is used for the study, therefore some risk is associated with the sample size. Altman Z Score was formulated and tested during 1960s. The samples he used were American companies. Even though it has been updated, the reliability of the model to the current situation and Indian Companies is not yet tested.

**CONCLUSION**

Fiscal fitness of a company should be assessed periodically. But such analysis is not given importance in a developing country like India and also in many emerging economies. This study has focused on measuring the financial health of automobile companies. It is revealed that even the public companies are not able to reach the overall average. Telecom sector is one which contributes considerably to the GDP of any economy. So, a study on this sector will provide insights of their performance to the external and internal users. The results show that all companies have underperformed after the Global Crisis. According to the study the BSNL and MTNL are not in safe zone, and the overall performance of the companies has decreased..

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# ELEMENTARY EDUCATION AND HUMAN CAPITAL BUILDING: THE JHARKHNAD EXPERIENCE

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**ABSTRACT**

*Universal Elementary Education is one of the Millennium Development Goals and is key to build a strong pool of human resources. Just as organisation's effectiveness and efficiency is determined by its human capital, in the same way the growth prospect of nations and states is affected by its human resources. The theoretical literature clearly demonstrates that states investing higher in human resource development have grown faster than those who do not. Elementary education is one of the key capability building measure and gateway to other HRD interventions. Jharkhand, despite being a resource rich state has failed to ensure that all of its children receive and complete a basic course in elementary education. Not educating the present cohorts has remarkable repercussions for the human resource development which finally manifests itself in maladies like poverty and unemployment. There are a plethora of issues that need immediate attention. The state not only lags behind on literacy front but also the quality of elementary education is deplorable. It seems a herculean task to achieve the UEE goal by 2015. However, the study recommends a multi pronged and concerted efforts to achieve the goal of UEE and elementary education must be given a front seat.*

*Key Words: elementary education, human resource development, Z and T score, coefficient of concordance*

JEL Classification: I 20, I 28, O 15

## 1. Prelude

Since the development is seen as expansion in choices, the role of investment in human capital has assumed much significance. Of several types of investments the state undertakes in developing its human resources, education is the most important. It is so because education and elementary education in particular, augments the capability of people and enlarges their choice set. The elementary education not only equips an individual with the basic skills of reading, writing and making simple calculations but has far reaching consequences for human capital building. First of all, being literate is a valued outcome in itself as it bolsters the self respect and self confidence of the individual which in turn, has several spill over effects. Furthermore, it prepares the individual for learning more sophisticated skills. The theoretical literature provides ample evidence that the nations and states having a good elementary education system as manifest in higher literacy rate have better human capital than those who do not. Needless to say, better human capital brings economic growth and development.

The state of Jharkhand accounts for 2.42% of the total geographical area and 4 % of the total population of the country. The state was created with a vision to become one of the most developed states of India, as it is endowed with extensive natural resources. However, it continues to remain laggard on many fronts and elementary education is one of them. What this study argues is that the state has not been able to realise its potential because it has poor human capital; elementary education lying in decrepitude. Given the fact that elementary education plays a pivotal role in building human capital, it is really a matter of concern that it has not been accorded due significance.

This study aims at summarising the status of elementary education in the state and points towards the implications of elementary education for human capital formulation and consequently economic growth and development of the state. The background of this study lies in the fact that with just two and half year in hand, it is going to be a herculean task for the state of Jharkhand to achieve the Millennium Development Goal of Universal Elementary Education (UEE). Universal elementary education assumes that all children irrespective of the caste, creed or location would complete primary education of comparable quality within the stipulated time frame. However, for lakhs of juveniles of Jharkhand the access to primary education continues to be a distant dream. And for those who are enrolled in the primary schools the situation is no far better. The elementary education system in the state is in moribund state as it is plagued with problems ranging from acute shortage of teachers to lack of basic amenities in the schools.

The remainder of the paper is divided into five sections. The following section (Section 2) delineates the materials and methodology of the study and comprises three sub sections. The sub section 2.1 discusses the objective and scope of the study and the next sub section focuses on Data source and methodology. It is followed by the development of hypotheses in the last sub section. Section three has been devoted to the analysis of data and related discussion. Section four summarises the key findings of the study. The last section summarises and concludes.

ISSN 2394 - 7780

## 2. ELEMENTARY EDUCATION, HUMAN CAPITAL AND DEVELOPMENT

Human capital is an extremely complex concept defined in non uniform manner. However, it usually refers to the resources in people. It has been defined by the OECD as "the knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity" (OECD, 1998). This is a sufficiently broad definition as it encompasses all sort of investments; one can think of in building and improving skills of the human resources of a state and thus is not limited to education alone. While analysing the nexus between elementary education, human capital building and development we face two obvious questions. First, why developed nations invest heavily in elementary education than higher education? Second, why human capital is better in developed nations as compared to developing ones? Interestingly, first question is the answer to the second one. The (social) rate of return is higher on elementary education than higher education, therefore still it is state funded in developed countries.

Elementary education contributes in human capital building in both, direct and indirect ways. It directly contributes in human capital building when it boosts people's self confidence; help them find better jobs, equips with basic skills and enable them to be a part of public debate thereby leading to demand for various services and social security measures from their respective governments (HDR, 2013). It also makes individuals aware of their rights at workplace and hence prevents exploitation by the employers. The spillover effects are no less important than direct benefits. For example, an educated person is more aware of his surroundings, is health conscious etc. From organisation point of view, what are its implications? There are empirical studies that report that firm's core competences or competitive advantage is induced by the investment of human capital entailed with value creating potential (Lepak & Snell, 1999). Education investment for workers significantly affects his/her productivity in the workplace (Lucas, 1988). After being employed, the workers tend to easily control their working condition in the workplace and relatively receive high rewards in the internal/external labor market (Edward, 1979). Similarly, many researchers present that accumulation of one's human capital on education and training investment largely affects the growth of an individual' wage, firms' productivity, and national economy (Denison, 1962; Schultz, 1961).

Elementary education has long been viewed as an important factor contributing to the economic well-being. The literature on growth and development illustrates three mechanisms through which education helps in building human capital may influence the growth process of states. First, education can increase the human capital inherent in the labor force, which increases labor productivity and thus transitional growth toward a higher equilibrium level of output (as in augmented neoclassical growth theories, Mankiw et al. (1992)). Second, education can increase the innovative capacity of the economy, and the new knowledge on new technologies, products, and processes promotes growth as in theories of endogenous growth (Lucas, 1988; Romer, 1990; Aghion and Howitt, 1998). Third, education can facilitate the diffusion and transmission of knowledge needed to understand and process new information and to successfully implement new technologies devised by others, which again promotes economic growth (Nelson and Phelps, 1966; Benhabib and Spiegel, 1994).

The Human Development Report 2011 reads *"States that perform better on health and education outcomes are also the states with higher HDI and thus higher per capita income".* Below we present below HDI and EDI rankings of few states of India to compare with Jharkhand.

**Table No.1: HDI and EDI Ranking of Select States**

| STATES | Jharkhand | Kerala | Himachal Pradesh | Punjab | Tamil Nadu | Uttar Pradesh | Bihar | Orissa |
|---|---|---|---|---|---|---|---|---|
| **HDI#** | 23 | 1 | 4 | 5 | 8 | 18 | 19 | 22 |
| **EDI*** | 20 | 2 | 4 | 7 | 3 | 13 | 21 | 15 |

**# HDI rank is for year 2007-08**

***Education Development Index for elementary education, 2006-07**

Since HDI constitutes of 3 key indicators of good human capital (since high development very strongly correlates with human capital), it is clear that states with high HDI ranking than Jharkhand have better elementary education system.

In short, we can say that elementary education builds human capital by (1) imparting basic skills of reading, writing and making simple calculations, (2) paving the way for learning advanced and sophisticated skills, (3)

ISSN 2394 - 7780

augmenting the awareness level of an individual and his capability to reason, (4) enlarging his choice set, and (5) enabling him to make informed and effective choices. These direct benefits generate many indirect benefits for the organisations, in turn.

## 3. METHODOLOGY

### 3.1 Objective and scope

The specific objective of this paper is to:

*i. assess the overall status of elementary education in the state*
*ii. enquire and measure the extent of regional inequities in terms of various indicators of primary education*
*iii. study the intra district variations in the distribution of elementary education facilities*
*iv. assess the status of incentives across various districts of the state*
*v. delve into the link between elementary education and human resource development*

The study is quite comprehensive in its scope. The study includes all the districts of the state. The time period of the study is 2008-2012.

### 3.2 Data source and technique

Secondary data has been utilised to accomplish the objectives of the study. Primarily, this study relies on District Information System for Education (DISE) dataset. However, data have also been taken from other sources as well. These include various reports and publications of organisations working in the field of elementary education such as UNESCO, CARE, NUEPA to name a few. Furthermore data published by the HRD ministry of Jharkhand as well as central government have been used in the study. Important data sources include:

*(1) annual data published by Government of India under the title, Selected Educational Statistics,*

*(2) annual status education report (ASER) of various years*

*(3) Jharkhand Education Project Council (JEPC)Publications*

In order to analyse the raw data of DISE 2008-09, MS Excel and statistical software SPSS have been used. The various measures that have been computed are ratio and proportion and percentages along with other appropriate statistical tools. A wide range of parameters and indicators have been used to assess the status of primary education. We have broadly classified these indicators into four groups-

coverage, efficiency, infrastructure and incentive. The ranking of districts has been done by using the standardised scores like Z score and T score.

**Z-Score = (Xi – Mean) / Standard Deviation**

**T-Score = 10Z + 50**

Kendell's rank method has been employed to assess the overall status and position of primary education in the entire 24 districts of the state. Co efficient of Concordance (W) has been used to study the significance of association of a priori said parameters.

### 3.3 Hypothesis

Following hypotheses have been formulated for the purpose of the study:

a. **$H_1$ :** The three sets of rankings of districts are independent for coverage parameter
b. **$H_2$ :** The three sets of rankings of districts are independent for efficiency parameter
c. **$H_3$ :**The three sets of rankings of districts are independent for infrastructure parameter
d. **$H_4$ :** The three sets of rankings of districts are independent for incentive parameter

## 4. RESULTS AND DISCUSSION

As per the provisional estimates of census of 2011 the literacy rate in the state has gone up to 67.63% from 54.11% in 2001. Still the state ranks at 27$^{th}$ position on literacy fronts.

### 4.1 Overall Position of Elementary Education

In this section we study the overall position of elementary education in the state by using the Kendell's rank method. The overall rankings of districts have been done by pooling the individual rankings of indicators constituting that dimension. The individual ranking of the all the 24 districts on each parameter is given in the appendix. The composite score so obtained is the summary measure of that district on the concerned dimension and the composite ranking of all the 24 districts is presented below:

ISSN 2394 - 7780

| Table 2: Composite Ranks of Districts | | | | |
|---|---|---|---|---|
| **DISTRICTS** | **Coverage** | **Efficiency** | **Incentive** | **Infrastructure** |
| BOKARO | 21.000 | 13.000 | 21.000 | 13.500 |
| CHATRA | 11.000 | 10.000 | 8.000 | 16.500 |
| DEOGHAR | 17.500 | 11.000 | 4.000 | 5.000 |
| DHANBAD | 17.500 | 17.500 | 9.000 | 18.000 |
| DUMKA | 12.500 | 9.000 | 19.500 | 20.500 |
| GARHWA | 9.500 | 6.000 | 16.000 | 7.000 |
| GIRIDIH | 23.000 | 4.000 | 1.000 | 2.000 |
| GODDA | 16.000 | 2.000 | 6.500 | 9.500 |
| GUMLA | 4.000 | 17.500 | 22.000 | 19.000 |
| HAZARIBAG | 2.000 | 5.000 | 19.500 | 6.000 |
| JAMTARA | 1.000 | 12.000 | 3.000 | 8.000 |
| KHUNTI | 3.000 | 16.000 | 23.000 | 22.000 |
| KODARMA | 5.000 | 21.000 | 17.000 | 9.500 |
| LATEHAR | 7.000 | 7.500 | 10.500 | 20.500 |
| LOHARDAGA | 19.000 | 24.000 | 18.000 | 12.000 |
| PAKAUR | 8.000 | 23.000 | 15.000 | 24.000 |
| PALAMU | 20.000 | 3.000 | 6.500 | 1.000 |
| WEST SINGHBHUM | 6.000 | 1.000 | 14.000 | 15.000 |
| EAST SINGHBHUM | 14.000 | 22.000 | 24.000 | 23.000 |
| RAMGARH | 9.500 | 15.000 | 5.000 | 13.500 |
| RANCHI | 12.500 | 20.000 | 12.000 | 16.500 |
| SAHIBGANJ | 22.000 | 7.500 | 2.000 | 3.000 |
| SARAIKELA-KHARSAWAN | 24.000 | 19.000 | 13.000 | 11.000 |
| SIMDEGA | 15.000 | 14.000 | 10.500 | 4.000 |

It is worthwhile to mention here that an inverse relationship exists between the status of elementary education and composite score of the districts. Higher the composite score worse is the condition of that district. From the above table it is clear that on the coverage dimension, Saraikela Kharsawan district is at the top position (rank 24) in providing easy availability of primary schools to its children. The Giridih districts stands at number two with a rank of 23 followed by Sahibganj (22). The districts of Jamtara, Khunti and Hazaribagh are in a deplorable state with regard to the availability of primary schools.

The second dimension is that of efficiency. The third column of table number 5 depicts the ranking of the districts on this parameter. Here Lohardaga, Pakur and East Singhbhum hold the first three positions in the same order with the ranks of 24, 23 and 22 respectively. West Singhbhum (1), Godda (2) and Palamu (3) are the laggard ones.

On the third dimension of infrastructure as shown in column number five, Pakur, East Singhbhum and Khunti are the top three districts respectively. Palamu, Giridih and Sahibganj are the worst performing districts with ranks 1, 2 and 3 in the same order. East Singhbhum is at the number one position with aspect to incentive followed by Khunti and Gumla.

**4.2 Association of parameters**

Now it will be interesting to find out whether any association exists among the different indicators under each dimension for the different districts. To accomplish this goal Kendall's coefficient of concordance (W) has been calculated. Since there are 24 districts which is greater than 7 the appropriate value of Chi square has been used to test the significance of the W. The calculated value of W and its corresponding chi square value has been tabulated in table number 3.

ISSN 2394 - 7780

| Table 3: Summary table for Test of Association of parameters | | | | |
|---|---|---|---|---|
| **Serial No.** | **Hypothesis** | **Kendell's W** | **$\chi 2$ value** | **Accept/Reject** |
| 1 | The three sets of rankings of districts are independent on coverage | 0.316 | 21.78 | Accept |
| 2 | The four sets of rankings of districts are independent for efficiency ratios | 0.201 | 18.49 | Accept |
| 3 | The three sets of rankings of districts are independent for incentive ratios | 0.470 | 32.44 | Accept |
| 4 | The three sets of rankings of districts are independent for infrastructure ratios | 0.184 | 21.19 | Accept |
| *Tabulated value of $\chi 2$ = 35.20 at degree of freedom 23* | | | | |

The chi square value for the first null hypothesis is 21.78, for the second it is 18.49, for third it is 32.44 and for the last null hypothesis it is 21.19. The tabulated value of chi square at 23 degree of freedom is 35.20. It is clear that the calculated value of chi square is less than the tabulated value of chi square for all four hypotheses, thereby leading to the acceptance of all the four hypotheses.

The acceptance of the first null hypothesis implies that the overall availability of the primary schools cannot be taken as a base for framing policies and planning for elementary education in the state. The individual indicators and factors have to be taken into account while improving the easy and adequate availability of the primary schools. Similarly, the acceptance of second null hypothesis implies that 4 sets of ranking are independent for efficiency dimension. There is no uniformity in performance of the districts on various individual parameters. Consequently, it requires a tailored approach rather than a approach based on a composite measure.

Similarly, the acceptance of the third null hypothesis has important implications. The various incentives need to be separately monitored and administered in the different districts so as to increase the enrolment ratio and decrease the dropout rate. Same is the case with the status of infrastructure, as is evident with the acceptance of the fourth null hypothesis. It requires attention on each and every parameter rather than looking at the composite picture and basing decisions on that picture. In nutshell, while designing any mechanism for better delivery of results each parameter demands individual treatment.

## 5. MAJOR FINDINGS OF THE STUDY

a. Elementary education builds human capital in two ways direct and indirect; directly it is beneficial for the individuals and indirectly it generates benefits for the organisations and states.

b. There is strong link between the status of elementary education, quality of human capital and growth rate for the Indian states.

c. The state as a whole is under covered by the primary school facility as well as there is wide disparity in the distribution of primary schools in different areas of the state.

d. Kolhan and Northern Chhota Nagpur divisions are relatively in better position and more efficient in providing elementary education facilities to its children than their three other counterpart.

e. The state as a whole is not performing well in providing elementary education infrastructure. The percentage of schools with electricity, drinking water facility, girl's toilet etc is much lower than most of the developed states.

f. Most of the indicators and parameters in the study show no association for the districts meaning thereby that the overall picture of the elementary education system cannot be used as a base for planning the elementary education system.

## 6. FINAL REMARKS

With the shift to a knowledge based economy, the role of human capital has become vital and all those investments that build human capital have become important. In this context, the role of elementary education or Education for All can hardly be overlooked. The elementary education may be viewed as a gateway to the

ISSN 2394 - 7780

world of higher education, knowledge and information. Being the very first stage of formal education, primary education bears the onus of equipping the children with the basic knowledge of reading – writing. It bestows a number of benefits both directly and indirectly to individuals, organisations and states. But it is a tyranny of the fact that millions of the children in the state are excluded from access to elementary education. The elementary education system in the state is in a desperate state plagued with a host of problems viz. never enrolment, poor attendance, high dropout rate, scarcity of teachers, inadequate number of schools, poor infrastructure to name a few. This has led to poor human capital in the state which has finally resulted in slow growth rate for the state. By not educating its present cohort of children the state also is devoid of the opportunity to leverage its youth potential in the coming years. It has to be recognised that there is enormous opportunity cost of not educating the ongoing generation. The government has to recognise that unless it makes adequate investment in developing its human resources the growth potential can't be realised. Also in the absence of elementary education it will be futile to undertake many programmes of HRD. Hence, elementary education must take the front seat and human resource development must be the first priority.

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# BUYING BEHAVIOR OF MOBILE PHONES OF RURAL AND URBAN CONSUMERS: A STUDY

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**ABSTRACT**
*India one of the most populous country in the world holds the potential to create the sustainable growth in the every sector including Telecom with optimum and efficient utilization of the modern technology. This study has been specifically designed to explore the buying behavior of rural and urban consumers in dewas district to mobile phones. Researcher has taken a sample of 200 people which include an equal number of rural and urban people and their belief about purchasing pattern of mobile phones. This research study is based on descriptive research and required primary data were collected using structuredquestionnaire supported with personal interviewing of the selected urban and rural customersThe results of the report revealed that people from both the areas have interested in features, style and brand of mobile phones and even rural people were more concern about the price and quality of phones as compared to urban consumers. The study suggested that the mobile phone sellers should consider the above mentioned factors to equate the opportunity.*

*Keywords: consumer buying behavior; mobile phones; price, quality*

## 1. INTRODUCTION

Today mobile phones have moved beyond their primary role of voice communications and have graduated to become an essential entertaining device for mobile users. We are in an era where users buy mobile phones not just to be in touch, today‘s youth use it to express their thoughts, for social networking, to show their interests, play games, read news, surf on the internet, listen to music, chat instantly with friends & families and even check their bank balances. There are various phone manufacturers providing handsets. The Indian mobile industry is the fastest growing in the world and India continues to add more mobile connections every month than any other country in the world. The telecom boom in the country provides great opportunity to handset manufacturers and the hottest segment for these manufacturers is the entry level segment. Among the fastest growing sectors in the country, telecom has been zooming up the growth curve at a fiery pace. The last few years saw India adding many firsts to its list of achievements. Some of these are-the world’s lowest call rates (1 paisa/sec), fastest growth in the number of subscribers (15-20 million per month), fastest sale of a million mobile phones (1 week), the world's cheapest mobile handset (777), and the world's most affordable 3G phone (4,999). The market in India is dominated by mobile. For mobile we have 840 million-plus users, unlike many other markets, mobile is becoming the dominant device for voice, for value-added services, and increasingly for mobile Internet also. It‘s somewhat similar to what we saw in Japan in 1999 where, because of the limitation of broadband and computing. There‘s a whole host of services being created around mobile. An effective management of mobile services requires an understanding of the factors that underlie the evolution of the market. Factors such as market potential and timing and speed of adoption are of great importance for telecom operators for capacity planning. Understanding the evolution of mobile phone market and its likely future trend is equally important for policy makers. India is currently facing the onslaught of cheap sub-standard Chinese phones, which occupy as much as 25 per cent of the market, thanks to the liberal import policies of India. The boost to exports to mobile phones and their parts will encourage local manufacturing, which is the best answer to compete with the cheap sub-standard Chinese phones imports. Mobile phone exports from India could double as a result of Commerce Ministry granting 2 per cent Focus Product Scheme (FPS) on mobile phone exports in the Foreign Trade President of Indian Cellular Association said that the special incentive accorded to mobile phone exports could result in the doubling of exports in the next 3-5 years from the annual level of `13,000 crore to `14,000 crore if other enabling policies are put in place. India is already a base for worldwide quality manufacturing of mobile phones.

In recent years, rural markets have acquired significance in countries like China and India, as the overall growth of the economy has resulted into substantial increase in the purchasing power of the rural communities. On account of the Green Revolution in India, the rural areas are consuming a large quantity of industrial and urban manufactured products. In this context, a special marketing strategy, namely, rural marketing has taken shape. Sometimes, rural marketing is confused with agricultural marketing – the later denotes marketing of produce of the rural areas to the urban consumers or industrial consumers, whereas rural marketing involves delivering manufactured or processed inputs or services to rural producers or consumers. Also, when we consider the scenario of India and China, there is a picture that comes out, huge market for the developed products as well as the labor support. This has led to the change in the mindset of the marketers to move to these parts of the world.

ISSN 2394 - 7780

**Table 1.1: Rural Buyer-Seller (Producer) Matrix**

| | Rural Seller (RS) | Urban Seller (US) |
|---|---|---|
| **Rural Buyer (RB)** | I: RS-RB<br>Intra-Rural (All products) | II: US-RB<br>Consumer goods, services, agro inputs, farm implements & machinery |
| **Urban Buyer (UB)** | III: RS-UB<br>Farm & Non-farm products | IV: US-UB<br>Intra-Urban (All products) |

Source: Vaswani*et al.* (2005), "Rural Marketing in Development Paradigm, International Conference on Marketing Paradigms for Emerging Economies, IIM-A, Jan 12-13.

### 1.1 MOBILE MARKET IN INDIA

India continues to witness a high growth in terms of mobile users. India, which is considered as the world's fastest growing mobile market, added 15.41 million mobile users in January 2009 - a record itself. The above data was released by the Telecom Regulatory Authority of India (TRAI).The total number of mobile phone users in India has gone up to 362.30 million. The number was 233.63 million in January 2008. According to TRAI, India now has 400 million telephone connections and 362.30 million mobile phone connections.

In 2009, India will continue to see new subscribers being added to cellular networks every month. However, competition will intensify with entry of new cellular operators launching services leading to very competitive and attractive tariffs for end-users. Existing operators will continue to invest in their networks to expand their coverage to far flung rural markets.

Rural markets will remain a key segment for both cellular operators as well as device vendors in terms of sales to first time buyers. The expected launch of 3G services will be a good opportunity for operators to increase their Average Revenue per User (ARPU) at least in the metros and top 10 cities. Due to the economic slowdown, consumers are holding back their decision to replace their mobile devices and this will affect replacement sales in 2009. Interestingly, in 2008, approximately 55% of the mobile devices were sold to first time buyers and the rest 45% came from replacement buyers. In the current scenario, replacement sales will be under pressure and are likely to decline in 2009.

More perilous, however, is the inequality between rural and urban India. Despite several policy initiatives to promote rural penetration, growth in tele density continues to be skewed in favor of urban India. In fact, the rural population is much worse off than it was a few years ago compared to its urban counterpart. , which means the divide has worsened almost 12 times in the last 10 years. Since number of fixed phones is declining, the entire change can be attributed to mobile telephony. A recent report by ICRIER (Indian Council of Research in International Economic Relations) on the impact of mobile phones shows there is a causal relationship between higher mobile tele density in Indian states and higher economic growth. States with high mobile penetration can be expected to grow faster than those states with lower mobile penetration rates, and by 1.2 percentage points for every 10 per cent increase in the penetration rate. This finding underlines the urgency of increasing tele density across all states and especially in those numerous many areas that are yet to reach threshold levels. Indeed, the Telecom Regulatory Authority of India has also recently expressed concern over the growing disparity in two of its recent documents. One is specifically devoted to rural penetration issues and the other relates to the regulatory regime for charges that an operator needs to pay for the use of a competitor's network, the so-called interconnect usage charge regime.

At a time when the world economic crisis threatens to shrink resources available for investment, TRAI proposed interconnection regime will hurt the business cases of incumbent operators who having covered urban areas are now already deploying networks in rural areas. It will, instead, help new entrants, keen to exploit regulatory anomalies in India, to eat into the urban revenues rather than aid growth in rural areas.

This is just not the scenario in India where large parts especially rural areas have no connectivity at all. With a termination charge of Rs. 0.30 per minute, the IUC regime in India is already amongst the most favorable to operators seeking interconnection. The current IUC can hardly be seen as a barrier to competition in the present state of network development. It seems implausible that India's incumbent operators can recover capital costs as they did traditionally through rental charges or through call charges, already among the lowest in the world. It is worth recalling that prepaid users that are around 80 per cent of India's total subscriber base do not pay a recurring monthly charge or significant connection fees. It is increasingly argued that the fragmentation of Indian telecom market has already led to inefficient utilization of scarce spectrum. That the new entrants in India's crowded telecom market were attracted primarily by the chance of acquiring precious spectrum at bargain prices has been amply demonstrated by recent transactions in mobile licenses.

ISSN 2394 - 7780

If, in the name of increasing competition, TRAI were to reduce the already low interconnection charges, we fear it will hurt rural users even before networks can be rolled out for them. It has been shown that access to telecommunications can help improve productivity and efficiency, and enable benefits of economic growth to be shared. The rural population, therefore, at least deserves a chance. If, say, in one year, the urban-rural disparity shows no signs of abating, TRAI may well be justified in considering a tougher IUC regime to reduce the unearned profits of mobile operators.

## 2. LITERATURE REVIEW

Cellular phones and digital televisions got more attention of marketing researchers as look upon the acceptance procedure (Saaksjarvi, 2003). Rogers (1976) has provided a classification of consumers in expressions of innovators, early adopters, early majority, late majority and laggards. But now a day's consumers are also give the impression of being into the compatibility of the new products to their self-image and life style (Saaksjarvi, 2003). Funk and Ndubisi (2006) study a significant involvement between color and the choice of an automobile. The study by Funk and Ndubisi (2006) further recognizes the gender moderation on the relationship between different color dimensions and the product choice. Barak and Gould (1985) found that younger consumers are superior fond of stylish goods than older ones. Young consumers have more interest in purchasing new products and they have information seeking behavior. And this behavior makes them self-confident and this self-confident leads to become a opinion leader which leads toward brand switching (Szmigin and Carrigan, 2001). Gupta (1987) studied the factors which motivate consumers while buy durables he found that brand choice, source of information, role of family members and customer satisfaction is the significant factors. Shanthi, R (2005) work on the perceptual dimensions of brand association with reference to mobile users. Singh (2011) compare the rural and urban market of India and found there is moderate differences for television and refrigerators and low differences for automobiles between rural and urban consumers. There is a significant positive relation with income of consumers and buying behavior of consumers (Singh 2011). Williams (2002) argues that deviation in "attitude, motivation and value orientations associated with differences in occupational opportunities and demands, childhood socialization patterns and educational influences may lead consumers to vary in many of their purchase behaviors across social classes". Rahman and Bhattacharyya (2003) studied about emerging markets and discuss the significance of emerging markets in the global business and places of interest how the road and rail network condition and consumer orientation in an emerging market support a first mover. Wilska (2003) argues that the conventional gender division in mobile phone use styles that could be observed is motivating in the light of assumptions that genders are flattering more similarly in their use of new technology. Sun and Wu (2004) studied Chinese market and found that Chinese rural and urban consumers are to be statistically dissimilar in provisions of their attitudes toward the whole marketing mix: "product price, brand names, promotions and distribution". Gupta (1988) found that sales promotions have impact on consumer buying behavior. Lee and Feick (2001) argues that customer satisfaction contribute positively in customer retention. To explain the link Lee and Feick (2001) found that switching cost plays a very important role. Switching cost further linked with quality. Mobile Phone Company focus on quality it will increase customer satisfaction. Lee and Feick 2001)

## 3. RESEARCH OBJECTIVES

- To study the level of influence of various factors affecting consumer purchasing buying behavior.
- To understand the role of family members in influencing brand choice among rural and urban consumers.
- To identify discrimination factors which affected rural and urban consumers buying decision of mobile phone as well as to measure their satisfaction/dissatisfaction form their mobile phone.

### 3.1RESEARCH METHODOLOGY

This research is a descriptive research which tries to find a relation between various factors and consumer buying behaviour of mobile phone. The research has been designed to know about how the mobile companies influence the consumer behaviour and make them to purchase, which among them is more reachable to the customers and what other factors influence consumer behaviour and make these outlets a preferred location for shopping. Data were collected from total 200 respondents in which 100 respondents were form rural area and another 100 were from urban area. In this research study required primary data were collected using structured questionnaire supported with personal interviewing of the selected urban and rural customers. By using survey research approach data were collected from the representative sampling units from Dewas District its surrounding villages who are the users of mobile phones.

### 3.2 RELIABILITY TEST

Internal consistency or reliability of the instrument was conducted by finding the Cronbach alpha coefficient.

ISSN 2394 - 7780

Cronbach's alpha is an index of reliability associated with calculating the reliability of items that are not scored right versus wrong (Fraenkel& NE, 2003). The higher the score, the more reliable the scale is (Nunnaly, 1978) has indicated 0.7 to be an acceptable reliability coefficient which our study achieved 0.645 as shown in Table 3.1.

**Table 3.1 : Reliability Alpha Score**

| Sr. No. | Grouped Indicator Items | Cronbach's Alpha Coefficient |
|---|---|---|
| 01 | Price of the Mobile | **.645** |
| 02 | Quality of the Mobile | |
| 03 | Style & Brand of the Mobile | |
| 04 | Functions of the Mobile | |

### 3.3 DEMOGRAPHIC PROFILE OF RESPONDENTS

The demographic data indicates that most of the respondents of rural sample fall in the age category of 20 to 40 years (37%) and of urban sample fall in the age category of below 20-35 years (47%). Further 87% of rural sample belong to male and 13% belong to female while in urban sample 55% belong to male and 45% belong to female.

Educational profile of the rural sample indicates that most of the respondents are under- graduate (60%); in urban sample too most of the respondents are under-graduate (59%).Occupation profile of the rural sample indicates that most of the respondents are from agricultures and other realted work (36%) while in the urban sample most of the respondents are from students (other) (55%).

Income profile of the rural sample indicates that most of the respondents are having monthly family income between Rs. 5,000 to Rs. 10,000 (47%), while in the urban sample most of the respondents are having monthly family income Rs. 10,000 and above (65%).

## 4. ANALYSIS

**Hypothesis: HD**: factors influence rural and urban customers at same level while purchasing the mobile phone.

**Table 4.1: Statistical Analysis of Factors**

| Parameters | Rural Consumers | | Urban Consumers | | Z-Value |
|---|---|---|---|---|---|
| | Mean | S.D. | Mean | S.D. | |
| Price | 4.38 | 0.76 | 3.80 | 1.07 | 6.2498 |
| Quality | 3.99 | 1.01 | 4.47 | 0.72 | 5.4728 |
| Style & Brand | 4.57 | 0.64 | 4.74 | 0.52 | 2.9155 |
| Functions | 4.55 | 0.65 | 4.63 | 0.57 | 1.3087* |

*Insignificant at 5% Level

Table 4.1 reveals that the difference on factors level is significant between the rural customers of mobile phone and the urban customers, on these four parameters.

For Price, the mean score of rural customers is 4.38 while for urban customers it is 3.80. It showed that the both the customers were significantly different. The rural customers were more price conscious as compared to urban customers. Weightage of price for rural customers were higher side.

Comparison of Quality and Style and brand showed that both the customers are at significantly different levels of quality and style of mobile phones that associated with brand.

Comparison of functions (features) showed that both the customers are not significantly different and it was concluded that companieswere providing maximum features to their customers.

**H0:** Family has no association with purchasing decisions of mobile phone among rural and urban consumer

**Significance level: 95%**

**Table 4.2: T-Test**

| | Test Value | | | | | |
|---|---|---|---|---|---|---|
| | t | df.. | Sig (2 tailed) | Mean difference | 95% Confidence | |
| | | | | | Lower | Upper |
| Family influence the purchasing of mobile phones | 46.256 | 319 | .000 | 2.388 | 2.29 | 2.49 |

ISSN 2394 - 7780

According to the table above, it is concluded that the significance level or the p value is less than 0.5 so we reject the null hypothesis in favor of alternative hypothesis which is family was highly associated with the purchasing of mobile phones.

**ANOVA**

**$H_0$: Customers' satisfaction towards mobile phone significantly between urban and rural consumers.**

**Table 4.3: ANOVA Test**

| Variables | Source | Sum of Squares | DF | Mean Square | F | Sig |
|---|---|---|---|---|---|---|
| Recommendation to family Vs Overall Satisfaction | Between Groups | 3.162 | 3 | 1.054 | 2.769 | .045 |
| | Within Groups | 46.070 | 121 | .381 | | |
| | Total | 49.232 | 124 | -- | | |
| Repurchase option Vs Overall Satisfaction | Between Groups | 10.738 | 3 | 3.579 | 5.101 | .002 |
| | Within Groups | 84.894 | 121 | .702 | | |
| | Total | 95.632 | 124 | | | |
| Quality of Relationship and discounts Vs Overall Satisfaction | Between Groups | 4.879 | 3 | 1.626 | 1.105 | .350 |
| | Within Groups | 178.129 | 121 | 1.472 | | |
| | Total | 183.008 | 124 | | | |

From the table 4.3 it can be inferred that the probability values of F test from two variables are greater at five per cent level of significance. Therefore, it is clearly revealed that customer satisfaction to mobile phone significantly different among rural and urban consumers.

**CONCLUSION**

The father of the nation Mahatma Gandhi rightly stated that India lives in villages and villages constitutes the very heart of India. This has been aptly put by a Hindi poet "Bharatmata Gram Vasini", which means, Mother India lives in her villages.

India have 6 lakh 28000 thousand villages and 68% of Indian population lives in villages. In order to utilize the immense potential of rural market in India, companies need to develop specific marketing strategies and action plans taking into account the complex set of factors that influence consumer's behavior. Rural marketing cannot succeed if the marketing strategy and action plans are only extrapolation or minor modification of the urban marketing strategy and plans. Innovative companies who adopted an integrated approach have succeeded in utilizing market opportunities that rural areas offer.

It has been observed that use of mobile phone has become a life style of urban even rural customers.Companies should divert their attention to rural areas to cater to the rural market as Indian market has still not reached to its saturation level, but it has to still make inroads in rural areas. It is suggested to the companies for tapping the untapped market of rural Indian, companies target to low cost mobile phones and incorporate more features for betterment of rural consumers like torch in phone, whether forecasting, agriculture consultancy or multiple phone book in mobiles.

Government should make an attempt to facilitate the companies for starting their business in rural areas that increase the disposable income of rural people. Government should provide thesecured environment so that the marketer get attracted to invest in rural India to serve some of the village requirements in order to provide better buying experience to rural consumers. Companies need to formulate integrated marketing strategies and action plans in such a way that they are able to get favourable consumer's response.

In Urban Indian the increased adoption of smart phones particularly by the young has brought many benefits and opened up access to new services and products. The advent of the Smartphone, iPads combined with the widespread deployment of mobile broadband networks, has led to an explosion of mobile data services. The mobile industry is a strong supporter of an open Internet, but the flexibility to manage traffic and innovate on the network and in customer propositions is required to keep it open and effective.

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ISSN 2394 - 7780


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# CONSUMER BRAND AND CONSUMER BEHAVIOUR

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## ABSTRACT
*A brand can be defined as the "relationship" with the consumer. Relationships are built on experiences. The relationship with a consumer constitutes the sum of a his experiences with your brand. Because the concept of a brand is the totality of a consumer's experiences with the brand, the consumer "owns" the brand because he owns his experiences with that brand, according to the Advertising Educational Foundation. As a business owner, you might own the trademark, which identifies the brand, but consumers will help define your brand. The brand experience incorporates all consumer contact with the brand from advertising and promotions to after-sale customer service. Your customers will evaluate your brand and regulate their behavior based on these interactions. For instance, poor customer service is toxic to a brand. Branding strategies will differ by product or service category, consumer familiarity and many other variables. You can study successful brands in your category and in other categories. These can be a rich source insight for developing your branding strategies.*

*Key word: consumer preferences, consumer Brand, consumer Behaviour,Values*

## NATURE AND SCOPE OF CONSUMER BEHAVIOUR

**Introduction: -** Consumer behaviour refers to the behaviour of consumers in deciding to the buy or not to buy or use or not to use or dispose of or not to dispose of the products which satisfy their needs, Consumer behaviour also refers to the use of scare resource like time, money and effort on consumption items.

**Which questions 'Consumer behaviour' tries to answer**

1. • What products and services consumer buy?
2. • What makes customers buy them?
3. • When are these bouhgt?
4. • From where?
5. • What is the frequency of buying?
6. • How often are they used?

Just consider a product, say a consumer durable like a photocopier who are the customer for photocopying machine? What do they look for in photocopying machine? What types of document are photocopied? What are they photocopied? What incentive do they need to replace their old photocopying machine?

## GROWTH OF CONSUMER BEHAVIOUR

Consumer behaviour is a multidisciplinary field which draws its concepts from several fields of study. It is useful to the marketing organisations, consumer groups and governmental authorities. It is an applied field since the concepts of behavioural science disciplines are applied to the understanding of human behaviour as far as consumption is concerned. By its very nature, it increases appreciative content of marketing programmes.

Business executives should also learn to value the research findings, and use them in the decision-making process. Researches should not lose sight of marketing realities while under taking their research. We can think of having some trained individual can be called 'Social Science Technicians' or 'Social engineers'.

## CONSUMER SCENE IN INDIA

India is country of great diversity. India is unique because there is unity in her diversity. Indian consumers of 60's and 70's had seen the Independence struggle from close quarters. There was streak of idealism running through them. They were inspired by a galaxy of freedom fighters Nehru was influenced greatly by the soviet experiment of socialism and wanted India to adopt a planned economy where public and private sector would

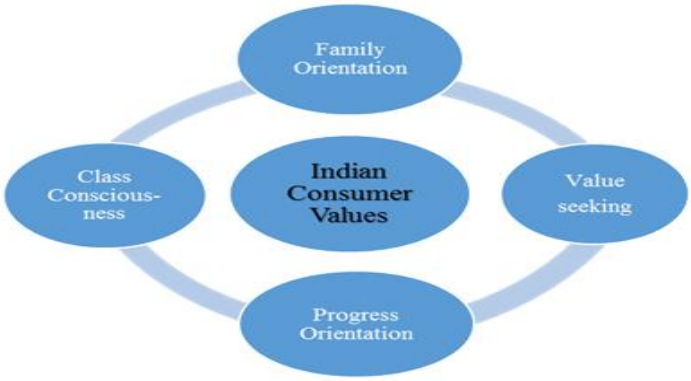
ISSN 2394 - 7780

coexist. But the commanding heights were occupied by the public sector. India talked of social equality, and slogans like GARIBI HATAO were popular.

In the late 80's and 90's the consumer was exposed to a far more liberal economy. Eating out became a common thing. White goods are purchased to improve quality of life and are no longer status symbols. Many of the luxuries of yesteryears have become necessities today. Consumer were no longer interested only in functional aspects of products. They also wanted aesthetics. There were many double-income households.

Man-woman roles now overlap. Foreign things are no longer a craze. In British India, the UK was the bench-mark. Reference has now shifted to the US. Even South Asian giants like Japan are looked up to, though they have lost some of their sheen due to Asian Cunene crisis and stock market crash recently.

**INDIAN CONSUMER SHOWS THE FOLLOWING CORE VALUES**

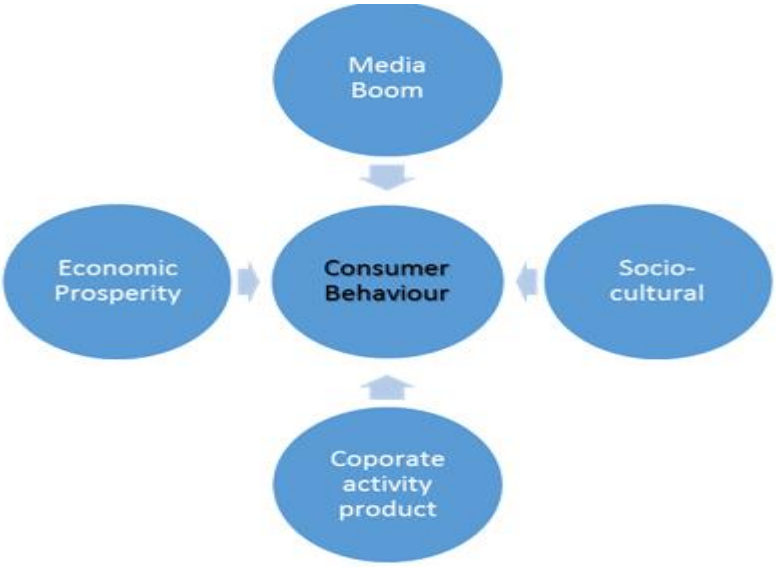



*INDIAN CONSUMER VALUES*

Madhulkar Subanvis of O&M compares and contrasts the two generations of consumer in India

| Previous Generation | Today's Generation |
|---|---|
| •Seurity | •Confidence |
| •Idealism | •Practicality |
| •Risk avoidance | •Risk taking |
| •Savings-oriented | •Investment-oriented |
| •Job security | •Job-satisfaction |
| •White goods as symbol/ stamp | •White gooods for lifestyle |
| •Habituals | •Experimentive |
| •Gender roles defiend | •Gender roles overlap |

**WHAT FORCES DRIVE THE CHANGE IN CONSUMER BEHAVIOUR?**




In the first decade of the new millennium, we can identify the four forces which drive the change in consumer behaviour. First of all, environmental changes such as rising personal disposable income, facilities to finance purchase easily and rising rural wealth factors affect consumer behaviour Kearny identifies four factor here –

ISSN 2394 - 7780

**VALUES DRIVING THE CONSUMER PREFERENCES**

In the pre- 80's, consumer were just price-conscious. In the mid- 80's, they tried to trade-off between price and quality. By the 90's, price-quality equation was supplemented by the enjoyment and time potential of the products. In the first decade of this new millennium, we combine quality with enjoyment or entertainment values and also at the same time put price, time, energy and stress as additional considerations in the value chain.


*Evolving Consumer Preference Adapted after KSA technopak*

**CONSUMER BRAND**

The history of branding is very much tied to the history of using animal as a commodity. The act of making livestock with fire heated marks to identify ownership begins in the ancient times.

**Introduction**

'Brand' for a firm is certainly a capital asset. Rather it is the only asset which may exist when other forms of assets like machines, furniture, building etc. may disappear. The importance of brand until recently was assessed in qualitative terms only.

**WHAT IS 'BRAND'?**

'Brand' is the name, term, design, symbol or any other feature that identifies one seller's product distinct from that of other seller.

**WHAT IS USEFULNESS OF 'BRAND'?**

It is used in business marketing, advertising, livestock branding adopted to differentiate one person's cattle from another by means of distinctive symbol burned into the animal skin with hot branding iron. A modern example of brand is Coca-Cola Company which belongs to Coca-Cola Company. Brand makes a person habit Val of any product which will enhance reputation of company.

**TREATMENT IN FINANCIAL BOOK**

It doesn't appear in balance sheet, but various argument regarding to this matter, some suggest that value of brand should as an assets in the balance sheet. This again can be depreciated year wise or left untouched. Other opinion that this value should be completely written off against available reserves and surplus balance in balance sheet. Without going into respective merits and demerits of the various accounting treatment let us analyse the other issues involved. What happens to the valuation of internally created brands? Should it be shown in the company's balance sheet, if yes, when and how?

**OTHER INFORMATION**

It a company tries to assign monetary value to its brand the whole exercise become highly subjective in nature, though it might reflect the true economic value of the company. A brand is created through several factors and many of these may not be exactly quantifiable. Even for factors which can be quantified like advertisement expenses, it is difficult to pin-point as to how much of such expenses have gone towards brand building as distinct from these for achieving sales in the short-run.

**BRAND VALUATION**

It is an important managerial technique that describes a money value to a brand and allows marketing investment to be managed (prioritized across a portfolio of brand) to maximise shareholder value. Although only acquired brand on a company's balance sheet.

**METHOD FOR BRAND VALUATION**

i. Valuation in terms of costs
   a. Historic Cost i.e. estimated actual cost of creation or acquisition of a brand.
   b. Replacement Cost i.e. estimated cost of replacing an existing brand by an identical new one through creation or acquisition.

ISSN 2394 - 7780

ii. Valuation according to market price i.e. price to buy or pay for acquiring brand well established in the market.

iii. Valuation according to potential earnings i.e. price a company will be prepared to pay based on the future earning potential of a brand to be acquired.

**FORMULAS FOR CALCULATING BRAND'S VALUE**

**a. Value of brand =**

$$= t - 1 - \frac{N}{(1+x)} + \frac{RB+Residual\ Value}{(1+x)N}$$

Where

RB+ =Anticipated revenue

t =Attributable to the brand

r =Discounting rate.

Residual Value beyond year N

$$= \frac{RB^N}{r} \qquad \frac{RB^N}{r-g}$$

g = rate of revenue growth

**b. The multiple method =**

When for a firm, P|E

$$= \frac{market\ value\ of\ equity}{known\ profits}$$

Brand multiple-

$$= \frac{Brand\ equity}{Brand\ net\ profits}$$

**BRAND PREFERENCE**

Measures of brand loyalty in which a consumer will choose a particular brand in presence of completing brand, but will not substitutes it that brand is not available.

**BRAND RANKING REPORT BY 'FORBES'**

As per Forbes report, following are top 10 brand (Based on Current year report)

1. Apple
2. Microsoft
3. Coca-Cola
4. IBM
5. Google
6. McDonald's
7. General Electric
8. Intel
9. Samsung
10. Louis's Vuitton

**CONSUMER NEEDS**

ISSN 2394 - 7780

**Functional Needs**
Taste, Price/Rates, Pack Size, Format, Service, Touch-Point etc.

**Identity Needs**
Poor group identification, Social level, and life-style.

**Emotive Needs**
Feelings consumer looking for and what it says about me and my personality.

**Symbolism**
Brand personality- fun loving, serious.

**Social Values**
Family, older, female etc.

**Product Features**
Sweet, rich, premium, compact, easy to use.

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# INFORMATION FOR RURAL COMMUNITIES DEVELOPMENT: NECESSITY OF UNDERSTANDABLE COMMUNICATION MECHANISMS

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*"It can be no accident that there is today no wealthy developed country that is information-poor, and no information-rich country that is poor and underdeveloped".*

*Dr. Mahathir Mohammed*

**ABSTRACT**

***Introduction.*** *We report on the role of information in the development of rural communities where the impact of the oral tradition remains very strong. The nature of the attributes, and the particular type of communication mechanisms to be used, have been proposed as key factors in the use of information in rural communities.*

***Method.*** *Literature studies have been conducted to determine the nature of information, and information handling skills of traditional people. An in-depth study with field visits provided information on real-life practices.*

***Analysis.*** *A qualitative analysis has been carried out to match evidence from a case study and field visits with evidence in the literature. Requirements for the development process were taken into account.*

***Results.*** *A comparison of the attributes of information with the requirements for development of traditional people revealed that certain attributes of information are conducive to development while others can be counterproductive to the development process if not addressed properly.*

***Conclusion.*** *The successful use of information as a resource for development depends in large part on knowledge of the nature of information and the ability of senders to apply appropriate communication mechanisms understandable to traditional people. This has implications for people involved in the development of rural communities.*

## 1 INTRODUCTION

When thinking of information that can help solve a problem in a development context, we inevitably see information as being a resource. Information is not necessarily the only resource with which to solve a particular problem. So, it is only natural that we shall compare information with other resources that are also needed for a development project. When comparing, we usually look at attributes of the things being compared; for example, the different resources needed for development purposes in rural communities. The purpose of this discussion is, to look first at the nature of information. We need, therefore, to identify and discuss the attributes of information, and to determine whether they all contribute to the usefulness of information for rural development. Secondly, we determine how the skilful use of information can add value to information as a development resource. In this discussion, we focus primarily on the use of information in rural development, while taking into account the information behaviour of focus groups and how it could determine the information use of developers.

## 2 PROBLEM STATEMENT

Because information plays such an important role in almost every human activity, its value in the development process has been a topic of extensive debate. According to a number of authors, such as Bell (1986), Boon (1992), Camble (1994), Sturges and Neill (1998), lack of information has impacted negatively on the development process. Although academics and researchers are aware of the value of information in development, there is some concern that information is still not perceived as being as important as other resources. A number of authors, such as Neelameghan (1980) and Camara (1990), hint that planners, developers and governments do not yet acknowledge the role of information as a basic resource, or are unaware of its potential value (Sturges and Neill, 1998).

The problem is also approached from the point of view of information users in developing communities. It seems that people are not always aware of what information entails (Manzvanzvike, 1993; Rosenberg, 1993). Ozowa (1995), for example, is of the opinion that a general lack of awareness among traditional farmers can be attributed to their high level of illiteracy, which in turn contributes to the low level of adoption of agricultural-production technology. It seems that the extent to which information users in developing communities are able to handle information (i.e., the extent to which they use information) will also determine the usefulness of information as a development resource.

ISSN 2394 - 7780

So far, the nature of information (and particularly its attributes) has not yet been challenged as a possible reason why information is not viewed in the same light as other development resources. On the one hand, it is said that information (or knowledge) is power, but on the other hand, that information by itself is worthless and cannot solve problems. Information has power only when used and applied (Boon, 1992; Martin, 1984; Paez-Urdaneta, 1989) effectively. This apparent contradiction warrants a closer look at the attributes of information, and at how well these attributes comply with development requirements.

Although information is recognised as an important development resource and it is acknowledged that an absence of information may impede development (Boon, 1992; Camble, 1994), little has been done in the field of information science to determine the use of information among people in rural communities originating from oral cultures. Sturges and Chimseu (1996) admit that information science 'in the past neglected research on what is basically a non-literate society'. Since developers are so eager to effectively apply information as a resource the above statements could be seen as a wake-up call for researchers and academics to examine the nature of information and its use in a non-literate or traditional society.

Although there may be many more reasons why information is not readily acknowledged as a useful development resource, in this discussion we focus on the impact of information attributes on the usefulness of information as a resource for rural development.

## 3 THE NATURE OF INFORMATION

Information as a resource has been a topic of discussion of academics and practitioners in various subject fields – especially in the field of economics. Economists such as Machlup, Porat and Bell pioneered the ideas of information economy with information as the transforming resource for postindustrial society. Authors such as Horton (Marchand & Horton, 1986) pioneered the view of information as a corporate resource, which like other resources such as people, money, raw materials, equipment and energy, should be managed to give a competitive edge. These authors helped develop both the idea of information as a resource and the idea of information-resources management (Badendoch et. al. 1994). In the wake of information and communication technologies, Hawkins (1987) confirmed that information has become a commodity. Yet requirements for economic enhancement are not necessarily requirements for development in rural communities when it comes to the basic survival of people.

This immediately raises the question of what prerequisites a resource should comply with in order to be useful for development purposes. Of course, many other resources are needed for developing people in rural communities with which information as a resource should favourably compare – for example, farming practices in rural communities will require input resources (seed, fertiliser), farming implements (tractors, ploughs), credit, markets, infrastructure, and natural resources (soil, water, climatic conditions). At first glance, when comparing information with these resources, it seems that most of them are tangible in nature, while information is not. And yet, many (Sturges & Neill; Boon, 1992; Van Rooyen, 1995) view information as one of the most important resources needed for rural development. Although information is recognised as an important, yet still under-utilised, development resource, one needs to look critically at the attributes of information to determine whether they could aggravate the problem of under-utilisation.

### 3.1 Attributes of information

While investigating the validity of information as a resource, the natural approach would be to compare attributes of information with those of other resources, in order to find some commonality. A comparison of this nature necessitates a closer look at the attributes of the different resources. To this end, Burk and Horton give nine basic similarities between information and other *traditional* resources to fit into a resource-management framework, namely:

- Information is acquired at a definite, measurable cost.
- Information has a definite value, which may be quantified and treated as an accountable asset.
- Information consumption can be quantified.
- Cost-accounting techniques can be applied to help control the costs of information.
- Information has a clear life cycle: definition of requirements, collection, transmission, processing, storage, dissemination, use, and disposal.
- Information may be processed and refined, so that raw materials (e.g., databases) are converted into finished products (e.g., published directories).
- Substitutes for any specific item or collection of information are available, and may be quantified as more expensive, or less expensive.

ISSN 2394 - 7780

- Choices are available to management in making trade-offs between different grades, types and costs of information.
  (Burk & Horton, 1988; cited in Eaton & Bawden, 1991).

From this it is clear that Burk and Horton felt that information should be seen as something tangible, physical and concrete, while viewpoints from within the information profession emphasise the intangibility of information. Counter-arguments from authors such as Vickers (1985), White (1985), Cleveland (1985), Boulding (1968), Repo (1986), Cronin & Gudrim (1986) show that information differs from tangible things generally thought of as valuable resources. In classifying resources needed for development, Boon (1992) distinguishes between material resources and know-how resources. Information, together with data and knowledge, is listed as a know-how resource. There is also the viewpoint of Boulding (1968) that information should be seen as a dynamic force, which constantly alters and extends a store of knowledge (Eaton & Bawden, 1991). Shannon (cited in Mark & Pierce, 2001) was probably the first to state that information can alleviate uncertainty - another intangible attribute.

In trying to identify those attributes of information that focus on its intangibility, Eaton and Bawden combine the viewpoints of various authors to come to the following key distinctions:

- **Value of information.** Unlike other tangible resources, information is not readily quantifiable - that is, it is impossible to predict the ultimate value of information to its users. Also, over time, there is no predictable change in the value of information.
- **Multiplicative quality of information.** The results produced by the use of information differ greatly from those produced by the use of other resources – for instance, information is not lost when given to others, and does not decrease when 'consumed': sharing information will almost always cause it to increase – that is, information has a self-multiplicative quality.
- **Dynamics of information.** Information cannot be regarded as a static resource to be accumulated and stored within the confines of a static system. It is a dynamic force for change to the system within which it operates. It adds value to an organisation through encouraging innovation and change without being tangible.
- **Life cycle of information.** Information seems to have an unpredictable life cycle. Ideas come into, go out of, and finally come back into, fashion.
- **Individuality of information.** Information comes in many different forms, and is expressed in many different ways. Information can take on any value in the context of an individual situation. This proves that, as a resource, information is different from most other resources. The very fact that information is characterised as a dynamic force, 'constantly altering and extending a store of knowledge' (Rogers 1992), corresponds with situations in development in which outside information is offered to focus groups to alter their understanding of certain practices, which in turn can help them solve problems (such as improving food security or standards of living) (Eaton & Bawden, 1991).

Apart from the attributes identified by Eaton and Bawden, the following, also containing elements of intangibility, may be added to the list:

- **Alleviation of uncertainty.** According to Mark and Pierce (2001), Shannon, as long ago as 1948, defined information as the resolution of uncertainty. This is perhaps one of the intangible attributes best known among a variety of researchers.
- **Interdependency.** Information almost always forms part of technology - it is the "soft" part (Röling, 1990). Without its information component, technology has little value as a resource for potential users who are not familiar with its workings or its background. With regard to developing rural communities, one should bear in mind that it is not necessarily new technology that brings about these achievements. All outside technology applied for the first time could be viewed as *new* to the user group or that particular situation, and could have similar effects.
- **Enhancement of economic growth.** A frequent complaint is that information is often denied its role as a resource (Neelameghan, 1980; Boon, 1992). Yet, when looking at the effect of information in development situations, there seems to be an underlying awareness of its importance. Kaimowitz *et al.*, (1990) refer to the impact of new technology (including information as the hidden component) in agriculture on the basis of such aspects as increased farm income, reduced risk, resource conservation, improved health, better (food) security, and overall economic growth.

ISSN 2394 - 7780

- **Extension of the knowledge base.** From a development point of view, there is more emphasis, first, on improving peoples' lives socially, and only secondly on economic improvement. In development, outside technology is often introduced with the help of education, training and visual demonstrations. Rogers (1992) states that training helps people in rural communities to expand horizons, increase perceptions, enhance competencies, enlarge sense of perspective, and enhance self-esteem.

The above seem to emphasise the impact of the dynamic force of information, where the 'extension or altering of people's stores of knowledge' (Eaton & Bawden, 1991) positively affected their social well-being. Thus, although information is an intangible entity, it has the ability to bring about change for the better; which is the ultimate goal of development.

- **Context dependency.** The value of information as a resource in rural development depends largely on situation-specific issues: for example, one could argue that agriculture-related information is mostly technical in nature. However, people with little exposure to modern society have many related issues they need to know about. Ozowa (1995), for example, identified certain types of basic information needed for the development of crop production by traditional farmers; *inter alia*, information about agricultural input (seeds, fertiliser, etc.), extension, technology (farming equipment, etc.), implementation techniques (ploughing, sowing, pest and weed control), soil, water and climatic conditions, conservation, credit, marketing and infrastructure.
- **Culture dependency.** Another attribute of information that can influence its usefulness as a development resource is that it is culture dependent - involving conceptual and cognitive differentiation. Pickering (1996) is of the opinion that because information is culture specific, it is incommunicable unless acculturated – that is, adapted for the cultural environment or the cultural mind-set of the recipient group. Here, Shields and Servaes (1989) also point out that information is not totally value-free, but is socially conditioned and shaped by the social structures that apply it. This aspect has serious implications for developers' efforts to transfer information to the rural communities of developing countries.
- **Medium dependency.** Information is not only culture dependent, but also medium dependent. Once information is concretised outside the human memory it should be packaged in some or other format (i.e., print, images, sound, electronic digits, etc..) to be communicated to someone else. Unless receivers know how to use that particular format, the information will remain inaccessible and rendered useless; for example, an electronic medium directed at users who are unfamiliar with such facilities can impede access to available information.

Thus, medium dependency of information can have serious implications for quite a number of rural people who are dependent on oral communication, owing to their oral tradition and the fact that many of them are not literate. This attribute could cause information to be a less useful resource when compared with other resources needed for development purposes.

- **Conversion dependency.** It is a well-known fact that information is not used in the original form offered by its creator alone-often, it needs to be adapted to suit a particular situation or specific circumstances. It can also happen that only a small chunk of the original information is used together with other chunks of information to form a new information package needed for a particular situation. In this way, more value can be added to the appropriateness of information. Particularly in a situation where outside information from the industrialised world is used to improve a practice in rural development, the information content needs to be adapted to bring it to the level of understanding of potential recipients.

**3.2 Suitability of attributes**

From the above, it is evident that information differs phenomenally from other resources needed for development – especially because it is intangible in nature. Although some of its attributes make it a suitable development resource (such as its ability to act as a dynamic force), others render it less suitable (such as its inaccessibility owing to its dependency on culture and media). As far as the requirements for rural development are concerned, it seems that the attributes can be divided into two categories, as indicated in the table below – those suitable for development, and those less suitable for development:

ISSN 2394 - 7780

| Attributes suitable for development | Attributes less suitable for development |
|---|---|
| ***Dynamic force*** | Intangible |
| ***Extends the knowledge base*** | Interdependent |
| ***Increases perceptions*** | Culture dependent |
| ***Enhances competencies*** | Medium dependent |
| ***Enhances self-esteem*** | Content dependent |
| ***Enhances growth*** | Conversion dependent |
| ***Multiplicative*** | |
| ***Versatile*** | |

**Table 1: A comparison of the attributes of information**

## 4 INFORMATION USE IN RURAL DEVELOPMENT

Attributes suitable for development may improve developing people's lives to such an extent that it is easy to see why information is regarded as a useful development resource, whereas attributes identified as less suitable for development can be regarded as limiting the usefulness of information. Because information is so crucial to almost all human activity, it seems obvious that developers would like to neutralise the negative impact in order to achieve their goals. So, to address the problem of information attributes less suitable for development purposes it would perhaps be worthwhile to take a closer look at the information behaviour of rural people used to the oral tradition. The reasoning behind this approach is that rural people used to the oral tradition have their own peculiar way of handling information that is closely related to their social and cultural background (Meyer, 2003).

As proved by an investigation of a case study (Meyer, 2000), in which the information behaviour of traditional people was unwittingly applied to encourage a group of traditional farmers to produce food for their own consumption, the incoming information was better understood and accepted by the group because the messages were communicated in a way with which they could identify. Background to this case study will reveal how the communication mechanisms of the indigenous knowledge system were skilfully applied to make the incoming information more palatable for the particular user group. Indigenous communication mechanisms were almost the only means by which the particular group exchanged information. Most members of the group had hardly, if ever, been exposed to modern society, whose way of communicating is based primarily on literacy.

### 4.1 Background to the case study

The main event that led to this particular case study was a field worker, who, on his own initiative, decided to introduce traditional farmers to a better way of paddy or wheat production for their own consumption. Although this training programme was aimed at improving paddy or wheat production, of interest to information science is the skilful manner in which the information behaviour of the farmers was accommodated to make the outside information understandable and acceptable at a level the farmers could identify with.

As was the case in many of the rural areas of Jamboni Block in West Midnapore district of West Bengal state during the middle of 2000s. As far as agricultural development in rural areas (where people were still applying traditional farming practices) was concerned, the approach followed was large-scale development and schemes centrally managed by parastatal companies. It was believed that this approach promoted better use of resources, and the use of paid labour. Central and State government have to undertake the projects through Director of Agriculture and Agricultural Extension Officers have to execute these projects. This approach is a typical example of the input/growth development model followed in developing countries at that time. Outside these schemes, little was done to improve the farming methods of traditional farmers. Apart from fiscal means, most of the traditional farmers also lacked knowledge of modern farming practices. Around the 1980s it became evident that the corporate managed settlement projects had failed. The operational costs were too high, and cooperatives under the jurisdiction of the development corporations were running at a loss. It was clear that the prevailing approach had had its day, and another approach was sought.

Members of the community were generally distrustful and in a bad-mood. Paddy and wheat fields were plundered before they could be harvested. Since the interviewers in question was well acquainted with the socioeconomic circumstances in Jamboni Block, we thought that development could best be initiated by teaching the traditional farmers the basic principles of effective paddy and wheat production at an elementary level. The interviewers firmly believed that the only way to succeed was to build trustworthy relationships with the farmers, to communicate at a level they could understand and in a way they were used to, and to be completely honest in everything said or done. We believed that by adopting such an approach, the traditional

ISSN 2394 - 7780

farmers could be convinced that the situation in which they found themselves was truly understood and sympathised with, and that the authorities had no intention of taking their crops or their fields (Adendorff, 1991). From an information science point of view, trust building and honesty had never before been considered factors that could promote or impede the transfer of information, and from interview it showed that their was a great influence on the acceptance of outside information.

Since most of the farmers could not read or write, the trainer had to devise a training programme in which information regarding the basic principles of paddy and wheat growing were conveyed in story form, with the aid of metaphors they could identify with. Where necessary, demonstrations and role-playing were built into the programme. Two interviewers priorities were that participation should be voluntary, and that men and women should have equal say in planning arrangements around the programme. The interviewers knew that the participants were sensitive about the literacy issue, so we decided to invite them to non-formal school where one does not need to read or write! This already indicates that one does not, as is generally believed, need to be literate to be able to use information.

Against this background, the initial training programme was put into action. The training programme was designed around the different phases of the paddy and wheat-growing season. Apart from factual information about paddy and wheat production, the farmers had to be introduced to additional information regarding soil preparation, weed and pest control, climatic conditions, how to arrange and care for tractors and other implements, how to arrange for seed, pesticides and bags for harvesting, and how to go about borrowing money, paying back loans, etc. From the above issues, it is obvious that the types of information needed to transfer information about paddy and wheat growing amounted to far more than isolated facts about paddy and wheat, indicating that to become useful, information about a specific issue also depends on information about related issues.

To make a particular type of information or technique even more meaningful to the target group, the training programme was linked to the different phases of the growing season, again indicating that timing is an important factor in an information-transfer strategy.

The training programme involved a great deal of preplanning in which a number of variables had to be considered before the actual training could begin, and also planning for activities that were to come into play after harvesting, and to ensure that the new method would become part of everyday farming practices.

The success of traditional farmers depends on effective implementation of training programme regarding season of harvesting and scientific methods relating to agriculture production and it led not only to a change in perception, but also to a change in attitude. Their self-image improved to such an extent that they asked to be trained in other skills as well. They were now ready to take responsibility for themselves-to earn a living by growing paddy and wheat in order to become self-reliant. It is interesting, that many of the participants now wished to be taught how to read and write!

**4.2 Information behaviour in traditional societies**

The way in which people used to the oral tradition handle information created the impression that they could better relate to information exchanged in the way they were accustomed to.

The results of an investigation into this particular case, together with a literature study of the information behaviour of people originating from the oral tradition (Meyer, 2000), led to an identification of communication mechanisms, which in turn reflected the information behaviour typical of people used to the oral tradition (Meyer, 2003). The following seem to be the main attributes of information handling among people used to the oral tradition:

- In an oral culture, information is stored in people's memories only. Therefore, people with good memories play a vital role in storing and transferring information, and so the death of a knowledgeable person may lead to valuable information being lost.
- The manner in which information is communicated will largely determine whether the community will react to it or not. For example if outside information is not offered in metaphorical speech or demonstrated in a way people are used to, they will not be able to understand it and it will not make any impression on them.
- Phrasing and repetition are used to ensure that critical expressions are stored in the memory. Phrasing provides the basis for consensually agreed upon interpretation, which may go beyond what was actually said.

ISSN 2394 - 7780

- A particular form of language delivered in a special way is employed in specialised contexts for particular purposes.
- Authority structures play a vital role in storing and transferring information, the implication being that if authorities are not familiar with a particular type of outside information, the information will not easily be sanctioned, and thus will not easily be accepted by the group.
- In cultures with an oral tradition, information is exchanged face to face. Information cannot be transmitted over long distances. Often, information remains within the borders of a particular community. Unless people of different communities interact, information created in other communities will remain inaccessible.
- As said above, in an oral culture, the only place to store information in, is people's memories. Stories and myths tend to be experiential (i.e., based on events familiar to the listener or storyteller).
- Mnemonic aids such as rhymes are widely used to make the oral transfer of information more reliable.
- Recipe-like patterns or stereotypical methods of expression are also very common. Unnecessary repetition may be used to ensure that information is conveyed correctly, and in detail.

By establishing a relationship between the attributes of information and the information behaviour of people used to the oral tradition, it becomes evident why certain information attributes may render information less useful for acceptance as a development resource. Also due to the requirements of rural communities as reflected in their information behaviour, it becomes clear why outside information has such a small chance of successfully crossing the boundaries between modern and traditional societies.

The above led to the idea that knowledge of both the nature of information and the information behaviour of the users in traditional communities could help developers apply appropriate communication mechanisms of the target group to enhance acceptance of outside information on the one hand, and to avoid pitfalls on the other.

## 5 ADDRESSING THE PROBLEM

In order to understand how information behaviour of the target group can impact on the acceptance of outside information it is necessary to take a closer look at how rural people respond to the particular information attributes identified as less suitable for development purposes.

The case study discussed earlier serves as practical proof that the attributes identified as less suitable for development can be addressed by applying appropriate communication mechanisms the target group(s) could relate to, as indicated below.

- **Intangibility.** Because information is not a tangible input resource for development as is technology, or as are products such as seed and fertiliser, traditional people often do not realise that they may lack information in this regard that could help them solve their problem. Ignorance of information as an aid could be ascribed to the fact that traditional people are more inclined to make sense of real-life objects they are familiar with or of abstract things they can compare to physical objects they are familiar with - for example, comparing a circle to the moon, or a square to a house, etc. (Goody & Watt, 1963; Ong, 1982). This perhaps explains why they find it so difficult to perceive and accept information about new concepts provided by way of a discussion on a particular topic without any visual demonstrations or comparison to something they can identify with. So, to address the problem of intangibility, it is important that the sender of information make use of communication mechanisms such as comparisons, metaphors or visual demonstrations the target group can relate to.
- **Interdependence.** Because information always forms part of technology (whether a product or a process), it is evident that information on that product or process will not be well received by traditional people when provided in isolation. Consequently, these people will be unable to add the information to existing knowledge. This could be ascribed to traditional people's inclination to relate any incoming information to real-life objects or situations. In the training programme it must be demonstrated that how deep the farmers should plough, and why, to gain the most benefit. To counteract this negative impact, prospective developers should not only provide technology, but also explain, by way of demonstrations, how to apply technology, and why.
- **Culture dependence**. If it is accepted that information is socially conditioned and shaped by the social environment from which it originated (Shields & Servaes, 1989), it should be remembered that if that information is transferred to a rural community with a different social background and environment, chances are that the information will not be understood in the way it was intended to. This is because

ISSN 2394 - 7780

background knowledge is not transferred along with the information. To neutralise the negative impact of culture dependence, developers need to provide additional information about related aspects in order to put the background into perspective for the prospective users. In the training programme problems regarding the related issues of agriculture production such as reasons for using fertilisers and applying weed control, understanding financing for input resources, and knowing about marketing practices must be alleviated. The additional information helped the users understand the bigger picture.

- **Medium dependence.** Information captured in a written or digital format is not accessible to people used to the oral tradition, since they never learned to read or access this type of format to find a solution to their problems. The trainer have to transferred the required information by word-of-mouth and face-to-face demonstrations of important concepts. This proves that developers can easily avoid this pitfall of inappropriate media by not assuming that traditional people will accept information on a particular topic when offered in a picture or even audiovisual format, such as a television programme. In the latter case, poor knowledge of the language and norms and values presented in the particular medium may also contribute to a skewed understanding of the message. The information packaged in images or audiovisual format will not have the intended effect unless potential users have enough background knowledge of the topic. To turn around the medium-dependency problem, developers should consider the use of media that they know their target groups are familiar with.
- **Context dependence.** In modern society, because of information recorded and stored outside the memory, (literate) people tend to group or classify all information on a certain topic or subject together. When needed, they know how, when and where to collect only that information which applies to a particular situation. In traditional societies, people store information in the memory by means of association. They tend to record and use information in accordance with a certain situation (Oslon, 1994). When outside information about a particular topic is offered, irrespective of the situation in the traditional context for which it is needed, it becomes overwhelming, and the receivers lose interest. The trainer have to addressed the context-dependence problem by providing information required only for that particular instance, and no more than the target group could memorise at one time. Too much information that is too sophisticated to link up with what the receivers already know causes confusion, and could result in no understanding at all.
- **Conversion dependence.** Closely related to the context-dependence attribute described above, is the conversion attribute. Generally speaking, information becomes more useful when packaged for a specific situation - more so in the case where users in a rural community lack specific information, and background knowledge, on a particular problem. In such a case, chunks of information put together in a new package will be more useful and readily accepted than when transferred in its original package(s). The trainer have to solved this problem by customising the training programme for the specific target group(s), proving that, to add value to information, the information package should be adjusted according to the requirements of a particular situation.

## 6 CONCLUSION

In this discussion, we tried to create a better understanding of the role of different attributes that help determine the nature of information. In as far as development requirements are concerned, a distinction was made between attributes conducive to development, and attributes less suitable to development.

By discussing the peculiar information behaviour of rural people used to the oral tradition together with lessons learned from the case study, we tried to prove that knowledge of information behaviour, including use of appropriate communication mechanisms, can be applied to reverse the negative effects of information. From the arguments raised in this discussion, it seems clear that an understanding of the nature of information and being appreciative of the information behaviour of people used to the oral tradition can be put to good use by prospective developers wishing to contribute to the upliftment of their target groups in rural communities. Application of appropriate communication mechanisms will help them to neutralise the less suitable effects, or to avoid pitfalls that could constrain development efforts. For researchers in information science it serves as an example of how information can be managed to achieve the desired results.

Although more research is necessary, this contribution could be viewed as a small step towards enhancing the use of modern information among people in predominantly non literate communities.

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# YOGA THERAPY AN EFFECTIVE TOOL FOR MINIMIZING STRESS AND ANXIETY– A STUDY ON WORKING PROFESSIONALS IN SERVICE INDUSTRIES OF GAUTAM BUDDHA DISTRICT

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**ABSTRACT**
*In the a21st century the corporate world is associated with the most tension giving elements such as competition, deadlines, market conditions and above all the desire to reach high on the corporate ladder. An employee, continuously facing long working hours, apprehensive deadlines and cut throat competition, many a time aligned with unhealthy relationships and improper nutrition, becomes a victim of stress and anxiety. Cases of spondylitis, hypertension, insomnia, fatigue, nausea, chronic headache, back pain, computer-related syndromes and dry eyes are being reported amongst the Corporate World.*

*The study was carried out on 50 working Executive aged between 20-50 years who attended regular 50 minutes yoga program at the organization. The study showed a significant difference in stress and anxiety. We concluded that regular practice of yoga in day to day life reduces stress and anxiety levels and improves feeling of wellbeing.*

*Key Words: Yoga, Executives, Stress, Anxiety*

## I. IMPROTANCE OF YOGA IN CORPORATE WORLD

In 21st century the corporate world is associated with the most tension giving elements such as competition, deadlines, market conditions and above all the desire to reach high on the corporate ladder. These four elements are ultimately responsible to impair the harmonious interplay of body, mind and spirit thereby leading to various health problems among corporate workforces. The productivity of the work force is the most decisive factor as far as the success of an organization is concerned. The productivity in turn is dependent on the psychosocial well being of the employees. Stress and anxiety can affect one‘s health, work performance, social life and the relationship with family members. The stressors and its consequences are to be understood at individual and organizational level. Stress and anxiety in the workplace have emerged as a major issue for businesses and has reached alarming proportions. Stress and anxiety is a negative consequence of modern living. In an age of highly dynamic and competitive world, man is exposed to all kinds of stressors that can affect him on all realms of life. Hence we can say that stress is a silent killer and prolonged exposure to stress may exert harmful effect on physical, Psychological and behavioral well being of an individual.

According to the National Institute for Occupational Safety and Health, 80 percent of workers experience job stress. Almost 60% to 70% of executives visiting Indraprastha Apollo Hospitals are suffering from stress and anxiety related diseases.

The corporate world started realizing the need of effective stress and anxiety management techniques in order to maintain the productivity of the organization with Stress –free employees. This research focuses on practices adopted by organizations to prevent, minimize and to overcome the stress and anxiety of their executives. The study aims at understanding use of yoga by different organizations as an antidote to workplace stress.

At Abbott, yoga sessions are held towards the evening. Maruti Suzuki, yoga sessions are organised post office hours, Intel started focusing on yoga for its employees since 2007. "They strongly believe that healthy and energised employees help build a great place to work, leading to the organisation's success," The yoga programme is available at most Intel India campuses in Bangalore. Coca-Cola, under its 'Health Work Policy', encourages employees to enroll in yoga programmes. The company funds 50% of the expenses incurred on memberships and equipment. The policy is applicable for employees as well as their families. Companies like Allied Blenders and Distillers, Aegon Religare Life Insurance are planning to start yoga sessions. Many practitioners have customised yoga into chair yoga, flight yoga, office yoga, laughing yoga, yoga on the move, walking yoga and even 10-minute yoga for BPOs where there is paucity of space and time.

The Indian Prime Minister Narendra Modi in his UN Address suggested the date of June 21 as it is the longest day of the year in the Northern Hemisphere and has special significance in many parts of the world. On December 11, 2014, India's Permanent Representative Asoke Mukherji introduced the draft resolution in UN. The first International Day of Yoga was observed world over on June 21, 2015. The ministry of AYUSH made the necessary arrangements in India. About 35985 people, including Indian Prime Minister Narendra Modi and

ISSN 2394 - 7780

a large number of dignitaries from 84 nations, performed 21 Yoga asanas (postures) for 35 minutes at Rajpath in New Delhi.

## II. LITERATURE REVIEW

**Kulkarni G. K.** (2006) in an article Burnout published in Indian Journal of Occupational and Environmental Medicine 2006 said that rapid change of the modern working life is associated with increasing demands of learning new skills, need to adopt to new types of work, pressure of higher productivity and quality of work, time pressure and hectic jobs are increasing stress among the workforce. Further he added that privatization and globalization has ignited mergers, acquisitions, and precarious employment has critically affected the domestic industry.

**Rudra Bhandari, Balkrishna Acharya and V. K. Katiyar** (2010) , in their study The yogic intervention was comprised of selected yogic postures, breathing mechanics (Pranayama), gestures, psychic locks, concentrations, and meditations was given for one month among 50 corporate personnel (25 male& 25 female) from Indian Telephone Industry, Raebrali, India. The result met showed significant effect of the yogic intervention to manage distress and enhance work performance at $p<0.01$and favored the efficacy of corporate yoga to boost health, harmony, morale, work motivation, commitment, performance and productivity at individual and organizational levels. Consequently, researcher thought of developing corporate yoga capsules and their scientific validation simultaneously at large.

**Singer** (1980) states that relationship between anxiety and performance can be illustrated by the inverted U-hypothesis which states that performance improves with increasing level of arousal (anxiety) to an optimum point, while upon further increase in arousal (anxiety) cause performance impairment.

**Kamakhy Kumar** (2004) noticed remarkable positive change in P. G. yoga student's anxiety and subjective well-being after practice of a Yoga Nidra daily, half an hour for six months. **Emerson, Sharma, Chauhary, & Turner's** (2003) conducted a research and had found, yoga can reduce autonomic sympathetic activation, muscle tension, and blood pressure, decrease physical symptoms and emotional distress, improve hormonal, and neuroendocrine activity, which equates to improvement in overall quality of life. **Malathi et al.** (1998) conducted a yoga intervention study on MBBS students and tested them before and after the examination, and found Anxiety reduction in the students at the time of examination.

**Gopukumar and Hussain Ali** (2002) reported that of 40 days meditation practice brought a significant positive change in the subjective well-being of students. **Manjunath & Telles** (2004) reported that the ten to thirteen year old girls who practiced 75 minutes of daily yoga, which consisted of breathing, internal cleansing, meditation, devotional songs, and relaxation over the course of one month allowed the girls to decrease the time required to execute a mental test. The study indicated that yoga increased blood flow to the frontal lobe of the brain, which resulted in the rapid realization and correction of errors. **Kaushik, Kaushik, Mahagan & Rajesh** (2006) suggested that The slow breathing during the yoga class is intended to reduce the heart rate, respiratory rate and blood pressure which is a direct response to the anxious state.

## III. OBJECTIVE OF THE STUDY

- To study the impact of Yoga on Stress and Anxiety reduction on working professionals
- To study and compare the stress and anxiety level of male and female working executives.

## IV. RESEARCH METHODOLOGY

The study is basically based on primary and secondary data. The aim of this paper is to evaluate the impact of Yoga on Stress and Anxiety reduction on working professionals in Service Industries of Gautam Buddha District. The Study was conducted on 50 working professionals aged 20- 50 years who attended regular Yoga class at the organization they work. The yoga class was conducted between 6 pm to 6:50 pm daily. The yoga practice schedule consisted of:

1. Prayer - 3 min.

2. Asanas – 20 min.

3. Pranayama - 10 min.

4. Meditation – 15 min.

6. Prayer - 2 min.

ISSN 2394 - 7780

Various books, Magazines, Journals, Newspapers, various websites of internet were also referred. The research is carried out by doing rigorous literature review of the researches done on the stress and Anxiety management techniques like Yoga as a tool for interventions to reduce/combat the workplace stress.

## V. ANXIETY

Anxiety is a general term for several disorders that cause nervousness, fear, apprehension, and worrying.

### A. Types of Anxiety

The five major types of anxiety disorder are:

**a. Generalized Anxiety Disorder (GAD):** GAD is chronic and can fill a person's day with exaggerated worry and tension, even though there is little or nothing that is provoking it. Having this disorder means always anticipating disaster, often worrying excessively about health, family, work, or money.

**b. Panic Disorder (Panic Attacks):** Individuals with panic have feelings of terror that may strike suddenly and repeatedly, and often without warning. They can't predict when an attack will occur, and many develop intense anxiety between episodes, often worrying about when and where the next one will strike. 27

**c. Social Phobia (Social Anxiety):** Social phobia, also known as social anxiety disorder, is characterized by overwhelming anxiety and excessive self-consciousness in social situations. People with social phobia have a persistent and chronic fear of being embarrassed by their own actions.

**d. Social Phobia (Social Anxiety):** Post traumatic stress disorder, or PTSD, is a debilitating condition that can develop following a terrifying event. People with PTSD often have uncontrollable frightening thoughts and memories of their experience and feel emotionally numb, especially with people they were once close to such as family members or friends.

**e. Obsessive Compulsive Disorder:** Obsessive Compulsive disorder, or OCD, is characterized by anxious thoughts or rituals you feel you cannot control. Those with OCD may be plagued by persistent, unwelcome thoughts or images, or by the urgent need to participate in certain rituals.

### B. Causes of Anxiety

Most people may experience feelings of anxiety before an important event or meeting such exam, business presentation, or a first date. Anxiety disorders, however, are illness that fill people's lives with overwhelming anxiety and fear that are chronic, unremitting and can grow progressively worse. People with anxiety are constantly tormented by panic attacks, obsessive thoughts; flashback of traumatic events, nightmares or countless frightening physical symptoms, some people with anxiety disorders might even become agoraphobia, making it possible to leave their house. The specific cause of anxiety is not known, as each individual may experience anxiety for a number of different reasons.

### C. Symptoms of Anxiety

Though we may all experience different types of symptoms and in varying degrees, anxiety is commonly associated with:

- Sleeping difficulty
- Difficulty thinking about anything besides a stressful topic
- Tenseness
- Restlessness
- Feeling jittery or dizzy
- Difficulty concentrating
- Fluctuations in appetite
- Being overly cautious
- Being startled easily
- Specific obsessions over stressful topics
- Having an ever-present feeling of impending doom, danger or disaster.

ISSN 2394 - 7780

**D. Treatment of Anxiety**

Research into the different types of stress and anxiety disorders has yielded numerous effective treatment options. According to the National Institute of Mental Health, two types of treatment are available for an anxiety disorder and include medications and specific types of psychotherapy. Both approaches can be effective for anxiety related disorders. The benefits the yoga are as follows:


## VI. ANALYSIS AND INTERPRETATION OF DATA

**Table 1 : Demographic Profile of Respondents**

| Sr. No | Demographic Factor | Details | No. of Respondents | Percentage |
|---|---|---|---|---|
| 1 | Age Group | Below 25 years | 15 | 30 |
| | | 25 – 45 years | 25 | 50 |
| | | Above 45 years | 10 | 20 |
| 2 | Gender | Male | 35 | 70 |
| | | Female | 15 | 30 |
| 3 | Marital Status | Single | 16 | 32 |
| | | Married | 34 | 78 |
| 4 | Education Qualification | UG & PG degree | 19 | 38 |
| | | Professional degree | 31 | 62 |
| 5 | Occupation | BPO Industry | 21 | 42 |
| | | Hospitality Industry | 16 | 32 |
| | | Travel Industry | 13 | 26 |
| 6 | Income Group | Below 3 Lakhs | 12 | 24 |
| | | 3 – 5 Lakhs | 14 | 28 |
| | | 5 – 8 Lakhs | 10 | 20 |
| | | Above 8 Lakhs | 14 | 28 |

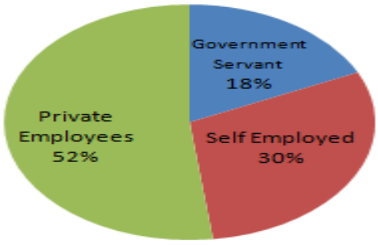
Table 1 exemplify the demographic analysis of the respondents participated in the study. This includes age, gender, marital status, education qualification, occupation and income groups. Age as an important demographic variable not only determines an individual's physical and mental maturity but also depicts his or her life experiences. The table shows that 50% of the respondents are in the age group of 25 – 45 years and 20% belongs to age group of above 45 years. In gender wise distribution of the respondents, the table revealed that among the total respondents, 70 percent of the respondents was male and 30 percent were female. In short, majority of the respondents were male in the study area. 78% of the respondents were married. The another important variable, education-wise classification of respondents shows that 62% respondents belong to the education group of professional degree and 38% belongs to the educated group of UG / PG degree. It is clear from the above table that out of 50 respondents surveyed, 42% belongs to the occupation group "BPO

ISSN 2394 - 7780

Industry", 32% belongs to the occupation group "Hospitality Industry" and the remaining 26% belong to "Travel Industry". The table also reveals that out of the 50 respondents, 28% belong to the income group of "above 8 lakhs", 20% belong to the income group of "5 - 8 lakhs", 28% belong to the income group of "3 - 5 lakhs" and rest 24% belong to " below 3 lakhs".

**Service profile of the Target Segment**

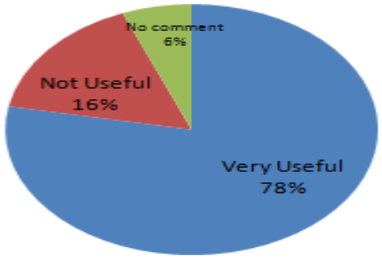
| Description | No of Respondents | Percentage |
|---|---|---|
| Government Servant | 9 | 18 |
| Self Employed | 15 | 30 |
| Private Employees | 26 | 52 |




From the above table & graph, it is understood that out of 50 respondents interviewed of different service profile, 52% are of private Employees.

**Feedback on usefulness of yoga practice at organization by Executives**

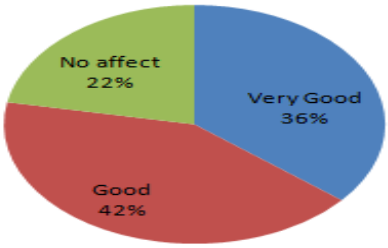
| Description | No of Respondents | Percentage |
|---|---|---|
| **Very Useful** | 39 | 78 |
| **Not Useful** | 8 | 16 |
| **No comment** | 3 | 6 |




From the above table & graph, it is understood that out of 50 respondents interviewed, 78% had accepted that yoga had positive and significant impact on minimizing stress and anxiety.

**Feedback on Effect of yoga practice at organization by Executives**

| Description | No of Respondents | Percentage |
|---|---|---|
| **Very Good** | 18 | 36 |
| **Good** | 21 | 42 |
| **No affect** | 11 | 22 |




- The study found less stress and anxiety among Government Servant as compare to Self Employed and Private Employees. Self Employed and Private Employees are associated with the most tension giving elements such as competition, deadlines, market conditions and above all the desire to reach high on the corporate ladder.
- 78% reported positive feedback in parameters such as sense of well being, feeling of relaxation, improved concentration, self confidence, improved efficiency, good interpersonal relationship, attentiveness, lowered irritability level and an optimistic outlook in life.
- Male responders are facing more stress and anxiety than women. The study shows the level of stress and anxiety is more among high income salary group compare to entry level.
- The study shows the level of stress and anxiety is more among married executives compared to unmarried.
- Most of satisfied respondents either belonged to the married, high income salary and private category. The study indicates that there was a reduction in the severity of anxiety from severe to moderate and mild indicating improvement in general well being after following yoga.

ISSN 2394 - 7780

## VII. CONCLUSIONS AND SUGGESTIONS

It can be concluded from the present research work that there is a positive and significant relationship between stress, anxiety and Yoga. Stress and anxiety can be minimized if companies take the right steps. Stress –free employees perform better, work harder, feel happier and have a long term commitment to the organization as compared to their counterparts. The packaging of yoga for corporate life style is the best preventive and therapeutic measure to optimize organizational health and culture as well. Now time has come when organizations should adopt the philosophy of - Healthy mind and healthy body- Which will help in the cultivation of right attitude and transformation of present turbulent societies into a stress - free society. This research is done in the area of Yoga with an intention to find its effect on the employees who were suffering from workplace stress. The strong evidences of the positive effect of Yoga gives this research a clearer approach to these interventions which result in a major reduction of workplace stress. Persistent practice of Corporate Yoga by a corporate executive makes him/her healthy and wealthy. The progress of Corporate Yoga practice will positively produce prolonged physical, mental, emotional, social and spiritual effects on executives. This will also help in producing effective leadership in corporate world. Nurturing effective leaders is one of the most important functions of the corporate excellence. This aspect also can be achieved by persistent practice of Corporate Yoga. There is no other method better than yoga that can make a corporate executive physically fit, mentally alert, emotionally rectified, socially adapted, rationally positive, completely self analytic and spiritually elevated.

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# VAT AND GST REFUNDS

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## TOWARDS MORE BUSSINESS –FRIENDLY MECHANISM?

Some countries cite their form of value added tax as a goods and sercices tax (GST). For ease of reading we refer in this article to all value added taxes as VAT.

## NEUTRALITY OF VAT V THE REAL WORLD

Businesses sometimes incur VAT on expenses in a foreign country while having no taxable activity or being established in that country. These expenses may be related to the economic activity of those business outside that country and, if so, those businesses should legitimately be entitled to recover the VAT charged to them on those expense. Because VAT, by its very nature ,is supposedly neutral and for VAT payers , the burden of the tax should not fall on taxable businesses. VAT should in principle only tax consumption by final consumers. Businesses should be entitled to deduct the tax on their purchases and offset that tax against the tax they normally collect on their own sales.

In the real world things are bit different. It would things are a bit different. It would seem that not all countries implement refund mechanisms and that some of the countries that do so have such complex or burdensome practices that they are difficult for business to apply in practice. In these circumstances VAT might in the end be a cost for businesses. Even when refunded, the amont of time required to obtain the refund creates a cash flow cost for businesses to which shold be added the costs of making the refund claims themselves.

In the particular context of the financial crisis, where cash flow is even more significant, this topic is of growing importance.

## THE EUROPEAN UNION

Different practices are implemented around the world .
In the European Union (EU), the now relatively well-integrated VAT system has ensured that refund claim mechanisms have been largely harmonised. When the foreign business incurring VAT is located outside the EU, the refund procedures are governed by the 13$^{th}$ VAT Directive 86/560/EECof 17 November 1986. When the foreign business is located with in the EU, the 8$^{th}$ VAT Directive 79/1072/EEC of 6 December 1979 is applicable. Those procedures are open to all businesses that incur VAT in and EU member state when they are not established or the purpose of their activity , nor registered in this Member State ( that is when they do not carry out oa taxable activity in the EU member State of the refund).

The EU recently adopted a new Directive 2008/9/EC of 12 February 2008 repealing with effects from 1 January 2010 the previous 8$^{th}$ VAT Directive, and replacing it. This Directive shold 'enhance the position of businesses' , as it was perceived that ' the current paper-based procedure is slow, coumbersome and costly'. The new procedure , which will apply ot refund applications submitted after 31 December 2009, will be fully electronic and the intention is to ensure quicker refunds for claimants, who will be able to initiate the procedure through the tax administration of their country of establishment. The new Directive implements a more business-friendly procedure , so as to improve the functioning of the internal market.

### Other countries

Other countries have different strategies.
Some countries simply do not provide a refund procedure. This means that is some cases VAT becomes a cost for foreign business. This might create a disincentive to invest in those contries , as usally a business that decides to st up in a country will incur costs before commencing a taxable activity ( although rules exist in many jurisdictions that allow recovery of the VAT incurred for the purpose of setting up a domestic taxable activity).

Some of the countries that do not have a refund procedure do , however, allow recovery of the tax through a registration mechanism. Usually , in the EU, a business can only register for VAT in a country- and has to – when it carries out a taxable activity in that country, which means that it will be consdered as a domestic VAT taxpayer in that particular country. In some other jurisdictions, such as Canada, it is possible to register in that country while not having a taxable activity in Canada, for the sole purpose of recovering the Canadian VAT incurred.
Yet other countries, such as New Zealand , have chosen to deal with that problem by implementing a wide series of exemption provisions when supplies are made to non resident companies. There do remain examples

ISSN 2394 - 7780

of countries where the VAT will be a cost to foreign businesses because the issue has not been coverd by any of these provisions. In such circumstances, those business willl have to implement strategies of their own in order to avoid beraring that non-recoverable VAT cost. They may for instance, develop a small taxable activity in that country that allows them to offset their input tax.

**THE PERCEPTION OF BUSINESS**

The lack of consistency between these approaches suggests that eh netrality of the tax could be threatened and that aby irrecoverable tax- and the resulting cascading effect- might distort competition and effect growth.

Bussinesses actively participate in the OECS's work on consumption taxes and they meet with government representatives in a Technical Advisory Group (TAG) to discuss these issues. A preliminary survey of business in July 2008 was an attempt to assess the magnitude of the isseue. The answers received showed that the refund of foreign VAT is a major issue for many respondents. This confirmed a survey previously made by the IMF that showed that 'refunding of credits… has been a source of tension between tax authorities and the business sector and , in some countries , has led to complex adminstractive measures that have significantly undermined the functioning of the VAT system.

Even when refund procedures are in place, business are often concerned about the complexity of those peocedures. Some countries do require reciprocity agreements with the claimant's hame country ( where the claimant is established in the non-EU country . for example) before making and refund , which means that some countries are 'blacklisted'. Some countries require that the claimants appoint a tax representative, who is usually in charge of completing all of the formalities related to the claim and is normally jointly liable iwht the claimant. The requirement to appoint a tax representative is , for instance,an option given to the EU member States under the 13$^{th}$ VAT Directive, Art2(3). Businesses are also concerned about the compliance burderns and cost of the procedures that are frequently paper-based and use the local language. There are also concerns about the length of the peocedure: the survery results suggest that some administrations ask many more questions that other and that the time for processing claims differs considerably from one country to another.

**THE NEED FOR GLOBAL CO-OPERATION**

On the other hand, granting refunds to businesses with no ' presence' in a country inevitabl brings and element of risk for tax administrations. The absence of 'jurisdictional power' over these businesses, or the lack of appropriate exchange of information procedures aro assistance in recovery may well leave the tax administration exposed to fraudulent claims, with little hope of recovering any incorrect refund payments.

The results of the preliminary survey made by the OECD in July 2008 suggests tht there is a strong need for co-operation on the refund issue between businesses and governments.

Discussions in a global forum such as the OECD's working party on Consumption Taxes, through its regular interaction with business in the TAG, help to achieve a better balance between ther interests of all parties. Governments better appreciate the concerns of business and osme countries that do not have refund mechanisms could be influenced to provide some form of appropriate mechanism.

The OECD will carrying out a new survey in May 2009, thus has been developed in collaboration with government and businsess representatives. It will create a unique opportunity for the broader businesses community ot express its views as the means of ensuring that VAT not incurred in such a way as to and economic cost. depending on outcome of the survey, it is possible the OECD may develop some guidelines on best peractices, or at least some clearer guidance on how best to ensure fiscal neturality.

In the context of the current crasis many countries, such as France. Already implemented specific provide ot facilitate the refund of VAT credit their domestiv business and it most be consistent to extend these measures to foreign businesses. International co-operation in needed ,as neither countries bnor businesses can be expected to solve problems in isolation. The OECD work on intenational VAT issuesis under way and guidance on ensure neutrality fro business may well for important element. More information the OECD's work consumption is available at www.oecd.org/ctp/com.

**Notes**

There are some exceptions. Sometimes businesses are not entitled to decides th VAT on their purchases some VAT becomes a sost many countries for instance, exempt specific activities from VAT and do not allow businesses involved in those activities to deduct the VAT on their purchases linked to those exempt activities.

1. In some countries , those activities are reffered to as 'input taxed, rathere thatn exempt. Health and financial services are amongst the most current exemptions. It many happens also that some countries have impelment specific input tax 'blocks' with respect to certain types of supplies of services or goods . VAT

ISSN 2394 - 7780

on purchases of vehicle fuel, for instance,is not or only partly recoverable in france depending on the type of fuel that is consumed ( articlae 298 $4.1^0$ and $1^0$ bis of the French tax code). These exceptions affects the neutrality of VAT and may create tax cascading effects.

2. See point (3) of the new coucil Directive 2008/9/ EC of 12 feburary 2008 laying doen detailed rules for the refund of value added tax. Provided or in Directive 2006/112/EC, to taxable persons not established in the Member State of refund but established in another Member state.
3. See http://www.lexisurl.com/yPfzl.
4. Canadian Excise Tax Act, s 240(3).
5. Harrison G. and Krelove, R.(2005) VAT refunds: a review of country experience , IMF working paper WP/05/218, IMF , Washington.
6. This is an option given to EU member States by $13^{th}$ VAT Directive, Art 2(2)).
7. See the French 'Decret' $n^0$ 2009-109 dated 29 January 2009 ' relatif aux modalites d'option pour un regimed' imposition d'apres le chiffre d' affaires reel et de rembousement des credits de taxe sur la valeur ajoutee').

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# AUTOMATIC GENERATION CONTROL USING FUZZY BASED INTELLIGENT CONTROLLER FOR TWO-AREA DEREGULATED POWER SYSTEM

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## ABSTRACT
*This paper presents the application of Fuzzy based intelligent controller for Automatic Generation Control (AGC) of a two-area interconnected deregulated power system consider with nonlinearities. The proposed intelligent controller consists of two-layer fuzzy logic system. Each layer is designed to target particular objectives, so that design is simpler and reduces the complexity of fuzzy rule design. The first layer is called pre-compensator, which is used to generate and update the reference value of Area Control Error (ACE) according to control area compliance with North American Electric Reliability Council (NERC). The Control Performance Standard (CPS) criterion used as the input of the pre-compensator and rules are designed to reduce the wear and tear of the equipment. The second layer is called fuzzy Proportional-Integral controller with dual mode control i.e., either proportional or integral mode. The concept of dual-mode control in the fuzzy system such that the proportional mode is made active when the rate of change of the new Area Control Error ($ACE_N$) is sufficiently larger than a specified limit otherwise switched to the integral mode. The simulation results of the Fuzzy based intelligent controller exhibits superior transient and steady-state performance of the AGC system compared to usual fuzzy logic controllers and conventional proportional-Integral (PI) controller. Moreover the proposed controller will significantly reduce frequent change in governor set points in order to avoiding unnecessary manipulation of the generating units and also it required less number of fuzzy rules thereby reducing computation time compared with usual fuzzy logic controller.*

*Keywords: Automatic Generation Control, Control Performance Standards, Fuzzy based Intelligent Controller, Deregulated Power System.*

## I. INTRODUCTION
Automatic Generation Control (AGC) is a necessary mechanism by which the balance between the power demand and the power generation is preserve with the objectives to keep the frequency at the nominal value and maintain the scheduled inter-area tie-line power flow (Singh, O et al.,). In deregulated environment the power system structure changed in such a way that would allow the evolving of more specialized industries for generation companies (Gencos), distribution companies (Discos), and transmission companies (Transcos). Various studies on deregulated of power system have brought out efficient design procedures in ensuring the reliability and quality of the system (Mukta, B. S. S). In this point of view adaptive AGC in a deregulated electricity market be designed to consider different types of possible transactions such as Poolco-based transactions, bilateral transactions and a combination of these two (Rakhshani and Sadeh). In this new paradigm, a Disco can contract individually with a Genco for meeting out the power demand and these transactions are done under the supervision of the System Operator (SO).

The Governor Dead Band (GDB) nonlinearity is defined as the total magnitude of a sustained speed change within which there is no change in valve position. The GDB nonlinearities tend to produce unexpected sustaining oscillations in area frequency and tie-line power transient response (Tsay). In establishing LFC signals, it should recognize that there is a limit to the rate at which generating unit output can be changed. This is particularly true for thermal units where mechanical and thermal stresses are the limiting factors. Due to effect of presence of Generation Rate Constraints (GRC) in generation unit, the system model becomes non-linear and linear control techniques cannot apply for controlling purpose (Pooja Devi and Ram Avtar Jaswal).

The Control Performance Standard (CPS) is specifically designed to comply with the performance standards imposed by the North American Electric Reliability Council (NERC) for equitable operation of an interconnected system (Jaleeli and VanSlyck). Control Performance Standard are derived from rigorous theoretical basis (Gross, George, and Jeong Woo Lee) and the control actions are taken only when necessary, when the compliance is low and close to violation of NERC standards. The conventional control strategies for AGC loop which exhibit poor dynamic response in the presence of uncertainties and nonlinearities (Sathans and Swarup). The fuzzy logic controller often yields superior results than the conventional control approaches (Hemmati et al.). However, the usual fuzzy logic controllers may fail to facilitate the smooth operation and less oscillatory when system is subjected to load disturbances also in presence of nonlinearities. When dealing with complex systems, the single-loop controller may not achieve the control performances and a multilayered controller turns out to be very helpful (Joo). The main advantage of the multilevel control lies in the freedom of

ISSN 2394 - 7780

the design of each layer (Kim et al.). The layers are designed to target particular objectives, so that design is simpler and the performance can be improved very well. Based on the application multilevel control, the proposed fuzzy based intelligent controller is design with two-layer control architecture to solve the rule explosion problem in multi-input fuzzy logic system. In this study a fuzzy based intelligent controllers are designed and implemented for AGC loop to control two-area reheat thermal interconnected deregulated power system with GDB and GRC nonlinearities and it can provide a better dynamic performance for all possible transactions and enhances an efficient way of coping even with imperfect information, offers flexibility in decision making processes as compared with conventional PI controllers and usual fuzzy logic controller.

## II. DESIGN OF CONTROLLERS

### 2.1 Design of Proportional-Integral Controller

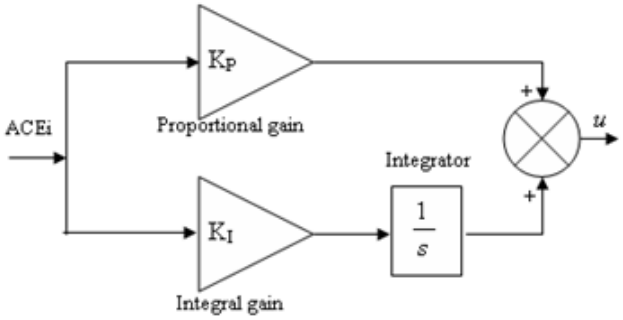


Figure-1: Block diagram of conventional PI controller

The block diagram of conventional Proportional-Integral (PI) controller is shown in Fig.1. The Proportional controller reduces the peak over-shoot in the damping oscillations of system response and Integral controller provides zero state error in frequency deviation and tie line power flow. In AGC loop nominal parameters of system is achieved with the generation of proper control signal by the PI controller is given by

$$(u(t) = K_P\ ACE(t) + \frac{K_P}{T_i} \int ACE(t)\ dt \qquad (1)$$

### 2.2 Design of Fuzzy logic Controller

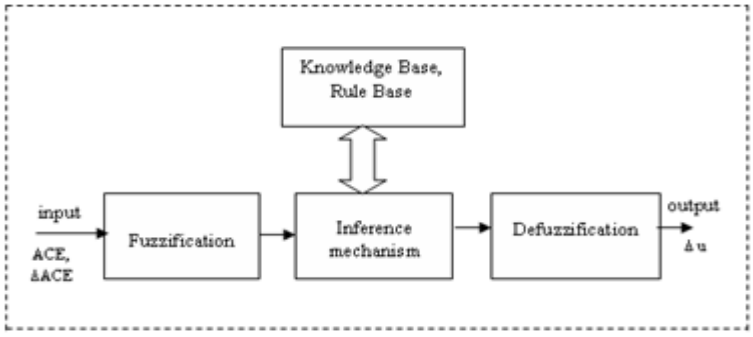


Figure-2: Components of fuzzy logic controller

The conventional structure for fuzzy controller comprises four main components such as fuzzifier, Inference mechanism, rule base and defuzzifier as shown in Fig.2. Based on the objectives in AGC, two variables such as area frequency and tie line power exchanges are weighted together by a linear combination to a single variable called Area Control Error (ACE) which is used as the control signal for the AGC problem. For AGC problem the input to the fuzzy controller for i[th] area at a particular instant are $ACE_i(t)$ and $\Delta\ ACE_i(t)$ and output of the fuzzy controller is $\Delta u_i$ .

$$ACE_i(t) = \beta_i \Delta F_i\ + \Delta P_{tie\,i-j\,error} \qquad (2)$$

$$\Delta ACE_i(t) = ACE_i(t) - \Delta ACE_i(t-1)\,. \qquad (3)$$

The fuzzifier first converts its two input signals, ACE and the step change of every sample ΔACE, to fuzzy members. The membership function would perform a mapping from the crisp value to a fuzzified value. Table 1 shows the fuzzy rules play a major role in fuzzy logic controller and have been investigated extensively. The

ISSN 2394 - 7780

output of the inference mechanism is a fuzzy value, so it is necessary to convert this fuzzy value into crisp value. This operation which is the inverse of fuzzification is known as defuzzification. The well known centre of gravity defuzzification method has been used and control output $\Delta u$ as follows

$$\Delta u = \frac{\sum_{j=1}^{25} \mu_j u_j}{\sum_{j=1}^{25} \mu_j} \tag{4}$$

Where $\mu_j$ is the membership value of the linguistic variable recommending the fuzzy controller action and $u_j$ is the precise numerical value corresponding to that fuzzy control action. The $\Delta u$ obtained from (4) is added with existing previous signal to obtain the actual output signal $u$ which will be fed to the governor.

**Table-1: Fuzzy Logic Rules for LFC**

| ΔACE / ACE | NB | NS | Z | PS | PB |
|---|---|---|---|---|---|
| NB | PB | PB | PS | PS | Z |
| NS | PS | PS | PS | Z | Z |
| Z | Z | Z | Z | NS | NS |
| PS | Z | Z | NS | NS | NS |
| PB | Z | NS | NS | NB | NB |

### 2.3 Design of Fuzzy based Intelligent Controller

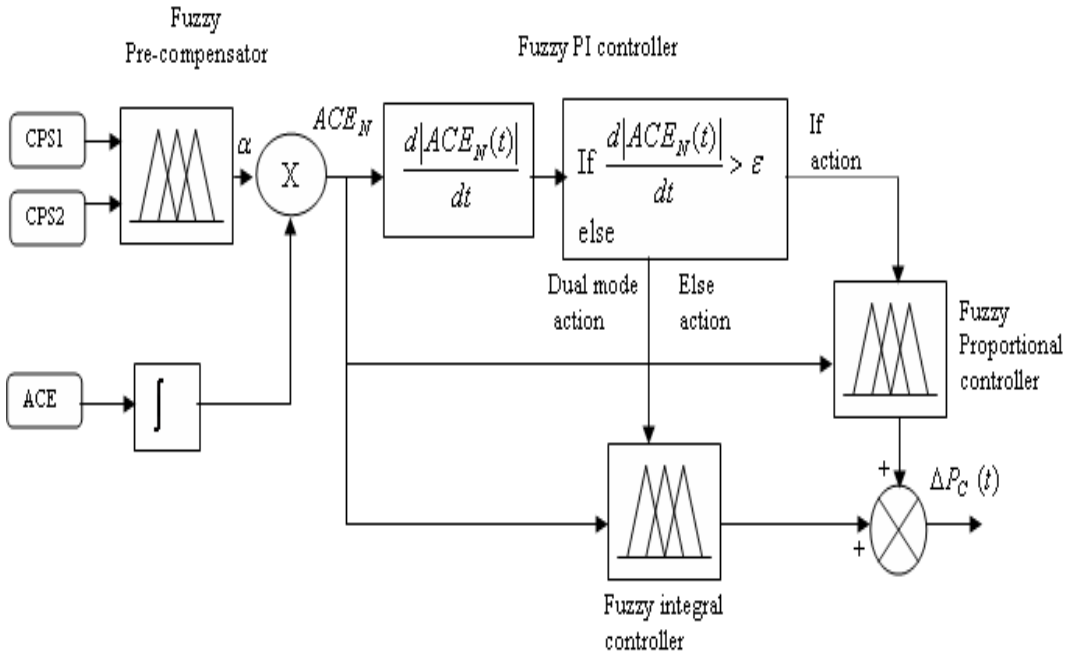


Figure-3: Control structure of proposed fuzzy based intelligent controller

This paper presents fuzzy based intelligent controller to solve the rule explosion problem in the multi-input fuzzy logic system. The proposed fuzzy based intelligent controller is shown in Fig 3. The multilevel control lies in the freedom of the design of each layer so that each layer is designed to target particular objectives (Rubaai and Ofoli). The controller design is simplify two-layer control architecture where the first layer is called pre-compensator, which is used to generate and update the reference value of ACE and assure its control performance in compliance with NERC's control performance standards and fuzzy rules are design to reduce the wear and tear of the equipment. The other layer called fuzzy PI controller with dual mode control namely Proportional mode, or integral mode fuzzy logic controller. The dual mode control concept can be adopted in a

ISSN 2394 - 7780

fast manner in order to eliminate the static and dynamic error of PI controller (Adhimoorthy and Chidambaram). The pre-compensator is also called as a control supervisor and constructed from fuzzy systems based on the current ACE and the predicted change of ACE. North American Electric Reliability Council (NERC) had proposed new control performance standards CPS1 and CPS2 to evaluate the control area performance in normal interconnected power system operation (Gross, George, and Jeong Woo Lee). The Control Performance Standard (CPS) criterion is introduced into the fuzzy pre-compensator design thus improves the dynamic quality of system. The fuzzy rules are designed according to their compliance based on control performances standard is shown in Table 2.

The second layer of the proposed controller is called fuzzy PI controller. This controller strategy combines fuzzy proportional and integral controller with a fuzzy switch. The dual mode control scheme is proposed in this paper. The proportional mode will be made during the transient period when the rate of change of error ($ACE_N$) is sufficiently larger, whereas the integral mode would be the better option when the rate of change of error is small. The dual mode control scheme of the fuzzy PI controller is shown in Fig 3. For the proposed control scheme, the control law is taken as follows

$$\Delta P_c(t) = -K_p\,(ACE_N\,(t)), \quad for \left|\frac{dACE_N(t)}{dt}\right| > \varepsilon \tag{5}$$

$$\Delta P_c(t) = -K_I \int (ACE_N\,(t)\,dt), \quad for \left|\frac{dACE_N(t)}{dt}\right| \le \varepsilon \tag{6}$$

The fuzzy Proportional and integral mode can use the same membership functions and the same rule base. Only the gains for the input and output signals have to be tuned with appropriate coefficients. In this controller design new Area control Error ($ACE_N$) and the rate of change of new Area control Error ($\Delta ACE_N$) as input variable and $\Delta P_C$ is output variable. The corresponding Fuzzy rules are shown in Table 3.

**Table-2: Pre-compensator Fuzzy logic rules for CPS**

| CPS1 / CPS2 | PS | PM | PB |
|---|---|---|---|
| PS | ZE | PS | PS |
| PM | PS | PB | PM |
| PB | PB | PVB | PVB |

**Table 3: Rule table for Feedback Fuzzy PI controller**

| $\Delta ACE_N$ / $ACE_N$ | N | Z | P |
|---|---|---|---|
| PS | N | N | Z |
| PM | N | Z | P |
| P | Z | P | P |

## III. RESULTS AND DISCUSSION

In this presented work, a two-area thermal reheat interconnected deregulated power system with PI, fuzzy logic and Fuzzy based intelligent controllers to illustrate the performance of AGC loop using MATLAB/SIMULINK package. The application of a new design of proposed fuzzy based intelligent controller is applied for each area of a deregulated power system is investigated and as shown in Fig 4.

### 3.1 Poolco based transactions

In this scenario, Gencos participate only in load following control of their areas. Assume that the load change occurs only in area 1. Thus, the load is demanded only by $Disco_1$and $Disco_2$. Let the value of this load demand be 0.01 pu.MW for each of them i.e. $\Delta P_{L1}$= 0.01 pu.MW, $\Delta P_{L\,2}$= 0.01 pu.MW, $\Delta P_{L3} = \Delta P_{L4}$= 0.0. Also, it is assumed that a case of Poolco based contracts between Discos and available Gencos are simulated based on the following Disco Participation Matrix (DPM- A).

ISSN 2394 - 7780

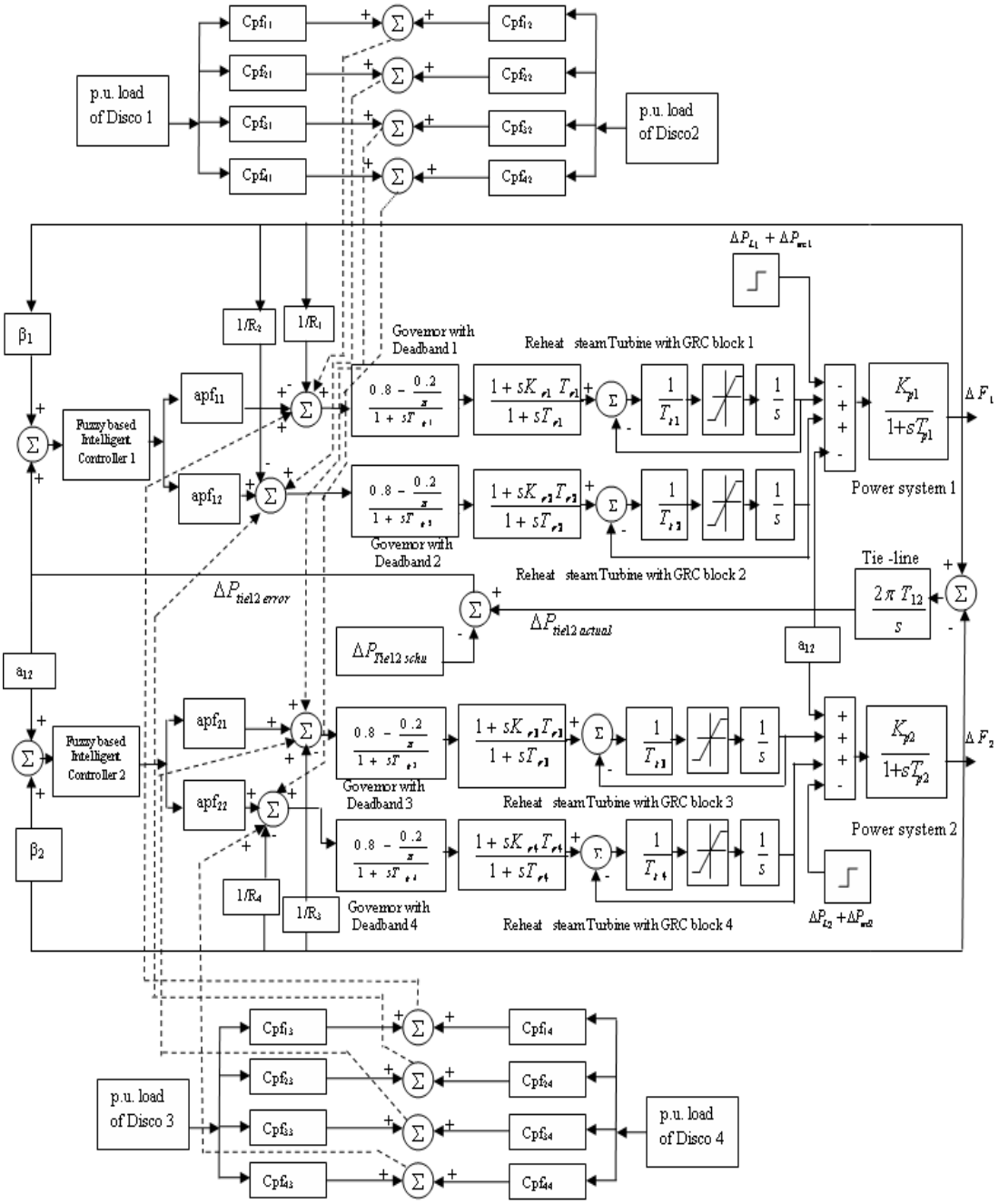


Figure-4: The Linearized model of two-area interconnected reheat thermal deregulated power system with GDB and GRC nonlinearities using fuzzy based intelligent controller

$$DPM - A = \begin{bmatrix} 0.5 & 0.5 & 0.0 & 0.0 \\ 0.5 & 0.5 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \end{bmatrix} \qquad (7)$$

Note that $Disco_3$ and $Disco_4$ do not demand power from any Gencos and hence the corresponding contract participation factors (columns 3 and 4) are zero. $Disco_1$ and $Discos_2$ demand identically from their local Gencos, viz., $Genco_1$ and $Genco_2$. Therefore, contract participation factor $cpf_{11} = cpf_{12} = 0.5$ and $cpf_{21} = cpf_{22} = 0.5$. For given transaction using (7), simulation results are shown in Fig. 5; it can be observed that using the proposed fuzzy based intelligent controller, the frequency deviation of all areas and the tie-line power are quickly driven back to zero and has not only less overshoots but also settling time as compared with usual fuzzy logic and PI controller. Since there are no contracts between areas, the scheduled steady state power flows over the tie-line are zero.

ISSN 2394 - 7780

### 3.2 Bilateral based transactions

In this scenario, Discos have the freedom to have a contract with any Genco in their or another areas. Consider that all the Discos have contract with the available Gencos for power as per following DPM:

$$DPM - B = \begin{bmatrix} 0.2 & 0.15 & 0.4 & 0.2 \\ 0.3 & 0.25 & 0.3 & 0.3 \\ 0.2 & 0.25 & 0.2 & 0.2 \\ 0.2 & 0.35 & 0.1 & 0.3 \end{bmatrix} \quad (8)$$

In this case, all the Discos, demands 0.01 pu.MW from Gencos as defined by *cpf* in the DPM matrix and each Gencos participates in LFC as defined by the following ACE participation factor $apf_{11}$ =0.75, $apf_{12}$ = 0.25 and $apf_{21}$ = $apf_{22}$ = 0.5. The comparative transient response of the system are shown in Fig.6, it can be observed that the oscillations in area frequencies and tie-line power deviations have decreases to a considerable extent using the fuzzy based intelligent controller. Note that ACE participation factor affect only the transient performance of the system and not the steady state performance when uncontracted load are absent, i.e., $\Delta P_{uc1}$ = $\Delta P_{uc2}$ =0.0. Also the tie-line power flow properly converges to the specified value, the scheduled power flow on the tie-line in the direction from area1 to area 2 is by expanding (2) we have, $\Delta P_{tie,1-2}^{scheduled} = 0.0045 p.u.MW$ . The Fig.6 (C) shows the actual power on the tie-line and it is to be observed that it settles to 0.0045p.u.MW which is the scheduled power flow on the tie-line in the steady state.

## IV. CONCLUSION

A new fuzzy based intelligent controller is proposed to solve the AGC problem in a deregulated power system. A control strategy is adopted by converting the usual fuzzy system to two-layered hierarchical fuzzy system to solve the rule explosion problem in multi-input usual fuzzy logic system. In this the control scheme update the reference value of ACE according to control area compliance with NERC' s standards and to manipulate the generator's set points only if need be to reduce the excessive manipulation and hence minimize the cost of operation and maintenance associated with LFC. The concepts of dual-mode control in the fuzzy logic system eliminate the conflict between the static and dynamic accuracy. Simulation results show that the fuzzy based intelligent controller is very effective and guarantees good robust performance against parametric uncertainties, load changes and disturbances even in the presence of GDB and GRC. The proposed scheme has superior steady-state and transient performance, compared to a usual fuzzy logic and PI controller for different types of transactions. Moreover the proposed controller has required less number of fuzzy rules thereby reducing computation time and improves the dynamic quality of system as compared with the usual fuzzy logic system.

## V. ACKNOWLEDGEMENT

The authors wish to thank the authorities of Annamalai University, Annamalainagar, Tamilnadu, India for the facilities provided to prepare this paper.

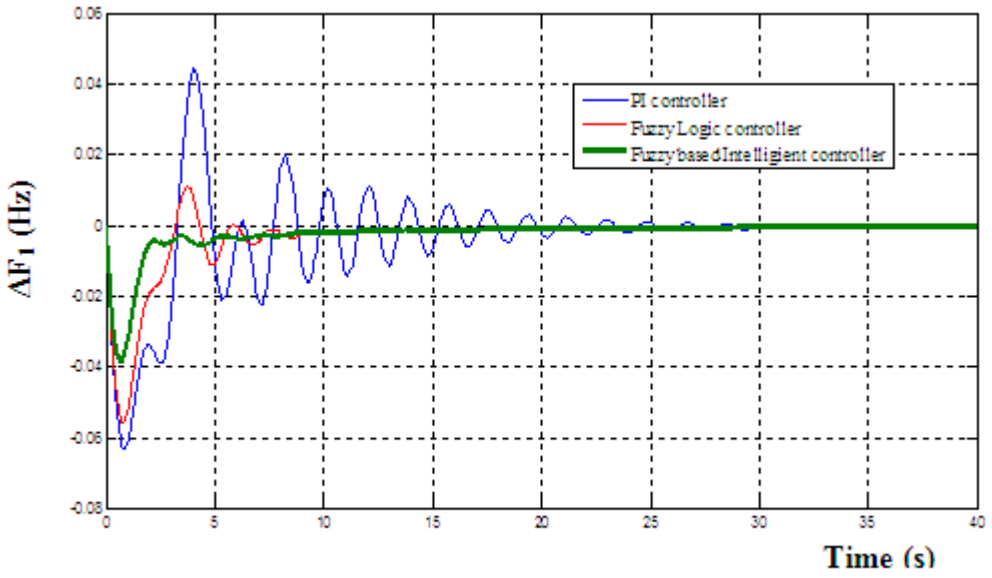


Figure-5 (A): $\Delta F_1$ (Hz) Vs Time (s)

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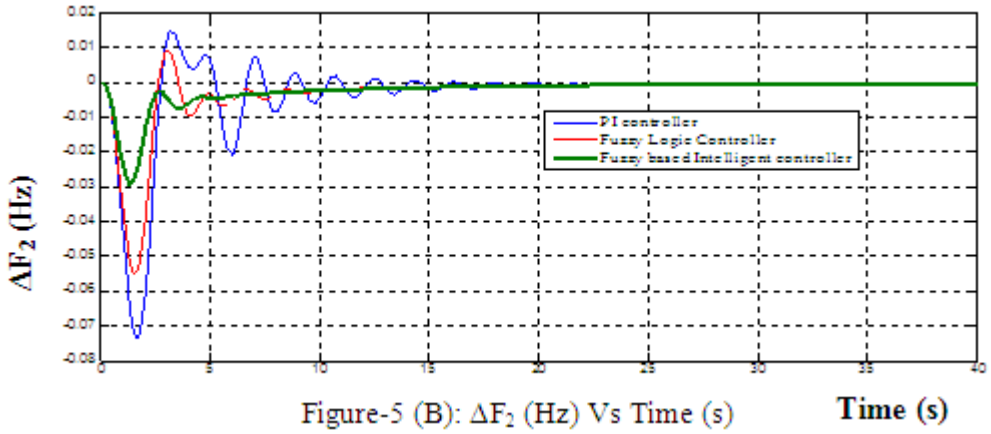


Figure-5 (B): $\Delta F_2$ (Hz) Vs Time (s)

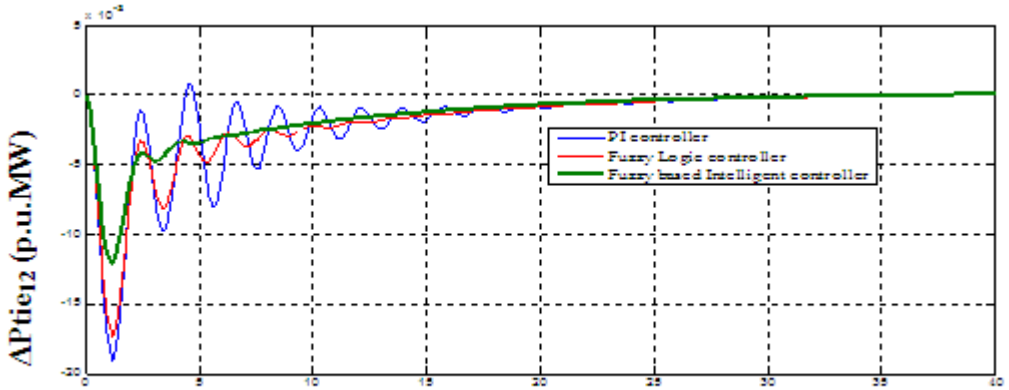


Figure-5 (C): $\Delta Ptie_{12}$ (p.u.MW) Vs Time (s)

Figure-5: Dynamic responses of the frequency deviations and tie- line power deviations, for a two area AGC system in the deregulated Scenario-1 (poolco based transactions)

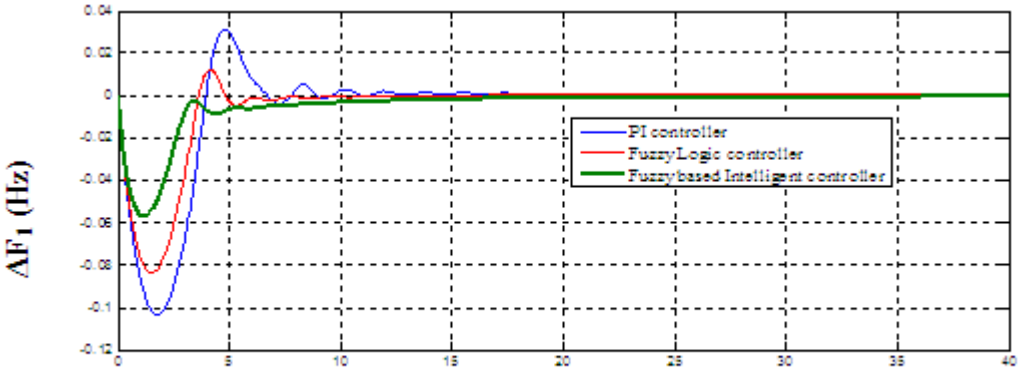


Figure-6 (A): $\Delta F_1$ (Hz) Vs Time (s)

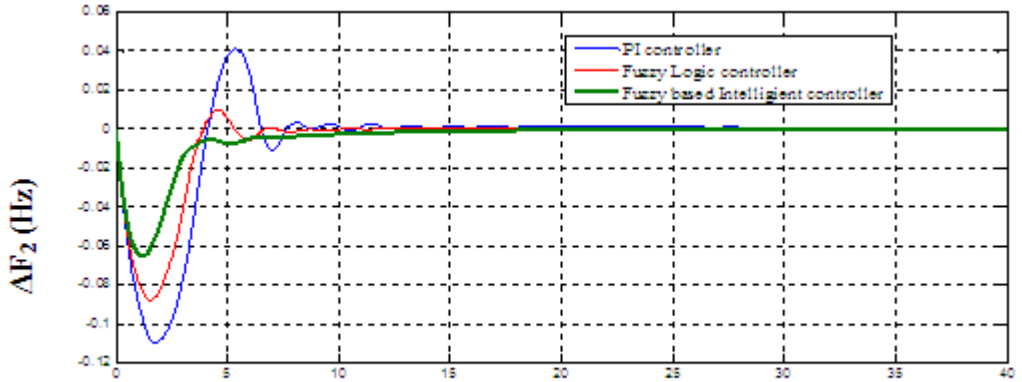


Figure-6 (B): $\Delta F_2$ (Hz) Vs Time (s)

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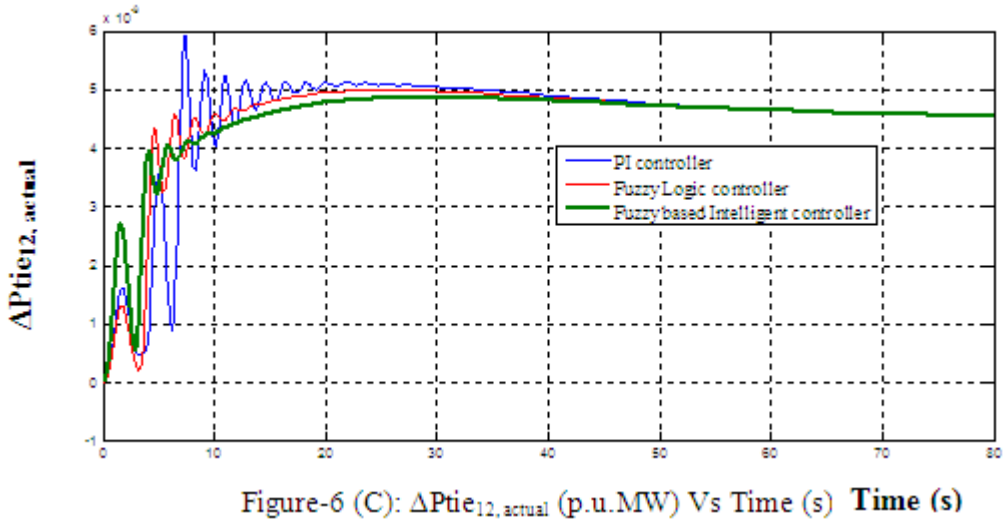


Figure-6 (C): $\Delta Ptie_{12,actual}$ (p.u.MW) Vs Time (s)

Figure-6: Dynamic responses of the frequency deviations and tie- line power deviations for a two area AGC system in the deregulated scenario-2 (bilateral based transactions)

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# DUAL MODE TWO-LAYER FUZZY LOGIC CONTROLLER FOR LOAD-FREQUENCY CONTROL IN A RESTRUCTURED POWER SYSTEM WITH SUPER CAPACITOR ENERGY STORAGE UNITS

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## ABSTRACT
*This paper presents the application of Dual Mode Two-Layer Fuzzy Logic controller to improve the dynamics of Load Frequency Control (LFC) in multi area deregulated power system. The main goal of the LFC problem is to maintain zero steady state errors in the frequency deviations and good tracking of load demands. But the conventional Proportional plus Integral controller does not eliminate the conflict between the static and dynamic accuracy. This conflict may be resolved Dual Mode controller operates by switching between proportional controller mode and Integral controller mode depending on the magnitude of the Area Control Error (ACE). Moreover Two-Layer Fuzzy Logic controller can also provide a robust control and requires only a limited number of rules and reduced computation time. Super Capacitor Energy Storage (SCES) can also coordinate with LFC system to ensure the system stability under momentarily variation in the load demand. The dynamic response of the LFC problem is studied using MATLAB simulink software. The results indicate that the proposed two layer Fuzzy logic controller exhibits better performance. Compliance with North American Electric Reliability Council (NERC) standards for LFC has also been established in this work.*

*Keywords: Control Performance Standards, Dual Mode Two Layered Fuzzy Logic Controller, Load-Frequency Control, Super Capacitor Energy Storage Unit.*

## 1. INTRODUCTION
Load Frequency Control is a very important issue in power system operation and control for supplying sufficient and reliable electric power with good quality. An interconnected power system can be considered as being divided into control area, all generators are assumed to form a coherent group. Given the present situation, it is generally agreed that the first step in deregulation will be separate the generation of power from the transmission and distribution, thus putting all the generation on the same footing as the Independent Power Producer [1]. In an interconnected power system, a sudden load perturbation in any area causes the deviation of frequencies of all the areas and also in the tie-line powers [2]. The Automatic Generation Control (AGC) in a restructured electricity market should be designed to consider different types of possible transactions such as Poolco-based transactions, bilateral transactions, and a combination of these two [2- 5]. In this new paradigm, a Disco can contract individually with a Genco for meeting out the power demand and these transactions are done under the supervision of the System Operator. Generally most of the conventional control schemes have been successful to some extent only [6] and choosing the optimal approach for energy Activities had also been suggested for more advanced control strategies to be incorporated for a better control [7]. In this aspect a better sophisticated intelligent controllers [8- 10] be adopted for a better power quality by replacing the conventional controllers because of their ability in ensuring faster and good dynamic response of the system. Fuzzy logic controllers have received considerable interest in recent years. Fuzzy based methods are found to be very useful in the places where the solution to the mathematical formulations is complicated. Moreover, fuzzy logic controller often yields superior results to conventional control approaches. The fuzzy logic based intelligent controllers are designed to facilitate the operation smooth and less oscillatory when system is subjected to load disturbances but the design procedures require more skill. In this paper, the control scheme consists of dual mode two layers viz fuzzy pre-compensator and fuzzy like P and Fuzzy like I controller. The purpose of the fuzzy pre-compensator is to modify the command signals to compensate for the overshoots and improve the steady state error. Fuzzy rules from the overall fuzzy rule vectors are used at the first layer, linear combination of independent fuzzy rules are used at the second layer. The two layer fuzzy system has less number of fuzzy rules as compared with the fuzzy logic system [10]. The proposed dual mode two layered fuzzy logic controllers give better simulation results which is compared with the simulation results obtained using the dual mode PI controllers. Thus the Dual mode two layered fuzzy PI controller enhances an efficient way of coping even with imperfect information, offers flexibility in decision making processes. Thus the Dual mode two layered fuzzy PI controller enhances an efficient way of coping even with imperfect information, offers flexibility in decision making processes. The conventional proportional plus integral controller with consideration of various efficient control scenarios [11] or sophisticated methodologies [12] may result in relatively large over shoots in transient frequency deviations in the output response of the system due to sudden load impacts. Further, the settling time of the system frequency deviations is also relatively long. It is well known that, if the control law employs integral control, the system has no steady state error. However, it

ISSN 2394 - 7780

increases the order of the system by one. Therefore, the response with the integral control is slow during the transient period. In the absence of integral control, the gain of the closed loop system can be increased significantly thereby improving the transient response. The proportional plus integral control does not eliminate between the static and dynamic accuracy. This conflict may be resolved by employing the dual mode control [12]. Fast-acting energy storage systems such as Super Capacitor Energy Storage (SCES) units to load frequency control problem can effectively damp electromechanical oscillations in a power system, because they provide storage capacity in addition to the kinetic energy of the generator rotors which can share sudden changes in power requirement. The energy density of SCES unit is approximately 100 times higher than that of conventional capacitors and power density is approximately 10 times higher than those of the batteries. The analysis [13] with regard to usage of energy storage devices shows that super-capacitors are best suited for short-term low power applications. Thus Super Capacitor Energy Storage (SCES) unit will, in addition to load leveling, a function conventionally assigned to them, have a wide range of applications such as power quality maintenance for decentralized power supplies [14]. The SCES are excellent for short-time overload output and the response characteristics possessed in the particular [15]. The effect of generation control and the absorption of power fluctuation required for power quality maintenance can be effectively be enhanced in a better manner with SCES unit .However, it will be difficult to locate the placement of SCES alone in every possible area in the interconnected system due to the economical reasons. In this paper SCES unit is located in area 1 of the two-area interconnected reheat thermal power system. The main function of LFC is to regulate a signal called Area Control Error (ACE), which accounts for error in the frequency as well as the errors in the interchange power with neighboring areas. Conventional LFC uses a feedback signal that is either based on the Integral of ACE or is based on ACE and it's Integral. These feedback signals are used to maneuver the turbine governor set points of the generators so that the generated power follows the load fluctuations. However, continuously tracking load fluctuations definitely causes wear and tear on governor's equipment, shortens their lifetime, and thus requires replacing them, which can be very costly. Control Performance Criteria (CPC) has been formerly used to evaluate AGC performance [16]. The Control Performance Standard (CPS) is specifically designed to comply with the performance standards imposed by the North American Electric Reliability Council (NERC) for equitable operation of an interconnected system. CPS1 and CPS2 are derived from rigorous theoretical basis. CPS1 is a measurement to asses the performance of frequency control in each area. CPS2 is designed to restrain the ACE 10-minute average value and in doing so provides a means to limit excessive unscheduled power flows that could results from large ACEs. In this paper a novel load frequency controller is presented. It is manipulated by a Fuzzy logic system whose rules are designed to reduce wear and tear of the equipment and assure its control performance is in compliance with NERC,s control performance standards, CPS1 and CPS2 [16, 17]. Considering the power system load frequency control, this paper establishes a fuzzy logic controller to predict the future frequency of the target object, thus forecasting the optimized controller is designed, which follows the CPS performance standards through the fuzzy logic rules [18]. The control parameter is reduced to diminish high frequency movement of the speed governor's equipment when the control area has high compliance with NERC's standards. When the compliance is low, the control parameter is raised to the normal value [19]. This paper adopts CPS1 and CPS2 as input to the fuzzy logic controller and output gain of fuzzy controller adjust control parameter gains depending up on NERC's compliance. The simulation results show that the dynamic performance of the system with SCES unit had improved a lot with the proposed controller.

## 2. LINEARIZED MODEL OF TWO-AREA INTERCONNECTED POWER SYSTEM IN RESTRUCTURED SCENARIO

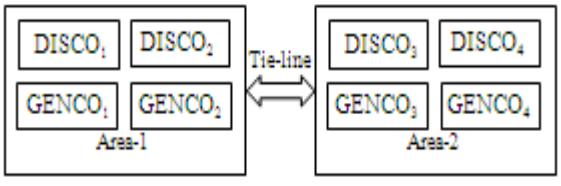


Fig-1: Schematic diagram of two-area system in restructured environment

In the restructured competitive environment of power system, the Vertically Integrated Utility (VIU) no longer exists. The deregulated system consists of GENCOs, DISCOs, and Transmissions Companies (TRANSCOs) and Independent System Operator (ISO). GENCOs which will compete in a free market to sell the electricity they produce. It can be assumed that the retail customer will continue for some time to buy from the local distribution company. Such distribution companies have been designated as DISCOs. The entities that will wheel this power between GENCOs and DISCOs have been designated as TRANSCOs. Although it is conceptually clean to have separate functionalities for the GENCOs, TRANSCOs and DISCOs, in reality there

ISSN 2394 - 7780

will exist companies with combined or partial responsibilities. With the emergence of the distinct identities of GENCOs, TRANSCOs, DISCOs and the ISO, many of the ancillary services of a VIU will have a different role to play and hence have to be modelled differently. Among these ancillary services one of the most important services to be enhanced the Load Frequency Control. The LFC in a deregulated electricity market should be designed to consider different types of possible transactions, such as poolco-based transactions, bilateral transactions and a combination of these two [1]. In the new scenario, a DISCO can contract individually with a GENCO for acquiring the power and these transactions will be made under the supervision of ISO. To make the visualization of contracts easier, the concept of a "DISCO Participation Matrix" (DPM) will be used [2- 4] which essentially provides the information about the participation of a DISCO in contract with a GENCO. In DPM, the number of rows has to be equal to the number of GENCOs and the number of columns has to be equal to the number of DISCOs in the system. Any entry of this matrix is a fraction of total load power contracted by a DISCO toward a GENCO. As a results total of entries of column belong to DISCO i of DPM is . In this study two-area interconnected power system in which each area has two GENCOs and two DISCOs. Let GENCO 1, GENCO 2, DISCO 1, DISCO 2 be in area 1 and GENCO 3, GENCO 4, DISCO 3, DISCO 4 be in area 2 as shown in Fig. 1. The corresponding DPM is given as follows

$$DPM = \begin{matrix} \\ G \\ E \\ N \\ C \\ O \end{matrix} \begin{bmatrix} D & I & S & C & O \\ cpf_{11} & cpf_{12} & cpf_{13} & cpf_{14} & \\ cpf_{21} & cpf_{22} & cpf_{23} & cpf_{24} & \\ cpf_{31} & cpf_{32} & cpf_{33} & cpf_{34} & \\ cpf_{41} & cpf_{42} & cpf_{43} & cpf_{44} & \end{bmatrix} \quad (1)$$

Where cpf represents "Contract Participation Factor" and is like signals that carry information as to which the GENCO has to follow the load demanded the DISCO. The actual and scheduled steady state power flow through the tie-line is given as

$$\Delta P_{tie1-2,\,scheduled} = \sum_{i=1}^{2}\sum_{j=3}^{4} cpf_{ij}\Delta P_{L\,j} - \sum_{i=3}^{4}\sum_{j=1}^{2} cpf_{ij}\Delta P_{L\,j} \quad (2)$$

$$\Delta P_{tie1-2,\,actual} = \left(2\pi T_{12}/s\right)\left(\Delta F_1 - \Delta F_2\right) \quad (3)$$

And at any given time, the tie-line power error $\Delta P_{tie1-2,\,error}$ is defined as

$$\Delta P_{tie1-2,\,error} = \Delta P_{tie1-2,\,actual} - \Delta P_{tie1-2,\,scheduled} \quad (4)$$

The error signal is used to generate the respective ACE signals as in the traditional scenario [3]

$$ACE_1 = \beta_1 \Delta F_1 + \Delta P_{tie1-2,\,error} \quad (5)$$

$$ACE_2 = \beta_2 \Delta F_2 + \Delta P_{tie\,2-1,\,error} \quad (6)$$

For two area system the contracted power supplied by i[th] GENCO is given as

$$\Delta Pg_i = \sum_{j=1}^{DISCO=4} cpf_{i\,j}\Delta PL_j \quad (7)$$

Also note that $\Delta PL_{1,LOC} = \Delta PL_1 + \Delta PL_2$ and $\Delta PL_{2,LOC} = \Delta PL_3 + \Delta PL_4$. In the proposed LFC implementation, contracted load is fed forward through the DPM matrix to GENCO set points. The actual loads affect system dynamics via the input $\Delta PL_{,LOC}$ to the power system blocks. Any mismatch between actual and contracted demands will result in frequency deviations that will drive LFC to re dispatch the GENCOs according to ACE participation factors, i.e., $apf_{11,}$ $apf_{12,}$ $apf_{21}$ and $apf_{22}$.

ISSN 2394 - 7780

## 3. MATHEMATICAL MODEL OF SCES UNIT

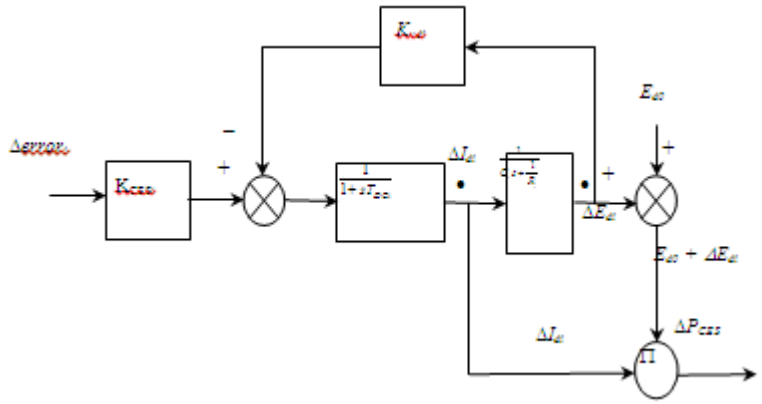

Fig-2: Block diagram with capacitor voltage deviation feedback

The block diagram representation of SCES unit is shown in Fig.2. Area Control Error (ACE) can be used as the control signal to the SCES unit. $E_{di}$ is then continuously controlled in accordance with this control signal. For the i[th] area, if $ACE_i$ (i.e., ($\Delta error_i = ACE_i$).) of the power system is used as the control signal to SCES, then the deviation in the current $\Delta I_{di}$. The power flow in the capacitor at any instant is

$$P_d = E_d \; I_d \tag{8}$$

and, the initial power flow into the capacitor is

$$P_{d0} = E_{d0} \; I_{d0} \tag{9}$$

Where $E_{d0}$ and $I_{d0}$ are the magnitudes of voltage and current prior to the load disturbance;

When a load disturbance occurs, the power flow into the coil is

$$P_{do} + \Delta P_d = (E_{d0} + \Delta E_d)\,(I_{d0} + \Delta I_d) \tag{10}$$

so that the incremental power change in the capacitor

$$\Delta P_d = (I_{d0}\,\Delta E_d + \Delta E_d \; \Delta I_d) \tag{11}$$

the term $E_{d0}.I_{d0}$ is neglected since $E_{d0} = 0$ in the storage mode to hold the rated voltage at constant value.

$$\Delta I_{di} = \left[\frac{1}{1+sT_{DCi}}\right]\left[K_{CESi}\;\Delta F_i - K_{vdi}\;\Delta E_{di}\right] \tag{12}$$

the tie-line power flow deviations can be sensed, then the Area Control Error (ACE) can also be fed to the SCES as the control signal (i.e., $\Delta error_i = ACE_i$). Being a function of tie-line power deviations, ACE as the control signal to SCES, will further improve the tie-power oscillations. Thus, ACE of the two areas are given by

$$ACE_i \;=\; B_i\;\Delta F_i + \Delta P_{tie-i\;j} \quad : i, j = 1, 2 \tag{13}$$

$\Delta P_{tie\ ij}$ is the change in tie-line power flow out of area i to j. Thus, if $ACE_i$ is the control signal to the SCES, then the deviation in the current ΔIdi would be

$$\Delta I_{di} = \left[\frac{1}{1+sT_{DCi}}\right]\left[K_{CESi}\;\;\Delta ACE_i - K_{vdi}\;\Delta E_{di}\;; i, j = 1, 2\right] \tag{14}$$

The linearized model of an interconnected two-area reheat thermal power system in deregulated environment is shown in Fig.3 after incorporating SCES unit

The control actions of Super Capacitor Energy Storage units are found to be superior to the action of the governor system in terms of the response speed against, the frequency fluctuations [15]. The SCES units are tuned to suppress the peak value of frequency deviations quickly against the sudden load change, subsequently the governor system are actuated for compensating the steady state error of the frequency deviations. Fig.4 shows the Linearized reduction model for the control design of two area interconnected power system with SCES units. The SCES unit is modeled as an active power source to area 1 with a time constant $T_{SCES}$, and gain constant $K_{SCES}$. Assuming the time constants $T_{SCES}$ is regarded as 0 sec for the control design [15]. Then the state equation of the system represented by Fig. 4 becomes

ISSN 2394 - 7780

$$\begin{bmatrix} \Delta\dot{F}_1 \\ \Delta\dot{P}_{T12} \\ \Delta\dot{F}_2 \end{bmatrix} = \begin{bmatrix} -\frac{1}{T_{p1}} & -\frac{k_{p1}}{T_{p1}} & 0 \\ 2\pi T_{12} & 0 & -2\pi T_{12} \\ 0 & \frac{a_{12}\, k_{p2}}{T_{p2}} & -\frac{1}{T_{p2}} \end{bmatrix} \begin{bmatrix} \Delta F_1 \\ \Delta P_{T12} \\ \Delta F_2 \end{bmatrix} + \begin{bmatrix} \frac{k_{p1}}{T_{p1}} \\ 0 \\ 0 \end{bmatrix} \begin{bmatrix} \Delta P_{SCES} \end{bmatrix} \tag{15}$$

The design process starts from the reduction of two area system into one area which represents the Inertia centre mode of the overall system. The controller of SCES is designed for the equivalent one area system to reduce the frequency deviation of inertia centre.

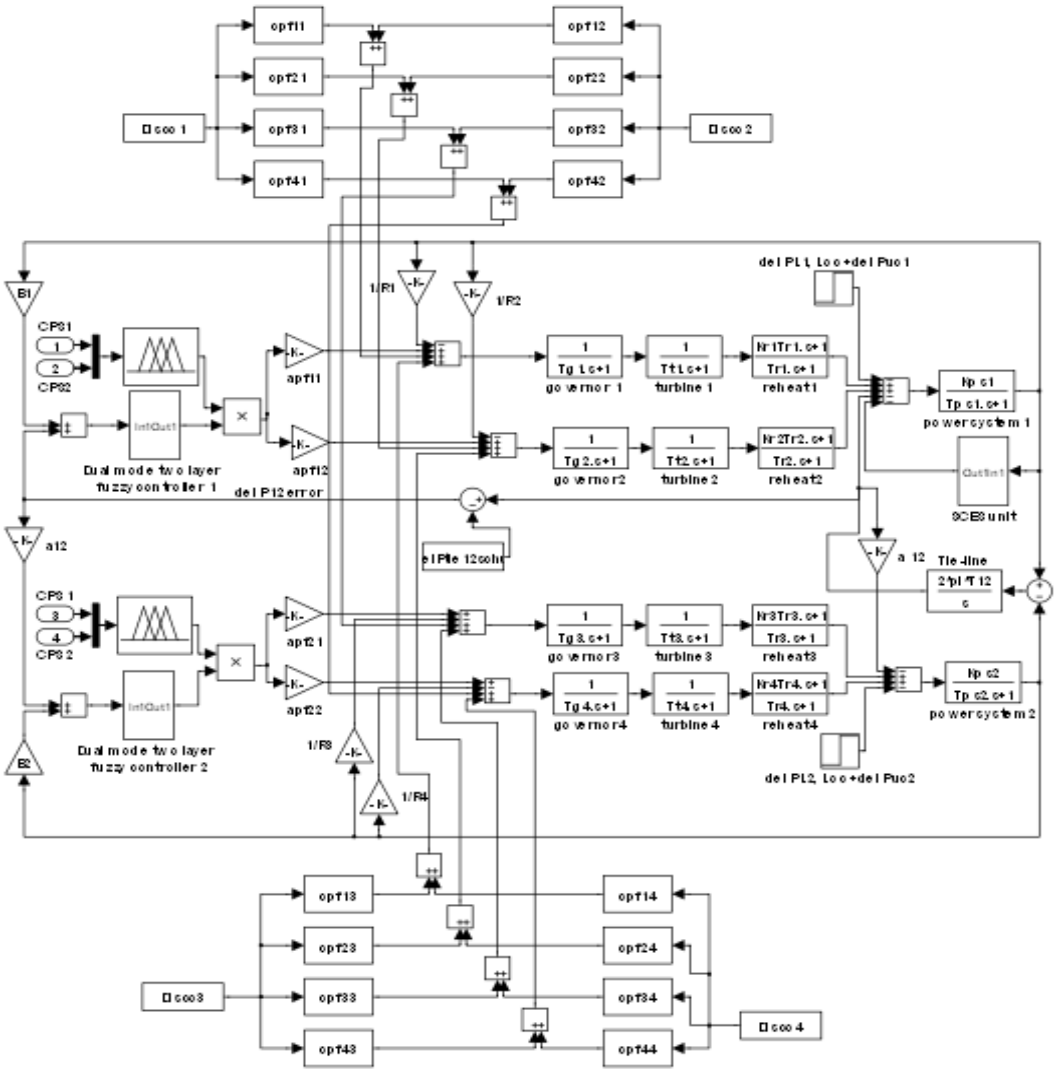


Fig-3: linearized model of two-area reheat thermal interconnected power system in restructured environment with SCES unit

The equivalent system is derived by assuming the synchronizing coefficient $T_{12}$ to be large. From the state equation of $\Delta\dot{P}_{T12}$ in Eq (15)

$$\frac{\Delta\dot{P}_{T12}}{2\pi T_{12}} = \Delta F_1 - \Delta F_2 \tag{16}$$

Setting the value of $T_{12}$ in Eq (16) to be infinity yields $\Delta F_1 = \Delta F_2$. Next, by multiplying state equation of $\Delta\dot{F}_1$ *and* $\Delta\dot{F}_2$ by $\frac{T_{p1}}{k_{p1}}$ and $\frac{T_{p2}}{a_{12}\, k_{p2}}$ respectively, then

$$\frac{T_{p1}}{k_{p1}}\Delta\dot{F}_1 = -\frac{1}{k_{p1}}\Delta F_1 - \Delta P_{T12} + \Delta P_{SCES} \tag{17}$$

ISSN 2394 - 7780

$$\frac{T_{p2}}{a_{12}\,k_{p2}}\Delta\dot{F}_2 = \frac{-1}{k_{p_2}\,a_{12}}\Delta F_2 + \Delta P_{T12} \tag{18}$$

By summing Eq (17) and Eq (18) and using the above relation $\Delta F_1=\Delta F_2=\Delta F$

$$\Delta\dot{F} = \frac{\left(-\frac{1}{k_{p1}}-\frac{1}{k_{p2}a_{12}}\right)}{\left(\frac{T_{p1}}{k_{p1}}+\frac{T_{p2}}{k_{p2}a_{12}}\right)}\Delta F + \frac{1}{\left(\frac{T_{p1}}{k_{p1}}+\frac{T_{p2}}{k_{p2}a_{12}}\right)}\Delta P_{SCES} + C\Delta P_D \tag{19}$$

Where the load change in this system $\Delta P_D$ is additionally considered, here the control $\Delta P_{SCES}$ = -$K_{SCES}$ $\Delta F$ is applied then.

$$\Delta F = \frac{C}{s + A + K_{SCES}\,B}\Delta P_D \tag{20}$$

Where $A=\left(-\frac{1}{k_{p1}}-\frac{1}{k_{p2}a_{12}}\right)\Big/\left(\frac{T_{p1}}{k_{p1}}+\frac{T_{p2}}{k_{p2}a_{12}}\right)$ $B=\frac{1}{\left[\frac{T_{p1}}{K_{p1}}+\frac{T_{p2}}{K_{p2}a_{12}}\right]}$

Where C is the proportionality constant between change in frequency and change in load demand since the control action of SCES unit is to suppress the deviation of the frequency quickly against the sudden change of $\Delta P_D$, the percent reduction of the final value after applying a step change $\Delta P_D$ can be given as a control specification. In Eq (20) the final values with $K_{SCES}$ = 0 and with $K_{SCES}$ ≠0 are C/A and C/(A+$K_{SCES}$ B) respectively therefore the percentage reduction is represented by

$$C/(A+K_{SCES}\,B)\Big/(C/A) = R/100 \tag{21}$$

For a given R, the control gain of SCES is calculated as

$$K_{SCES} = \frac{A}{BR}(100 - R) \tag{22}$$

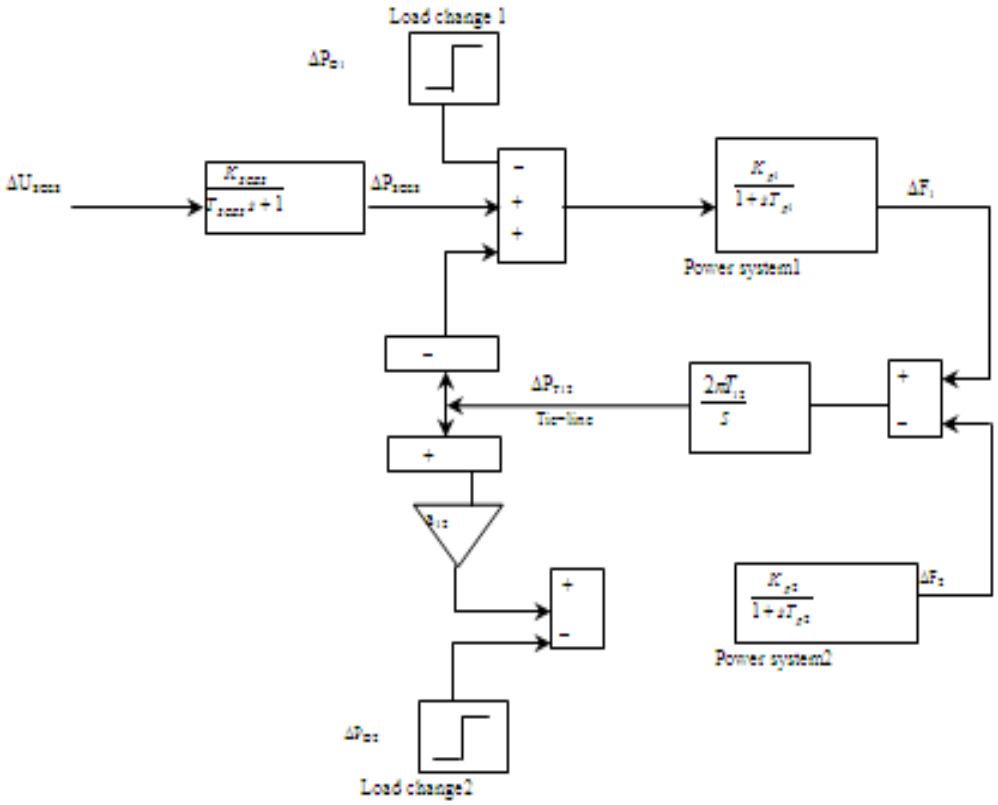


Fig-4: Linearized reduction model for the control design

ISSN 2394 - 7780

## 4. TWO-LAYERED FUZZY LOGIC CONTROLLER

The aim of introducing two layered fuzzy logic controller [10] is to eliminate the steady state error and improve the performance of the output response of the system under study. The proposed control scheme is shown in Fig.5.

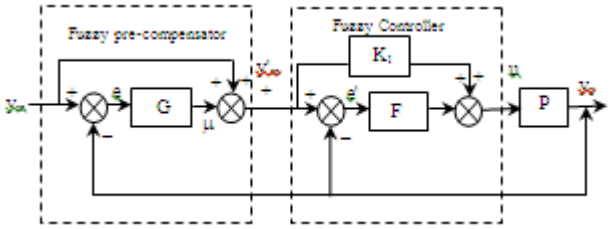


Fig-5: Two layered fuzzy logic controller

The controller consists of two "layers": a fuzzy pre-compensator and a usual fuzzy PI controller. The error e (k) and change of error Δe (k) are the inputs to the pre compensator. The output of the pre-compensator is μ(k). The PI Controller is usually implemented as follows:

$$u(k) = k_p e(k) + TK_i \sum_{n=0}^{k} e(n) \tag{23}$$

Where $e(k) = y(k) - y_r(k); \Delta e(k) = e(k) - e(k-1)$ the controller output, process output and the set point are denoted as u, y and $y_r$ respectively. Experience-based tuning method especially Ziegler-Nichols method requires a close attention since the process has to be operated near instability to measure the ultimate gain and period. This tuning technique may fail to tune the process with relatively large dead time. In order to improve the performance of PI tuning a number of attempts have been made which can be categorized into two groups: Set point modification and gain modification. The set point modification introduces new error terms

$$e_p = y_r(k)F_p(e, \Delta e) - y(k) \tag{24}$$

$$e_i = y_r(k)F_i(e, \Delta e) - y(k) \tag{25}$$

Where $F_p$ , $F_i$ are non linear functions of e and Δe the corresponding control law is given by

$$u(k) = k_p e_p(k) + TK_i \sum_{n=0}^{k} e_i(n) \tag{26}$$

As a special case, the set point is being modified only in proportional terms which implies $F_p$ = β; $F_i$ =1 set point weight [10] therefore

$$U(k) = K_p\{\beta y_r(k) - y(k)\} + TK_i \sum_{n=0}^{k} e(n)$$

$$U(k) = K_p e'(k) + TK_i \sum_{n=0}^{k} e'(n) \tag{27}$$

The pre-compensation scheme [10] is easy to implement in practice, since the existing PI control can be used without modification in conjunction with the fuzzy pre-compensator as shown in Fig. 5 The procedure of rule generation consists of two parts (i) learning of initial rules which determines the linguistic values of the consequent variables. (ii) Fine tuning adjusts the membership function of the rules obtained by the previous step. The structure of the pre-compensation rule is written as If e is $L_e$, and Δe is LΔe then C is $L_c$ where $L_e$, $\Delta L_e$ and $L_c$ are linguistic values of e, Δe, C respectively. Each fuzzy variable is assumed to take five linguistic values Le, LΔe, or $L_c$ = {NB, NS, ZE, PS and PB} this leads to fuzzy rules, if the rule base is complete. The dynamics of overall system is than described by following equations

$$e(k) = ym(k) - yp(k) \tag{28}$$

$$\Delta e(k) = e(k) - e(k-1) \tag{29}$$

$$\mu(k) = G[e(k), \Delta e(k)] \tag{30}$$

ISSN 2394 - 7780

Where μ(k) is a compensating term which is generated using a fuzzy logic scheme

$$y'_m(k) = y_m(k) + \mu(k) \quad (31)$$

$$e'(k) = y'_m(k) + y_p(k) \quad (32)$$

$$\Delta e'(k) = e'(k) - e'(k-1) \quad (33)$$

The proposed two layered FLC compensate these defects and gives fast responses with less overshoot and/or undershoot. Moreover the steady state error reduces to zero. The first layer fuzzy pre-compensator is used to update and modify the reference value of the output signals to damp out the oscillations. The second layer which is known as feedback fuzzy logic control reduces the steady state error to zero. The output of the FLC is given by

$$u(k) = K_1 y'_m(k) + F[e'(k), \Delta e'(k)] \quad (34)$$

**5. PROPOSED DUAL MODE CONTROL SCHEME**

The fixed gain controllers are designed at nominal operating conditions and fail to provide best control performance over a wide range of operating conditions. The well designed integral controller can bring the steady state error to zero but the speed of the response of the system becomes slow resulting high over/ under shoot and settling time. The over/under shoot is reduced and speed of the response improves by using only proportional controller. It is obvious that the presence of the proportional controller is highly required at transient to make system response faster thus reducing the over/under shoot. But incorporating the proportional controller alone fails to bring the steady state error to zero. So there is need to have both proportional and integral controllers. In view of the above context, it seems appropriate selection of the proportional or integral controller be adopted to ensure a better transient and steady state response. When the error is large one control strategy might be chosen and for sufficiently small error another control strategy might be chosen. The control law employed during the transient period, is switched between Eqn (35) and Eqn (36) depending on the magnitude of error signal i.e., ACE (t). For | ACE (t)| > $\varepsilon$ the output of the control

$$\Delta P_c(t) = -K_p . ACE(t) \quad (35)$$

Where $\Delta P_c(t)$ output signal of the controller and E is is constant indicating the specified limit of error signal.

$$\Delta P_c(t) = -K_i . \int ACE(t)\, dt \quad (36)$$

Based upon the above mentioned facts, the dual mode concept is introduced here in the following way. The proportional controller will act during the transient period when the error (ACE) is sufficiently larger, whereas the integral controller would be the better option when the error is small. For the proposed control scheme, the control law is taken as follows

$$\Delta P_{c1}(t) = -K_{p1}(ACE(t)), \quad for |ACE_1| > \varepsilon_1 \quad (37)$$

$$\Delta P_{c1}(t) = -K_{i1} \int (ACE(t)\, dt), \quad for |ACE_1| \le \varepsilon_1 \quad (38)$$

$$\Delta P_{c2}(t) = -K_{p2}(ACE(t)), \quad for |ACE_2| > \varepsilon_2 \quad (39)$$

$$\Delta P_{c2}(t) = -K_{i2} \int (ACE(t)\, dt), \quad for |ACE_2| \le \varepsilon_2 \quad (40)$$

When the error signal remains within the specified limit, i.e., | ACE (t)| < $\varepsilon$ , the system will operate in the integral control strategy.

**6. NERC' S CONTROL PERFORMANCE STANDARDS**

North American Electric Reliability Council (NERC) had proposed new control performance standards CPS1 and CPS2 to evaluate the control area performance in normal interconnected power system operation [16, 17]. Each control area is required to monitor its control performance and report its compliance CPS1 and CPS2 to NERC at regular intervals [18, 19].

ISSN 2394 - 7780

**6.1 Control Performance Standard 1(CPS1)**

CPS1 assesses the impact of ACE on frequency over a certain period window or horizon and it is defined as follows: over a sliding period, the average of the "clock-minute averages" of a control area' s ACE divided by "10 times its area frequency bias" times the corresponding "clock- minute averages of the interconnection frequency error" shall be less than the square of a given constant, $\epsilon_{1,}$ representing a target frequency bound. This is expressed by [18, 19]

$$AVG_{period}\left[\left(\frac{ACE_i}{-10\beta_i}\right)_1 \Delta F_i\right] \leq \varepsilon_1^2 \quad (41)$$

Where $ACE_i = \Delta P_{Tie} + \beta_i \Delta F_i$ , $\Delta F_i$ is the clock- minute average of frequency deviation, $\beta i$ the frequency bias of the $i^{th}$ control area, $\varepsilon_1$ the targeted frequency bound and *n*-scaling factor for CPS1 and $(.)_1$ is the clock-1 min average. To calculate CPS1 ($K_{CPS1}$), a compliance factor ($K_{CF}$) is defined as:

$$K_{CF} = \frac{\sum\left[\left(\frac{ACE_i}{-10\beta_i}\right)_1 \Delta F_1\right]}{n\varepsilon_1^2} \quad (42)$$

CPS1 is then obtained from the following equation $K_{CPS1} = (2 - K_{CF}) * 100\%$ (43)

1. When $K_{CPS1} \geq 200\%$, which means $K_{CF} \leq 0$, there is $\sum (ACE_1 * \Delta F_1) \leq 0$. Under this condition, ACE facilitates the frequency quality

2. When $100\% \leq K_{CPS1} < 200\%$, which means $0 < K_{CF} \leq 1$, there is

$$0 \leq \Sigma\left[\left(\frac{ACE_i}{-10\beta_i}\right)_1 * \Delta F_1\right] \leq n\varepsilon_1^2.$$

The CPS1 standard is satisfied.

3. When $K_{CPS1} < 100\%$, which means $K_{CF} > 1$, there is

$$\Sigma\left[\left(\frac{ACE_i}{-10\beta_i}\right)_1 * \Delta F_1\right] > n\varepsilon_1^2.$$

ACE has exceeded the permitted range so that it has a bad effect on the frequency and quality of power grid.

**6.2 Control Performance Standard 2 (CPS2)**

The second performance standard, CPS2 ($K_{CPS2}$), limits the magnitude of short- term ACE values. It requires the 10-min averages of a control area's ACE be less than a given constant ($L_{10}$), as in the equation below:

$$AVG_{10\min}(ACE_i) \leq L_{10} \quad (44)$$

Where, $L_{10} = 1.65\,\varepsilon_{10}\sqrt{(-10\beta_i)(-10\beta_s)}$ . Note that $\beta_s$ is the summation of the frequency bias settings of all control areas in the considered interconnection, and $\varepsilon_{10}$ is the target frequency bound for CPS2. To comply with this standard, each control area must have its compliance no less than 90%. A compliance percentage is calculated from the following equation:

$$K_{CPS2} = \frac{AVG_{10\min}(ACE_i)}{L_{10}} \quad (45)$$

In order to meet the requirements of the power grid frequency quality, the average ACE value during 10 min in each control region should be in the normal distribution as:

$$\sigma = \varepsilon_{10}\sqrt{(-10\beta_i)(-10\beta_s)} \quad (46)$$

**6.3 Optimization rules based on Control Performance Standards**

Suppose Control Performance Standard 1 ≥100% and Control Performance Standard 2 ≥90% to be goal of the LFC control strategy. Table 1 shows LFC optimization rules based on Control Performance Standard. Fuzzy logic rules are designed to manipulate the conventional integral- type load frequency control to achieve two objectives: (i) minimize equipments' s wear and tear and (ii) comply with NERC, s Control Performance Standard 1 and Control Performance Standard 2. The control structure for each area is

$$u_i = \Delta P_{ci} = \alpha_i \; K_i \int ACE_i \, dt \quad (47)$$

ISSN 2394 - 7780

Where $\Delta P_{ci}$ is the governor set point or raise / lower signal, $K_i$ the integral- control parameter and $\alpha_i$ is set using fuzzy logic and called fuzzy gain. This paper uses the information that reflects compliance with CPS1 and CPS2 are used as the input to form the fuzzy rules. The proposed fuzzy logic will lower the integral gain $K_i$ when the control area has high compliance. On the other hand, that the integral gain $K_i$ will be increased when the compliance with CPS1 of the control area is low according to the optimized rules from the Table 1,

**Table-1: LFC Optimization rules based on CPS**

| Condition | | The state of LFC units |
|---|---|---|
| CPS1 ≥100% and CPS2 ≥90% | | No optimization adjustment |
| CPS1<100% and CPS2 ≥90% | ACE*ΔF>0 | Optimization adjustment |
| | ACE*ΔF<0 | No optimization adjustment |
| CPS1≥100% and CPS2<90% | | Optimization adjustment |
| CPS1<100% and CPS2<90% | | Optimization adjustment |

## 7. SIMULATIONS RESULTS AND OBSERVATIONS

Dual Mode Two Layered Fuzzy logic based controllers are designed and implemented in the multi -unit interconnected thermal reheat restructured power system as shown in Fig.2, in each equal area consists of two GENCOs and two DISCOs. With the installation of SCES unit at the terminal of area 1, the performance of system has been analyzed by adopting LFC. The nominal parameters are given in Appendix. The gain values of SCES ($K_{SCES}$) are calculated for the given value of speed regulation coefficient (R). The gain value is of the super capacitor is found to be $K_{SCES} = 0.67$. Relative compliance of the propose controller based LFC schemes to the NERC standards have been establish for the above power system In the present work, variation of load has been considered for different transactions and the compliance factor ($K_{CF}$) is computed for 1-h using Eq (42). Assuming that the response of the controller to the load variations for the year will be similar to that obtained during the sample period of 1-h. According to the compliance factor ($K_{CF}$) value to calculate Control Performance Standard 1, as defined in Eq (43). In addition, the Control Performance Standard 2, as defined in Eq (45), has also been computed. CPS1 and CPS2 will be the two inputs of the fuzzy logic controller, fuzzy logic rules are design according to their Compliance and Dual Mode Two Layered feed back fuzzy gain changes depend up on the compliance. The gain of the Dual mode two layer fuzzy controllers consists of products of two terms, a pre compensator control gain and feed back fuzzy gain. This feedback fuzzy gain has either Proportional gain or Integral gain. This conflict may be resolved by employing the principle of Dual Mode control. The Dual Mode controller operates by switching between proportional controller mode and Integral controller mode depending on the magnitude of the Area Control Error (ACE). The feedback fuzzy gain is also retune automatically changed according to individual control area's percentages of compliance with CPS1 and CPS2. The fuzzy rule also assures compliance NERC's Control Performance Standards for different transactions. This algorithm will significantly reduce the wear and tear of the equipment since movements of the governor set point or raise/lower signal ($\Delta P_c$) generated from feedback fuzzy gain are less frequent when the control area has high compliance or that values of 1-minute average compliance factor (CF) or accumulatively average compliance factor ($CF_{ac}$) is less than unity. The Super Capacitor Energy Storage unit is located in area 1 which is adopted to ensure the coordinated control action along with the governor unit to enable more improvement in the inertia mode oscillations as shown in Fig. 6 and 7. It is also evident that the settling time and peak over/under shoot of the frequency deviations in each area and tie-line power deviations decreases considerable amount with use of SCES unit. More over it should be noted that SCES coordinated with governor unit requires lesser control effort. From the Table-2 it can be observed that the controller design using dual mode Two layered fuzzy logic controller for two area thermal reheat power system with SCES unit have not only reduces the cost function but also ensure better stability, as they possesses less over/under shoot and faster settling time. Thus SCES unit coordinated with governor unit improves not only inertia mode but also the inter area mode oscillations effectively. The fuzzy rule also assures compliance NERC' s Control Performance Standards for different transactions.

### 7.1 Scenario 1: Poolco based transaction

Consider a case where the GENCOs in each area participate equally in LFC. Assume that the load change occurs only in area 1. Thus, the load is demanded only by DISCO 1 and DISCO 2. Let the value of this load demand be 0.1 pu.MW for each of them i.e. $\Delta PL_1 = 0.1$ pu.MW, $\Delta PL_2 = 0.1$ pu.MW, $\Delta PL_3 = \Delta PL_4 = 0.0$. DISCO Participation Matrix (DPM), referring to Eq (1) is considered as

ISSN 2394 - 7780

$$DPM = \begin{bmatrix} 0.5 & 0.5 & 0 & 0 \\ 0.5 & 0.5 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad (48)$$

Note that DISCO 3 and DISCO 4 do not demand power from any GENCOs and hence the corresponding contract participation factors (columns 3 and 4) are zero. DISCO 1 and DISCO 2 demand identically from their local GENCOs, viz., GENCO 1 and GENCO 2. Therefore, $cpf_{11} = cpf_{12} = 0.5$ and $cpf_{21} = cpf_{22} = 0.5$ For given transaction using Eq (48), simulation results are shown in Fig.6 (a, b, c); it can be observed that the oscillations in area frequencies and tie-line power deviations have decreases to a considerable extent as compare to that of the system without SCES unit. The settling times and peak over/under shoot for the frequency deviations in each area and tie-line power deviations for three case studies are shown in Table 2. It is observed that the systems with SCES unit effectively suppress the oscillation and stabilize the system effectively. The frequency deviation in each area goes to zero in the steady state since there are no contracts of power between a GENCO in one area and a DISCO in another area, the scheduled steady state power flow over tie-line is zero as shown in Fig. 6 (c). In the steady state, generation of a GENCO must match the demand of the DISCOs in contract with it. Expanding eq (7), $\Delta P_{gi} = cpf_{i1}\,\Delta PL_1 + cpf_{i2}\,\Delta PL_2 + cpf_{i3}\,\Delta PL_3 + cpf_{i4}\,\Delta PL_4$ for the case under consideration,

$$\Delta P_{g1,steady-state} = 0.5*0.1 + 0.5*0.1 = 0.1\ p.u.MW,$$

$$\Delta P_{g2,steady-state} = 0.5*0.1 + 0.5*0.1 = 0.1\ p.u.MW,$$

$$\Delta P_{g3,steady-state} = 0\ p.u.MW, \Delta P_{g4,stead-state} = 0\ p.u.MW.$$

Fig.6 (f, g) shows the actual generated powers of the GENCOs reaches the desired values in the steady state when the GENCO 3 and GENCO 4 are not contracted by any of the DISCO for a transactions of power, hence, their change in generated power is zero in the steady state. Thus coordinated control by SCES unit is superior to stabilize the frequency oscillations when compared to that of the system without SCES unit.

**7.2 Scenario 2: Bilateral transaction**

Here all the DISCOs have contract with the GENCOs and the following DISCO Participation Matrix (DPM) be considered.

$$DPM = \begin{bmatrix} 0.4 & 0.25 & 0.75 & 0.3 \\ 0.3 & 0.2 & 0 & 0.25 \\ 0.2 & 0.2 & 0.25 & 0.25 \\ 0.1 & 0.35 & 0 & 0.2 \end{bmatrix} \quad (49)$$

In this case, the DISCO 1, DISCO 2, DISCO 3 and DISCO 4, demands 0.15 pu.MW, 0.05 pu.MW, 0.15 pu.MW and 0.05 pu.MW from GENCOs as defined by *cpf* in the DPM matrix and each GENCO participates in LFC as defined by the following ACE participation factor $apf_{11} = 0.75$, $apf_{12} = 0.25$ and $apf_{21} = apf_{22} = 0.5$. The dynamic responses are shown in Fig.7. Note that ACE participation factor affect only the transient behaviour of the system and not the steady state behaviour when uncontracted load are absent, i.e., $\Delta Puc_1 = \Delta Puc_2 = 0.0$. The scheduled power flow on the tie-line in the direction from area1 to area 2 is by expanding eq (2) we have,

$$\Delta P_{tie,1-2}^{scheduled} = (cpf_{13} + cpf_{23})\Delta PL_3 + (cpf_{14} + cpf_{13})\Delta PL_4 - (cpf_{31} + cpf_{41})\Delta PL_1 - (cpf_{32} + cpf_{42})\Delta PL_2$$

$$\Delta P_{tie,1-2}^{scheduled} = (0.75 + 0)0.15 + (0.3 + 0.25)0.05 - (0.2 + 0.1)0.15 - (0.2 + 0.35)0.05 = 0.0675\ p.u.MW \quad (50)$$

The Fig.7 (c) shows the actual power on the tie-line and it is to be observed that it settles to 0.0675p.u.MW which is the scheduled power flow on the tie-line in the steady state. As given by Eq (7), $\Delta P_{g1,\ steady\text{-}state}$ =0.2Pu MW, $\Delta P_{g2,\ steady\text{-}state}$ =0.0675Pu MW, $\Delta P_{g3,\ steady\text{-}state}$ =0.09Pu MW, $\Delta P_{g4,\ steady\text{-}state}$ =0.0425Pu MW. This is also in Fig.7 (g, h, i, j ).

ISSN 2394 - 7780

**Table-2: System performance for two area interconnected restructured power system**

| **Without SCES units Setting time ($\tau_s$) in sec** | | | **With SCES unit Peak over / under shoot** | | |
|---|---|---|---|---|---|
| $\Delta F_1$ | $\Delta F_2$ | $\Delta P_{tie}$ | $\Delta F_1$ in Hz | $\Delta F_2$ in Hz | $\Delta P_{tie}$ in p.u.MW |
| 16.98 | 15.91 | 26.13 | 0.2974 | 0.1782 | 0.0781 |
| 9.262 | 7.761 | 16.76 | 0.1692 | 0.0846 | 0.0384 |

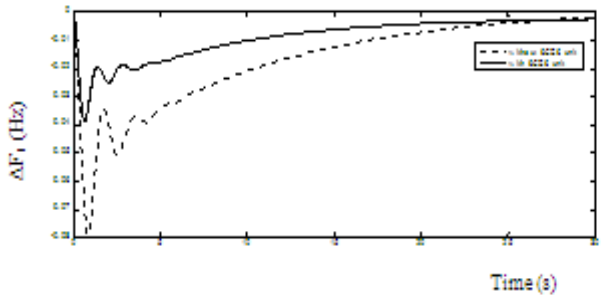


**Fig.6 (a)** $\Delta F_1$ (Hz) Vs Time (s)

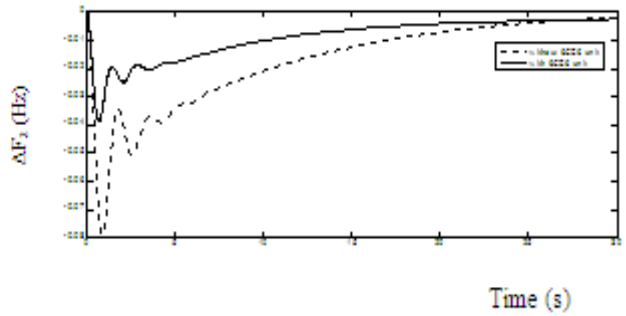


**Fig.6 (b)** $\Delta F_2$ (Hz) Vs Time (s)

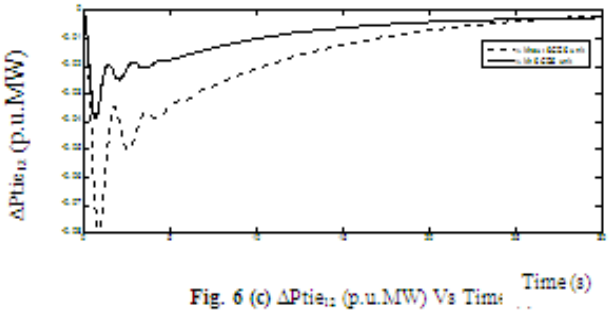


**Fig. 6 (c)** $\Delta Ptie_{12}$ (p.u.MW) Vs Time (s)

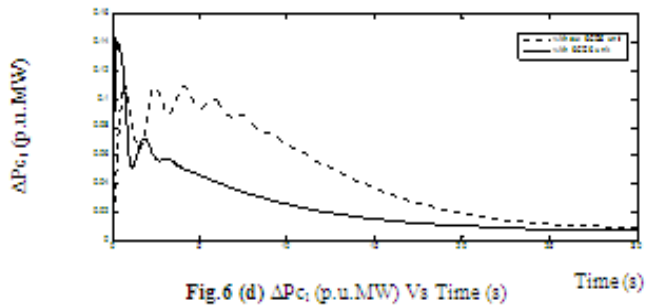


**Fig.6 (d)** $\Delta Pc_1$ (p.u.MW) Vs Time (s)

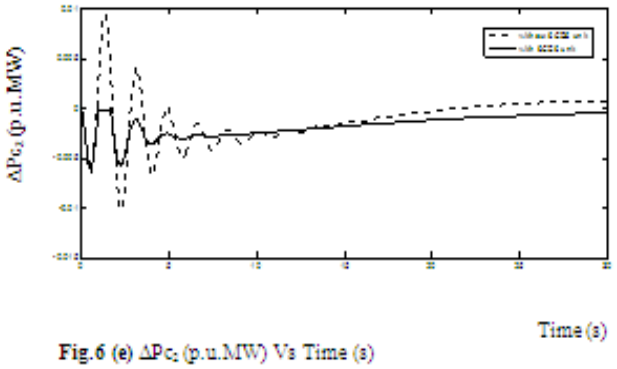


**Fig.6 (e)** $\Delta Pc_2$ (p.u.MW) Vs Time (s)

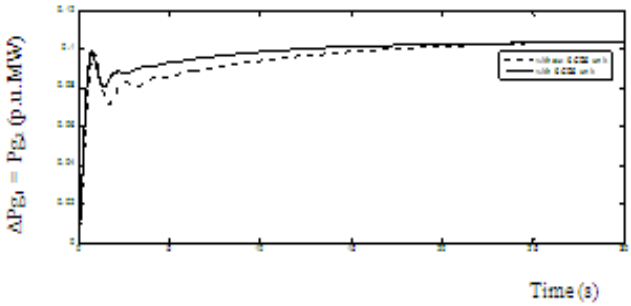


**Fig.6 (f)** $\Delta Pg_1 = Pg_2$ (p.u.MW) Vs Time (s)

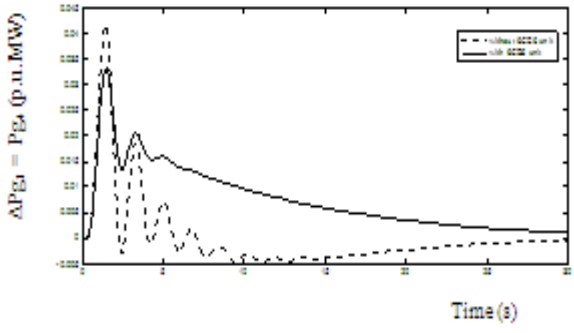


**Fig.6 (g)** $\Delta Pg_3 = Pg_4$ (p.u.MW) Vs Time (s)

Fig.6 Dynamic responses of the frequency deviations, tie- line power deviations, Control input deviations and required additional mechanical power generation for a two area LFC system in the restructured Scenario-1 (poolco based transactions)

ISSN 2394 - 7780

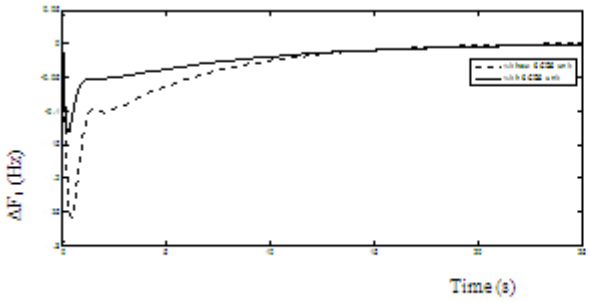


**Fig.7 (a)** $\Delta F_1$ (Hz) Vs Time (s)

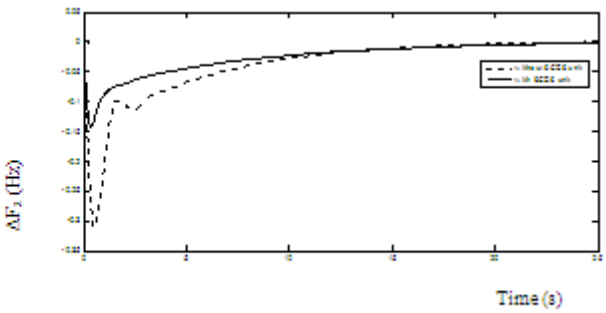


**Fig.7 (b)** $\Delta F_2$ (Hz) Vs Time (s)

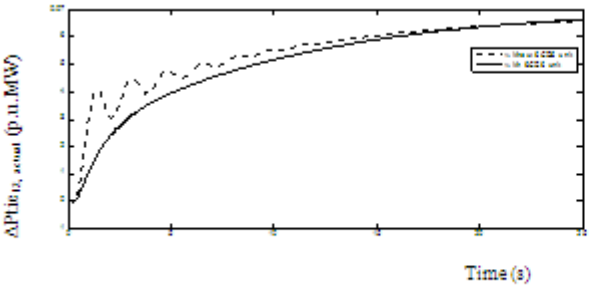


**Fig.7 (c)** $\Delta Ptie_{12,\ actual}$ (p.u.MW) Vs Time (s)

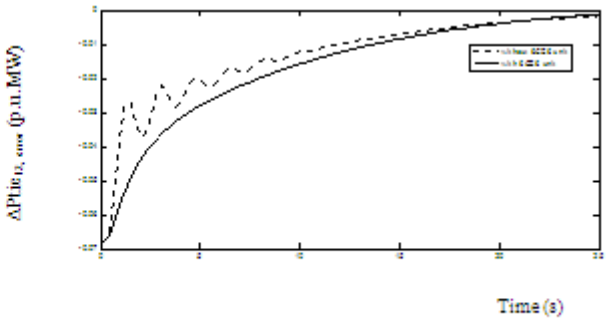


**Fig.7 (d)** $\Delta Ptie_{12,\ error}$ (p.u.MW) Vs Time (s)

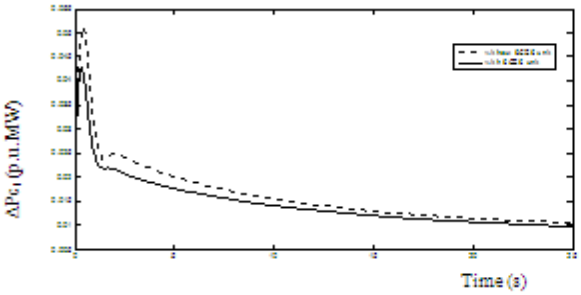


**Fig.7 (e)** $\Delta Pc_1$ (p.u.MW) Vs Time (s)

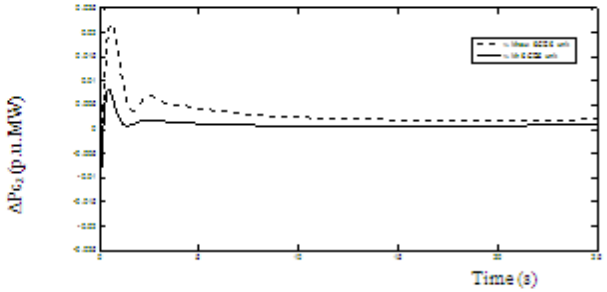


**Fig.7 (f)** $\Delta Pc_2$ (p.u.MW) Vs Time (s)

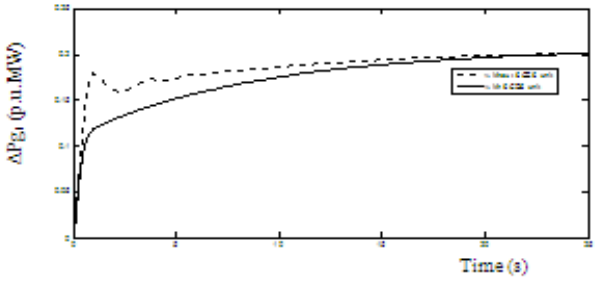


**Fig.7 (g)** $\Delta Pg_1$ (p.u.MW) Vs Time (s)

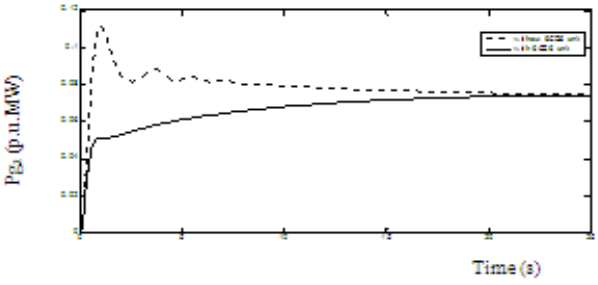


**Fig.7 (h)** $Pg_2$ (p.u.MW) Vs Time (s)

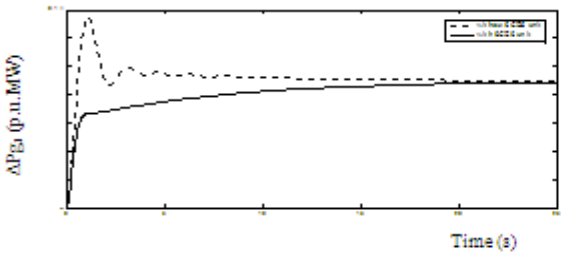


**Fig.7 (i)** $\Delta Pg_3$ (p.u.MW) Vs Time (s)

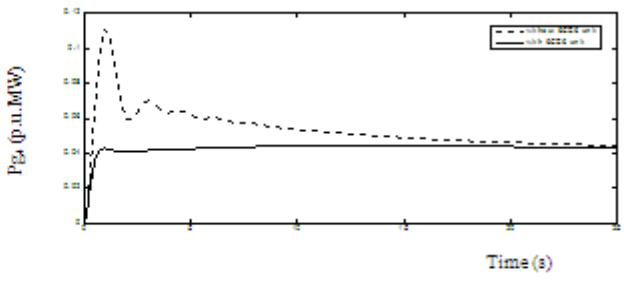


**Fig.7 (j)** $\Delta Pg_4$ (p.u.MW) Vs Time (s)

Fig.7 Dynamic responses of the frequency deviations, tie- line power deviations, Control input deviations and required additional mechanical power generation for a two area LFC system in the restructured scenario-2 (bilateral based transactions)

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## CONCLUSION

Dual Mode Two Layered Fuzzy Logic Controllers were designed and implemented for a two area thermal reheat interconnected restructured power system with Super Capacitor energy storage devices. In this the control scheme consists of two layers viz fuzzy pre-compensator and fuzzy like P and fuzzy like I controllers. Fuzzy rules from the overall fuzzy rule vectors are used at the first layer, linear combination of independent fuzzy rules are used at the second layer. The two layer fuzzy system has less number of fuzzy rules as compared with the fuzzy logic system. The design objectives are (i) to comply with the North American Electric Reliability council's Control Performance Standards (CPS1 and CPS2) (ii) to reduce wear and tear of generating unit's equipments, and (iii) to design feasible control structure. The fuzzy gain is set using fuzzy logic rules which are developed to comply with NERC' s standards and to manipulate the generator's set points only if need be to reduce the excessive manoeuvring and hence minimize the cost of operation and maintenance associated with LFC. For an overload condition for a short time period because of nature of SCES, extremely faster response is obtained with use of SCES unit. From this it is evident that SCES contributes a lot in promoting the efficiency of overall generation control through the effect of the use in load levelling and the assurance of LFC capacity after overload characteristic and quick responsiveness. It may be noted that the design concept accounts for damping out the inertia mode and inter-area mode oscillations in an effective manner by suppressing the frequency deviation of two area system simultaneously with SCES unit. As the influence of the Super Capacitor Energy Storage devices is predominant in damping out the transient oscillation due to the step load disturbance and it may be expected to be utilized as a new ancillary service for stabilization of the tie-line power oscillations even under congestion management environment of the power transfer.

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**APPENDIX – A**

**A.1 Data for Thermal Reheat Power System [21, 22]**

$f^0$ = 60 Hz, $Pr_1 = Pr_2$ = 2000 MW, $K_{p1} = K_{p2}$ = 120 Hz/pu.MW, $T_{pS1} = T_{pS2}$ = 20 sec, $T_{t1} = T_{t2}$ = 0.3 sec, $T_{g1}=T_{g2}$= 0.08 sec, $K_{r1}=K_{r2}$= 0.5, $T_{r1} = T_{r2}$ = 10 sec, $R_1=R_2$= 2.4 Hz/p.u MW, $\beta_1=\beta_2$ = 0.425 pu.MW/Hz, $\Delta P_{D1}$=0.01p.u.MW, T=2sec (Normal sampling rate), $T_{12}$=0.545pu.MW/Hz, $\varepsilon_1$=18mHZ, $\varepsilon_{10}$= 5.7mHZ

**A.2 Data for Super Capacitor Energy Storage unit [17]**

$T_{SCES}$ =0.01sec, $K_{vd}$ =0.1 KV/KA, Ko = 70 KV/Hz, $T_{DC}$= 0.055sec, C = 1F, R= 100ohm, $E_{do}$ =2 kV

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# POWER SYSTEM SECURITY ASSSESMENT OF AN INTERCONNECTED POWER SYSTEM CONSIDERING MIXXED LOAD AND THERMOSTATICALLY CONTROLLED LOADS WITH VARIOUS D-FACTS DEVICES

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## ABSTRACT
*This paper proposes the overview of a control strategies for the security assessment of an interconnected power system coordinated with different loads which can be governed by D-FACTS especially. In this method, the island is prevented from the total loss of supply using few FACTS devices. The limiting factor of the stability and the determination of the transfer limits depend on the load-voltage characteristic since load relief due to the load-voltage dependency results in larger transfer limits. The optimization process is carried out using Bacterial Foraging Optimization Algorithm. The optimized result exhibits tremendous improvement in the system performance. When the proposed scheme is adopted in a IEEE 14 bus test system.*

*Keywords: Distributed Flexible AC Transmission System (FACTS), Interline Power Flow Controller (IPFC), Mixed Load and Thermostatically Controlled Loads*

## I. INTRODUCTION

Load modeling has to provide adequate information considering the aggregate behavior of loads especially for Thermostatically Controlled Load (TCL) model indicating the complex composition of loads defining a dynamic load with temperature control. The recording of the load behavior directly provides information about the operating conditions. The applicability of this information might be used for the dimensioning of the transfer limits, the maximum transfer capacity and the calculation of security limits. Model classification has to be studied in detail based on its operation and the impact on the power system and various inherent compositions. Determining parameters for those models, on the other hand, usually relies on comparison of model response with actual measured behavior [1,2]. Parameter estimation processes seek to minimize the difference between measured and simulated behavior. Different choices for model structure will usually result in different parameter values. This is a consequence of the estimation process which tries to compensate for poorly modeled or ejects the model. In all cases, the models and associated parameter sets are approximations, though the goal should always be obtain to the best possible approximations.

This paper deals with the utilization of the few FACTS controllers like SVC/ UPFC/ IPFC for providing enhanced damping with the optimization procedures or by regulating the performance of the controller even for small perturbations [3,4]. This paper discusses the solution methodologies for power quality improvements by adopting effective monitoring and control strategy / equipments. The basic restoration assessment for thermostatically controlled loads in the power system network has been carried out and the various control corrective actions [4,5] using the three FACTS devices namely SVC, UPFC, IPFC are considered for the power system security assessment studies.

## II. MATHEMATICAL MODELLING OF THERMOSTATICALLY CONTROLLED LOADS (TCL)

This type of loads give raise to pulse sequence where the pulse width and frequency arise from the control hysteresis and the heat balance in these load while the power changes between two or more relatively fixed value. The equivalent thermal parameters for such loads are given by

$$\frac{dT_a}{dt} = \frac{1}{C_a}\left[T_n H_m - T_i\left(G_a + H_m\right) + Q_a + T_o G_a\right] \tag{2.1}$$

$$\frac{dT_m}{dt} = \frac{1}{C_m}\left[H_m - (T_i - T_n) + Q_m\right] \tag{2.2}$$

Where $G_a$ is the Conductance of the load model, $T_o$ is the Outdoor air temperature, $T_i$ is the Indoor air temperature, $T_n$ is the inner mass temperature, $H_m$ is the conductance between the inner air and inner solid mass. $Q_a$ is the heat flue into the interior air mass, $C_a$ is the heat flux into the interior air mass, $C_m$ is Thermal mass of building material and furnishing, $Q_m$ is the heat flux is the interior solid mass, $Q$ is the total heat flux, $Q_i$ is Heat given from the internal load, $Q_s$ is the solar heat gain, $Q_g$ is the heat given from the heating / cooling system. The equivalent thermal parameter such [5,6] individual device loads. According to power state of the unit the heat flux $Q_k$ will have two values as.

ISSN 2394 - 7780

$$Q_h^{on} = Q_i + Q_s + Q_g \quad \text{and} \quad Q_h^{off} = Q_i + Q_s \tag{2.3}$$

Where $T_i$ and $T_n$ is the state variable and time depends on the model parameters, that are collected as a parameter vector as λ.

$$\lambda = \left[G_a, C_a, H_m, C_m, Q_i, Q_s, Q_g, T_o\right]^T \tag{2.4}$$

**2.1 Mathematical Modelling of Mixed Load**

Polynomial or Mixed loads are the nonlinear load model whose powers are a quadratic expression of the bus voltage [2.7]. The Mixed model is a polynomial model as represented in equations (2.5) and (2.6). This section describes in detail about the loads which is similar to a frequency dependent load [6,7]. In addition, the active and the reactive powers depend on the time derivative of the bus voltage. This load when included in the power flow analysis requires accurate modeling apart from the PQ load connected at the same bus [8].

The differential equations represents the two state variables ie time derivatives of the voltage magnitude and angle.

$$\dot{x}_p = \left(-\upsilon_h / T_{f\upsilon} - x\upsilon\right) / T_{f\upsilon} \tag{2.5}$$

$$\Rightarrow \frac{d\upsilon_h}{dt} = x\upsilon + \upsilon_h / T_{f\upsilon}$$

$$\dot{x}_q = -\frac{1}{Tf_t}\left(\frac{1}{2\pi f_n}\frac{1}{T_{ft}}(\theta - \theta_0) + x_\theta\right) \tag{2.6}$$

$$\Rightarrow \Delta G = x_\theta + \frac{1}{2\pi f_n}\frac{1}{T_{ft}}(\theta - \theta_0)$$

The bus power injections $p_h$ and $q_h$ are defined as follows:

$$-p_h = K_{pf}\Delta G + p_0\left[\left(\frac{\upsilon_h}{\upsilon_0}\right)^{a_p} + T_{p\upsilon}\frac{d\upsilon_h}{dt}\right]$$

$$-q_h = K_{qf}\Delta G + q_0\left[\left(\frac{\upsilon_h}{\upsilon_0}\right)^{a_q} + T_{q\upsilon}\frac{d\upsilon_h}{dt}\right]$$

(2.7) The power flow solution provides the initial voltage that is needed for computing the power injections. Where $k_p$ = Percentage of active power, $K_{pf}$ = Frequency coefficient for the active power, $k_q$ = Percentage of reactive power, $x$ = Indexes of filter state variable, $x_v$ = Auxiliary state variable which defines the time derivatives of the voltage magnitude, $x_\theta$ = Auxiliary state variable which defines the time derivatives of the voltage angle, $v_h$ = Active power voltage coefficient, $T_{f1}$ = Filter time constant, $v_0$ = Initial voltage determined in the power flow solution, $K_{qf}$ = Frequency coefficient for the reactive power, $T_{ft}$ = Time constant of voltage angle filter, $T_{f\upsilon}$ = Time constant of voltage magnitude filter, $T_{p\upsilon}$ = Time constant of $dV/dt$ for the active power, $T_{q\upsilon}$ = Time constant of $dV/dt$ for the reactive power, $\alpha_p$ = Voltage exponent for the active power, $\alpha_q$ = Voltage exponent for the reactive power

**IV.COMPUTATION OF VOLTAGE COLLAPSE PERFORMANCE INDICES (VCPI)**

With the power flow model, Jacobian Matrix J represents the first derivatives of active and reactive power mismatch equations, ΔP = ΔP(θ, E) and ΔQ = ΔQ(θ, E), with respect to the voltage magnitude E and angles θ, i.e., the linearization of these equations yields

$$\begin{bmatrix}\Delta P \\ \Delta Q\end{bmatrix} = J \begin{bmatrix}\Delta\theta \\ \Delta E\end{bmatrix} \tag{4.42}$$

Where [ΔP], [ΔQ], [Δθ ] and [ΔE ] are the increments change in nodal bus powers, reactive power, angles and voltage magnitudes.

ISSN 2394 - 7780

$$[J] = \begin{bmatrix} J_1 & J_2 \\ J_3 & J_4 \end{bmatrix} \quad (2.8)$$

$$J_1 = \frac{\partial P}{\partial \theta}, \quad J_2 = \frac{\partial P}{\partial E}, \quad J_3 = \frac{\partial Q}{\partial \theta}, \quad J_4 = \frac{\partial Q}{\partial E} \quad (2.9)$$

The voltage stability of the system is affected by both P and Q. However, at each operation point we keep P constant and evaluate voltage stability by considering the incremental relationship between Q and ( E or V ). This is analogous to the Q-V curve approach. In [8], the authors proposed to reduce the load-flow Jacobian to the first derivative of reactive power equations in relation to voltage magnitude, by assuming that the generator and load buses present no active power variation, i.e., ΔP = 0. Thus,

$$\begin{bmatrix} \Delta P \\ \Delta Q \end{bmatrix} = \begin{bmatrix} J_1 & J_2 \\ J_3 & J_4 \end{bmatrix} \begin{bmatrix} \Delta \theta \\ \Delta E \end{bmatrix} \quad (4.45)$$

$$[\Delta\theta] = -[J_{P\theta}]^{-1} . [J_{PE}]. [\Delta E] \quad (2.10)$$

$$[\Delta Q] = [J_{Q\theta}] [\Delta E] + . [J_{QE}]. [\Delta E] \quad (2.11)$$

After substituting $[\Delta \vartheta], [\Delta Q]$

$$[\Delta Q] = \left( [J_{QE}] - [J_{Q\theta}] . [J_{P\theta}]^{-1} . [J_{PE}]. [\Delta E] \right) \quad (2.12)$$

or

$$[\Delta Q_{load}] = [J].[R].[\Delta E_{load}] \quad (2.13)$$

$$\Delta Q = \left( J_4 - J_3 J_1{}^{-1} J_2 \right) \Delta E = JR\ \Delta E \quad (2.14)$$

Where

$$[J] . [R] = \left( [J_{QE}] - [J_{Q\theta}] . [J_{P\theta}]^{-1} . [J_{PE}] \right) \quad (2.15)$$

$$[\Delta V_{load}] = [J].[R]^{-1}.[\Delta Q_{load}] \quad (2.16)$$

$$\Delta E = \left( J_4 - J_3 J_1{}^{-1} J_2 \right)^{-1}\ \Delta Q\ = JR^{-1}\ \Delta Q \quad (2.17)$$

Where $[J][R]^{-1}$ is called inverse reduced V-Q Jacobian matrix. Its i[th] diagonal element is the V-Q sensitivity at the bus i.

Few parameters can be directly measured and can be used in real time application to compute proximity to collapse index quickly. An example of such indicator is sensitivity of the generated reactive powers with respect to load parameters and voltage magnitude. Voltage Collapse Performance Index (VCPI) is obtained using sensitivity analysis computation using the relation between voltage change and reactive power change and the elements of the inverse of the reduced Jacobian matrix *JR* are Q-V sensitivities [9].

**III. IN BFO FINNALY BY ELIMINATION AND DISPERSAL**

In order to keeping the number of bacteria in the population constant, if a bacterium is eliminated, simply disperse one to a random location on the optimization domain[19,20]

Problem Formulation

$Min\ J = k_2\ p_i^2 + k_1\ p_i + k_0$ (2.18)

*Subject to:*

$P_{min} \le P \le P_{max}\ ; Q_{min} \le Q \le Q_{max}\ ;\ V_{min} \le V \le V_{max}$

Where $k_0$, $k_1$, $k_2$ are cost coefficient and $p_i$ are the parameters to be optimised.

ISSN 2394 - 7780

## III. SIMULATION RESULTS AND OBSERVATION CASE 1

IEEE 14 bus system is considered for the Security Assessment studies are carried. The performance analysis of a IEEE 14-bus, 5-generator system coordinated with different types of Dynamic load models without and with FACTS devices were studied [9-18]. And the optimum utilization requirement with the FACTS devices for each load was determined using BFO [20,21].The performance analysis of a IEEE 14-bus, 5-generator system coordinated with TCL load model without / with FACTS devices (SVC, UPFC, IPFC) were studied [22].

In this case1 1 of study the buses 4, 5 and 14 are connected with TCL Loads. The FACTS devices are connected as follows

1. IPFC connected to Bus 4 between lines 7 and 9
2. UPFC connected to Bus 5 in Line 10
3. SVC at Bus 14.

In a second case of study the buses 4, 5 and 14 are connected with ZIP Loads. The FACTS devise are connected as

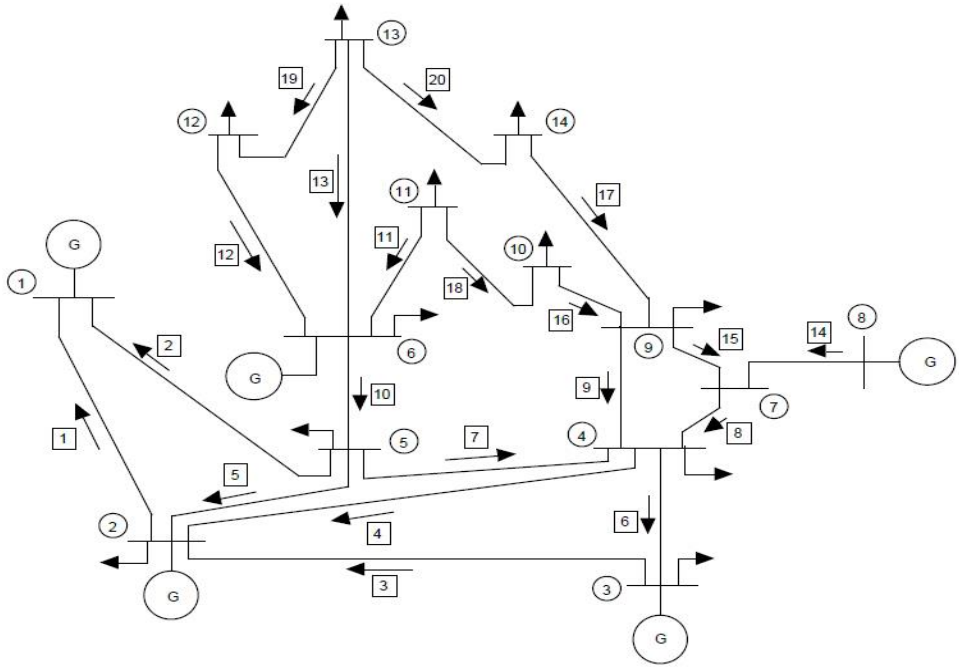

Fig-1: IEEE 14 Bus Systems

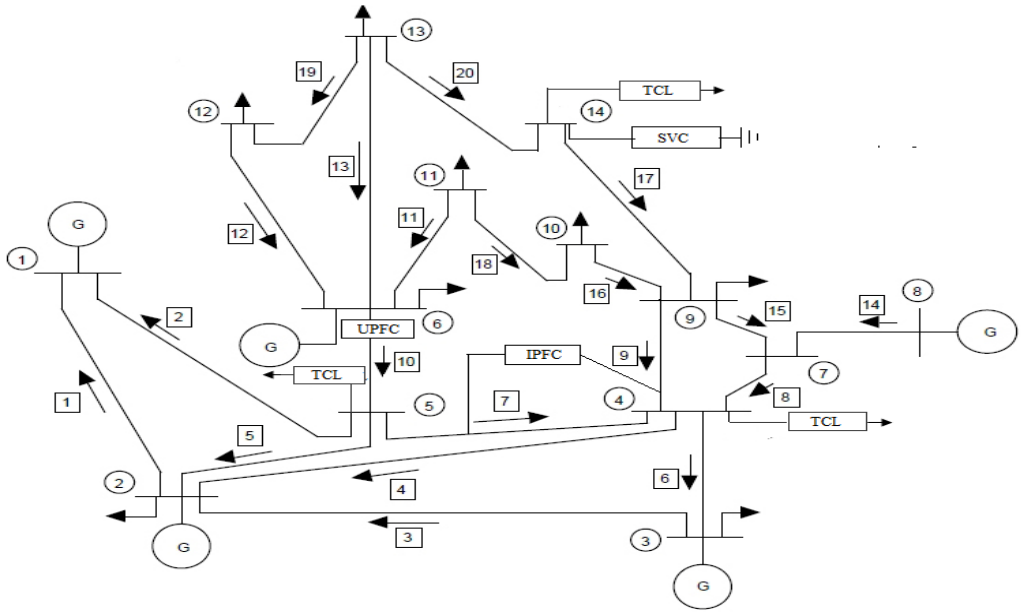


Fig-2: Single line diagram representation of IEEE 14 bus system with various FACTS controllers

ISSN 2394 - 7780

**Table-1: Power flow solution for IEEE 14 bus systems with Thermostatically Controlled Load in bus 4, 5 and bus 14**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.0000 | 2.6204 | -0.4545 |
| 2 | 1.0000 | -6.555 | 0.1830 | 0.7515 |
| 3 | 0.9800 | -15.772 | -0.9420 | 0.3363 |
| 4 | 0.9556 | -12.955 | -0.4780 | 0.0390 |
| 5 | 0.9573 | -11.137 | -0.0760 | -0.0160 |
| 6 | 1.0000 | -18.905 | -0.1680 | 0.1408 |
| 7 | 0.9730 | -17.562 | 0.0000 | 0.0000 |
| 8 | 1.0000 | -17.562 | 0.0000 | 0.1533 |
| 9 | 0.9566 | -20.035 | -0.4781 | -0.1660 |
| 10 | 0.9559 | -20.159 | -0.0900 | -0.0580 |
| 11 | 0.9737 | -19.666 | -0.0350 | -0.0180 |
| 12 | 0.9820 | -19.930 | -0.0610 | -0.0160 |
| 13 | 0.9746 | -20.018 | -0.1350 | -0.0580 |
| 14 | 0.9246 | -21.220 | -0.1490 | -0.0500 |

**Table-2: Weak bus identification indices**

| BUS | VCP INDICES |
|---|---|
| 4 | 32.9343 |
| 5 | 24.5183 |
| 14 | 16.9818 |
| 7 | 12.2831 |
| 10 | 10.0011 |
| 13 | 6.0746 |
| 11 | 4.0992 |
| 12 | 1.3754 |
| 9 | 1.1056 |

**Table-3: Power flow solution for IEEE 14 bus systems with Thermostatically Controlled Load and SVC at bus 14**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.00 | 2.5266 | -0.1708 |
| 2 | 1.0000 | -6.02 | 0.2488 | -0.1979 |
| 3 | 1.0000 | -15.06 | -0.9420 | 0.2945 |
| 4 | 0.9905 | -12.73 | -0.4780 | 0.0452 |
| 5 | 1.0300 | -10.88 | -0.0581 | 0.0234 |
| 6 | 1.0014 | -18.27 | -0.1680 | -0.0117 |
| 7 | 1.0000 | -16.92 | 0.0000 | -0.0000 |
| 8 | 0.9934 | -16.92 | 0.0000 | -0.0081 |
| 9 | 0.9919 | -19.19 | -0.4781 | -0.1660 |
| 10 | 0.9919 | -19.33 | -0.0900 | -0.0580 |
| 11 | 1.0069 | -18.93 | -0.0350 | -0.0180 |
| 12 | 1.0170 | -19.36 | -0.0610 | -0.0162 |
| 13 | 1.0132 | -19.67 | -0.1350 | -0.0580 |
| 14 | 1.0000 | -20.44 | -0.1495 | -0.0491 |

ISSN 2394 - 7780

**Table-4: Power flow solution for IEEE 14 bus systems with Thermostatically Controlled Load and UPFC connected to the buses 5 in line10**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0400 | 0.00 | 2.5308 | -0.1748 |
| 2 | 1.0000 | -6.01 | 0.2488 | -0.2030 |
| 3 | 1.0000 | -15.05 | -0.9420 | 0.2945 |
| 4 | 1.0000 | -12.71 | -0.4780 | 0.0451 |
| 5 | 0.9914 | -10.92 | 0.0581 | 0.0234 |
| 6 | 1.0400 | -18.51 | -0.1680 | 0.0125 |
| 7 | 1.0021 | -16.76 | 0.0000 | 0.0000 |
| 8 | 1.0000 | -16.76 | 0.0000 | 0.0117 |
| 9 | 0.9947 | -18.96 | -0.4781 | -0.1660 |
| 10 | 0.9948 | -19.18 | -0.0900 | -0.0580 |
| 11 | 1.0134 | -18.97 | -0.0350 | -0.0180 |
| 12 | 1.0299 | -19.73 | -0.0610 | -0.0160 |
| 13 | 1.0279 | -20.23 | -0.1350 | -0.0582 |
| 14 | 1.0000 | -19.68 | -0.1493 | -0.0496 |

**Table-5: Power flow solution for IEEE 14 bus systems with Thermostatically Controlled Load and IPFC Between lines 9 and 7 at bus 4**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.00 | 2.5266 | -0.1647 |
| 2 | 1.0000 | -5.98 | 0.2487 | -0.1644 |
| 3 | 1.0000 | -15.15 | -0.9420 | 0.2943 |
| 4 | 1.0000 | -12.93 | -0.4780 | 0.0454 |
| 5 | 0.9895 | -10.97 | -0.0589 | 0.0233 |
| 6 | 1.0200 | -18.23 | -0.1680 | -0.0335 |
| 7 | 1.0007 | -17.24 | 0.0000 | 0.0000 |
| 8 | 1.0000 | -17.24 | 0.0000 | 0.0042 |
| 9 | 0.9921 | -19.58 | -0.4781 | -0.1660 |
| 10 | 0.9890 | -19.65 | -0.0900 | -0.0580 |
| 11 | 1.0004 | -19.08 | -0.0350 | -0.0180 |
| 12 | 1.0065 | -19.27 | -0.0610 | -0.0160 |
| 13 | 1.0029 | -19.50 | -0.1350 | -0.0580 |
| 14 | 1.0000 | -21.25 | -0.1490 | -0.0487 |

**Table-6: Power flow solution for IEEE14 bus systems with Thermostatically Controlled Loads and SVC in bus 14, UPFC in line 10 and IPFC between line 9and 7**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.0000 | 2.3256 | -0.1713 |
| 2 | 1.0000 | -5.478 | 0.2474 | -0.2508 |
| 3 | 1.0000 | -14.289 | -0.9420 | 0.2951 |
| 4 | 1.0000 | -11.747 | -0.4780 | 0.0440 |
| 5 | 1.0000 | -10.185 | -0.0584 | 0.0209 |
| 6 | 1.0200 | -16.386 | -0.1454 | -0.0342 |
| 7 | 1.0043 | -15.153 | -0.0100 | -0.0100 |
| 8 | 1.0000 | -15.153 | 0.0000 | -0.0246 |
| 9 | 1.0000 | -16.922 | -0.3150 | -0.1808 |
| 10 | 1.0010 | -17.141 | -0.0900 | -0.0580 |
| 11 | 1.0041 | -16.904 | -0.0350 | -0.0180 |
| 12 | 1.0040 | -17.315 | -0.0610 | -0.0161 |
| 13 | 0.9986 | -17.381 | -0.1350 | -0.0582 |
| 14 | 1.0000 | -18.235 | -0.1490 | 0.0501 |

ISSN 2394 - 7780

**Table-7: Weak bus identification indices after incorporating D-FACTS**

| BUS | VCP INDICES |
|---|---|
| 14 | 24.7509 |
| 5 | 19.7802 |
| 4 | 11.9220 |
| 7 | 9.7742 |
| 10 | 8.3210 |
| 13 | 4.9275 |
| 11 | 3.8335 |
| 12 | 0.9957 |
| 9 | 0.8166 |

**Table-8: Weak bus identification indices with its percentage after incorporating D-FACTS**

| Bus No. | VCP Index | | | |
|---|---|---|---|---|
| | Without D- FACTS | | With D-FACTS | |
| | Actual | % | Actual | % |
| **4** | 32.93 | **100** | 24.75 | **75.15** |
| **5** | 24.51 | **100** | 19.78 | **80.70** |
| **14** | 16.98 | **100** | 11.92 | **70.20** |

## IV. SIMULATION RESULTS AND OBSERVATION CASE II

IEEE 14 bus system is considered for the Security Assessment studies as discussed below. The performance analysis of a IEEE 14-bus, 5-generator system coordinated with different types of Dynamic load models without and with FACTS devices were studied. And the optimum utilization requirement with the FACTS devices for each load was determined using Dynamic embedded optimization technique.

In this case of study the buses 4, 5 and 14 are connected with ZIP Loads. The FACTS devise are connected as

1. IPFC connected to Bus 4 between lines 7 and 9

2. UPFC connected to Bus 5 in Line 10

3. SVC at Bus 14

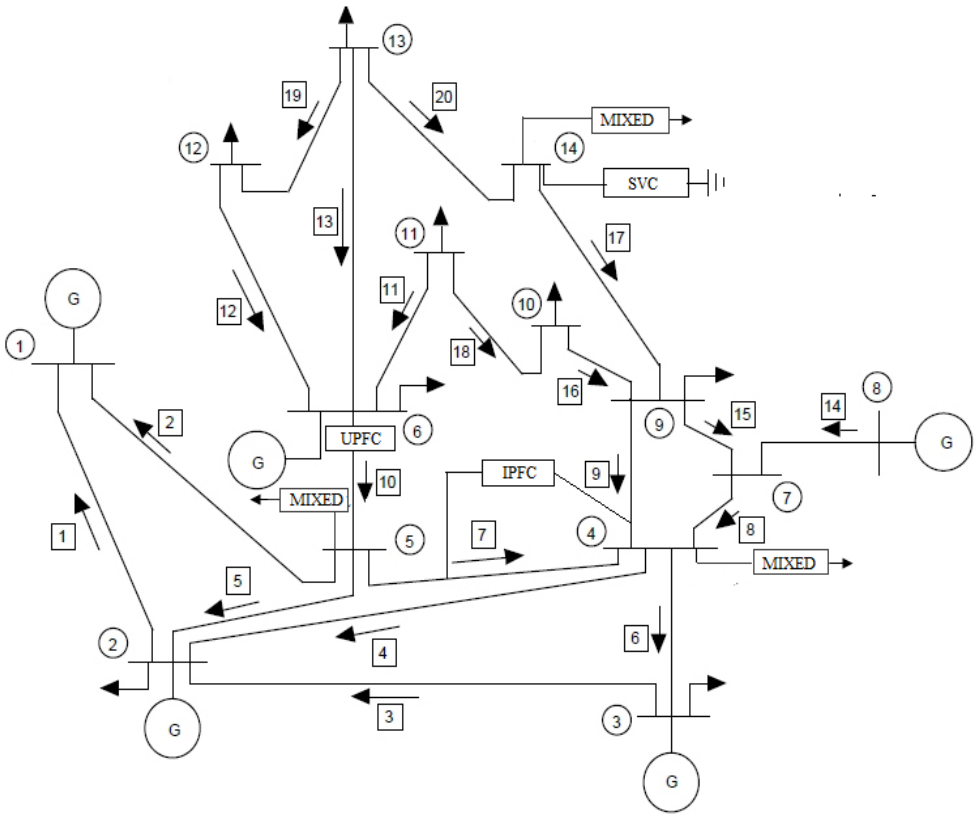


Fig-3: Single line diagram representation of IEEE 14 bus system with various FACTS controllers

ISSN 2394 - 7780

**Table-9: Power flow solution for IEEE 14 bus systems with Mixed Loads in bus 4, 5 and bus 14**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.0000 | 1.9273 | -0.4014 |
| 2 | 1.0000 | -4.888 | 0.1830 | 0.4224 |
| 3 | 0.9900 | -13.067 | -0.9420 | 0.3483 |
| 4 | 0.9729 | -9.472 | -0.4780 | 0.0390 |
| 5 | 0.9720 | -7.961 | -0.0760 | -0.0160 |
| 6 | 1.0000 | -12.014 | -0.0103 | -0.0127 |
| 7 | 0.9920 | -11.117 | -0.0090 | -0.0090 |
| 8 | 1.0000 | -11.117 | 0.0000 | 0.0454 |
| 9 | 0.9869 | -11.932 | -0.0094 | -0.0094 |
| 10 | 0.9814 | -12.273 | -0.0900 | -0.0580 |
| 11 | 0.9870 | -12.289 | -0.0350 | -0.0180 |
| 12 | 0.9841 | -12.931 | -0.0610 | -0.0161 |
| 13 | 0.9794 | -12.960 | -0.1350 | -0.0582 |
| 14 | 0.9643 | -13.529 | -0.1490 | 0.0501 |

**Table-10: Weak bus identification indices**

| BUS | VCP INDICES |
|---|---|
| 4 | 31.4343 |
| 5 | 25.6183 |
| 14 | 18.1818 |
| 7 | 12.2831 |
| 10 | 9.9011 |
| 13 | 5.9746 |
| 11 | 4.0992 |
| 12 | 1.3754 |
| 9 | 1.1056 |

**Table-11: Power flow solution for IEEE 14 bus systems with Mixed Load and SVC at bus 14**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | - 0.00 | 1.8466 | -0.0758 |
| 2 | 1.0000 | -4.41 | 0.2446 | -0.3179 |
| 3 | 1.0000 | -12.46 | -0.9420 | 0.2982 |
| 4 | 1.0000 | -9.21 | -0.4780 | 0.0426 |
| 5 | 0.9967 | -7.75 | -0.0601 | 0.0245 |
| 6 | 1.0500 | -11.56 | -0.0103 | -0.0504 |
| 7 | 1.0345 | -10.76 | 0.0090 | -0.0090 |
| 8 | 0.9945 | -10.76 | 0.0000 | -0.0265 |
| 9 | 0.9913 | -11.51 | -0.0094 | -0.0094 |
| 10 | 1.0132 | -12.27 | -0.0901 | -0.0580 |
| 11 | 1.0275 | -12.62 | -0.0351 | -0.0180 |
| 12 | 1.0329 | -12.35 | -0.0610 | -0.0162 |
| 13 | 1.0268 | -12.29 | -0.1350 | -0.0580 |
| 14 | 1.0000 | -12.41 | -0.0492 | -0.0501 |

**Table 12: Power flow solution for IEEE 14 bus systems with Mixed Load and UPFC connected to the Bus 5 in line10**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.00 | 1.8420 | -0.0646 |
| 2 | 1.0000 | -4.40 | 0.2446 | -0.3053 |
| 3 | 1.0000 | -12.44 | -0.9420 | 0.2983 |
| 4 | 1.0000 | -9.19 | -0.4780 | 0.0427 |
| 5 | 0.9944 | -7.71 | -0.0602 | 0.0244 |
| 6 | 1.0300 | -11.73 | -0.0103 | -0.0057 |
| 7 | 1.0101 | -10.66 | 0.0090 | -0.0090 |

ISSN 2394 - 7780

| | | | | |
|---|---|---|---|---|
| 8 | 0.9862 | -10.66 | 0.0000 | -0.0573 |
| 9 | 0.9945 | -11.38 | -0.0094 | -0.0094 |
| 10 | 1.0069 | -11.75 | -0.0900 | -0.0584 |
| 11 | 1.0149 | -11.87 | -0.0350 | -0.0183 |
| 12 | 1.0149 | -12.66 | -0.0610 | -0.0160 |
| 13 | 1.0102 | -12.75 | -0.1350 | -0.0580 |
| 14 | 1.0000 | -12.86 | -0.0490 | -0.0493 |

**Table-13: Power flow solution for IEEE 14 bus systems with Mixed Load and IPFC Between lines 9 and 7**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.00 | 1.8409 | -0.0637 |
| 2 | 1.0000 | -4.37 | 0.2445 | -0.2873 |
| 3 | 1.0000 | -12.50 | -0.9420 | 0.2979 |
| 4 | 1.0000 | -9.32 | -0.4780 | 0.0428 |
| 5 | 0.9944 | -7.79 | -0.0602 | 0.0244 |
| 6 | 1.0300 | -11.71 | -0.0103 | -0.0007 |
| 7 | 1.0102 | -10.85 | 0.0090 | -0.0090 |
| 8 | 1.0000 | -10.85 | 0.0000 | -0.0579 |
| 9 | 0.9856 | -11.60 | -0.0094 | -0.0094 |
| 10 | 0.9965 | -11.93 | -0.0900 | -0.0580 |
| 11 | 1.0149 | -11.95 | -0.0350 | -0.0180 |
| 12 | 1.0152 | -12.59 | -0.0610 | -0.0160 |
| 13 | 1.0110 | -12.65 | -0.1350 | -0.0580 |
| 14 | 1.0000 | -13.34 | -0.0490 | -0.0492 |

**Table-14: Power flow solution for IEEE 14 Bus system with Mixed Load and SVC in bus 4, UPFC in line 10 and IPFC between line 9and 7**

| Bus No. | Voltage Magnitude | Voltage Angle | Real Power | Reactive Power |
|---|---|---|---|---|
| 1 | 1.0300 | 0.00 | 1.8477 | -0.0695 |
| 2 | 1.0000 | -4.40 | 0.2446 | -0.3120 |
| 3 | 1.0000 | -12.44 | -0.9420 | 0.2983 |
| 4 | 1.0000 | -9.19 | -0.4780 | 0.0427 |
| 5 | 1.0000 | -7.77 | -0.0602 | 0.0245 |
| 6 | 1.0400 | -12.01 | -0.0103 | -0.0014 |
| 7 | 1.0146 | -10.54 | 0.0090 | -0.0090 |
| 8 | 1.0000 | -10.54 | 0.0000 | -0.0262 |
| 9 | 1.0145 | -11.21 | -0.0094 | -0.0094 |
| 10 | 1.0115 | -11.65 | -0.0903 | -0.0584 |
| 11 | 1.0222 | -11.96 | -0.0352 | -0.0183 |
| 12 | 1.0278 | -13.06 | -0.0620 | -0.0160 |
| 13 | 1.0248 | -13.36 | -0.1350 | -0.0580 |
| 14 | 1.0000 | -12.15 | -0.0490 | -0.0497 |

**Table-15: Weak bus identification indices after incorporating D-FACTS**

| BUS | VCP INDICES |
|---|---|
| 14 | 22.2509 |
| 5 | 16.2802 |
| 4 | 10.1220 |
| 7 | 8.3742 |
| 10 | 7.5210 |
| 13 | 4.3275 |
| 11 | 2.6335 |
| 12 | 0.8957 |
| 9 | 0.8166 |

ISSN 2394 - 7780

**Table-16: Weak bus identification indices with its percentage after incorporating D-FACTS**

| Bus No. | VCP Index | | | |
|---|---|---|---|---|
| | Without D- FACTS | | With D-FACTS | |
| | Actual | % | Actual | % |
| **4** | 31.43 | **100** | 22.25 | **70.79** |
| **5** | 25.61 | **100** | 16.28 | **63.56** |
| **14** | 18.18 | **100** | 10.12 | **55.66** |

## V. CONCLUSION

This paper proposes the essential control using few FACTS devices especially SVC, UPFC, IPFC for a IEEE 14-bus system. The results indicate that the adoption of these Distributed Flexible AC Transmission System (D-FACTS) controllers can successfully improve the dynamic stability of the system by restoring the system in a faster manner. Moreover it has been found that with the UPFC, IPFC controllers the load shedding implementation is considerably reduced and can easily be adopted for essential / emergency control. the use of D-FACTS devices ensures a better total control of the power system by means of providing a quality power flow. As the Thermostatically control load's impacts are similar to pulse sequence load impacts which can easily be curtailed with D-FACTS devices, the nonlinear load impacts especially with polynomial loads be considered for the future power system security assessment.

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# A REVIEW STUDY ON DEMOGRAPHY OF NAGPUR MUNICIPAL CORPORATION WITH RESPECT TO THEIR STURDY DEVELOPMENT

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## ABSTRACT
*As per demography of India Nagpur is the second level metropolitan city under government of Maharashtra. Nagpur has benefit of location it is geographically scene at center of India from four metropolitan cities (Mumbai, Delhi, Chennai, Kolkata) flanked by (850 Km-1100 km). As per census 2001 population of Nagpur is 20.50 million but order of population predispose not so fast as like Mumbai and Pune of Maharashtra state but as per City development report it will be doubled during next 25 years. Government of India and Maharashtra fully concentrated on Nagpur due to its demographical returns such as road connectivity, Air connectivity, and Rail connectivity. This paper concentrated on the Nagpur city its connectivity demographical and geographical advantages City Expansion and opportunities. Revenue generation by Nagpur Corporation system, Government support with various schemes its impact on urbanization. This paper also engraves up on new ideas implemented by Nagpur Municipal Corporation and effect on primary resources. Concentrated on Physical and environmental aspects like land usage and pollution levels and finally taken views on the financial status of the municipal corporation.*

## INTRODUCTION
Nagpur is the winter capital of Maharashtra with advantageous geographical location. The Nagpur city got its name from the River Nag or Nag people and is known since prehistoric times. Nagpur and its surrounding region also find a mention in the Vedic and Mauryan scriptures.

Nagpur city foundation lay since year 1703 by the "Bhakt Buland Shah" King of Gond from Deogad. Nagpur city development started since 17th century with wall of 3 miles around 'Nag river' completed by his successor sultan till year 1743. Since year 1744 to year1817 Bhonsle Raghojirao to Appasaheb laid and develops to Nagpur city improves in economical and cultural status. In 1817 British battle with Bhonsle and defeated at sitabuildi after that they concentrated on development of Nagpur declared as second capital of Maharashtra till 1936. Since 1956 it is again part of Maharashtra state. As per geographical climate advantage Nagpur is ahead in production of "Orange", because of its famous oranges Nagpur is known as "orange city". In general Nagpur has a moderate climate, however during the summer it is one of the most heat affected areas of India with an average temperature of 45°C. Sufficient primary and secondary resources for civilization are advantageous values of Nagpur city due to this lot of the projects are concentrated on the Nagpur.

## REVIEW OF LITERATURE
1) **Mrinali Balki and Zarayasmoon: (year 2007): Sixth national conference at Nagpur critical study on transformation of small cities**: 'Transformation of smaller cities as an advent of sprawling development and compacting core: change in urban life/environment.' Recommendations given by the studied authors for Nagpur is as follows:

- Holistically and reinforce public place in coherence to current urban scenario
- Formulate category wise/ congestion or activity wise hierarchy, Street level, Nodes, and block level, specific regulations for vehicular and pedestrian streets.
- Redevelopment of plots in congested area for residential, historical, religious, institutional and commercial building should vary site with respect to consensus with local residents.2

2) **Kirti D. Bhosale (B.Arch), Institute of town planner, Indian journal, july-sep2010: 'A study on urbanization in Nagpur District':**

- Studied on plan for balanced and integrated development of the district and to control the growth of Nagpur.
- Potential cities and towns should be developed to their optimum capacity. These growth centers should be developed not only to direct some of the population that would otherwise come to Nagpur. Big gap in research should be requiring covering with proper study.

3) **RasayanJournal.Com: Vol.3, No.4 (2010), 800-810 ISSN: 0974-1496. 'Study and interpretation of physico-chemical characteristic of lake water quality in Nagpur city (India)'** Purushottam J. Puri,

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M.K.N. Yenkie , D. G. Battalwar1 , Nilesh V. Gandhare and Dewanand B. Dhanorkar 'Lake water quality parameters undergo seasonal changes and values are generally higher during summer season. The present study has shown that Futala, Ambazari, Gandhisager and Gorewada lakes much more polluted, So

Demographical study related to water resources is required.

**RESEARCH METHODOLOGY:**

- Secondary descriptive study and chart interpretation considered in this paper.
- Primary data from various papers taken for study.

**SCOPE OF STUDY:**

- Only Nagpur is the study area and secondary data premeditated in this paper.
- Data for demographical study taken from secondary and authorized resources.
- Nagpur municipal area considered in this study.
- Some demographical characteristics taken for study such as population, water resources, industrial improvement, sewerage water system in urbanization etc.

**SIGNIFICANCE OF STUDY:**

1) People in Nagpur, urbanization, their required facilities, as increase in population.
2) Human and their population and services provided by authorities, living space, basic resources etc. requirements.
3) Fulfillment done by the public authorities and support given by the governmental authorities worth various schemes.

**OBJECTIVES OF STUDY:**

i) To study various characteristics of Nagpur city
ii) To study public authority and its governance
iii) To study urbanization of Nagpur city.
iv) To study strength, weakness, opportunity and challenges in front of Nagpur city.

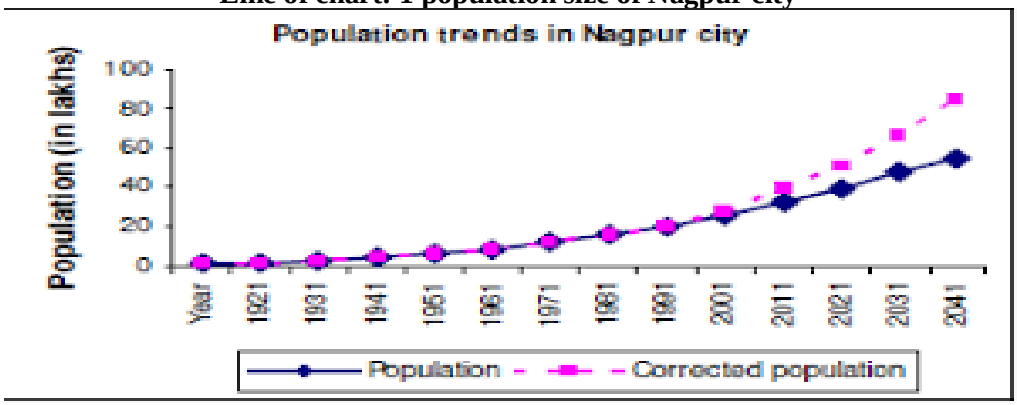
**LIMITATIONS:**

a) Only secondary data is used for study
b) Nagpur city related reports are studied
c) Conclusions are done and suggested with studied secondary data.
d) Only Nagpur municipal corporation and evolution and expansion studied
e) Only concentrated on demographical supporting characteristics

**DESCRIPTION:**

**1) Size and Shape of Population:** Nagpur is the growing city whose population increases gradually but not fast as like Mumbai and Pune. Numbers of the projects were attracted towards the Nagpur due to this urbanization now a day's going on rapidly since previous 5 years.

**Line of chart: 1 population size of Nagpur city**




Courtesy: Nagpur metropolitan by Government of Maharashtra

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**Interpretations:** since 2001 rapid increase in population due to industrial variations as well as attraction towards city migration of population from rural. Nagpur Municipal Corporation has to concentrate on the urbanization with improvement in basic needs. Size of population increases since 2001 basic needs of city increases such as things required for human development.

**2) Demographical characteristics related to connectivity and water resources**

Nagpur is said as central point of India because all metropolitan cities are at equal distance from Nagpur. Importance of the said city increases steadily with gradual increase in population if lot of the resources are few than other cities. Nagpur is the 13th largest urban developing metropolitan city in India. Located near the geographical center of India it is the winter Capital of the state of Maharashtra and is also headquarters of Nagpur Division administration. The Integrated Road Development Project (IRDP) revolutionized the roads in the city, which now enjoy an excellent status, in terms of both coverage and quality. Vehicle ownership is quite high; there are 4.6 million registered vehicles and 280 are being added every day. But the corresponding infrastructure in terms of parking facilities is highly inadequate.

**Water resources**

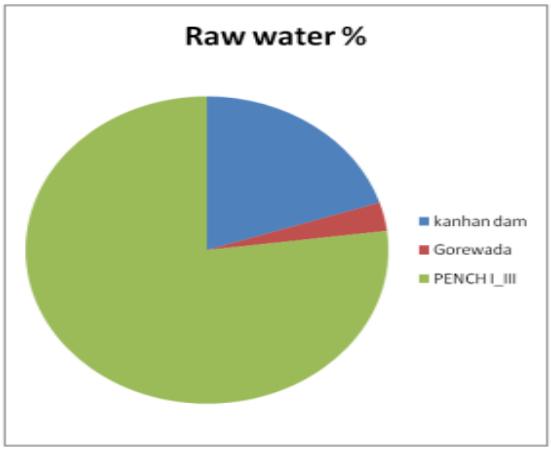
For expansion of any city water is the spirit resource for subsist beings but some lakes around the Nagpur city carry out this since 1990 population increases due to this

Water resources are reserved for civilization.

**Table-1: history of Nagpur water supply water resources dam's**

| Year | Population | Water Supply in mld | Ipcd Rate | Sources |
|---|---|---|---|---|
| 1961 | 644000 | 80.00 | 124 | Ambasari + Gorewada + 1st Aug. Kanhan |
| 1981 | 1217000 | 125.00 | 103 | Ambazari (discarded ), Gorewada + 3 Times Aug. to Kanhan |
| 2001 | 2150000 | 370.00 | 172 | Gorewada + Kanhan + Pench -I + Pench -II |
| 2004 | 2350000 | 470.00 | 200 | Gorewada + Kanhan + Pench -I + Pench -II + Pench -III |

**Pie chart**




Courtesy: Nagpur Municipal Corporation: water project 24*7

**Interpretation**

As per above table and pie chart: since 1961 only two-three resources are sufficient to the Nagpur city for drinking and utilization, since 1981 Ambasari is discarded from water supply system now Nagpur city is depending on Kanhan (20%) and Pench 1-3 (77%) with only 3% of Gorewada. Required water is now reached in between (600 MLD to 700 MLD) due this water system is one of major requirement of vastly growing city Nagpur. Government of India and Maharashtra provides funds under various schemes under various programs such as JNNRUM, SMART CITY etc. Each and every growing city faces problem of water in summer but now a day's Nagpur have sufficient water resources till 2041 by CDC the report.

Another basic need of each and every city is living area for the city for population. Nagpur is surrounded by hills and rivers as well as large agree and non reserved area is available for expansion of population so it's reliable city.

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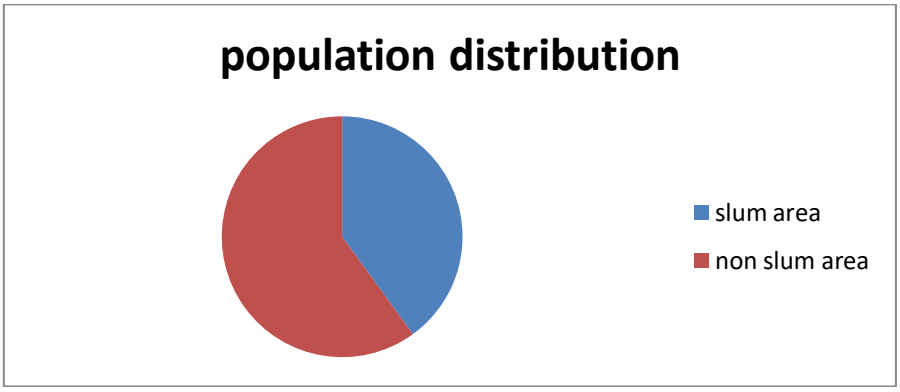
**Sewage system**

The drainage function of an urban local body is related to the disposal of wastewater and storm water. This is carried out either through underground piped drains (sewers) or surface drains, which may be covered or open. Ideally, storm water drainage should be separate from the wastewater drainage system. But most of the cities in India do not have an adequate drainage system to carry the wastewater. So, often the sewage flows through surface drains, which are supposed to carry storm water. In the case of Nagpur, only 60% of the city has underground sewers.

**Nagpur city structure (population and slum population):**




Source: census data from survey 2001

**Interpretation:** Any urbanization and its successes are mainly depending on the expansion of city facilities provided for the population. Better facilities have required space for expansion so in this paper view on the provision of expansion area of Nagpur. In Nagpur, 40% of the population lives in slums. There are about 427 slum pockets in the city spread over an area of about 17 sq. km. Of the 427 slums, 292 slums housing 80% of the slum population are notified. In 1997, the slum population of Nagpur was about 6.61 millions, which increased to 7.4 millions in 2001 and 8.08 millions in 2005, thus showing a growth of 22% in the last eight years. This statistic is alarming for a growing city like Nagpur. The slums are spread over the geographical expanse of the city. The area of slum pockets varies from 2,000 to 50,000 sq. m...

**CLIMATE OF NAGPUR CITY**

Climate is one of the important characteristics of each and every city which is expanding. In summer season temperature reaches to 47 degree centigrade whereas after monsoons, the average temperature varies between 27 degree Centigrade and approx 6-7 degree Centigrade right through December and January. The average annual rainfall is 45 inches, with more rain in the east than in the west.

**CONCLUSIONS**

As per Demography of Nagpur city related to Nagpur Municipals Development: since 1990 to 2010 studied and suggestions given in the form of SWOC analysis.

***** Strengths: As per above study researcher concluded strengths of the Nagpur municipal city:**

1) Strong historical back ground since 10$^{th}$ century (A.D. 940) Rashtrakuta, part of Dandak forest recorded in olden times.
2) Various kings ruled out to Vidarbha which is part of Empire Ashoka. Whereas area Vidarbha made to order under Nagpur city and since 1803 underneath of Mount Elphinstone British started governing the city and formulated west Nagpur.
3) Simon commission visited to Nagpur 1926 and is part of Mumbai- Maharashtra since 1956-1960 till date.
4) Nagpur city have Excessive land available in and around for consumption.
5) High compactness centers rather than at margin
6) Lack of choice in ways to travel but underdone routs are available throughout the India
7) Fragmented open space, Narrow gaps between development and scattered appearance
8) Different type of choices available in housing sector with low to high prices depending on population requirements.
9) Water resources are required to develop as per requirement by authorities.

ISSN 2394 - 7780

10) Commercial buildings have large space available in and around city.

11) Number of the public places available with sufficient area and required facilities.

12) Number of the community centers also available in the city with minimum facilities.

13) Good number of reservoirs and location wise water wiring is available.

****Weakness: As per demographical study of Nagpur city concluded weakness:**

a) No separation of uses into distinct areas

b) Cyclical one story development system but not actualized

c) Routes are available but transportation has problems due to development and renovations.

d) Commercial space and buildings available as per town planning but parking and its reservation is major problem in front of development plan.

e) Lack of quality public spaces and compacted community centers.

f) Internal road structuring and facilities are not sufficient for expanding cities.

g) Concentration is required on the water resources.

h) Required to reduce water loss per day from reservoirs of Nagpur city.

**Opportunity: As per study demographical characteristics opportunity in front of Nagpur:**

i) Transformation of smaller city to A** Second level metropolitan city improving facility.

j) Most important with compacting urban core and sprawling development could largely be addressed

k) Major themes and designs could be implemented in all direction and strategies and design guidelines. (Roads, rivers, fiber lines, Sewerage system, architecture etc.)

l) Due to central advantage from four metro cities expansion and urbanization major opportunity in front of Nagpur.

**Challenge: As per demography of Nagpur city challenges as follows:**

1) This could be an attempt to retain the lifestyle and environment wherever required specifically in old core cities which is transforming drastically and affecting the whole urban precinct and native inhabitants.

2) A poor resource of water and water pollution is the challenge in front of the administrating body.

3) Old core city and expansion of business is major problem in front of Nagpur Municipal Corporation.

4) Sub urban area and its connectivity and area under NMRDA and flair given that is the challenge in front of city.

**Outcome: With this study paper sights on all sides of the Nagpur city with its demographical characteristics.**

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# FOLIAR APPLICATION OF MINOR ELEMENTS AND ITS EFFECT ON ESSENTIAL ELEMENTS UPTAKE BY SOYBEAN CROP

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## ABSTRACT
*A field experiment was conducted during the year 2016-17 at Sawandgaon tal.vaijapur dist Aurangabad.M.S.India. with aim to study the effect of seed fortification with Mo and foliar application of Zn and Fe on uptake of nutrient at critical growth stages of soybean crop. The treatments comprise of RDF along with seed fortification of Mo and foliar application Zn and Fe alone and in different combination. The foliar application Zn and Fe @ of 0.5% used at 30,50 and 70 days after sowing.*

*This study results shows that the significant and maximum nutrient uptake i.e. 174.18, 181.55 and 186 kg N ha$^{-1}$, 16.84, 17.81 and 19.23 kg Pha$^{-1}$, 128.17, 134.35 and 141.13 kg K ha$^{-1}$ and 18.96, 21.12 and 24.34 kg S ha$^{-1}$ were recorded at flowering, pod formation and harvesting stages of soybean crop with application of treatment $T_9$ which received RDF along with seed fortification of Mo and foliar application Zn and Fe. Similarly, micronutrient uptake was also noticed significant and maximum i.e. 162.91, 166.91 and 177.41 g. Zn ha$^{-1}$, 398.85, 401.24 and 402.39 g. Fe ha$^{-1}$ and 189.57, 198.18 and 203.15 g. Mo ha$^{-1}$ at flowering pod formation and harvesting stage of soybean plot with use of treatment T9, except the Fe content was found maximum with the use of treatment $T_6$ which comprised of RDF along with foliar application of Fe and Zn.*

*Keywords: minor elements, Soybean crop, essential elements, foliar application.*

## INTRODUCTION
The increasing cost of fertilizer nutrients have led to search for alternative practices of managing the fertilizer nutrients more judiciously, efficiently and in balance proportions. Such approach would reduce the depletion of macro and micronutrients from soil. Among the nutrients, macro-nutrients have been given the priority and little attention has been given the priority and little attention has been paid towards micronutrients. In the absence of micronutrients, plant shows physiological disorder which eventually lead to low crop yield and fair quality. feeding in which micronutrients in the form of liquid are used into leaves[6]. Foliar application of micronutrient is more beneficial than soil application. Since application rates are lesser as compared to soil application, same quantity of nutrient application could be supplied easily and crop reacts to nutrients application immediately. Foliar spraying of micronutrient is very helpful when the roots cannot provide necessary nutrients. Crop roots are unable to absorb some important nutrients such as Zn, because of soil properties, such as high pH, lime or heavy texture, and in this situation, foliar spraying is better as compared to soil application[2]. It has been found that micronutrient foliar application is in the same level and even more influential as compared to soil application. Resistance to different stresses will be increased by foliar application of micronutrients. Since in field situation, soil features and environmental factors which affect nutrients absorption are extremely changeable, foliar application could be an advantage for crop growth and yield.

## MATERIAL AND METHODS
The experiment was conducted in 2016-17 at sawandgaon tal.vaijapur dist Aurangabad.. Experiment was conducted to study the effect of foliar application of micronutrients (Zn, Fe) and seed treatment with Mo on growth, yield, uptake of nutrients and quality of Soybean.

The experiment was laid out in Randomized Block design with nine treatments replicated thrice; each treatment consisted of 10 rows with row to row spacing of 45 cm. The soil had pH 7.7 and EC 0.28 dSm$^{-1}$ and clayey texture. NPK fertilizer application (30:60:30) and other agronomic practices were carried out uniformly according to the recommendations in all the treatments. Seed treatment of Mo @ 4 g kg$^{-1}$ (Source: Ammonium molybdate) at the time of sowing and foliar application of $ZnSO_4$ (0.5%) and Fe $SO_4$ (0.5%) at 30, 50, 70 DAS was given. Plant sample was collected at flowering, pod formation of soybean from each plot and uptake of nutrients were estimated. The nutrient (N, P, K and S) and micronutrient (Fe, Zn and Mo) uptake at flowering at pod formation and at harvest was calculated by multiplying its per cent concentration with total dry matter. Total nitrogen content in plant and grain was determined using the digestion method described by Parkinson and Allen[7].

Whereas, total Zn and Fe were determined by di-acid mixture extraction method[3] and total Mo was determined by spectrophotometric method as described by Purvis and Peterson[11]. The soil physicochemical characteristics

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are presented in Table 1. The findings of the present study as well as relevant discussion have been presented under following heads.

**NUTRIENT UPTAKE**

**Uptake of essential nutrients**

The data recorded on nutrient uptake by soybean as influenced by foliar application of Zn and Fe with or without seed treatment of molybdenum increased the uptake of nitrogen, phosphorus, potassium and Sulphur significantly.

**Nitrogen uptake**

Data presented in (Table 2) with respect to nitrogen uptake by soybean as influenced that at flowering, pod formation and harvest stages, the highest uptake of nitrogen was recorded i.e. 174.18 and 181.55. kg N $ha^{-1}$. In treatment ($T_9$) which received N,P,K,S and foliar application of iron and zinc with seed treatment of molybdenum. It was Observed with $T_7$ and $T_6$ found superior over rest of the treatments. The lowest uptake of nitrogen was recorded i.e.121.62 and 127.74 kg N $ha^{-1}$ respectively in control ($T_1$) which receives N, P, K, and S alone. This result might be due to foliar feeding with micronutrients. It could partially counteract the negative effect of NaCl on nutrients uptake through improving root growth and prevented the nutritional disorders and caused an increase in the uptake of nutrients by the roots. The increased uptake of nitrogen might be resulted due to increased dry matter production. These results are in conformity to the finding of El-Foully et al., in wheat and Vyas et al.[10], in soybean.

**Phosphorus uptake**

Data with respect to Phosphorus uptake by soybean as influenced by foliar application of Zn and Fe with or without seed treatment of molybdenum presented in Table 1, revealed that, at flowering, pod formation and at harvest the highest uptake of phosphorus was recorded (16.84, 17.81 and 19.23 kg P $ha^{-1}$ respectively) in treatment ($T_9$) which received N, P, K, S and foliar application of iron and zinc with seed treatment of molybdenum. Treatment $T_9$ was at par with $T_7$ and found superior over rest of the treatments. The lowest uptake of phosphorus was recorded i.e.12.13, 12.56 and 12.87 kg $Pha^{-1}$ respectively in control ($T_1$) which receives N, P, K and S alone. This result might be due to synergistic effect of iron with phosphorus increased nutrient uptake will result in higher dry matter production and yield. These findings are in conformity with the result reported by Ravi et al.[8] in safflower and Mahatma. N[4]. in cotton.

**Potassium uptake**

Data with respect to potassium uptake by soybean as influenced by foliar application of Zn, Fe with or without seed treatment of Mo presented in Table 1 indicated that, at flowering, pod formation. The highest uptake of potassium was recorded i..128.17, 134.35 and 141.13 kg K $ha^{-1}$ respectively with application of treatment ($T_9$) which received N, P, K, S and foliar application of Fe and Zn with seed treatment of Mo. This treatment $T_9$ was found to be was at par with $T_7$ and $T_6$ and superior over rest of the treatments. The lowest uptake of potassium was recorded 94.49, 97.58 and 102.61 kg $ha^{-1}$ respectively with control ($T_1$) which receives N, P, K and S alone.

**Sulphur uptake**

Table-2 reveals that on uptake of the Sulphur recorded at flowering, pod formation and at harvest were showed that, the uptake of S was significantly affected due to foliar application of micronutrients. At flowering stage, at pod formation significantly highest uptake of Sulphur was recorded (18.96, 21.12 and 24.34 kg ha-1 respectively) with treatment $T_9$ which received NPKS + FeSO4 (0.5%) + ZnSO4 (0.5%) + Mo. It was at par with $T_7$ and $T_6$ and found superior over rest of the treatments. The lowest uptake of S was recorded (10.84, 11.23 and 11.84 kg $ha^{-1}$ respectively) in control ($T_1$). Similar results were reported by Ravi et al.[8], on Sulphur.

**UPTAKE OF NON-ESSENTIAL NUTRIENT**

**Zinc uptake**

Table 3- data reveals that with respect to Zn uptake by soybean as influenced by foliar application of Zn, Fe with or without seed treatment of Mo showed that at flowering, pod formation and at harvest stage of soybean the highest uptake of Zn was noticed i.e. 172.51, 178.59 and 184.01 g Zn $kg^{-1}$ respectively in treatment ($T_6$) which received N, P, K, S and foliar application of Zn and Fe. It was at par with $T_9$ and found superior over rest of the treatments. The lowest uptake of zinc was recorded 141.10, 148.57 and 151.32 g Zn $kg^{-1}$ respectively in control (T1). This might be due to Zn spray improved the root growth and prevented nutritional disorders and consequently, caused increase the uptake of Zn and also due to interaction effect of Zn and Fe. The available soil Zn status (0.4 mg Zn $kg^{-1}$) was below critical level hence, there is significant response in terms of zinc uptake observed in the treatment receiving Zn. This result was supported by the findings of El Foully et al.[1] in wheat, Ravi et al[8]. in safflower.

ISSN 2394 - 7780

**Iron uptake**

Table 3- data reveals that with respect to Iron uptake by soybean as influenced by foliar application of zinc, iron with or without seed treatment of molybdenum revealed that at flowering, pod formation and at harvest stages the highest uptake of Fe was recorded (401.30, 408.31 and 419.66 g kg-1 respectively) with allocation of treatment ($T_6$) which received N, P, K, S and foliar application of Zn and Fe. It was at par with $T_9$ and $T_7$ while found superior over rest of the treatments. The lowest uptake of Fe was recorded 340.09, 346.24 and 349.29 g kg-1 respectively in control ($T_1$) which receives N, P, K and S alone. Increase in iron uptake due to improve the performance of root growth and prevented nutritional disorders and consequently caused increased the uptake of iron.

**Molybdenum uptake**

Table 3- data reveals that with respect to molybdenum uptake by soybean as influenced by foliar application of zinc, iron with or without seed treatment of molybdenum showed that at flowering stage, at pod formation and at harvest stage the highest uptake of molybdenum was recorded 189.57, 198.18 and 203.15 g kg-$^{1}$ respectively) with allocation of treatment $T_9$ which received N, P, K, S and foliar application of Zn and Fe with seed treatment of Mo. Treatment $T_9$ was at par with $T_6$, $T_8$, $T_7$ and $T_5$ found superior over rest of the treatments. The lowest uptake of molybdenum was recorded 159.35, 163.45 and 171.39 g kg-1 respectively in control (T1) which receives N, P, K and S alone. The increased in Mo was might be due to synergistic effect of zinc, iron and molybdenum in the metabolic activities in photosynthesis, nitrogen metabolism, essential for protein synthesis. Molybdenum and iron plays important role in activities of several enzymes. Similar result was quoted by Nadiya Gad[5]. in cowpea due to molybdenum seed treatment. Sale and Nazirkar[9]. reported that micronutrient application had significant effect on nutrient uptake of soybean.

**CONCLUSION**

From this study it is concluded that application of treatment $T_9$which received RDF along with seed fortification of Mo and foliar application Zn and Fe significantly superior in order to have maximum essential nutrient (N P K S) and non-essential nutrient (Zn and Mo) uptake in soybean. It was observed that the treatment $T_7$ is the next best option.

**Table-1: Physical and chemical properties of soil at experimental site**

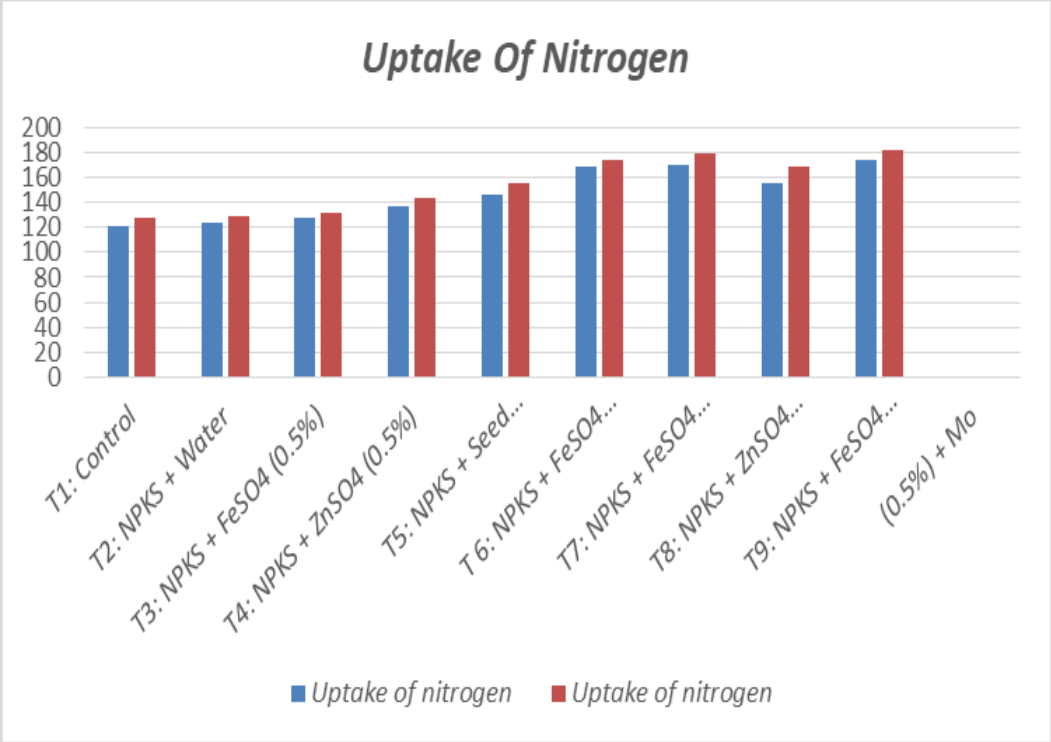
| Sr.No. | Particulars | Value |
|---|---|---|
| **(A)** | **Physical properties** | |
| 1. | Soil texture | Clay |
| **(B)** | **Chemical properties** | |
| 1. | pH | 7.7 |
| 2. | EC (d \Sm$^{-1}$) | 0.28 |
| 3. | Organic carbon (g Kg$^{-1}$) | 7.0 |
| 4. | Calcium carbonate | 6.5 |
| 5. | Available Nitrogen (Kg ha$^{-1}$) | 126.75 |
| 6. | Available Phosphorus (Kg ha$^{-1}$) | 16.22 |
| 7. | Available Potassium (Kg ha$^{-1}$) | 567.07 |
| 8. | Available Sulphur (Kg ha$^{-1}$) | 16.45 |
| 9. | Available Zinc (mg kg$^{-1}$) | 0.4 |
| 10. | Available Iron (mg kg$^{-1}$) | 1.2 |
| 11. | Available Molybdenum (µg g$^{-1}$) | 0.06 |

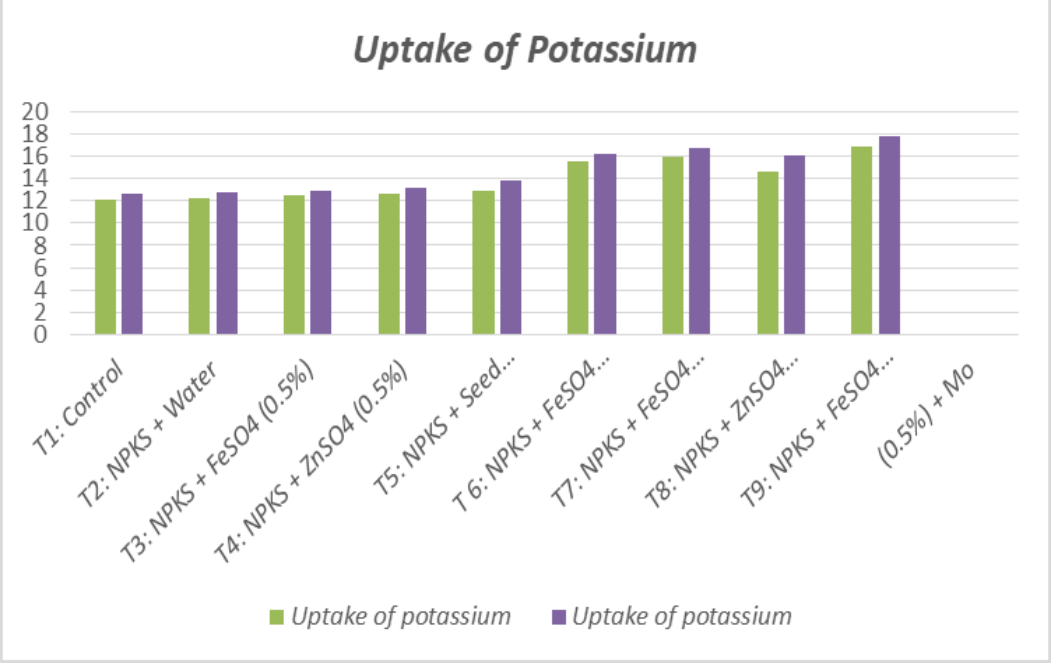
**Table-2: Uptake of major nutrients in soil as influenced by foliar application of micronutrient at critical growth stages of soybean**

| Treatments | Up take of nitrogen | | Up take of potassium | | Up take of phosphorous | | Up take of Sulphur | |
|---|---|---|---|---|---|---|---|---|
| | **At Flowering** | **At pod formation** | **At Flowering** | **At pod formation** | **At Flowering** | **At pod formation** | **At Flowering** | **At pod formation** |
| T1: Control | 121.62 | 127.74 | 12.13 | 12.56 | 94.49 | 97.58 | 10.84 | 11.23 |
| T2: NPKS + Water | 124.21 | 129.44 | 12.29 | 12.78 | 97.87 | 101.73 | 12.01 | 12.54 |
| T3: NPKS + FeSO4 (0.5%) | 126.97 | 131.76 | 12.46 | 12.93 | 105.49 | 109.4 | 12.45 | 12.89 |
| T4: NPKS + ZnSO4 (0.5%) | 137.11 | 143.58 | 12.57 | 13.19 | 108.52 | 113.26 | 13.76 | 13.85 |

ISSN 2394 - 7780

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| T5: NPKS + Seed treatment with Mo | 146.43 | 155.59 | 12.87 | 13.84 | 110.42 | 117.68 | 14.54 | 15.45 |
| T 6: NPKS + FeSO4 (0.5%) + ZnSO4(0.5%) | 168.79 | 173.58 | 15.51 | 16.26 | 119.74 | 121.5 | 16.32 | 17.54 |
| T7: NPKS + FeSO4 (0.5%) + Mo | 170.48 | 178.64 | 15.99 | 16.67 | 122.85 | 126.98 | 18.29 | 19.89 |
| T8: NPKS + ZnSO4 (0.5%) + Mo | 155.24 | 168.80 | 14.62 | 16.07 | 116.11 | 120.7 | 15.34 | 16.45 |
| T9: NPKS + FeSO4 (0.5%) + ZnSO4 (0.5%) + Mo | 174.18 | 181.55 | 16.84 | 17.81 | 128.17 | 134.35 | 18.96 | 21.12 |
| **S.E. ±** | 4.73 | 4.71 | 0.4321 | 0.46 | 3.33 | 3.46 | 1.19 | 0.51 |
| **C.D @ 5%** | 14.25 | 14.19 | 1.3 | 1.39 | 10.02 | 10.42 | 3.59 | 1.56 |



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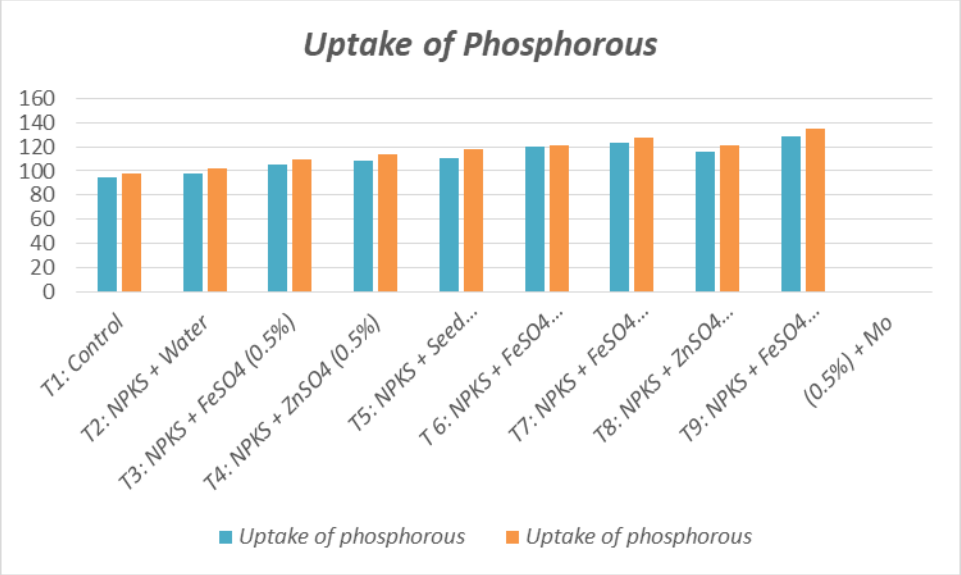


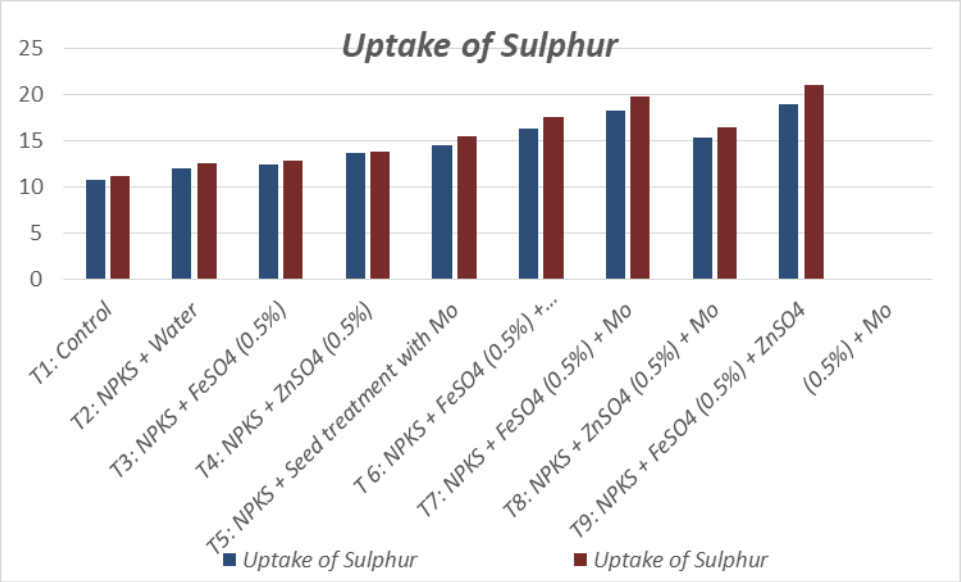
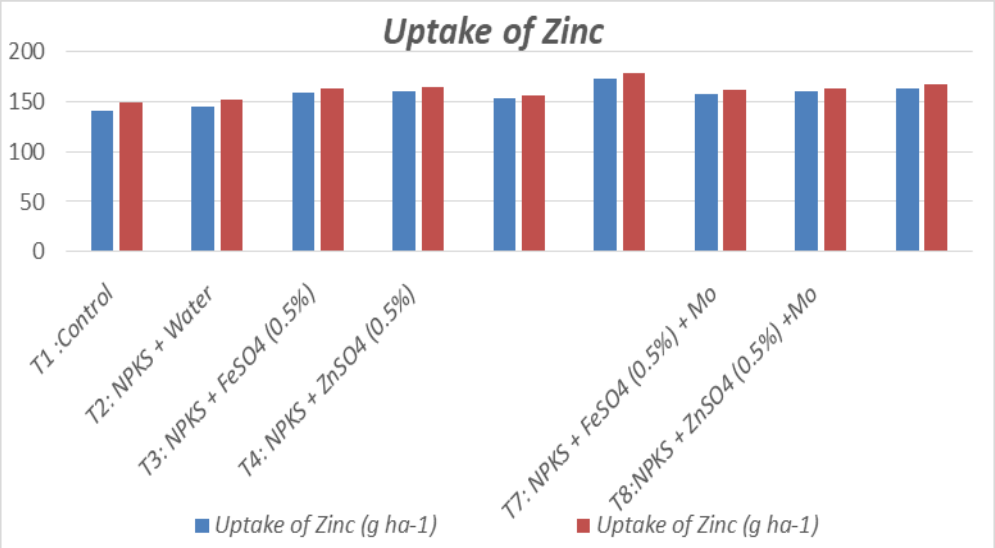



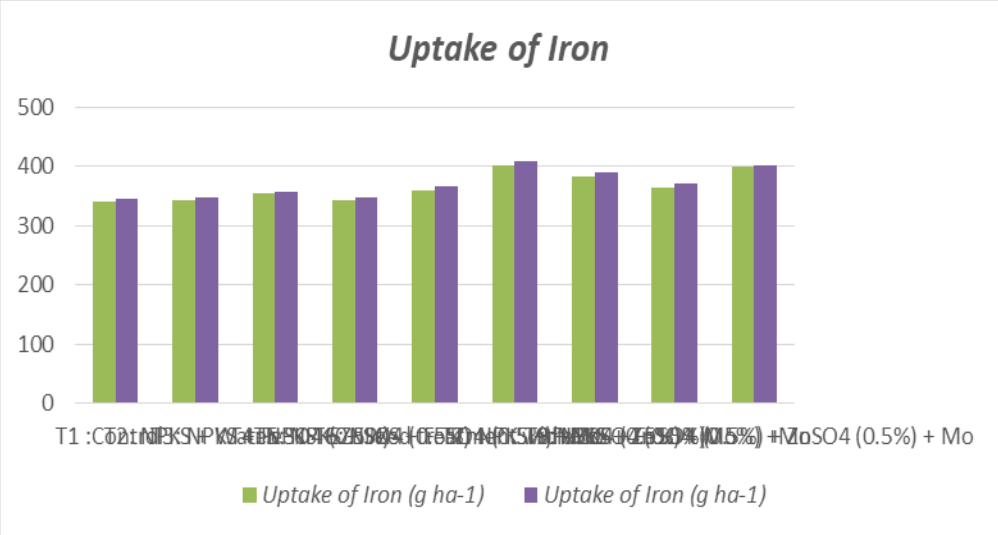

**Table-3: Uptake of minor nutrients in soil as influenced by foliar application of micronutrient at critical growth stages of soybean**

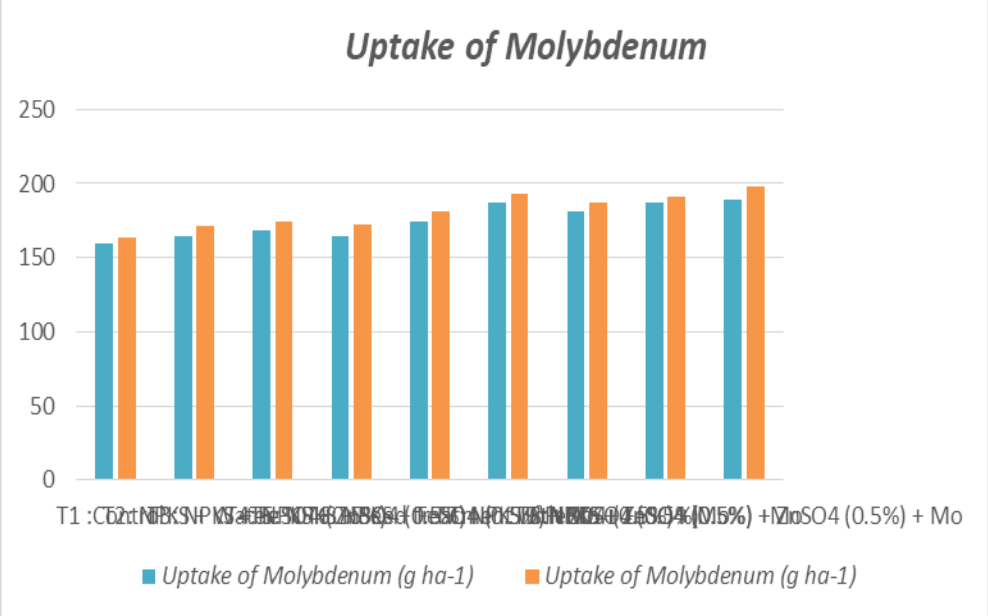
| Treatments | Uptake of Zinc (g ha-1) | | Uptake of Iron (g ha-1) | | Uptake of Molybdenum (g ha-1) | |
|---|---|---|---|---|---|---|
| | At Flowering | At pod formation | At Flowering | At Pod Formation | At Flowering | At Pod formation |
| T1: Control | 141.1 | 148.57 | 340.09 | 346.24 | 159.35 | 163.45 |
| T2: NPKS + Water | 145.03 | 151.3 | 342.17 | 347.29 | 164.45 | 171.51 |
| T3: NPKS + FeSO4 (0.5%) | 158.22 | 162.38 | 353.42 | 357.65 | 168.29 | 174.71 |
| T4: NPKS + ZnSO4 (0.5%) | 159.92 | 164.50 | 343.04 | 348.06 | 164.79 | 172.63 |
| T5: NPKS + Seed treatment with Mo | 153.73 | 156.28 | 359.87 | 365.9 | 174.59 | 181.58 |
| T6: NPKS + FeSO4 (0.5%) + ZnSO4 (0.5%) | 172.51 | 178.59 | 401.3 | 408.31 | 187.22 | 193.56 |
| T7: NPKS + FeSO4 (0.5%) + Mo | 157.31 | 161.51 | 383.29 | 389.82 | 181.54 | 187.59 |
| T8: NPKS + ZnSO4 (0.5%) +Mo | 159.77 | 163.65 | 362.95 | 370.94 | 186.81 | 191.48 |

ISSN 2394 - 7780

| | | | | | | |
|---|---|---|---|---|---|---|
| T9: NPKS + FeSO4 (0.5%) + ZnSO4 (0.5%) + Mo | 162.91 | 166.58 | 398.85 | 401.24 | 189.57 | 198.18 |
| **S.E. ±** | 4.98 | 5.032 | 10.75 | 11.2 | 5.58 | 5.68 |
| **C.D @ 5%** | 14.99 | 15.14 | 32.37 | 33.74 | 16.8 | 17.09 |



ISSN 2394 - 7780

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# STUDY OF THE AERO MICROFLORA BY USING DIFFERENT TYPES OF AIR SAMPLERS

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## ABSTRACT
*Aero-mycological studies were conducted in Jabalpur during January to December 2013 at two sites of the town Vaijapur Dist. Aurangabad by using Vertical sampler, Durham sampler, Rotorod sampler & petriplates with PDA. Altogether 76 types of fungal spores were identified, 01 belonging to Zygomycotina, 24 to Ascomycotina, 4 to Basidiomycotina and 48 to Deuteromycotina. The analysis of the spore catches revealed that the spores of Aspergilli dominated the airspora. The other predominant forms were Cladosporium, Alternaria, Curvularia, Basidiospores, Smut spores, Rust spores. Nigrospora and Helminthosporium*

*Keywords: Sampling, air spora, fungi, vaijapur dist Aurangabad*

## INTRODUCTION
An aerobiological study has been carried out from January to December2013 at two locations in vaijapur dist.Aurangabad to obtain a clear picture of the predominant fungal spores. Air sampling was carried out fortnightly for one year using Durham's sampler (Durham, 1946). Vertical sampler (Gregory, 1961) and Roto rod sampler (Harrington, 1959). Simultaneously Petri plates with PDA were also exposed to culture the fungal genera. Slides were mounted in glycerin jelly and scanned under 40x magnification of the microscope. Identification was confirmed using (Ellis, 1971,1976, Barnett & Hunter, 1982, Tilak 1989). Altogether 77 types of fungal spores were indemnified in this study,01belonging to Zygomycotina, 24 to Ascomycotina, 4 to Basidiomycotina and 48 to Deuteromycotina. The analysis of the spore catches compiled from all the tables revealed that the spores of Aspergilli dominated the airspora and contributed (57.7%) to the airspora, followed by *Cladosporium* (50.6%) the other predominant forms *were Alternaria* (17.0%), *Curvularia* (11.8%) and Basidiospores (19.1%), & Smuts (19.9%). The dominant ascospores were *Didymosphaeria* (4.3%) *Chaetomium* (1.6%), *Hysterium* (1.5%), Otthia (1.8%) & Sordaria (1.6%) Zygomycotina was represented only by *Cunninghamella* contributing 0.27% to the airspora. Unidentified spores formed 0.9% and hyphal fragments contributed 20.8% to the airspora. On a comparative basis of samplers, most types of spores were trapped on Durham's sampler and least types on vertical sampler. Vertical and Durham are passive samplers exposed to the air for 24 hours. Roto rod is a portable battery-operated impaction sampler, & was run at fortnightly intervals for half an hour. Even then it has given good spore catches and thus is very efficient as seen in the Table no. 1. High concentration of Aspergilli was observed by D'Silva & Freites (1981) at Bombay. *Cladosporium* occupied second position in reports from India and abroad. (Sreeramulu & Ramalingam, 1966, Gregory & Hirst 1957). Data of sampling period has revealed that the frequency of Deuteromycetes was comparatively more & this class comprised the highest percentage on all samplers. As seen in this study also the overwhelming majority of Deuteromycotina spores has been recorded by several workers (Vittal & Gloory 1985). As far as the types of good and efficient air samplers out of three used are Roto-rod and Durham's air samplers are the best one as compared to vertical air sampler. At present Tilak's air sampler and hi-media manufacturing samplers are in frequent use to study prevalence of concentration of air microflora. It is also useful for forecasting of disease in advance and allergens causing allergy.

There is a great need for understanding the prevalence of microflora of different regions and its effects on human health. The continuous monitoring of airborne allergens is a valuable tool for diagnosis & treatment of allergy patients. It is hoped that this study may help to find out suitable means to control the various types of human allergies induced by fungal spores.

**Table-1: Comparative table showing the spore types trapped on the different samplers duringJuly2015to October2015**

| Sr. No. | Spore Type | Percentage contribution on each sampler | | |
|---|---|---|---|---|
| | | Vertical | Durham | Roto rod |
| | zygomycotina | | | |
| 1. | *Cunnighamella* | - | 0.223 | .052 |
| 2. | *Bitrimonospora* | .143 | .029 | .026 |
| 3. | *Calospora* | .214 | .104 | .026 |

ISSN 2394 - 7780

| | | | | |
|---|---|---|---|---|
| 4. | *Chaetomhim* | - | .566 | 1.136 |
| 5. | *Didymosphaerla* | 2.431 | 1.044 | .924 |
| 6. | *Hypoxylon* | - | .015 | - |
| 7. | *Hysterium* | .858 | .581 | .290 |
| 8. | *Leptosphaeria* | - | .088 | .052 |
| 9. | *Lophiostoma* | 1.001 | .268 | .237 |
| 10. | *Massarina* | - | 059 | - |
| 11. | *Melanospora* | .929 | .059 | .396 |
| 12. | *Metasphaeria* | - | - | .026 |
| 13. | *Meliola* | .071 | .029 | - |
| 14. | *Nodulosphaeria* | 1.072 | .298 | .343 |
| 15. | *Otthia* | 1.144 | .492 | .317 |
| 16. | *Parodiella* | . | - | .026 |
| 17. | *Passerinella* | - | .208 | .264 |
| 18. | *Pleospora* | .858 | .179 | .396 |
| 19. | *Pringsheimia* | .500 | .149 | .132 |
| 20. | *Rosellinia* | - | - | .026 |
| 21. | *Sordaria* | 1.144 | .298 | .237 |
| 22. | *Sporormia* | - | .104 | .528 |
| 23. | *Teichospora* | .643 | .208 | .449 |
| 24. | *Valsaria* | - | .044 | .105 |
| 25. | *Xylaria basidiomycotina* | - | .044 | .105 |
| 26. | Basidiospores | 10.868 | 3.103 | 5.206 |
| 27. | Rusts | 6.864 | 2.596 | 3.805 |
| 28. | Smuts | 8.508 | 50237 | 6.289 |
| 29. | Uredospores | - | 0.059 | - |
| | Deuteromycotina | | | |
| 30. | *Alter naria* | 7.078 | 5.028 | 5.047 |
| 31. | *Aspergilli* | 10.725 | 17.591 | 29.598 |
| 32. | *Beltrania* | - | .029 | 0.079 |
| 33. | *Bispora* | 1.144 | 1.313 | 1.242 |
| 34. | *Cephaliophora* | - | .059 | - |
| 35. | *CMamydomyces* | - | .059 | .502 |
| 36. | *Cladospporium* | 10.582 | 25.962 | 14.297 |
| 37. | *Cordana* | 0.143 | .358 | .845 |
| 38. | *Corynespora* | .715 | .208 | 132 |
| 39. | *Curvularia* | 4.075 | .208 | .132 |
| 40 | *Dendrographium* | | .29 | .079 |
| 41. | *Dictyoarthrinium* | | | |
| 42. | *Dendryphiopsis* | - | - | .052 |

ISSN 2394 - 7780

| | | | | |
|---|---|---|---|---|
| 43. | *Dictyosporium* | - | .029 | - |
| 44. | *Diplodia* | 1.144 | .223 | .105 |
| 45. | *Drecshlera* | - | .059 | .343 |
| 46. | *Epicoccum* | .929 | .581 | .369 |
| 47. | *Excipularia* | - | .059 | .105 |
| 48. | *Exosporium* | .357 | .193. | .343 |
| 49. | *Fusariella* | - | .059 | .052 |
| 50 | *Fusarium* | - | .044 | .211 |
| 51. | *Haplosporella* | - | .149 | .264 |
| 52. | *Helmithosporium* | .214 | .954 | 1.057 |
| 53. | *Heterosporium* | ;64S | .373 | .211 |
| 54. | *Lacellinopsis* | - | .537 | .396 |
| 55. | *Melanographium* | - | .015 | - - |
| 56. | *Mitteriella* | - | .238 | .184 |
| 57. | *Monodictys* | - | .044 | - |
| 58. | *Memnoniella* | .429 | .746 | .132 |
| 59. | *Nigrospora* | 6.220 | 2.447 | 2.642 |
| 60. | *Papularia* , | . | .233 | |
| 61. | *Periconia* | . | .916 | |
| 62. | *Pestalotia* | - | - | . |
| 63. | *Phaeotrichoconis* | - | .029 | .052 |
| 64. | *Pithomyces* | 2.073 | .596 | .924 |
| 65. | *Pseudotorula* | . | .268 | .211 |
| 66. | *Pyricularia* | | .059 | .502 |
| 67. | *Ramulispora* | - | .015 | - |
| 68. | *Sirodesmium* | - | .104 | .079 |
| 69. | *Spegazzinia* | .071 | .029 | .026 |
| 70. | *Sporidesmium* | - | .015 | - |
| 71. | *Sporothrix* | - | .029 | - |
| 72. | *Stachybotrys* | .572 | .223 | .026 |
| 73. | *Tetraploa* | - | .581 | .290 |
| 74. | *Torula* | - | .074 | .105 |
| 75. | *Trichocladiwn* | .143 | .074 | .184 |
| 76. | *Trichoconis* | 2.145 | 1.238 | 2.140 |
| 77. | *Algal fragments* | 6.944 | 6.789 | 7.214 |
| 78. | *Fungal fragments* | 2.145 | 1.238 | 2.140 |
| 79. | *Insects parts* | .429 | .387 | - |
| 80. | *Insect scales* | - | .283 | .449 |
| 81. | *Plant parts* | , '"M | .686 | . |
| 82. | *Pollen grains* | 4& | 9.623 | 3.382 |

ISSN 2394 - 7780

| | | | | |
|---|---|---|---|---|
| 83. | *Protozoan cyst* | .m | .104 | - |
| 84. | *Un-indentified* | .429 | .373 | .237 |

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# SOCIAL BANKING IN INDIA IN THE REFORMS ERA: THE WAY AHEAD

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**ABSTRACT**
*In the ongoing era of economic reforms, the significance of social banking has come down. This is because, all banks including the public sector banks are thinking on commercial lines. The new generation private sector banks which were granted license during the reforms era are not even coming under the purview of priority sector lending norms. In this context, this paper looks into the relevance of social banking in the ongoing reforms era.*

*Keywords: Social Banking, Narasimham Committee, Financial Inclusion.*

## 1. INTRODUCTION

In the ongoing era of economic reforms, the relative significance of social banking as envisaged by the Priority Sector Loans (PSL), otherwise called as Special and Preferred Sector Finance, has come down drastically. This is because of the fact that in the ongoing regime all commercial banks in India including the public sector banks (PSBs) are supposed to function on commercial lines, and profit-motive is not an option but an imperative for their survival and growth. The new generation private sector banks (NGPBs) which were granted license during the ongoing reforms era are not even coming under the purview of PSL lending norms. Hence, NGPBs are functioning purely on commercial lines, by focusing on customer segments that offer with the highest levels of profitability. This paper makes a critical study of the relevance of social banking in India in the ongoing reforms era.

## 2. OBJECTIVES OF THE PAPER

(i) To study the banking sector reforms and its impact on India's banking sector;

(ii) To study the consequences of banking sector reforms on social banking, and the impact of banking sector reforms on the economic development of India;

(iii) To make suggestions for redesigning the social banking system in India to make it more inclusive considering the special features of the Indian economy.

## 3. METHODOLOGY

The methodology involves analysis of the data relating to commercial banking as are available in RBI publications, IBA Bulletin and other reputed research journals using tools of statistical analysis and accordingly draw meaningful conclusions.

## 4. ANALYTICAL SIGNIFICANCE

The analysis throws light on the vital issue of the balanced and equitable development of the economy based on sound principles of social justice; while at the same time ensuring its market competitiveness as is essential in a liberalized environment.

## 5. SOCIAL BANKING IN INDIA: A HISTORICAL PERSPECTIVE

It may be stated that the Banking Regulation Act, 1949 provided some level of homogeneity and coherence to the banking system and gave it some sense of direction in the field of deposit mobilization and credit dispensation. Even then it was believed that there was a need for closer dovetailing of credit with the priorities of economic planning. As the banking sector is a key constituent of country's economy, it should serve the basic social and economic goals and prevent monopolistic tendencies, concentration of power and improper use of resources. The V V Pai Anandikar's Report to the government of India highlighted the fact that new entrepreneurs had not been able to secure adequate credit from the banking system. The report also highlighted the fact that the banks had failed to cater to the requirements of agriculturists and small industrialists. To overcome these defects the report recommended social control of banks. Social control of banks was expected to:

(i) improve the position of agriculturists and small industrialists.

(ii) enable the government to effectively implement the Five Year Plans.

(iii) bring about wider representation in the boards of Directors of banks and in the actual decisions with respect to advances.

ISSN 2394 - 7780

To realize these objectives the Banking Laws (Amendment) Bill, 1967 was introduced in the Parliament that received the assent of the President in December, 1968 and implemented with effect from first week of February, 1969. But it was soon realized that the social control over banks could not realize the objectives as visualized in the Act. Consequently, 14 major Indian commercial banks were nationalized to fulfil the requirements of a developing economy in conformity with national priorities and objectives. After nationalization Mrs. Indira Gandhi announced the banking policy of the Government of India. The highlights of the policy were:

- These banks will meet only genuine requirements of large scale organized industries and would give preference to those industries which provided essential goods and services for mass consumption.
- They would not extend any credit facilities to any trader or industrialist who would use such facilities for anti-social and anti-national activities and also not for hoarding stocks of essential commodities.
- The nationalized banks would give more and more credit facilities to the enterprises in the public sector.
- They would invest an increasing amount of their resources in the backward areas of the country to ensure their speedy economic development.
- They would coordinate their activities with the specialized financial institutions with a view to meeting the short and long-term credit needs of the industries.
- They would make continuous efforts to promote cordial relations with their staff.
- These banks would give due share to the business connected with the government treasury which had hither to been exclusive monopoly of the State Bank of India.
- Every bank would be free to evolve its own procedures for its efficient functioning within the broad framework of government policy.

After nationalization Indian banking system witnessed several developments as wide-spread branch expansion especially in rural and semi-urban areas, Lead bank scheme, Service Area Approach etc. All these developments primarily stemmed from the socialization of banking. While these developments made banking services easily accessible to the masses, especially the weaker sections of the society, there was a growing concern regarding the deterioration of the banking services. Further, the insistence of higher CRR and SLR ratios by the RBI coupled with the directed credit policy of the government adversely affected the profitability of the banks.

As part of the New Economic Policy, 1991 the Government was forced to have a rethinking on the banking sector policies and the government appointed Narasimham Committee to suggest measures to revamp the functioning of the banks. Implementation of the recommendations of the Narasimham Committee resulted in a paradigm shift in banking operations. As a result, there has been a distinct change in the way in which banking business is being done in India. One of the most significant outcomes of the deregulation in the banking industry has been the cut-throat competition. Further, because of the change in governmental policies, profit making is no longer a dirty word even for the Public Sector Banks (PSBs) which were expected to function as instruments of social banking, especially after nationalization of a number of private sector banks in 1969. Accordingly, unlike in the past, sustained profitability has become an imperative for survival and growth for any bank; whether it is public sector or private sector, old or new, domestic or foreign. As such, following the adoption of the said reforms "social" banking (or "mass" banking) is sought to be replaced by "profit" banking (or, "class" banking). Efficiency, competitiveness and quality have emerged as key success factors in the changed environment. In the above context, because of the paradigm shift in the way of functioning of banks, it is worthwhile to examine the consequences of banking sector reforms on the social banking.

## 6. BANKING SECTOR REFORMS IN INDIA

In India major private sector banks were nationalized in two phases. First in 1969 (14 banks) and then in 1980 (6 banks). Even after nationalization, private sector banks and foreign banks were also allowed to function side by side with nationalized banks. However, they were stringently regulated by the government. During the pre-reforms period, the nationalized banks extended their branch network many times particularly in rural areas. This lowered population per office and increased bank deposits as a percentage of national income from 15.5% to 50%. Further, the credit extended to the weaker sections of the society (priority sector) also increased from 14% to 37.7%. PSBs had pumped enormous amount of credit into the priority sector.

Financial sector reforms were initiated in India in the year 1992 following the report of the Committee on the Financial Systems (CFS). The recommendations of the CFC were framed with the broad objective of

ISSN 2394 - 7780

consolidating the quantitative progress achieved in Indian financial system after nationalization of the major private sector banks and arresting the qualitative deterioration of services that had accompanied the quantitative growth. As pointed out earlier, the base of the reform measures in the banking sector were the recommendations of the Narasimham Committees I and II. But it is to be mentioned that the government has implemented these recommendations only on a selective basis.

**First Phase of Banking Sector Reforms – (Narasimham Committee Report – I )**

The main recommendations of Narasimham Committee–I, tabled in Parliament on December 17, 1991 were:

- Phased reduction of Statutory Liquidity Ratio (SLR) to 25% over a period of five years.
- Progressive reduction in Cash Reserve Ratio (CRR)
- Phasing out of directed credit programmes and redefinition of priority sector.
- Deregulation of interest rates so as to reflect emerging market conditions.
- Stipulation of minimum capital adequacy ratio of 4% to risk weighted assets by March 1993, 8% by March 1996 and 8% by banks having international operations by March 1994.
- Adoption of uniform accounting practices in regard to income recognition, asset classification and provisioning against bad and doubtful debts.
- Imparting transparency to bank balance sheets and making full disclosures (stopping window dressing practices by banks).
- Setting up special tribunals to speed up the process of recovery of loans.
- Setting up Asset Reconstruction Fund (ARF) to take over from banks a portion of their bad and doubtful advances at a discount.
- Restructuring of the banking system so as to have three or four large banks which could become international in character, 8 to 10 national banks and local banks confined to specific regions and RRBs confined to rural areas.
- Setting up one or more rural banking subsidiaries by public sector banks.
- Permitting RRBs to engage in all types of banking business.
- Abolition of branch licensing.
- Liberalizing the policy with regard to allowing foreign banks to open more offices in India.
- Rationalization of foreign operations of Indian banks.
- Giving freedom to individual banks to recruit officers.
- Inspection by supervisory authorities based essentially on the internal audit and inspection reports.
- Ending the duality of control over banking system by Banking Division and RBI.
- A separate authority for supervision of banks and financial institutions which would be a semi-autonomous body under RBI.
- A revised procedure for selection of Chief Executives and Directors on Boards of PSBs.
- Segregation of direct lending functions of IDBI to a separate institution.
- Obtaining resources from the market on competitive terms by DFIs.
- Supervision of merchant banks, mutual funds, leasing companies etc. by separate agency to be set up by RBI and enactment of separate legislation providing appropriate framework for mutual funds and laying down prudential norms for such institutions.

The committee had also recommended for proper sequencing of the process of reforms in the financial system. Among the above recommendations, those implemented by the Central Government so far along with their outcomes are depicted in Table – I below.

ISSN 2394 - 7780

**Table-I: First Banking Sector Reforms: Governmental Initiatives and Outcomes.**

| Recommendations implemented by Govt. | Outcome / Aftereffects of the reform measures. |
|---|---|
| (i) Deregulation of entry of new private banks (domestic and foreign) in 1992-'93. | Deregulation and Liberalization have resulted in increased competition amongst the banks. By 1996, nine domestic and eleven foreign banks were granted licenses after being convinced that the new entrants were well managed, financially viable and technologically strong. |
| (ii) Liberalization of branch licensing policy to allow more branches according to market needs subject to certain minimum requirements. | |
| (iii) Phase-wise deregulation of interest rates of deposits and advances. | Interest rates that were previously completely administered by RBI, are now allowed to be administered by the individual banks in respect of term deposits maturity over 1 year and all advances exceeding 2 lacks. |
| (iv) Introduction of capital adequacy norm of 8% (initially) | International norm of capital adequacy of 8% was fixed originally. (Later it was increased to 9%) |
| (v) Institution of transparent prudential and income recognition norms. | Norms for Income Recognition, Classification and Provisioning have been introduced in tune with global standards. |
| (vi) Allowing PSBs to access the capital market to raise equity. | Now, public can subscribe upto 49% of the total capital of nationalized banks. |
| (vii) Gradual reduction of CRR and SLR. | CRR and SLR were revised downwards several times in order to reach the levels recommended by Narasimham Committee (At present, these are 5% and 25% respectively). |

Source: Adapted from Sathe, V S, "Second Phase Reformations in Banking Sector and its Internal and External Competitiveness", p.143-149; edited by Banerjee, Amalesh et al (2002) in Banking and Financial Sector Reforms in India.

**The major impacts of the First Generation Reforms have been as follows**

- The number of private sector banks has increased marginally. This has resulted in tremendous competition in the industry – the new generation private sector banks being very aggressive and dynamic and are equipped with most modern technology.
- The non-interest income of banks in general, particularly the private sector banks has increased remarkably because of the income from allied services like merchant banking, credit cards, Leasing & Hire Purchasing etc. Further, income from treasury activities particularly from investments in government securities has also contributed towards non-interest income.
- The ratio of Non Performing Assets (NPAs) has decreased considerably over the years. In the case of PSBs, it has declined to the level of 16% in 1997-'98 whereas the same is 10% in the case of private sector banks. (These ratios further declined afterwards, showing better quality of lending – the details are discussed under the next head viz. second generation reforms).
- The deposits and advances of non-banking financial intermediaries including finance companies, mutual funds and capital market have declined; partly because of the saturation factor.
- The then capital adequacy ratio of 8% was not achieved by all PSBs. (Presently all banks including PSBs have achieved the current capital adequacy ratio of 9%, as of 31.03.2004. It is worth pointing out that this ratio is more than 10% in almost all banks).
- The profitability of PSBs has not improved considerably. (During the period of second generation reforms, however, all PSBs have registered considerable improvement in profitability.
- Credit-Deposit Ratio declined during post-reforms period. It was as high as 60.6% in 1991-'92 and the same declined to the level of 52.2% in 1993-'94. Thus, in spite of reduction of CRR and SLR, the CDR declined.
- The reduction in CRR and SLR, stringent prudential norms and industry recession resulted in the reduction in credit off-take and hence in the CDR ratio. This factor had another consequence viz. huge cash surpluses with the banks. This prompted banks to invest more in government securities where the capital adequacy norms were not applicable. Further, the difference in interest on advances and government securities also reduced which in turn made such investments more attractive.

ISSN 2394 - 7780

**Second Phase of Banking Sector Reforms: (Narasimham Committee Report – II )**

The genesis of the second generation reforms can be traced to the Indian Economic Survey - 1998-'99. The Survey called for a comprehensive second phase of reforms to avert possible fiscal deficit. The reform measures as suggested by the survey were liberalization of trade in agriculture, a sharp reduction in fiscal deficit and further cuts in interest rates. These measures were expected to help the economy to overcome the effects of a continued global slowdown. The agenda for the second phase of economic reforms were as follows:

(1) Monetary situation calls for softening of interest rates.

(2) Review of labour laws and also SSI reservation for export sector; doing away with state monopoly on warehousing, cargo handling.

(3) Allowing entry of insurance, pension funds for long term funds for infrastructure.

(4) Use of NBFCs to channel funds to the productive sectors.

(5) Removal of quantitative curbs on agri-exports and imports.

(6) Imposing constitutional limits on deficits.

(7) Use of taxes and prices to further environmental goals.

Reforms during 1998-'99 were based on the recommendations of Narasimham Committee – II on banking sector reforms. The RBI announced a number of decisions on 30th October, 1998. These included the following:

(i) Introduction in a phased manner risk weight to government approved securities

(ii) Risk weight for government guaranteed advances

(iii) General provision for standard assets

(iv) Higher Capital Adequacy Ratio (or, Capital to Risk Weighted Assets Ratio, CRAR) of 9 percent.

**The major impacts of the Second Generation Reforms have been as follows:**

(1) Competition in the banking industry became intense. In view of the cut-throat competition, banks started marketing their products aggressively in order to maintain and improve their market share. Even PSBs are no exception in this regard, though the private sector banks and foreign banks have been more aggressive in their approach. Another significant development has been the paradigm shift of banks from industrial / corporate credit to retail credit. On the one hand, the economic recession has resulted in reduced credit off-take to corporate, commercial and other business sectors; thus making retail credit a better business proposition for banks. On the other hand such factors like, (i) availability huge surplus funds (ii) high disintermediation pressures (iii) relatively safe nature of retail credit portfolio particularly housing finance (iv) rising disposable income of the upper middle class etc. also contributed their share in the above paradigm shift towards retail.

(2) The non-interest income of banks in general has increased substantially. This is primarily because of the huge income from treasury activities especially investments in government securities. The low CRR and SLR ratios and reduced credit off-take to the industrial sector prompted banks to resort to shoring up their surplus funds in investments to improve their bottom lines.

(3) There has been remarkable improvement in profitability and financial position of all banks, particularly the PSBs. It can be noticed that there has been substantial improvement in respect of asset quality as is evidenced by the constantly lowering NPA figures particularly the PSBs; the exception being the private sector banks. Similarly all PSBs could register higher profit than in the previous years during the last few years. Further, all the PSBs could attain the minimum stipulated Capital Adequacy ratio during the last two years viz. 2003 and 2004. The exceptions are a few private sector banks, here also.

## 7. BANKING SECTOR REFORMS AND ITS IMPACT ON ECONOMIC DEVELOPMENT

**The impact of the banking sector reforms on the economic development of India are mainly the following**

(i) As part of the ongoing financial sector reforms, Merchant banking emerged as a major financial service catering to the industrial development of the nation. Almost all the major commercial banks have got their Merchant Banking divisions.

(ii) As part of the banking sector reforms, the concept of Consortium financing emerged. Accordingly huge amounts of capital may be raised through consortium lending. (Here, a group of banks and financial

ISSN 2394 - 7780

institutions collectively finance projects involving large amounts of capital. eg. Goshree project in Cochin is financed by a consortium of banks.)

(iii) The progressive reduction of CRR and SLR has resulted in abundant supply of money within the banking system. This in turn has resulted in a situation in which banks can lend more for developmental activities.

(iv) Dilution of directed credit policy has helped the banks in a big way to improve their profitability and financial stability by appropriately selecting their business portfolios.

(v) The acceptance of Basle principles has resulted in strengthening of the capital base of banks. All the PSBs have attained the minimum Capital Adequacy ratio. Some of them had also gone for fresh issue of capital in the recent past.

(vi) Competition among PSBs and the entry of new generation private sector banks and foreign banks improved the quality of the banking services while at the same time reducing the interest rates. It has also prompted many banks to start IT Enabled Services (ITES). Further, there have been tremendous improvements in the service delivery systems among banks of all types. The modern service delivery modes include ATMs, Internet banking, Mobile banking, extended service hours / days etc. All these in one way or the other has contributed to the economic development of the country.

## 8. SUGGESTIONS FOR MAKING INDIAN BANKING MORE INCLUSIVE

In this section, in view of the foregoing discussions, some suggestions have been set forth for making the financial system in India more inclusive and socially responsive

(1) Development of new rural credit products. Banks and micro-credit institutions be encouraged to extend credit to community-based projects (e.g. those catering to basic infrastructure needs like water, sanitation and housing) and accordingly can move up in the value chain.

(2) Financial inclusion initiatives prove themselves to be a profitable business proposition as more and more business houses are venturing into this segment with their innovative business models which are essentially based on inclusiveness as the cornerstone. The government may encourage such businesses through budgetary provisions and other fiscal measures with a view to ensure rapid, but balanced and equitable economic development.

(3) Enhanced credit flow to the agricultural sector as well as to SSI sector. Enhanced credit to agriculture is an imminent need as it ensures balanced and sustained economic growth. It is high time that benefits from industry and trade go beyond industry and urban areas and extend to agriculture. Similar is the growing significance of promotion of SSIs, as the balanced economic development of the nation depends on the healthy growth of SSIs; with due thrust on promoting competitiveness of their products and processes. Hence, conducive policy initiatives are urgently required to promote these vital sectors of the economy.

(4) Micro-finance initiatives have to be encouraged more aggressively as a model for faster economic development of the rural populace, particularly the women. The 'Grameen Bank' project of Prof. Mohammed Yunus has revolutionised the rural credit scenario in Bangladeh and it has proved that unsecured credit to the poor could be an effective weapon to fight against poverty. Today, over 6 million poorest of the poor in Bangladesh alone have become credit worthy based on the above model. Worldwide, this model is increasingly being replicated. As of now, not less than 100 countries have adopted this model. In India also, this model appears to be quite workable and also extremely relevant as it makes the poor bankable and hence ensures financial inclusion in letter and spirit. It is to be noted that in India most of the leading practitioners of micro-credit follow the above model. (These agencies include Share Microfin, Spandana and SKS in Andhra Pradesh, Cashpor in UP, Grameen Koota in Karnataka, ASA in Tamil Nadu and a host of others.)

(5) New and innovative approaches for promotion of financial inclusion to be developed and promoted. The recent initiative by the RBI to use post offices for channelising credit to rural areas is one such welcome initiative. Accordingly, through 1.39 lakh post offices in the country, access to credit by rural populace can be greatly enhanced. Similar is the case of utilizing the services of NGOs, SHGs, MFIs, JLGs etc. in enhancing the outreach of the banking sector.

## 9. CONCLUDING REMARKS

Banks function on the twin principles of liquidity and profitability and accordingly they have to satisfy the profitability principle. So they have to be extra cautious while extending loans and have to ensure that their advances are secure. However, in view of the peculiar characteristics of Indian economy and hence the need for

ISSN 2394 - 7780

socially inclusive banking policies, there is equal significance for social banking and financial inclusion; particularly when we consider the fact that worldwide the poor are proving themselves to be bankable and credit worthy. Accordingly, while going ahead aggressively with the ongoing financial deregulation measures, the policy makers have to ensure that equal emphasis is being given to ensure that all such measures are financially inclusive in letter and spirit.

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# TECHNOLOGY AND OTHER INTERNAL DETERMINANTS OF PERFORMANCE OF NEW GENERATION PRIVATE SECTOR BANKS IN INDIA: AN ECONOMETRIC ANALYSIS

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## ABSTRACT
*It is well recognized that technology has got a vital role in improving the performance of banks in terms of enhanced operational efficiency and stronger risk management capability. New generation Private sector Banks (NPBs) in India which started functioning in the reforms era, operate on higher-end technology platforms compared to the 'traditional' Old Private sector Banks (OPBs) and Public Sector Banks (PSBs). Focusing on NPBs, this paper seeks to (i) study the role of technology in improving their Net Interest Margin (NIM) and Non-Interest Margin (NOM), the popularly used measures for operational efficiency and risk management, and (ii) other internal determinants that significantly affect NIM and NOM of NPBs.*

*Key Terms: IT in Banking, Technological Change, Operational Efficiency, NIM, NOM.*

## 1. INTRODUCTION
The crucial role of Information Technology (IT) in enhancing the operational efficiency of businesses is well recognized in literature. This is particularly true for banking business in India in the ongoing era of globalization and financial sector deregulation, which is characterized by fierce industry competition and added thrust on non-interest revenue. The New generation Private sector Banks (NPBs)I in India which started their operations in the ongoing reforms era, have got higher end technology platforms compared to their 'traditional' counterparts viz. Old Private sector Banks (OPBs)II and Public Sector Banks (PSBs)III. As it is widely recognized that IT can enhance the operational efficiency of banks and their risk management capability, this paper seeks to identify the impact of IT on two vital performance measures viz. Net Interest Margin (NIM) and Non-Interest Margin (NOM), with a focus on NPBs in India. Also, the paper seeks to identify the other internal determinants of performance, like cost of production, risk etc.

## 2. REVIEW OF RELEVANT LITERATURE AND RESEARCH GAP
Studies by Clifford (1996)[7], Bajaj (1999 & 2000)[2][3], Bhasin (2001 & 2008)[4][5] and B. Janki (2002)[6] have categorically proved the crucial role of IT in enhancing efficiency of banks and other financial intermediaries. The empirical study at the macro level (bank group-wise) by Arora, S & Kaur, S (2008)[1] has sought to identify the determinants of diversification by banks including the role of technology, and has also revealed the positive impact of IT on earnings of banks. In this 'bank-group' level study for 8 years' period (FY 2000-2007), though the role of technology (explanatory variable) on earnings (dependent variable) is studied, there has not been any analysis at individual bank level. Besides, the effect of the asset quality (in terms of NPA level) has not been considered. The most recent study by Manoj (2010) [11] has sought to bridge the above research gap (lack of micro level studies) and has made a study on OPBs focusing on the four Kerala-based OPBs. Still there exists the research gap relating to micro level studies on NPBs in India. Hence this study seeks to bridge the above gap by making a focused study on the four NPBs that have been functioning throughout the ten years' period under study (FY 2000 to 2009) in the second phase of the ongoing reforms era. The role of asset quality (NPA level) on earnings is studied, along with other relevant variables.

## 3. OBJECTIVES OF THE STUDY
(i) To study the impact of technological change on (a) Operational efficiency measured in terms of non-interest margin (NOM) (ie, the ratio of non-interest income to total assets), and (b) Credit risk management capability measured in terms of net interest margin (NIM) (ie. the ratio of net interest income to total assets) of NPBs in India;

(ii) Identify determinants other than technology that significantly affect the performance of NPBs in India;

(iii) Suggest meaningful strategies for enhanced performance of OPBs

## 4. HYPOTHESES OF THE STUDY
(i) Technological change reduces the NIM of NPBs.

(ii) Technological change enhances the NOM of NPBs.

ISSN 2394 - 7780

## 5. METHODOLOGY AND MODEL SPECIFICATION

Whether technology has got a significant role in deciding the operational efficiency and risk management of NPBs?. This aspect needs to be studied, along with identifying factors other than technology that affect the performance of NPBs significantly. In the literature, the vital relationship between return (earnings) and other relevant factors, (like, risk, technology, cost of production, capital etc.) are well established. Studies by De Young and Rice, 2004[8]; Landi and Venturelli, 2002[9]; and Lapetit, et.al, 2005[10] have underscored the above vital relationship. Here, the earnings (return) of financial intermediaries like banks are quite often expressed in terms of net-interest margin (NIM) and non-interest margin (NOM). For instance, NIM is the most widely used parameter for profitability and operational efficiency, and is also the best determinant of the credit risk management capability of a bank. Likewise, NOM is increasingly used as an efficiency parameter of financial intermediaries like banks. This approach is more relevant in the ongoing era of globalization, because non-interest income is growingly becoming the driver of operational efficiency of banks as their interest income is constantly dwindling under competitive pressures. Accordingly, NOM and NIM respectively are taken as the dependent variables for assessing the operational efficiency and risk management capability of NPBs, in this research study.

Risk is an important determinant of NIM and NOM of banks. Risk is given by the variability in returns of a bank. The higher the variability, the higher is the risk. In finance theory as higher risk is associated with higher returns, a bank with higher risk is expected to have higher returns. Thus RISK is taken as an explanatory variable. Cost of production (COP) is another factor (explanatory variable) that may affect the operational efficiency and the risk management capability of a bank. If a bank is relatively inefficient, then it needs to charge higher interest and/or fees to recover its production costs. Here, COP is defined as the operating expenses to total assets of a bank. The sign of the co-efficient of this productivity variable (COP) in the regression equation is expected to be positive. This in turn signifies that lower the COP, lower is the expected NIM and NOM. Regulatory cost (REG_COST) might be another factor that may affect the earnings potential of a bank. Though stipulations regarding the minimum capital requirement and risk provisioning as per Basel guidelines are applicable for all financial intermediaries the world over, there exist significant variations among the individual players as to the exact amount of capital that they actually maintain and also its composition (like, Tier I or Tier II etc.). In effect there is a differential imposition of the cost of doing business (in terms of regulatory capital) from to firm to firm. Thus, REG_COST (defined as the total bank capital to total bank assets) is taken as another explanatory variable.

Investment in Technology resulting in technological change (TECH_CHG) is growingly becoming a determinant of earnings of a bank. Technology brings with it substantial cost savings because of lower operating costs. Moreover, technological investments have a direct influence on the non-interest income of banks (like, various fee-based incomes) because only banks equipped with higher-end technology can provide such high-tech products that can command a higher rate of returns. Thus, TECH_CHG is taken as another explanatory variable. Here, it may be noted that in spite of the positive impact of technological change on non-interest income as noted above, there may be a negative impact on net interest income (NIM) because of the substantial interest burden associated with huge investments in technology which may reduce the net interest income. Besides, heavy technological investments reduce the thrust on lending and also resource allocation to it. As such, a positive association of TECH_CHG with NOM and a negative association with NIM are expected as per the theory. (The first two hypotheses set aim to test the above facts). Yet another internal determinant of earnings of banks is the quality of assets (which in turn is denoted by the NPA level) which is defined as the ratio of net non-performing assets to net advances. Other things being equal, a bank which follows an aggressive approach towards lending is expected to have higher level of NPA also. This is because of the dilution in due diligence resorted to by banks for attracting more customers. So, NPA is taken as an explanatory variable. The econometric models for NIM and NOM are expressed as follows:

$$\mathbf{NIM} = \alpha_1 + \alpha_2\,\mathbf{(RISK)} + \alpha_3\,\mathbf{(COP)} + \alpha_4\,\mathbf{(REG\_COST)} + \alpha_5\,\mathbf{(TECH\_CHG)} + \alpha_6\,\mathbf{(NPA)} + \varepsilon$$

$$\mathbf{NOM} = \beta_1 + \beta_2\,\mathbf{(RISK)} + \beta_3\,\mathbf{(COP)} + \beta_4\,\mathbf{(REG\_COST)} + \beta_5\,\mathbf{(TECH\_CHG)} + \beta_6\,\mathbf{(NPA)} + \mu$$

Here, $\alpha_t$ is the estimated coefficients ($\alpha_t$ is the intercept term, a constant) and $\varepsilon$ is the error term. Likewise, $\beta_t$ is the estimated coefficients and $\mu$ is the error term.

The sample for study is all the NPBs which have been functioning throughout the ten years' period under study (viz. FY 2000 to 2009). Thus, four NPBs are selected based on deliberate sampling method, viz. (i) Axis Bank, (ii) HDFC Bank, (iii) ICICI Bank, and (iv) Indus Ind Bank. The late entrants into the NPB group (viz. Yes Bank, and Kotak Mahindra Bank) have been excluded from the purview of this study.

ISSN 2394 - 7780

## 6. ANALYSIS AND DISCUSSION

The data for the ten years (FY 2000-2009) for the four NPBs individually and the group as a whole are studied using SPSS package to find relationship between the variables. Table: I shows the values of the various parameters used for the analysis for the ten years period, FY 2000 to FY 2009 in respect of Axis Bank (AXIS). Using the econometric model for NIM as noted in Para 5 above, regression is done using SPSS and the summary of the results obtained are shown in Table II. From Table II, it follows that there is a significant positive association between NIM and risk borne (RISK) by the bank at 10% LOS. It may be noted that this positive association of NIM and RISK is as expected as per the underlying theory (Para 5). Regression analysis for NOM has also been done using the econometric model mentioned earlier, for AXIS. The results of this regression analysis are tabulated in Table III. From Table III, it is observed that there is statistically significant (5% LOS) and positive association between NOM and TECH_CHG in respect of AXIS. Besides, there is a strong positive relation between NOM and RISK also at 10% LOS. Both these positive associations are in conformity with the underlying theory.

Table IV shows the values of the various parameters used for the analysis for the ten years' period, FY 2000 to FY 2009 in respect of HDFC Bank (HDFC). Using the econometric model for NIM as given Para 5 above, regression is done and the summary of the results obtained are shown in Table V. Table V shows that there is a strong, significant (5% LOS) and positive association between NIM and RISK, COP (Cost of Production) and net NPA level (NPA) for HDFC. Similarly, there is a strong negative and significant (5% LOS) between NIM and TECH_CHG also. It may be noted here that all the above relations are as per the underlying economic theory. A similar regression analysis for NOM has been done for HDFC as per the econometric model noted above. The results of this regression are tabulated in Table VI. From Table VI, it is observed that there is strong, statistically significant (5% LOS) and positive association of NOM with TECH_CHG, COP, RISK and NPA. All these positive relations are in conformity with the underlying economic theory. Table VII shows the values of the various parameters used for the analysis for the ten years' period, FY 2000 to FY 2009 in respect of ICICI Bank (ICICI). Using the econometric model for NIM as noted in Para 5 regression is done using SPSS. The summary of the results obtained are shown in Table VIII. From Table VIII, it follows that there is not a significant association between NIM and any of the five variables under study. A similar regression analysis for NOM has been done using the econometric model noted earlier, for ICICI. The results of this regression analysis are tabulated in Table IX. Here also there is not a single significant relation with NOM.

Table X shows the values of the various parameters used for the analysis for the ten years' period, FY 2000 to FY 2009 in respect of Indus Ind Bank (INDUS). Using the econometric model for NIM as noted in Para 5, regression is done using SPSS and the summary of the results obtained are shown in Table XI. From Table XI, it follows that there is positive and significant (10% LOS) regulatory cost (REG_COST) and NIM for INDUS. A similar regression analysis for NOM has been done for INDUS and the results of this regression are given in Table XII. It is observed that there is a strong, positive significant (5% LOS) relation between NOM and TECH_CHG. This positive relation is in conformity with the underlying economic theory. Table XIII shows the values of the various parameters used for the analysis for the ten years' period, FY 2000 to FY 2009 in respect of NPBs as a whole. Table XIV gives the regression results between NIM of NPBs and the five other variables. From Table XIV, it follows that there is a significant (10% LOS) and negative association of NIM of NPBs with technological changes (TECH_CHG). From Table XV, it is observed that there is strong, statistically significant (5% LOS) and positive association of NOM with TECH_CHG. Likewise, NOM has got a positive and significant (10% LOS) relationship with RISK also. Both these relationships are as expected as per the underlying economic theory.

## 7. OVERALL FINDINGS AND TESTING OF HYPOTHESES

The summary of the findings is given Table XVI. It may be noted that there is a clear and significant positive relationship between NOM and technological change (TECH_CHG) suggesting that technological advancements can lead to higher non-interest income of banks. This positive relationship is true for NPBs in general and three out of the four individual NPBs, the only exception being ICICI. But, the negative impact of TECH-CHG on NIM is there in the case of HDFC alone (5% LOS), though the general case of NPBs also support this relation at 10% LOS. Another general observation RISK is having a positive association with NOM at 5% LOS in respect of HDFC. Such a positive relation is there in respect of AXIS also, though at 10% LOS. Besides, the overall case of NPBs also support this positive association at 10%LOS. Similar positive association of RISK is there in the case of HDFC and AXIS, towards NIM. But none of the other cases, including the general case of NPBs support such positive relation to NIM. In respect of HDFC alone strong and positive relation (5% LOS) is there for COP and NPA with both NIM and NOM. This positive relation is also not supported by any other NPB individually or NPBS as a whole.

ISSN 2394 - 7780

First Hypothesis: Technological change reduces the NIM of NPBs.

The first hypothesis as above is supported by HDFC alone (5% LOS) and NPBs as a whole (10% LOS). None of the other three NPBs support this. So, the first hypothesis is rejected.

Second Hypothesis: Technological change enhances the NOM of NPBs.

The second hypothesis as above is supported at 5% LOS by all NPBs (except ICICI) and also NPBS as a whole. So, the second hypothesis is accepted.

## 8. POLICY SUGGESTIONS AND CONCLUDING REMARKS

In view of the foregoing discussions, it may be meaningful to suggest the following two strategies for NPBs for enhanced operational efficiency and risk management capability, particularly credit risk management. (1) NPBs must give more thrust on technological upgradation for enhanced levels of NOM and higher profitability. This might not affect their NIM adversely. (2) Higher levels of risk borne by NPBs may lead to higher NIM and NOM in general. Aggressive lending could be one strategy in this regard. However, more thrust is required on due diligence (stricter credit appraisal) to ensure low NPA level.

The above strategies have got special significance in the ongoing era of globalization and international competition. In a service industry like banking, higher competitiveness in services, business growth and asset quality are all the more important for sustained growth and profitability. Adoption of technology can address this issue reasonably well.

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## END NOTES

I. NPBs, here, refer to the set of all New Generation Private Sector Banks (NPBs) that have been functioning throughout the ten years' period (FY 2000 to FY 2009) under study. NPBs were given registration only since the mid-1990s (FY 1995 and afterwards) by the Reserve Bank of India. These banks being governed by the regulatory policies of the Government pertaining to the ongoing era of financial sector reforms in India, their commitment towards priority sector and such other directed credit policies of the Government are much lesser than those of Public Sector Banks (PSBs) and Old Private Sector Banks (OPBs). Besides, these new banks are equipped with latest technological platforms. In short, NPBs are more or less

ISSN 2394 - 7780

comparable with foreign banks (FBs) functioning in India, rather than PSBs or OPBs. NPBs that have been functioning throughout the ten years' period under study (FY 2000 to 2009) are considered for this study. As such, the newer NPBs (like, Kotak Mahindra Bank and Yes Bank) are not included. Accordingly, four NPBs viz. (i) Axis Bank (formerly, UTI Bank), (ii) HDFC Bank, (iii) ICICI Bank, and (iv) Indus Ind Bank have been considered.

II. OPBs here means the set of all Old Private Sector Banks. OPBs have been functioning in India even before the initiation of financial sector reforms in the early 1990s.

III. PSBs, or Public Sector Banks (PSBs) refer to the government owned banks in India. These include 8 State Bank group banks, 19 Nationalised Banks and IDBI bank.

**Table-I: Major Performance Parameters – AXIS**

| Year | NIM | NOM | RISK | COP | REG_COST | TECH_CHG | NPA |
|---|---|---|---|---|---|---|---|
| 2000 | 10.53 | 1.32 | 0.818 | 0.013 | 0.0419 | 0.1254 | 6.32 |
| 2001 | 9.132 | 1.7227 | 1.1248 | 0.0098 | 0.028 | 0.1886 | 4.71 |
| 2002 | 10.2052 | 1.8698 | 0.7567 | 0.012 | 0.0211 | 0.1832 | 3.43 |
| 2003 | 9.38 | 3.31 | 1.3089 | 0.0143 | 0.0428 | 0.3529 | 3.39 |
| 2004 | 8.6197 | 2.4154 | 1.5134 | 0.0165 | 0.0468 | 0.2802 | 2.39 |
| 2005 | 7.25 | 2.47 | 0.9203 | 0.0174 | 0.0396 | 0.3407 | 1.29 |
| 2006 | 6.2176 | 1.3437 | -0.5113 | 0.0154 | 0.0589 | 0.2161 | 1.39 |
| 2007 | 6.6 | 1.67 | 0.1023 | 0.0164 | 0.0433 | 0.253 | 0.98 |
| 2008 | 7.42 | 1.64 | 1.0635 | 0.0166 | 0.0324 | 0.221 | 0.72 |
| 2009 | 7.663 | 1.9641 | 1.5134 | 0.0197 | 0.08 | 0.2563 | 0.42 |

Source: RBI, *Report on Trend and Progress of Banking in India*, for FY 2000 to FY 2009.

| Model Variables | Un-standardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 6.638 | 3.444 | | 1.928 | 0.112 |
| RISK | 1.088 | 0.471 | 0.481 | 2.308 | 0.069** |
| REG_COST | -7.827 | 24.291 | -0.097 | -0.322 | 0.760 |
| COP | 36.394 | 233.256 | 0.078 | 0.156 | 0.882 |
| TECH_CHG | -3.015 | 4.747 | -0.143 | -0.635 | 0.553 |
| NPA | 0.524 | 0.278 | 0.718 | 1.883 | 0.118 |

Dependent Variable: NIM ( ** Significant at 10% LOS)

**Table-II: Results of Regression Analysis (Dependent Variable: NIM) for AXIS**

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NIM | 8.3127 | 1.4172 | 0.917 | 0.842 | 2.068 |
| RISK | 0.9129 | 0.6272 | | | |
| REG_COST | 0.0458 | 0.0175 | | | |
| COP | 0.0155 | 0.0030 | | | |
| TECH_CHG | 0.2441 | 0.0674 | | | |
| NPA | 2.3127 | 1.9409 | | | |

| Model Variables | Un-standardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 0.042 | 0.890 | | 0.047 | 0.965 |
| RISK | 0.282 | 0.122 | 0.303 | 2.314 | 0.069** |
| REG_COST | 1.747 | 6.278 | 0.052 | 0.278 | 0.792 |
| COP | -38.577 | 60.282 | -0.200 | -0.640 | 0.550 |
| TECH_CHG | 8.427 | 1.227 | 0.974 | 6.869 | 0.001* |
| NPA | 0.069 | 0.072 | 0.230 | 0.961 | 0.381 |

Dependent Variable: NOM (* Significant at 5% LOS) (** Significant at 10% LOS)

ISSN 2394 - 7780

**Table-III: Results of Regression Analysis (Dependent Variable: NOM) for AXIS.**

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NOM | 1.998 | 0.5831 | 0.968 | 0.937 | 2.098 |
| RISK | 0.9129 | 0.6272 | | | |
| REG_COST | 0.0458 | 0.0175 | | | |
| COP | 0.0155 | 0.0030 | | | |
| TECH_CHG | 0.2441 | 0.0674 | | | |
| NPA | 2.313 | 1.941 | | | |

**Table-IV: Major Performance Parameters – HDFC**

| Year | NIM | NOM | RISK | COP | REG_COST | TECH_CHG | NPA |
|---|---|---|---|---|---|---|---|
| 2000 | 10.48 | 1.9 | 0.5427 | 0.0204 | 0.0576 | 0.1813 | 1.08 |
| 2001 | 8.4951 | 1.5663 | 0.7463 | 0.0147 | 0.0785 | 0.1844 | 0.77 |
| 2002 | 9.2358 | 1.3605 | 0.502 | 0.0198 | 0.0373 | 0.1473 | 0.45 |
| 2003 | 8.69 | 1.7 | 0.8684 | 0.0176 | 0.0817 | 0.1956 | 0.5 |
| 2004 | 7.4633 | 1.7454 | 1.0041 | 0.0195 | 0.074 | 0.2339 | 0.37 |
| 2005 | 7.01 | 1.32 | 0.6106 | 0.0191 | 0.0541 | 0.1883 | 0.16 |
| 2006 | 6.6004 | 1.3897 | -0.3392 | 0.0211 | 0.0762 | 0.2105 | 0.24 |
| 2007 | 7.16 | 1.8 | 0.0678 | 0.023 | 0.0523 | 0.2514 | 0.44 |
| 2008 | 8.36 | 1.84 | 0.7056 | 0.0265 | 0.0493 | 0.2201 | 0.43 |
| 2009 | 9.0147 | 2.0348 | 1.0041 | 0.0281 | 0.0863 | 0.2257 | 0.47 |

Source: RBI, *Report on Trend and Progress of Banking in India*, for FY 2000 to FY 2009.

**Table-VII: Major Performance Parameters – ICICI**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2000 | 10.6 | 1.74 | 0.5111 | 0.0119 | 0.0441 | 0.1642 | 2.88 |
| 2001 | 8.952 | 2.0368 | 0.7028 | 0.0127 | 0.0952 | 0.2275 | 1.53 |
| 2002 | 7.8099 | 1.3833 | 0.4728 | 0.0169 | 0.0665 | 0.1771 | 2.19 |
| 2003 | 3.47 | 0.93 | 0.8178 | 0.006 | 0.0634 | 0.268 | 5.48 |
| 2004 | 8.883 | 2.9953 | 0.9456 | 0.0188 | 0.0682 | 0.3372 | 5.21 |
| 2005 | 7.67 | 2.64 | 0.575 | 0.0205 | 0.0663 | 0.3442 | 2.21 |
| 2006 | 6.4256 | 2.3327 | -0.3195 | 0.0197 | 0.0758 | 0.363 | 1.65 |
| 2007 | 6.83 | 2 | 0.0639 | 0.0199 | 0.0886 | 0.2928 | 0.72 |
| 2008 | 7.72 | 1.99 | 0.6645 | 0.0194 | 0.0687 | 0.2578 | 1.02 |
| 2009 | 8.2714 | 2.367 | 0.9456 | 0.0204 | 0.1171 | 0.2862 | 1.55 |

Source: RBI, *Report on Trend and Progress of Banking in India*, for FY 2000 to FY 2009.

| Model Variables | Un-standardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 8.354 | 3.755 | | 2.225 | 0.077 |
| RISK | 1.243 | 2.201 | 0.272 | 0.565 | 0.597 |
| REG_COST | -18.648 | 30.215 | -0.267 | -0.617 | 0.564 |
| COP | 284.633 | 204.297 | 0.739 | 1.393 | 0.222 |
| TECH_CHG | -17.070 | 13.449 | -0.617 | -1.269 | 0.260 |
| NPA | -0.023 | 0.704 | -0.020 | -0.032 | 0.976 |

Dependent Variable: NIM

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NIM | 7.6921 | 1.7908 | 0.705 | 0.497 | 1.57 |
| RISK | 0.5704 | 0.3919 | | | |
| REG_COST | 0.0805 | 0.0256 | | | |
| COP | 0.0168 | 0.0047 | | | |
| TECH_CHG | 0.2693 | 0.0647 | | | |
| NPA | 2.4118 | 1.567 | | | |

ISSN 2394 - 7780

**Table-VIII: Results of Regression Analysis (Dependent Variable: NIM) for ICICI**

| Model Variables | Un-standardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | -0.265 | 0.877 | | -0.302 | 0.775 |
| RISK | 0.453 | 0.514 | 0.312 | 0.881 | 0.419 |
| REG_COST | -4.275 | 7.056 | -0.193 | -0.606 | 0.571 |
| COP | 81.060 | 47.705 | 0.663 | 1.699 | 0.150 |
| TECH_CHG | 3.777 | 3.140 | 0.430 | 1.203 | 0.283 |
| NPA | 0.002 | 0.164 | 0.006 | 0.012 | 0.991 |

Dependent Variable: NOM ( * Significant at 5% LOS)

**Table-IX: Results of Regression Analysis (Dependent Variable: NOM) for ICICI.**

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NOM | 2.0334 | 0.5683 | 0.853 | 0.728 | 1.736 |
| RISK | 0.5704 | 0.3919 | | | |
| REG_COST | 0.0805 | 0.0256 | | | |
| COP | 0.0168 | 0.0047 | | | |
| TECH_CHG | 0.2693 | 0.0647 | | | |
| NPA | 2.4118 | 1.5671 | | | |

**Table-X : Major Performance Parameters – INDUS**

| Year | NIM | NOM | RISK | COP | REG_COST | TECH_CHG | NPA |
|---|---|---|---|---|---|---|---|
| 2000 | 10.6100 | 1.4800 | 0.7117 | 0.0141 | 0.0811 | 0.1395 | 7.2000 |
| 2001 | 8.9997 | 2.0448 | 0.9786 | 0.0113 | 0.0639 | 0.2272 | 5.9800 |
| 2002 | 8.7535 | 1.4000 | 0.6583 | 0.0119 | 0.0604 | 0.1599 | 5.2500 |
| 2003 | 7.5300 | 1.9600 | 1.1387 | 0.0093 | 0.0551 | 0.2603 | 6.5900 |
| 2004 | 7.3905 | 2.5639 | 1.3167 | 0.0119 | 0.0608 | 0.3469 | 4.2500 |
| 2005 | 7.8900 | 2.7600 | 0.8007 | 0.0144 | 0.0495 | 0.3498 | 2.7200 |
| 2006 | 7.3882 | 1.6331 | -0.4448 | 0.0170 | 0.0479 | 0.2210 | 2.7100 |
| 2007 | 7.1500 | 1.1400 | 0.0890 | 0.0180 | 0.0386 | 0.1594 | 2.0900 |
| 2008 | 7.7800 | 1.2700 | 0.9252 | 0.0164 | 0.0404 | 0.1632 | 2.4700 |
| 2009 | 8.5119 | 1.3468 | 1.3167 | 0.0173 | 0.0580 | 0.1582 | 2.2700 |

Source: RBI, *Report on Trend and Progress of Banking in India,* for FY 2000 to FY 2009.

| Model Variables | Un-standardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 2.383 | 4.045 | | 0.589 | 0.581 |
| RISK | 0.227 | 0.425 | 0.120 | 0.533 | 0.617 |
| REG_COST | 62.380 | 30.618 | 0.717 | 2.037 | 0.097** |
| COP | 149.490 | 206.248 | 0.476 | 0.725 | 0.501 |
| TECH_CHG | -2.988 | 3.626 | -0.216 | -0.824 | 0.447 |
| NPA | 0.175 | 0.368 | 0.350 | 0.475 | 0.655 |

Dependent Variable: NIM

**Table-XI: Results of Regression Analysis (Dependent Variable: NIM) for INDUS**

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NIM | 8.2802 | 1.0340 | 0.937 | 0.877 | 2.653 |
| RISK | 0.7942 | 0.5456 | | | |
| REG_COST | 0.0560 | 0.0119 | | | |
| COP | 0.0147 | 0.0033 | | | |
| TECH_CHG | 0.2167 | 0.0747 | | | |
| NPA | 3.8791 | 2.0687 | | | |

ISSN 2394 - 7780

| **Model Variables** | **Un-standardized Coefficients** | | **Standardized Coefficients** | **t** | **Sig.** |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | -0.640 | 1.010 | | -0.633 | 0.554 |
| RISK | 0.041 | 0.106 | 0.043 | 0.390 | 0.712 |
| REG_COST | 10.587 | 7.648 | 0.238 | 1.384 | 0.225 |
| COP | 14.584 | 51.519 | 0.091 | 0.283 | 0.788 |
| TECH_CHG | 7.082 | 0.906 | 1.002 | 7.819 | 0.001* |
| NPA | 0.007 | 0.092 | 0.029 | 0.081 | 0.939 |

Dependent Variable: NOM ( * Significant at 5% LOS)

**Table-XII: Results of Regression Analysis (Dependent Variable: NOM) for INDUS**

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NOM | 1.7629 | 0.5280 | 0.985 | 0.971 | 2.539 |
| RISK | 0.7942 | 0.5456 | | | |
| REG_COST | 0.560 | 0.0119 | | | |
| COP | 0.0147 | 0.0033 | | | |
| TECH_CHG | 0.2167 | 0.0747 | | | |
| NPA | 3.8791 | 2.0687 | | | |

**Table-XIII: Major Performance Parameters – NPBs in India**

| Year | NIM | NOM | RISK | COP | REG_COST | TECH_CHG | NPA |
|---|---|---|---|---|---|---|---|
| 2000 | 8.8947 | 1.8427 | 0.8881 | 0.0121 | 0.0664 | 0.2069 | 3.2475 |
| 2001 | 9.0011 | 1.5034 | 0.5975 | 0.0152 | 0.0463 | 0.1669 | 2.8300 |
| 2002 | 7.2675 | 1.9750 | 1.0334 | 0.0118 | 0.0607 | 0.2692 | 3.9900 |
| 2003 | 8.0891 | 2.4300 | 1.1949 | 0.0167 | 0.0625 | 0.2995 | 3.0550 |
| 2004 | 7.4550 | 2.2975 | 0.7266 | 0.0179 | 0.0524 | 0.3058 | 1.5950 |
| 2005 | 6.6580 | 1.6748 | -0.4037 | 0.0183 | 0.0647 | 0.2527 | 1.4975 |
| 2006 | 6.9350 | 1.6525 | 0.0807 | 0.0193 | 0.0557 | 0.2392 | 1.0575 |
| 2007 | 7.8200 | 1.6850 | 0.8397 | 0.0197 | 0.0477 | 0.2155 | 1.1600 |
| 2008 | 8.3653 | 1.9282 | 1.1949 | 0.0214 | 0.0854 | 0.2316 | 1.1775 |
| 2009 | 8.9513 | 2.0193 | 1.1303 | 0.0220 | 0.0852 | 0.2277 | 1.0650 |

Source: RBI, *Report on Trend and Progress of Banking in India,* for FY 2000 to FY 2009.

| **Model Variables** | **Un-standardized Coefficients** | | **Standardized Coefficients** | **t** | **Sig.** |
|---|---|---|---|---|---|
| | **B** | **Std. Error** | **Beta** | | |
| (Constant) | 8.920 | 4.539 | | 1.965 | .121 |
| RISK | .993 | .521 | .604 | 1.905 | .130 |
| REG_COST | 6.385 | 17.574 | .102 | .363 | .735 |
| COP | 35.263 | 211.942 | .145 | .166 | .876 |
| TECH_CHG | -12.521 | 4.812 | -.618 | -2.602 | .060 ** |
| NPA | .150 | .688 | .191 | .217 | .839 |

Dependent Variable: NIM (** Significant at 10% LOS)

**Table-IV: Results of Regression Analysis (Dependent Variable: NIM) for NPBs**

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NIM | 7.943692E0 | .8575548 | 0.89 | 0.78 | 1.92 |
| RISK | .728256 | .5213251 | | | |
| REG_COST | .062699 | .0137098 | | | |
| COP | .017427 | .0035248 | | | |
| TECH_CHG | .241507 | .0423180 | | | |
| NPA | 2.067500E0 | 1.0971624 | | | |

ISSN 2394 - 7780

| Model Variables | Un-standardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | .152 | .970 | | .157 | .883 |
| RISK | .251 | .111 | .446 | 2.257 | .087 ** |
| REG_COST | 1.419 | 3.755 | .066 | .378 | .725 |
| COP | 7.045 | 45.281 | .084 | .156 | .884 |
| TECH_CHG | 5.372 | 1.028 | .773 | 5.225 | .006 * |
| NPA | .027 | .147 | .102 | .186 | .862 |

Dependent Variable: NOM ( * Significant at 5% LOS) (** Significant at 10% LOS)

**Table-XV: Results of Regression Analysis (Dependent Variable: NOM) for NPBs**

| Variables | Mean | Standard Deviation | R | R Square | Durbin – Watson |
|---|---|---|---|---|---|
| NOM | 1.9008 | 0.2941 | 0.96 | 0.92 | 2.01 |
| RISK | 0.7283 | 0.5213 | | | |
| REG_COST | 0.0627 | 0.0137 | | | |
| COP | 0.0174 | 0.0035 | | | |
| TECH_CHG | 0.2415 | 0.0423 | | | |
| NPA | 2.0675 | 1.0972 | | | |

**Table-XVI: Overall Results of Regression Analysis**

| Dependent Variable: NIM | | | | | |
|---|---|---|---|---|---|
| Model Variables | AXIS | HDFC | ICICI | INDUS | All NPBs |
| RISK | S-P-10% | S-P-5% | | | |
| REG_COST | | | | S-P-10% | |
| COP | | S-P-5% | | | |
| TECH_CHG | | S-N-5% | | | S-N-10% |
| NPA | | S-P-5% | | | |
| Dependent Variable: NOM | | | | | |
| RISK | S-P-10% | S-P-5% | | | S-P-10% |
| REG_COST | | | | | |
| COP | | S-P-5% | | | |
| TECH_CHG | S-P-5% | S-P-5% | | S-P-5% | S-P-5% |
| NPA | | S-P-5% | | | |

**Legends:**

S-P-5% : Statistically Significant at 5% LOS, Positive association

S-N-5% : Statistically Significant at 5% LOS, Negative association

S-P-10% : Statistically Significant at 10% LOS, Positive association

S-N-10% : Statistically Significant at 10% LOS, Negative association

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# WHY TO OPEN A DEMAT ACCOUNT FOR TRADING IN STOCK EXCHANGE: A MARKET POTENTIAL

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## ABSTRACT
*Demat or Dematerialized account an account in which shares, and securities are held electronically in India. This helps us overcome the age-old technique of investor taking physical possession of certificates of the shares that he/she possesses. Before registering with an investment broker, it is essential for the investor to open a Dematerialized account, which is then quoted for all transactions to enable electronic settlements of trades to take place. This study focuses on the importance of DEMAT account in stock trading and will focus on the possible scenarios where the key factors such as investor's perceptions act, importance, utility, etc. There would be instances where a we would be dealing with the ideal situations of opening a DEMAT account and its usage in dealing with stock market. We would also be taking various variable and aligning its awareness and impact with the DEMAT account and trading stocks.*

*There are many students which are unaware about the usage of DEMAT account hence the researcher feels the need to study on the importance of opening a DEMAT account and its market potential.*

*Keywords: Dematerialized account, electronic settlements, investor, investor's perceptions act, stock market, etc.*

## INTRODUCTION
The Indian stock exchange markets have evolved tremendously over a couple of decades with a huge potential to become the greatest stock market. Especially after guidelines issued by the SEBI or Securities and Exchange Board of India it has become safe for the investors as there have been several reforms implemented to reorganize the administrative aspect. These policies are not only work as safeguard the investor's interest but also make several amendments in broker dealings with the investor. Current study aims to study on the awareness of the DEMAT account and its potential as an asset to invest.

## WHY DO WE REQUIRE A DEMAT ACCOUNT?
In the present scenario it is important for an investor to have a DEMAT account and settle all Sock exchange trades in DEMAT form. On January, 2002 it was made a compulsion for any company listed in stock exchange to trade of shares to open market by SEBI. It is thus made a compulsory necessity for an investor to trade in respective companies by DEMAT that would hold shares in dematerialized form and to undertake scripless trading.

DEMAT not only acts as a collective space to keep the details of all stocks owned by the investor but also give the investor to trade anywhere. EDMAT account can also be linked to any banking account where the liquid money from a banking account can be transformed into securities and that can be used for trading shares.


FIG 1: DEMAT and other variables

## ADVANTAGES OF HOLDING SECURITIES IN DEMAT
- The transfer rate is faster
- There are no longer bad deliveries
- The transaction cost is low

ISSN 2394 - 7780

- The interest rate is low
- The facility to nominate a nominee
- No Stamp Duty

**STEPS THAT SHOULD AN INVESTOR TAKE TO OPEN AN ACCOUNT WITH STOCK BLOCKERS LIMITED DP (DEPOSITORY PARTICIPANT)**

- It is very easy to open an account. It is very similar to the process of opening a bank account.
- CSBL DP provides the application form that needs to be filled and submitted along with proof of identity.
- It is required to execute an agreement on a stamp paper by the investor before opening DEMAT account.
- A unique BO ID (Beneficial Owners Identification) is allotted once the account is opened. This BO ID is in all transactions.
- There can be upto 3 account holders on one DEMAT account. All account holders can also nominate their nominees.

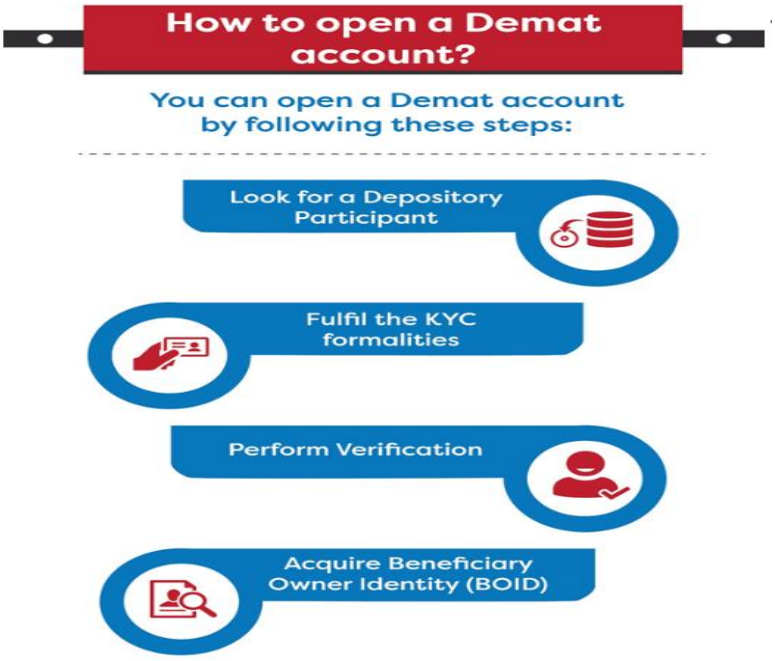


FIG 2: How to open a DEMAT account

**SIGNIFICANCE OF DEMAT ACCOUNT**

A Dematerialized or DEMAT account holds all the shares and securities electronically instead of possessing physical certificates. A DEMAT account can be accessed from all across the globe and the investor can sell, purchase or view the status of their investment at any point of time. Although it must be noted that it would require the investor a predetermined credentials that will be used to protect the DEMAT account from unauthorized access. The sale or purchase of shares from DEMAT is instantaneous and highly secure. The transaction also eliminates the utilization of a lot of paperwork that in turn saves a lot of time and is very easy. It is a fast and secure way of trading in a controlled environment that ensures investor's interest.

**ADVANTAGES**

- It is not required to maintain any minimum balance in the account. If the user wishes he can withdraw all the funds from the account.
- The details about the account is highly secure. Even the Depository Participatory can access only those investor's accounts they service.
- There is no limitation of the DEMAT account that any investor can open. The Investor can proceed and open any number of DEMAT account he wishes as long as he has all the documents in place.
- A transaction statement is being generated and provided to the Investor at regular intervals. This helps the customer to keep a track of his account holdings.

ISSN 2394 - 7780


FIG 3: Advantages of DEMAT account

**DISADVANTAGES**

- DEMAT account is like any other bank account ant should not be treated any differently. The only difference between these are that in DEMAT accounts there are shares instead of liquid cash.
- In order to convert physical shares into DEMAT form it is required to pay a certain amount called DEMAT charge or DEMAT cost.
- It is very important to keep a keen observation on the account for any transaction that might not have processed without the knowledge or authorization of the Investor.

**CONCLUSION**

There are several instances in which it is observed that the Investor does not have proper knowledge before he decides to invest in stock market. This research emphasis on the benefits of DEMAT and how it can be utilized in order to start trading in stocks. The research also brings out the shortcomings of DEMAT and that Investors should be watchful over the account that they are creating and will be using in trading. It is very essential to keep in mind the guidelines issued by SEBI. To ensure smooth start of training an Investor must have all the necessary documents and id proofs. If an Investor take some precautionary measures he can start his trading in stocks with DEMAT account very easily.

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# WORK HOME INTERACTION: A CHALLENGE TO HUMAN RESOURCE MANAGEMENT

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## ABSTRACT
*The current study aims to find out the scenario about the Work Home interaction and how it is becoming a challenge to human resource management. With the evolution of working culture and behavioral patterns of the employees' one thing that has emerged as a challenge is to maintain a balance between the interactions in work and home. There is different type of difficulties that a person faces in order to maintain a healthy work life and personal life balance. Some of these will be discussed in the upcoming pages. With the world, transforming families where most or all adults go to work every day it is hard for the personnel to keep up with the tasks of daily household. This has also promoted the upcoming of various ideas or start-ups that are making our life easier but even after that there are certain things that every individual is missing. It is not only tough but also an important task to maintain a balance. Some people try out various strategies to cope this issue, others simply try to adjust between the change in the life at personal and professional front.*

*There are many students, which are unaware about the Work Home Interaction, and how it is becoming a challenge to human resource management, hence the researcher feels to study on the awareness of developing a good interaction between work and personal life and to overcome this as a challenge.*

*Keywords: interaction, evolution, behavioral patterns, balance, balance, personnel, professional, etc.*

## INTRODUCTION
There are so many challenges that an individual face and many techniques to overcome that. Current study aims to study on the awareness of the interaction between work and home and how to overcome the challenges that a person faces on a daily basis. For an instance, work home interaction depends on the time management and priority management, which are two interrelated factors that are important.

## LITERATURE REVIEW
There are several studies on developing a good work home interaction. Few of them are highlighted as:

1. **Charles Wankel in Work-Home Interaction: A Challenge to Human Resources Management** Although historically speaking there has been a gender-based division of labor (i.e., men working in the public sphere and women in the private one—being in charge of the domestic tasks, raising children), the scenario has changed since World War II as women entered the public workforce. This trend caused the two previously separate scopes to interact and merge into one. Different theories appeared to explain the way in which this so-called work-home interaction (WHI) affects employees and organizations, and different strategies have developed to promote positive consequences of such an interaction.
2. **Karina Mostert and Adele Van Aarde in Work-home interaction of working females: What is the role of job and home characteristics?** Family roles, workforce demographics and the relationship between work and family are changing. An increase in dual-career couples, single-parent households, and gender integration in organizations are just some of these changes, and the result is that more families find themselves struggling to juggle both work and family. Understanding the interaction of work and family issues has become increasingly important because of the increasing number of women in the workforce.
3. **Sebastiaan RothmannI and Candice Baumann in Employee engagement: The effects of work-home/home-work interaction and psychological conditions** Engaging employees is an important strategy for organizations, for various reasons: Engagement may contribute to the psychological well-being of individuals at work. Furthermore, engaged employees are less inclined to be absent from work, present a better service to the clients, and contribute to organization's productivity and profitability.
4. **SABINE A. E. GEURTS1, TOON W. TARIS1 and MICHIEL A. J. KOMPIER in Work-home interaction from a work psychological perspective:** Development and validation of a new questionnaire, the SWING- many scholars have theorized about the way in which people manage the possibly conflicting demands from work and family life assumes that people possess limited and fixed amounts of resources (e.g. time and energy). Managing multiple roles (e.g. of employee, spouse and parent) is problematic as they draw on the same scarce resources.

Before the study, it is essential to know what the aims and objectives are of managing a good work life balance for an employee:

ISSN 2394 - 7780

**The main objectives for Work Home interaction and how it is becoming a challenge to human resource management**

a) To make uniform and skillful system addressing all the challenges faced by human resource management due to improper work home interaction across the country.

b) To address all the issues that an individual face because of improper work home interaction.

c) To minimize the efforts and improving the skills for an individual.

d) To replace a lot of other patterns to reduce efforts of an employee.

e) To detail the best practices of having a good work home balance.

f) To manage the reflections of the two aspects of life i.e, work and home.

g) To reducing the management problems to avoid further issues.

h) To ensure the availability of knowledge for the improvement

i) To improve the competitiveness of the students.

## AIMS AND OBJECTIVES OF THE STUDY

a. To explaining about Work Home interaction and how it is becoming a challenge to human resource management.

b. To study about the awareness of Work Home Interactions.

c. To study of methods, practices and other ways to cope up with the issues created to maintain a good balance between work and home.

## HYPOTHESIS

a. There is not clear picture of about Work Home interaction and how it is becoming a challenge to human resource management to the all sectors.

b. Students, employees are not having proper knowledge of about the style required to maintain a good balance between work and home.

## RESEARCH METHODOLOGY

The interview & questionnaires method was used for the current study with the management of Personal visit to various scale of business in various sectors of Mumbai. The records were collected and observed information is analyzed. There were two sources of data collection is used as:

A) **Primary data**: The Primary data is the data that is directly collected through interview & questionnaires from the respondents.

B) **Secondary data:** Secondary data is collected from the information, which is available in printed form i.e. Magazines, Journals, Books, Company records etc .

## DATA COLLECTION

As the current study is empirical study, the researcher has selected different individuals as sample size. For the current study, the researcher has focused on those respondents willing to participate and co-operate in order to ask the proper responses.

## RESULTS OF THE STUDY

The data collected from the selected ten industries were analyzed and the average performance of it is given in the below table with the selected parameters of current study:

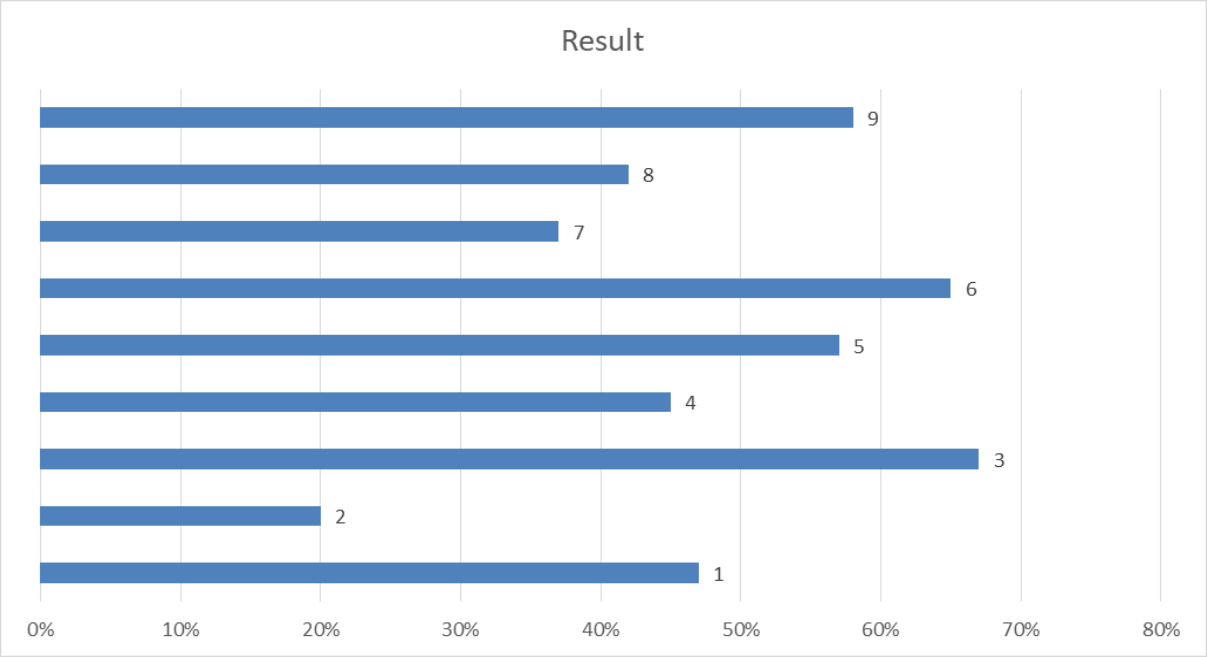
X axis is denoted by parameters from 1 to 9 listed below:

| Sr No | Parameters | Result |
|---|---|---|
| 1 | Issue in commuting from home to work and vice versa | 47% |
| 2 | Percentage time lost in commuting home to work and vice versa | 20% |
| 3 | Problems in managing home affairs after work | 67% |
| 4 | Problems in following a routine life due to work life balance | 45% |
| 5 | Problems in giving time to the family | 57% |

ISSN 2394 - 7780

| | | |
|---|---|---|
| 6 | Finding life to be monotonous | 65% |
| 7 | Inconsistancy in professional life | 37% |
| 8 | Arriving late at office | 42% |
| 9 | Lack of supervision of younger ones (in case of dual-career couples) | 58% |

Table 1: Problem faced by employees due to improper Work-Home Interaction




Graph 1: Percentage of people facing issues due to improper Work-Home Interactio

**FINDINGS**

1) On an average almost 50% employees live far from work and spent more than 2-3 hours a day just in commutation.
2) After a hectic day at work it is tough for people go back home and manage the household tasks feels very difficult.
3) Due to work load it is challenging for an to maintain a healthy and routine life.
4) It is observed that due to huge workloads the employees face, they have trouble giving proper time to the family and for dual-career couples it is a tough task to keep a supervision on the children.
5) People often find their life monotonous.
6) This also affect the professional life of an employee. Employees are observed to arrive late for office at regular basis and their performance also deteriorates.

**STRATEGIES AND TECHNIQUES PEOPLE USE**

1. Since most of the people living in Mumbai work far from their homes and take public transport. It is observed on a regular basis that people try to utilize the journey hours for something productive. Most people can be seen working or preparing presentations on their way to office whereas many people can be spotted cutting vegetables and completing other household work on the way back.
2. People are trying to adapt along with the changing world. Due to digitalization and emergence of e-commerce it is observed that most of the people order goods instead of buying them from stores. This applies to groceries as well. By this they save time that otherwise is wasted in shopping from stores.
3. With the emergence of play schools people now keep their kids in these establishment where they are taken care of after their school and before their parents leave office. At these places the kids are taken care of in a supervised environment.

**CONCLUSION**

There are several cases within which students, employee themselves are confused about the key aspect of balancing the Work and home interactions. Therefore, students knew solely that these are some of styles

ISSN 2394 - 7780

required. What's precisely some of important styles and its applications only a few of apprehend. It's not straightforward and simple to apply a good Work Home Interaction so the idea of managing it in a way that it is no longer a challenge for Human Resource management is very much necessary for the improvement. In todays' world there are several reasons that are leading people to stress out by managing the two fronts of life. On the other end people are using their skills and time management to turn this into their advantage. It is to be noted by the students and they must be able to utilize this to their upcoming future.

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# A STUDY OF BUDDING GREEN INCLINATIONS FOR VIRTUAL PAYMENTS BY CONSUMERS

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## ABSTRACT

***Purpose:*** *This paper strives to instigate the acceptance of Virtual payments by consumers by discovering the impacting factors of captivating Virtual modes that are specific to the environment of Virtual payment and envisaged for impending research on this growing movement and the influential role of Virtual payments in budding Virtual green inclinations by consumers.*

***Design / Methodology / Focus:*** *This paper explores and ascertains the structure that operates among consumers concerning the idea of Virtual uses among modern consumers. This paper is substantiated on information collected with questionnaires from Indian Virtual consumers who propose a ground for carrying out research.*

***Findings:*** *The findings of this paper presents the budding hypothetical framework for Virtual approval of consumer Virtual shopping conduct and casts radiance on acceptance practices ensuing from the logic of consumers in acceptance of Virtual payment methods.*

***Research limitations/implications of the research:*** *This paper is based on a small sample size of one hundred ninety-five respondents. Precaution should be taken while applying results to a larger population.*

***Functional implications:*** *The paper analyzes the justification regarding Virtual intents' of Virtual consumer behavior. Marketing specialists can devise strategies for consumer approval of Virtual payment methods as a tactic to improve consumers' behavior relating to Virtual shopping practices.*

***Societal implications:*** *Marketers and society must the ways consumers are embracing Virtual payments to know the motives responsible for the acceptance of Virtual modes of payment.*

***Originality/value:*** *This paper is intended to understand deeply acceptance and the Virtual arrangement, this paper investigates Virtual acceptance patterns.*

*Demonetization was gaining knowledge of the curve that reinforced the payments market. Demonetization has indicated to amazing evolution in the Virtual payments industry in India India is furthering in the path of a key Virtual transformation. In contemporary decades, Indian consumer payment models have altered, where the majority of the public has discarded the conformist method of doing payments using cash and instead reformed to more contemporary payment keys, Virtual payment methods. Consumer Virtual transmissions made for various items purchased through the network, smartphone, payment Virtually are termed as Virtual payments. Virtual modes have also modernized trade and facilitate consumers including a wide range of products from around the world.*

*The Virtual payment industry has glanced at innovation, development, and revolution at a steady pace. Consumer behavior is resplendent, so it is necessary to escalate consumer adoption for Virtual payment, especially when it is an impending and new manifestation that is being carefully scrutinized in a budding nation like India. Awareness of such modes holds a sustainable and constructive influence on the adoption of such innovative modes also contributes towards the creation of a green environment.*

*This paper aims to investigate consumer support of such modes by empirically determining causes associated with espousal that are identifiable to the milieu of Virtual payment and thus its involvement in the creation of a green environment.*

***Keywords:*** *Virtual payment, privacy, trust, consumer behaviour, Virtual India, security.*

## INTRODUCTION

The last decade has observed diverse advancement in the usage of the net and smartphone in India. On one hand, when the business world is becoming more socially responsible, the consumers are also changing their attitudes as they shift from buying conventional products to ecofriendly/green products (Ghosh, 2010). Lately, awareness of the green environment has gained tremendous attention worldwide because of environmental deterioration which leads to global problems. It is also observed that companies have started using green marketing for various reasons like social responsibility, green policies, etc. (Kumar, 2010). Due to this transition and excessive competition, it has become pivotal for marketers to formulate the marketing strategies in line with consumer attitudes to be successful. This growing usage of the net, mobile usage, and government endeavors

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such as Virtual India is yet another operator promoting an exponential promotion in the use of Virtual payments, which are operating as a facilitator which promotes exponential advancement in the usage of such innovative cashless modes. It identifies interferences and pronouncements supporting the acquiescence of cashless modes in India, namely Mobile wallets, Prepaid credit cards, Debit cards, Aadhaar enabled payment system, United Payments Interface, etc,

The Virtual payment is a type of commercial transaction commerce pact to include making payment electronically for the procurement of products and services through various Virtual modes like Paytm, Freecharge, Google pay, etc. This paper intends to comprehend in what way ultimate users are beneficially exchanging with such new modes of cashless payments and also impacting the green environment. The study collected responses from one hundred and ninety-five users and studied perception, dispositions, and satisfaction effectiveness with such modes.

**LITERATURE REVIEW**

In the prevailing era, particular studies have highlighted the rewards of the endorsement of Virtual modes and expediency in reconnoitering Virtual payments smoothed payments through card payment devices like mobile and laptop. Consumers are spellbound by other people who transform into the Virtual way of paying for motivating reasons that include easy and convenient usage, accessibility, and the savings of cost (Schwartz, 2001). Virtual modes are recommended to empower the consumer to make payments trendily in widespread e-commerce by decreasing the usage of cash to make payments. It was also suggested that consumer caution potential for consumer adoption of Virtual systems needs to be explored. Consumers end up buying those items which are not required when payment is made by credit cards. It turns out as routine enablers for making payments (Crockett 2005). It is also claimed that tangible mode of outlay affects consumer behavior causing it to be “play money”( S .Raghubir, 2008). The literature review shows that it is full of findings on mobile and technology on app adoptions and continuous usage adoption relating to Virtual payment systems in Indian and global context.

An increase in investigations into the issue of Virtual modes adoption by researchers opined that delight leads to an increase in consumers’ usage of facilities related to net (M. Kim, 2001) and also services of mobile (Verkasalo, 2008 ). Hultman (2005) pronounces how consumers are assessing the eminence of amenities offered while switching over to Virtual modes.

M. Taylor (2011) have tackled the issue of modes of payment as to in what way modes of payment effect on consumer outlay behavior. These authors have also examined the inclination of users to apply existing indication that outlay for the credit card is greater as compared to cash outlay. Studies also revealed that credit cards promote an upsurge of not so required items acquisitions (Soman, 2003). Many famous models relating to consumers' adoption of technology have been suggested in the past. Avocated by Davis in 1986 is one of the famous models associated with the adoption of technology is the technology acceptance model (TAM).

TAM explains the theoretical epicenter of the services to designate consumer behavior, concerning the adoption of technology. TAM is envisioned as a significant addendum of (TRA) - theory of reasoned action. Venkatesh (2012) in an analysis entitled "Consumer acceptance and use of information technology: expanding the unified theory of acceptance and use of technology" showed UTAUT as an influential structure. The proposition is vital for consumer behavior regarding the usage of technology in comparison with a condition that fluctuates allowing dynamics They also proposed a vital outcome on the behavior of consumers by technology usage in meeting a speckled condition that is effervescent.

**GREEN VIRTUAL TRENDS**

Virtual trends are advocating eco-friendly/green initiatives in payment. It is like traditional cash payments together with expecting the societal as well as eco-friendly factors for protecting the environment. These days the environment is a matter of concern to all. As the cashless economy becomes more popular there is a decrease in the need for producing paper, printing currency, and distributing it. As Virtual modes involve the online transfer of funds many trees are saved from cutting. A lot of paper is required for vouchers, receipts, the printing of tickets, bank statements, etc. With Virtual transfers, paperless transactions are done leading to saving of cutting of trees. Banks have embarked on offering amenities like mobile/online banking, online settlement of bills, online financing, usage of ATM, etc which are substantiated on the sensitivity towards green Virtual practices. Some of the policies comprehended by banks are carbon standing business, energy cognizance, societal accountability amenities like tree estate camps, and conservation of parks, etc. Green banks can be contemplated as developers of hygienic energy reserves throughout the globe. The big push to go Virtual – paying with an app, not a note; e-bank statements; the paperless office – resonates with people nowadays

ISSN 2394 - 7780

concerned about the environment. Moreover, with the adoption of modern green energy to power ATMs, lesser printing of bank passbooks due to messages regarding balances coming in mobiles there is a lot of contribution towards saving of environment. Until the highest of the twentieth century, green was just the color of money for banks in India. With the introduction of any time money machines (ATMs) in 2001in India, the banking sector procured programs towards an environment-friendly banking system.

There's a requirement on the part of Virtual payment providers to opt green practices and emphasize environmental and ecological deportments. Global warming is developing as a national and international dilemma; it is resulting in destroying natural resources. To control this worldwide warming delinquent there should be global specialized green and eco-friendly initiatives undertaken by all. Thereafter, many steps were started viz. usage of eco-friendly credentials, solar-driven ATMs, green schemes, energy efficacy methods, place of work healthiness and protection, arranging knowledge drives, online banking arrangements, etc. This paper accords with green strategies and innovations that emerged in the new trends of the Virtual payment sector in India. The role of Virtual payment users in adopting green practices by switching to cashless modes has been studied.

## OBJECTIVES

The objective of this paper is to comprehend the approach of consumers' concern about the purchase inclinations for the green or eco-friendly environment by taking on the Virtual modes of payments. The paper endeavors to investigate how consumer behavior is influenced by green marketing practices by swapping to Virtual modes of payment. This paper is intended to secure an understanding of Indian consumers' mindsets towards green marketing by the consumption of Virtual modes of payment that supports environmental protection. After having reviewed the literature, the authors felt that there is a necessity to study the responsiveness levels of users regarding various Virtual payment instruments, their liking towards the same, and influence on the environment with the adoption of Virtual payment practices. More explicitly, the paper endeavors to realize the following research objectives:

1. To appraise the cognizance of customers concerning Virtual trends of payments.
2. To study challenges in adopting Virtual modes for making India a cashless economy.
3. To evaluate the core factors conscientious for the advocacy of green Virtual modes.
4. To explore the benefits of Virtual payment modes and renovating into a cashless society.

## RESEARCH METHODOLOGY

The present paper is supported on information assembled from one hundred and ninety-five participants from various regions of Delhi. To gather data an organized questionnaire was used which was intended to examine the notion of consumers towards the acquiescence of modes of Virtual payment.

### Sampling Method

For this study, the interview method was followed, along with a questionnaire that was framed for gathering primary data online through google forms. The purpose of this paper was explained to the consumers. There had been no personal bias while choosing respondents for recording the responses.

## RESULTS AND DISCUSSION

### Participants' Description

Table 1 replicates the respondents involved in the usage of Virtual modes. Chiefly the participants are 53% males and 42% females. In the private sector 32% of participants were employed and 20% government sector, graduate participants were 55%, 10+2 (21%), in the age group of 25-35 years (29%).41% in annual income of Rs. 7.5 to 10 Lacs. This is the ideal profile for a user of Virtual mode and who are educated, employed, and having a decent income.

**Table 1 Participants' Demographic Description**

| Factor | Traits | Rate | Percent |
|---|---|---|---|
| Gender | Male | 103 | 53 |
| | Female | 92 | 47 |
| Age group | 18-25 years | 63 | 32 |
| | 25-35 years | 56 | 29 |
| | 35 -45 years | 45 | 23 |
| | 45-55 years 55 & above | 31 | 16 |
| Education | Post-Graduation | 20 | 10 |

ISSN 2394 - 7780

| | | | |
|---|---|---|---|
| | **Graduation** | **107** | **55** |
| | **10+2** | **41** | **21** |
| | **10th or below** | **27** | **14** |
| **Profession** | **Pupil** | **43** | **22** |
| | **Employee-Private Segment** | **62** | **32** |
| | **Employee-Public Segment** | **43** | **20** |
| | **Self engaged** | **29** | **15** |
| | **Others** | **18** | **11** |
| **Yearly Income p.a.** | **Up to 2.5 Lacs** | **27** | **14** |
| | **2.5-5 Lacs** | **18** | **9** |
| | **5-7.5 Lacs** | **55** | **28** |
| | **7.5-10 Lacs** | **80** | **41** |
| | **10 Lacs & above** | **15** | **8** |

**FREQUENCY ANALYSIS**

Frequency analysis was carried out to ascertain consumer perception and total level satisfaction among users. The highly significant and vital responses have been confirmed by consumer statements indicating a positive perception and vice versa. The highly significant and significant responses are the positive responses of the statement with a specific characteristic of the Virtual payment method. The Slightly significant and Not significantresponses are those which do not support the statement correlated to a particular attribute and indicate no satisfaction.

Most of the participants agree that Virtual modes extend people benefits in procuring products, enhances the attribute of the decisiveness, aids to procure products rivaled to traditional cash-based methods, recommend an extensive variety of banking services, and alternatives for payment. They also approve to trust service givers. Most of the participants stated that significant or highly significant statements are related to brand confidence, convenience, safety, time-saving, adoption of Virtual wallets at various outlets, and rates related to transactions. Most respondents said it was Significant or Highly Significant to associate with the brand, ease of use, secure transactions, time savings, acceptance of Virtual wallets in different stores, and transaction prices (transaction costs, service fees, etc. ) The Frequency Analysis of consumers satisfaction towards the eco-friendly Virtual mode of adoption is presented below in Table 2 shows consumers insight for Virtual modes of payment as depicted

**Table 2: Frequency Analysis of Consumer's Insight for Virtual modes of payment.**

| Statement | Highly Significant | Significant | Moderately significant | Slightly significant | Not significant |
|---|---|---|---|---|---|
| **Trustworthiness** | 101 | 59 | 23 | 10 | 2 |
| **Convenience** | 29 | 113 | 27 | 20 | 6 |
| **Security** | 101 | 68 | 18 | 6 | 2 |
| **Saving of Time** | 146 | 25 | 12 | 8 | 4 |
| **Eco- Friendly/Green practices** | 43 | 105 | 31 | 14 | 2 |
| **Fee/Charge** | 10 | 103 | 55 | 20 | 7 |

**FINDINGS**

This study attempted to comprehend user acclimatization to Virtual mode no massive difficulties were perceived by male and female respondents for a bigger share of qualities of characteristics of Virtual mode. The outcome of the present study directs that the acquaintance and understanding of the consumer about the green environment has a constructive effect on their espousal of Virtual modes of payment. There prevails a positive stimulus on consumer mindsets for progressing to Virtual products that are harmless to our environment. This is expressly true in the instance of younger respondents.

An enormous number of participants consented that it is convenient, easy, useful, beneficial, trustworthy, time-saving to adopt Virtual modes of payments, and eco friendly too. The present study has striven to know consumer adaptation towards Virtual payment modes. If a person is a graduate or above and having Internet knowledge, he would be prone to employ Virtual payment methods. It has also been found that in areas/regions where education is high, the likelihood of assenting to Virtual payment is much greater. The evolution of smartphone users and the dissemination of the Internet in these segments have also enabled the acceptance of Virtual payment.

ISSN 2394 - 7780

## CONCLUSION AND PRACTICAL IMPLICATIONS

This paper is a valuable foundation of knowledge for green marketers concerning the consumers' perception of the green environment and becomes an important source of information for marketing strategy formulation. This paper presents important discussion and outlines the scope and possibilities that can be drawn by marketers through the understanding of consumers' stance towards a green environment by espousing Virtual modes of payment.

Utilizing the findings of the study, it is examined that younger consumers are comparatively more active advocates of green environment, therefore, promotional drives can be planned with a specific emphasis on the younger generation.

The potential of the planet rests in the thoughtful and viable usage of Virtual products. The consumers need to be dependable in their procuring conduct and companies must endorse environmentally sustainable avenues of production and marketing activities. To promulgate the intention to go green amongst consumers, companies need to be candid and authentic in their actions for the planet.

## LIMITATIONS

A major limitation of this paper is that findings are limited to a small group of respondents out of a vast population thus to generalize the results, including a diverse population and not limited to a particular region would be helpful.

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ISSN 2394 - 7780


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# A COMPARATIVE STUDY OF MODERNIZATION AMONG PROFESSIONAL AND NON PROFESSIONAL WOMEN GRADUATES

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## ABSTRACT
*Modernization means the development of a modern outlook in everyday life. It does not mean the abandonment of religion and mere acceptance of modern equipment's tools and gadgets. It refers to an inherent change in the mode of life. The present descriptive survey was conducted to compare the level of modernization of professional and non-professional graduate women with respect to Socio Religious Values, Position of Women, Marriage and Education. The data for study was obtained by administering the Modernization Scale by Raghavendra Singh to a sample of 250 female women graduates belonging to the old city of Hyderabad. The sample comprising of 124 professional graduate women and 126 non professional graduate women was collected through stratified random sampling technique. The t- test was used to compare the significance between the obtained mean scores. The obtained result revealed that there is no significant difference in social religious and marriage aspect of modernization among professional and non professional graduate women. However, the professional women graduates had a higher level of modernization with respect to Position of Women and Education. A significant difference was also found in the over all modernization level between professional graduate women and nonprofessional graduates. The professional graduate women have higher level modernization than the non professional graduate women of old city of Hyderabad.*

## INTRODUCTION
The process of change in social life is a universal reality. No human society can remain stagnant forever. Social change is inevitable. The rate of change, however, varies not only form society to society but also from time to time within the same society. In developing countries, in spite of traditional obstructions and socio cultural hindrances, societies are changing. This change in the mode of life, patterns of marital and social relationship, systems of economic distributions, and ways of behaviour have given birth to a new process termed as modernization.

According to Deutch " Modernization is a process in which major clusters of old social, economic and psychological commitments are eroded and broken and people become available for new pattern of socialization and behaviour. " The process of economic growth, expansion of science and technology, and change in the social structure commensurate with demands for social and economic growth as essential components of modernization (Singh, 1991) On the cultural sphere, a modern society is characterized by a growing differentiation of the major elements of the major culture and value system that is religion, philosophy and science, the spread of secular education and literacy. Modernization involves changes not only in the material culture of the society but also in its beliefs system, values and the way of life on the whole. It is the process of transformation of the society from its backward outlook to a forward looking, progressive and prosperous structural build up.

## WOMEN AND MODERNIZATION
The process of modernization has been instrumental in bringing about a change is the ways and work of women of this country. Urban communities are more exposed to the forces of modernization than the rural areas. Modernization among women depends on the extent of acceptance of modernism and the degree of exposure to modern forces. Modernization has created a need as well as opportunity for educated and skilled women to take up employment in offices and commercial and industrial houses. This has led to a tremendous increase of women in the white collar force. Modernization has created a need for organizational innovations such as working women's hostels, crèches, and other agencies for taking up domestic responsibilities. At the same time it has also given rise to tensions, conflicts, disruptions and crisis of adjustment. The employed women are required to face these because most of them come from those sections of the society that were under the firm hold of tradition which prohibited them from taking the employment. Working or professional women have modernized themselves in the economic sphere of their life to the extent of taking up the remunerative jobs, but they are still traditional bound in their social life. Education is held as an instrument of social change. Education motivates the female population and influences their attitude and attempts to enhance their social status and give them autonomy and freedom. Due to a number of factors, women started stepping in other professions. They have made tremendous achievement in the field of medicine and teaching which seem to be preferable,

ISSN 2394 - 7780

but still administration, law, business etc. are the occupations where women are offered 30% reservation. So this study has selected women from all these fields.

The concept of modernization in the present context means a change both in the form and content of social intuition such as socio religious problems, marriage, position of women etc. Education will definitely bring changes in the prevailing women's attitudes towards dowry system, marriage etc. Acceptance of widow remarriage, promotion of women's decision making power in the family and work situation are the changes brought about in the present social set up due to education. Many researchers in the field of women education have emphasized the power of education to bring in positive social changes to enhance the position of women and empower them in major realms of society.

**SIGNIFICANCE OF THE PROBLEM**

Women have played very important and varied roles in the history of mankind. Education is the potential source of empowering women in several ways. Education and modernization increases the women's ability to inculcate an attitudinal change within them thereby giving birth to a feeling of self-worth. It also gives them an increased ability to challenge power and authority. Education emphasizes the role of women in decision making, economic self-reliance and facilitates protection against discrimination. The present study in aimed to investigate to what extent education has facilitated the development of all above significant factors among the professional and non – professional women graduate women of the old city of Hyderabad.

**OBJECTIVES OF STUDY**

Keeping the above problems in view the objectives of the present study were spelt out as follows:

1. To assess the level of modernization among the educated women belonging to the old city of Hyderabad.
2. To compare the levels of modernization of professional graduate women and non professional graduate women of old city of Hyderabad.
3. To compare the attitude to professional graduate women and non professional graduate women of old city of Hyderabad towards marriage and socio – religious aspects.
4. To compare the attitudes of professional graduate women and non – professional graduate women of old city of Hyderabad towards education and position of women.

**HYPOTHESES**

1. There is no significant difference between professional graduates and non professional graduates women of old city of Hyderabad towards socio religious aspects.
2. The professional graduate women and non professional graduate women of old city of Hyderabad have the same attitude towards marriage.
3. The professional graduate women of old city of Hyderabad are significantly higher in their attitudes towards position of women than the non professional graduate women of old city of Hyderabad.
4. The professional graduate women and non professional graduate women of old city of Hyderabad show a significant difference in their attitude towards education.
5. There is a significant difference in the level of modernization between the professional graduate women and non professional graduate women of old city of Hyderabad.

**METHODOLOGY**

The research was conducted as it described the phenomenon in its natural settings. The study was carried out in the old city of Hyderabad and data was collected from professional and non-professional graduate women through descriptive survey method.

**SAMPLE**

The population selected for the study was educated women resided on the old city of Hyderabad. Data was collected from two specific non respondent groups drawn from a population of Post graduate and non-professional women of old city of Hyderabad. The sample comprising of 124 professional graduate women and 126 nonprofessional graduate women was selected through stratified random sampling technique.

**RESEARCH TOOL**

The tools used for calculation of data is the modernization scale by Raghavendra S Singh, Amarnath tripathi and Rajiv Lal. The scale assesses the attitude towards modernity in the sub areas of socio religious marriage. Position of women and education. This is a likert type of scale and self-administering inventory which can be

ISSN 2394 - 7780

administered individually or in group. It compromises of 32 items covering all the above sub areas and gives the area wise modernization score as well as total score indicating the overall modernization score. The reliability of the scale is 0.78 and validity of subscales with the total scale range from 0.61 to 0.97.

**STATISTICAL TECHNIQUES**

Initially the data obtained was examines by using descriptive statistic like mean and standard deviation. And further the critical ratio was computed to assess the significance of difference between the mean values in all the sub areas of modernization.

**COMPARISON OF PROFESSIONAL GRADUATE AND NON PROFESSIONAL GRADUATE WOMEN ON MODERNIZATION**

| Factor | Category | N | Mean | S.D | t – values | Inter Predation |
|---|---|---|---|---|---|---|
| Socio Religious | Professional Graduates Women | 124 | 42.56 | 22.16 | 1.60 | Not significant |
| | Non -Professional Graduates Women | 126 | 38.47 | 17.91 | | |
| Marriage | Professional Graduates Women | 124 | 71.00 | 27.82 | 0.13 | Not significant |
| | Non -Professional Graduates Women | 126 | 70.55 | 24.40 | | |
| Position of Women | Professional Graduates Women | 124 | 41.50 | 5.55 | 9.55 | Significant |
| | Non -Professional Graduates Women | 126 | 34.81 | 5.80 | | |
| Education | Professional Graduates Women | 124 | 37.46 | 7.79 | 5.58 | Significant |
| | Non -Professional Graduates Women | 126 | 30.65 | 11.44 | | |
| Total Modernization Score | Professional Graduates Women | 124 | 148.62 | 17.20 | 12.84 | Significant |
| | Non -Professional Graduates Women | 126 | 122.28 | 15.21 | | |

**RESULTS AND DISCUSSION**

1. From the above table it is evident that the calculated t-value for the sub-area socio-religious aspect of professional-graduate women and non-professional graduate women is t(1.60). t (1.60) < 1.96 and t (1.60) < 2.58 which is not significant at both 0.01 and 0.05 level of significance. Hence the hypothesis that there is no significant difference between professional graduates and nonprofessional graduate women of old city of Hyderabad towards social-religious aspects is accepted. The findings of the study are in consonance with the study of Fatima Nusrat (1989) which showed the women having higher education have a similar and favorable attitude towards girls' education and shedding of social evils and socio religious customs like dowry etc.

2. The calculated t-value of the sub area of attitude towards marriage for the professional graduate women and nonprofessional graduate women is t (0.13). t (0.13) < 1.96 and t (0.13) < 2.58.Hence the difference between means is not significant at both 0.01 and 0.05 level of significance. Therefore, the hypothesis that professional graduate women and nonprofessional graduate women of old ciy of Hyderabad have the same attitude towards marriage is accepted. The result supported the study that majority of the educated women held marriages as a matter of obligation and a religious bond irrespective of their level of education ( Sakhare 1977) . Further also education qualification of the women have a significant effect towards family size and marriage age.

3. The mean values of professional women graduates towards the sub-area of position of women (41.50) is higher than that of non-professional graduate women (34.81) . The calculated t value t (9.55) > 1.96 and also t(9.55) > 2.58 , which is significant both at 0.01 level and 0.05 level of significance. Hence the professional working graduate have a higher attitude towards their position than the non-professional women graduates. Thus the hypothesis that the professional graduate women at old city of Hyderabad are significantly higher in their attitude towards position of women than the non-professional graduate women

ISSN 2394 - 7780

of old city of Hyderabad is accepted. This may be due to the fact that working women are socially more aware and more independent than non-working omen (Parul Gaur 2003) . Professional education can help a women progress and develop professional skills and high degree of self-respect. There is a clear association between higher educational and occupational aspirations and professional women view their profession as utilization to achieve economic self-dependence and enhance one's own position (Rajvanshi Jyotsna) . Skilled professional women have a positive perception of their self, are more satisfied in their jobs and hence have high position and status (Hota Sujata)

4. The mean values of professional women graduates towards the sub area of education (37.46) is higher than that of non-professional women graduates (30.65) . The calculated t value is t(5.8) >1.96 and t (5.58)> 2.58 which is significant at both 0.01 and 0.0 5level of significance. Hence the professional graduate women have a more favorable attitude towards education. Therefore, the hypothesis that The professional graduate women and nonprofessional graduate women of old city of Hyderabad show a significant difference in their attitude towards education is accepted. These findings are in agreement with the finding that women at different professional occupations and age levels displayed favorable attitude towards education ( Vasuki N, 1990)
5. The calculated t value for overall modernization score of both the respondent categories of women is t (12.84) > 1.96 and t (12.84) >2.58. Hence it is significant at both 0.01 level and 0.05 level of significance. Thus the professional graduate women exhibit a higher level of modernization than nonprofessional graduate women. Hence the hypothesis that there is a significant difference in the level of modernization between the professional graduate women and non-professional graduate women of old city of Hyderabad is accepted. This finding is supporting some similar findings that secondary and higher professional education among women has a positive effect on their occupational mobility and unemployment ( Fatima Nusrat 1989) and professional educated girls has positive attitude towards female education, female employment, coeducation higher capabilities of women for adjustment in adversity (Choudhary Pratima K,1998)

**CONCLUSIONS**

From the above interpretations and discussions, the following conclusions were drawn.

1. The professional women graduate and non-professional women graduates of old city of Hyderabad have the same attitude towards the socio-religious aspects of modernization and also towards marriage.
2. The professional women graduates have a more favorable attitude towards the position of women than the non-professional women graduates of old city of Hyderabad.
3. The professional women graduate have a higher attitude towards education than the non-professional women graduates of old city of Hyderabad.
4. The professional women graduate of old city of Hyderabad have a higher level of modernization than their non-professional women graduate counterparts.

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ISSN 2394 - 7780

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# STUDY ON THE BASIS OF HISTOLOGICAL, PHYSIOLOGICAL AND BEHAVIOURAL CHANGES IN INDIAN DOMESTIC PIGEON (COLUMBA LIVIA) INCLUDING AGE AND SEX

**Thakur G.K and Ranjan Saurabh**

## ABSTRACT

*The Importance of study is to analyze the Haematological parameter relation to age,sex mode and mechanism of flight and behaviour of domestic living pigeon. The first hint that birds evolved from reptiles appeared in 1861 with the discovered of an beautiful skeleton of a late Jurassic bird named Archaeopteryx, the first known birds discovered in early 1860.The most distinguishing feature of pigeon is the possession of feathers, which don't occurs in animals. The smaller forms are usually called doves and larger forms called pigeon. Thus a pigeon may be described as a feathered, bipedal, flying vertebrate possessing wings. They attract attention because of flight, colourful plumages, springtime songs, strange migration, many fascinating habits and considerable economic value of man*

## INTRODUCTION

The science of ornithology has a long history and studies on birds have helped develop several key concepts in evolution, behavior and ecology such as the definition of species, the process of speciation, instinct, learning, ecological niches, guilds, island biogeography, phylogeography and conservation. While early ornithology was principally concerned with descriptions and distributions of species, ornithologists today seek answers to very specific questions, often using birds as models to test hypotheses or predictions based on theories. Most modern biological theories apply across taxonomic groups and the number of professional scientists who identify themselves as "ornithologists" has therefore declined. A wide range of tools and techniques are used in ornithology, both inside the laboratory and out in the field, and innovations are constantly made. Pigeon, any of several hundred species of birds constituting the family Columbidae (order Columbiformes). Smaller forms are usually called doves, larger forms pigeons. An exception is the white domestic pigeon, the symbol known as the "dove of peace."It appears that only pigeons are able to identify their males and females apart without any confusion, as they both have very similar outer appearance. However, a closer look with keen attention to certain features and habits would reveal whether it is a male or a female. Therefore, it is very important to know about these differentiating pigeon characteristics into males and females.

- Males are larger and heavier than the females.
- Males coo more, while females peep and squeak more.
- Male pigeons perform an attractive dance following the female, while female watches it and shows her acceptance by simply dropping the wings down before mating.
- Most obviously, females lay eggs, but males do not upon mating.

Usually, males incubate eggs during the morning session, whereas female takes it over for the rest of the time including afternoon and night.

- Pectoral girdle of females is wider, but it is not wide, but closely located hipbones in males.
- The foremost toe of both legs is slightly longer in males, whereas in females all the toes are equal .

## MATERIALS AND METHODS

Experimental Laboratory animal-Experiments were done on male and female pigeons at the Department of Zoology, S.K.M. University, Dumka, Jharkhand after ethical approval from the department.

Experimental Protocol :Reproductive Behaviour of male and female pigeons.

Haematological Assays :

Collection of Blood **:**The blood and tissues from the pigeons have been taken out as a sample to test and collect the data. Blood samples were obtained from the Veins puncture for both haematological assay (blood in EDTA vial).

1. Red Blood Cell Count
2. White Blood Cell Count
3. Differential Leucocyte Count

ISSN 2394 - 7780

a. Granulocytes
b. Monocytes and
c. Lymphocytes

***4.*** **Hemoglobin Concentration**

***5.*** **Erythrocyte Sedimentation Rate**

6. Hematocrit
7. Mean corpuscular volume (MCV)
8. Mean corpuscular hemoglobin (MCH)
9. Mean corpuscular hemoglobin concentration (MCHC)

**Haematological Observations:**

Total Erythrocyte Count (TEC) of male squab is 4.320 ± 0.04359 million /Cu mm

TEC of male pigeon was 4.860 ± 0.08327 million /Cu mm.

TEC of female squab was 4.390 ± 0.04933 million /Cu mm

TEC of female pigeon was 4.590 ± 0.03786 million /Cu mm statistically significant at $p< 0.05$.

Haemoglobin of male squab is 11.65 ± 0.1041 gm/dl

Haemoglobin of male pigeon was 13.27 ± 0.3712 gm/dl.

Haemoglobin of female squab was 11.82 ± 0.04410 gm/dl

Haemoglobin of female pigeon was 12.57 ± 0.1453 gm/dl statistically significant at $p< 0.05$.

PCV of male squab is 40.33 ± 1.453 percent

PCV of male pigeon was 44.00 ± 1.732 percent.

PCV of female squab was 39.00 ± 0.5774 percent

PCV of female pigeon was 40.00 ± 1.155 percent statistically significant at $p< 0.05$.

ESR of male squab is 18.67 ± 0.8819 mm.

ESR of male pigeon was 10.33 ± 0.8819 mm.

ESR of female squab was 14.00 ± 0.5774 mm.

ESR of female pigeon was 19.67 ± 0.8819 mm statistically significant at $p< 0.05$.

TLC of male squab is 15967 ± 145.3/Cu mm.

TLC of male pigeon was 12333 ± 145.3 /Cu mm.

TLC of female squab was 16033 ± 176.4/ Cu mm.

TLC of female pigeon was 12617 ± 101.4/Cu mm statistically significant at $p< 0.05$.

MCH of male squab is 26.63 ± 0.2028 µµgm.

MCH of male pigeon was 28.57 ± 0.1453 µµgm.

MCH of female squab was 26.80 ± 0.1732 µµgm.

MCH of female pigeon was 26.67 ± 0.1453 µµgm statistically significant at $p< 0.05$.

MCHC of male squab is 29.13 ± 0.3283 gm/dl.

MCHC of male pigeon was 32.17 ± 0.1856 gm/dl.

MCHC of female squab was 29.83 ± 0.2603 gm/dl.

MCHC of female pigeon was 30.87 ± 0.4631 gm/dl statistically significant at $p< 0.05$.

MCV of male squab is 89.63 ± 0.6360 fl.

ISSN 2394 - 7780

MCV of male pigeon was 89.60 ± 0.4726 fl.

MCV of female squab was 88.33 ± 0.4807 fl.

MCV of female pigeon was 86.83 ± 1.014 fl statistically significant at p< 0.05.

Bleeding time of male squab is 25.67 ± 0.6667 second.

Bleeding time of male pigeon was 29.67 ± 0.8819 second.

Bleeding time of female squab was 34.33 ± 1.202 second.

Bleeding time of female pigeon was 39.67 ± 1.453 second statistically significant at p< 0.05.

Clotting time of male squab is 191.7 ± 7.265 second.

Clotting time of male pigeon was 184.3 ± 8.090 second.

Clotting time of female squab was 236.3 ± 4.910 second.

Clotting time of female pigeon was 217.7 ± 7.219 second statistically significant at p< 0.05.

Neutrophil of male squab is 77.67 ± 1.453 percent.

Neutrophil of male pigeon was 73.33 ± 1.202 percent.

Neutrophil of female squab was 77.33 ± 2.028 percent.

Neutrophil of female pigeon was 76.33 ± 1.453 percent statistically significant at p< 0.05(Graph - 11).

Lymphocyte of male squab is 20.33 ± 1.453 percent.

Lymphocyte of male pigeon was 24.00 ± 1.155 percent.

Lymphocyte of female squab was 22.67 ± 1.453 percent.

Lymphocyte of female pigeon was 23.00 ± 2.082 percent statistically significant at p< 0.05.

Eosinophil of male squab is 01 percent.

Eosinophil of male pigeon was 01 percent.

Eosinophil of female squab was 00 percent.

Eosinophil of female pigeon was 00 percent statistically significant at p< 0.05.

Monocyte of male squab is 01 percent.

Monocyte of male pigeon was 01 percent.

Monocyte of female squab was 00 percent.

Monocyte of female pigeon was 00 percent statistically significant at p< 0.05.

Basophil of male squab is 00 percent

Basophil of male pigeon was 00 percent.

Basophil of female squab was 00 percent

Basophil of female pigeon was 00 percent statistically significant at p< 0.05.

## HISTOLOGICAL STUDY

**Histopathological Study:** Histological study of Testicular & Ovarian tissues of Squab & adult pigeons was done.

### Histology of ovary of female squab

Ovary of female squab show many immature follicles in cortical region of ovary, medulla is not well developed. Germinal epithelium is dense with scattered nuclei. Ovary of female squab show germinal epithelium with dense and scattered nuclei. Many primary follicles were observed in cortex region of ovary. Immature ova were observed in follicle. Ovary of female squab show many follicles in immature status. Cytoplasmic material and nuclear material were observed in normal condition. Medulla is not well developed. Germinal epithelium is dense and wavy. Ovary of female squab show many developing follicles. Many primary follicles were observed

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in cortex region of ovary. Immature ova were observed in follicle. Germinal epithelium were observed in immature stage.

**Histology of ovary of adult female pigeon**
Ovary of adult female Pigeon show mature follicle and many developing follicle with developed and prominent ova. Germinal epithelium is well developed. Corpus luteum was also well developed in structure. Medulla is also well differentiated. Ovary of adult female Pigeon show many developed primary, secondary and tertiary follicles. Medulla and germinal epithelium is well developed. Different stages of follicle development were observed. Ovary of adult female Pigeon show well developed corpus leuteum, both cytoplasmic material and nuclear material was normal in structure. Medulla is also well differentiated. Ovary of adult female Pigeon show many developed follicles. Germinal epithelium is well developed. Mature ova were prominent in mature graffian follicles.

**Histology of testis of male squab**
Testis of male squab show many immature seminiferous tubules. Immature primary and secondary spermatocyte were observed in seminiferous tubule. Testis of Male squab show many developing seminiferous tubule. Many primary spermatocyte were observed in seminiferous tubule. Lumen of seminiferous tubule is not distinct. Testis of Male squab show many immature spermatocyte. Many immature secondary spermatocyte were observed in seminiferous tubule. Wall of seminiferous tubule is thick. Testis of Male squab show intact seminiferous tubule with ill developed cytoplasm. Interstitial spaces are filled with cytoplasmic material. Lumen of cytoplasm was not distinct.

**Histology of testis of adult male pigeon**
Testis of adult male pigeon show distinct primary and secondary spermatocyte. Lumen of seminiferous tubule is distinct. Interstitial spaces are well organized. Testis of male squab show distinct seminiferous tubule. Different stages of spermatogenesis were visible. Spermatid was also visible in lumen. Testis of adult male pigeon show distinct primary and secondary spermatocyte. Lumen of seminiferous tubule is distinct. Interstitial spaces are well organized. Testis of adult male pigeon show distinct seminiferous tubule with well organized spermatocyte and spermatid. Lumen was distinct.

**OBSERVATIONS**
**Behavioral Studies**
**1.Flocking behavior of Pigeons** Flying birds often form flocks, with social, navigational and anti-predator implications. Further, flying in a flock can result in aerodynamic benefits, thus reducing power requirements, as demonstrated by a reduction in heart rate and wing beat frequency in pelicans flying in a V-formation. But how general is an aerodynamic power reduction due to group-flight? V-formation flocks are limited to moderately steady flight in relatively large birds, and may represent a special case. What are the aerodynamic consequences of flying in the more usual ‘cluster’ flock? Here we use data from innovative back-mounted Global Positioning System (GPS) and 6-degrees-of-freedom inertial sensors to show that pigeons .Indeed, the increased flap frequency, whether due to direct aerodynamic interactions or requirements for increased stability or control, suggests a considerable energetic cost to flight in a tight cluster flock.

**2. Social Systems in Pigeons** Many city squares are famous for their large pigeon populations, for example, the Piazza San Marco in Venice, and Trafalgar Square in London. For many years, the pigeons in Trafalgar Square were considered a tourist attraction, with street vendors selling packets of seeds for visitors to feed the pigeons. The feeding of the Trafalgar Square pigeons was controversially banned in 2003 by London mayor Ken Livingstone. However, activist groups such as Save the Trafalgar Square Pigeons flouted the ban, feeding the pigeons from an area south of Nelson's Column in which the ban does not apply.

**3. Feeding Behavior** Domestic Pigeons mainly eats seeds and grains. Pigeons also eat insects, fruit, and vegetation, and scavenge food people provide for them intentionally or unintentionally. Pigeons feed on open ground such as that found in parks and squares, on rooftops, at food loading docks and garbage dumps, and wherever people eat outdoors. They seem to prefer open feeding areas that permit a speedy getaway if a threat is detected.

**4. Parental Care** Baby pigeons, normally called squabs, require about 24 hours to peck and wiggle their way out of their egg. Those who raise baby pigeons need to allow the little squab to work their own way out of the egg, as the fight for freedom is a healthy part of their body’s development and any interference can cost them their life. Once their damp downy little bodies emerge, the baby pigeon is considered to be one of the least attractive of baby birds, with large awkward eyes and almost thin floppy neck. Of course, as they grow up they will adapt a more visually appealied

ISSN 2394 - 7780

**DISCUSSION**

The investigation on "Study on the basis of Hormonal, Behavioural and Physiological changes in Indian Domestic Pigeon(Columba livia) including age and sex has been specially aimed to focus on over all behavioral pattern related to reproduction, growth and development of the pigeon with physiological adaptations and variations in corpuscular haematological parameters.

Present research has been designed to find out variation corpuscular haematological parameters related to reproduction, growth, development and behaviour of the domestic or feral pigeon.

The Rock Dove (Columba livia) or Rock Pigeon is a member of the bird family Columbidae (doves and pigeons). In common usage, this bird is often simply referred to as the "pigeon".

The domestic pigeon (Columba livia) (also called the rock dove or city pigeon) was originally found in Europe, Northern Africa, and India. Early settlers introduced it into the eastern United States as a domestic bird in the 1600s. Since then, it has expanded throughout the United States to Alaska, across southern Canada, and south into South America.

Pigeons originally lived in high places—cliffs, ledges, and caves near the sea—that provided them with safety. Over time they have adapted to roosting and nesting on windowsills, roofs, eaves, steeples, and other man-made structures.

Feral pigeons (Columba livia), also called city doves, city pigeons, or street pigeons, are derived from domestic pigeons that have returned to the wild. The domestic pigeon was originally bred from the wild Rock Dove, which naturally inhabits sea-cliffs and mountains. Rock (i.e., 'wild'), domestic, and feral pigeons are all the same species and will readily interbreed. Feral pigeons find the ledges of buildings to be a substitute for sea cliffs, have become adapted to urban life, and are abundant in towns and cities throughout much of the world. The species includes the domestic pigeon (including the fancy pigeon), and escaped domestic pigeons have given rise to feral populations around the world.

Wild Rock Doves are pale grey with two black bars on each wing, although domestic and feral pigeons are very variable in color and pattern. There are few visible differences between males and females. The species is generally monogamous, with two squeakers (young) per brood. Both parents care for the young for a time.Pigeons are usually gray, but can have several color phases, including reddish-brown, tan, mottled and white. They generally have two black bars on the wing, a broad black band on the tail, a whitish rump and red feet. Their average weight is 370 grams and average length is 28cm. When pigeons take off their wing tips touch, making a characteristic clicking sound.

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# BRIEF STUDY OF PIGEON (COLUMBA LIVIA) INCLUDING BEHAVIOUR, REPRODUCTION, GROWTH & DEVELOPMENT

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## ABSTRACT
*The most distinguishing feature of pigeon is the possession of feathers, which don't occurs in animals, thus a pigeon may be describe as a feathered, bipedal, flying vertebrate possessing wings. This include the study of behavior,growth,and development in pigeon .They attract attention because of their flight, colorful plumages, springtime songs, strange migration, many fascinating habits and considerable economic value to man.*

*Keyword: Physiological parameters in feral pigeon including reproduction growth and histopathology.*

## INTRODUCTION
The Rock Dove (Columba livia) is a member of the bird family Columbidae.

The domestic pigeon was originally found in Europe, Northern Africa, and India. Early settlers introduced it into the eastern United States as a domestic bird in the 1600s. Since then, it has expanded throughout the United States to Alaska, across southern Canada, and south into South America. Pigeons originally lived in high places cliffs, ledges, and caves near the sea that provided them with safety. Over time they have adapted to roosting and nesting on windowsills, roofs,

The science of ornithology has a long history and studies on birds have helped develop several key concepts in evolution, behavior and ecology such as the definition of species, the process of speciation, instinct, learning, ecological niches, guilds, island biogeography, phylogeography and conservation (Mayr 1984). While early ornithology was principally concerned with descriptions and distributions of species, ornithologists today seek answers to very specific questions, often using birds as models to test hypotheses or predictions based on theories. Most modern biological theories apply across taxonomic groups and the number of professional scientists who identify themselves as "ornithologists" has therefore declined (Abzhanov et al. 2004, Newton 1998). A wide range of tools and techniques are used in ornithology, both inside the laboratory and out in the field, and innovations are constantly made. Pigeon, any of several hundred species of birds constituting the family Columbidae (order Columbiformes). Smaller forms are usually called doves, larger forms pigeons. An exception is the white domestic pigeon, the symbol known as the "dove of peace." Therefore, the present study deals to find out variations in corpuscular haematological parameters related to reproduction, growth, development and behaviour of the domestic or feral pigeon (Alcorn 2002; Slater 2003). All birds reproduced by laying eggs, when they have to lay eggs, they build homes called nests. Baby birds are born in the nests. Nests act as shelters for birds. this nest keeps young birds warm and protect them from enemies and various challenging weather Pigeons are usually gray, but can have several colour phases, including reddish-brown, tan, mottled and white. They generally have two black bars on the wing, a broad black band on the tail, a whitish rump and red feet. Their average weight is 370 grams and average length is 28cm. They feed not only on grains but also on the treats that humans provide such as bread, popcorn, peanuts, cake, etc.

## MATERIALS AND METHODS
Experimental Laboratory animal: Experiments were carried out on male and female pigeons at the Department of Zoology, S.K.M. University, Dumka, and Jharkhand after ethical approval from the department.

Experimental Protocol : Reproductive behaviour of male and female pigeons were collected from local and carried out utilizing the laboratory protocols along with some experimental work- Live specimens of both sexes of pigeon were collected from the local areas. For morphological study both sexes were observed externally and different parts of their body were measured with the help of a divider and mm graduated scale, whichever required.

Hematological Assays: The blood samples were obtained from the venous puncture of male and female squabs for haematological assay using EDTA vials. The haematological parameters Red Blood Cell Count (RBC's), Hemoglobin percentage (HGB), PCV, Mean Cell Volume of RBC's (MCV), Mean Cell Hemoglobin (MCH), White Blood Cell Count (WBC's) and Differential Leukocyte counts were done manually.

Behavioral Study : The behavioural study in male and female squabs and adult pigeons were carried out.

***Nesting***-The process of nest building begins with the male pigeon choosing a nest site in view of the female, selecting one stick, bringing it to the female and placing it in front of her. The female stays at the nesting site,

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accepting the sticks brought to her by the male one piece at a time, and places them underneath her. The female usually lays two white eggs and both parents split the egg warming duties: males stay on the nest during the day and females at night. Egg incubation takes between 16 and 19 days.

*Flocking*:- **In the present study, the behavioral activities in male and female pigeons were carried out. Flying birds often form flocks, with social, navigational and anti-predator implications. Further, flying in a flock can result in aerodynamic benefits, thus reducing power requirements, as demonstrated by a reduction in heart rate and wing beat frequency in pelicans flying in a V-formation. But how general is an aerodynamic power reduction due to group-flight.**

***Feeding***: Domestic Pigeons mainly eats seeds and grains. Pigeons also eat insects, fruit, and vegetation, and scavenge food people provide for them intentionally or unintentionally. Pigeons feed on open ground such as that found in parks and squares, on rooftops.

***Caring***: Baby pigeons, normally called squabs, require about 24 hours pecking and wiggling their way out of their egg. Those who raise baby pigeons need to allow the little squab to work their own way out of the egg, as the fight for freedom is a healthy part of their body's development and any interference can cost them their life. Once their damp downy little bodies emerge, the baby pigeon is considered to be one of the least attractive of baby birds, with large awkward eyes and almost thin floppy neck. Of course, as they grow up they will adapt a more visually appealing body.

***Statical Analysis***: Results are presented as mean ± SD and total variation present in a set of data was analyzed through one way analysis of variance (ANOVA). Difference among mean values has been analyzed by applying Dunnet's t-test. Calculations were performed with the Graph Pad Prism Program (Graph Pad software, Inc., San Diego, U.S.A.). The criterion for statistical significance was set at $P< 0.05$.

**Results :** *Haematological findings:*

Data of haematological parameters are shown from Fig. 1-9 shows significant changes in the in the erythrocyte counts (RBCs), hemoglobin percentage, PCV levels, ESR, MCV, MCH, WBC Counts, Neutrophil counts, Lymphocyte counts in male and female squabs ($P < 0.0001$).

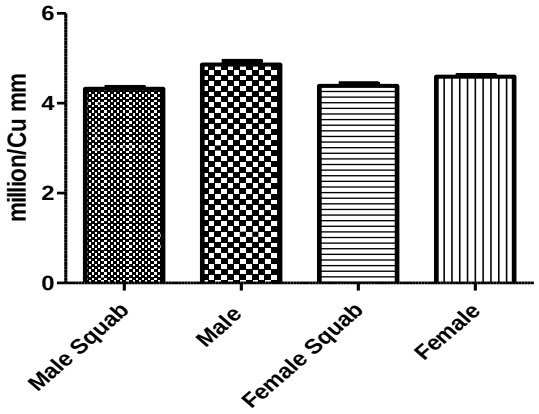


Fig.1. Total RBC Counts. The data are presented as mean ± S.D, n = 6, significance at $P< 0.001$.

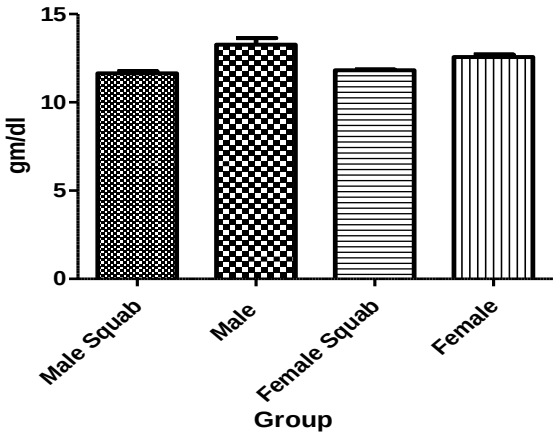


Fig.2. Haemoglobin Percentage. The data are presented as mean ± S.D, n = 6, significance at $P< 0.001$.

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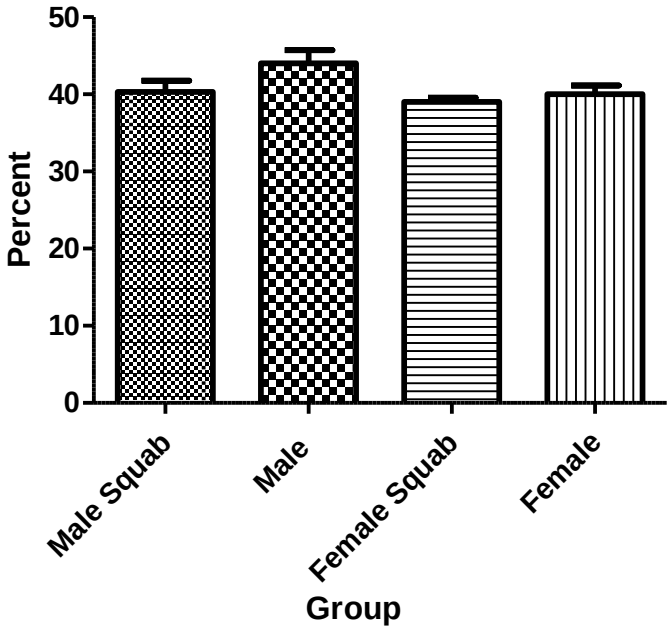


Fig.3. PCV Level. The data are presented as mean ± S.D, n = 6, significance at P< 0.001.

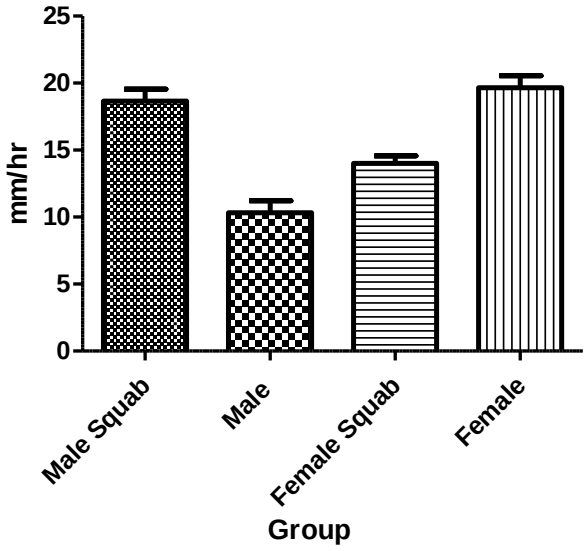


Fig.4. ESR Levels. The data are presented as mean ± S.D, n = 6, significance at P< 0.001.

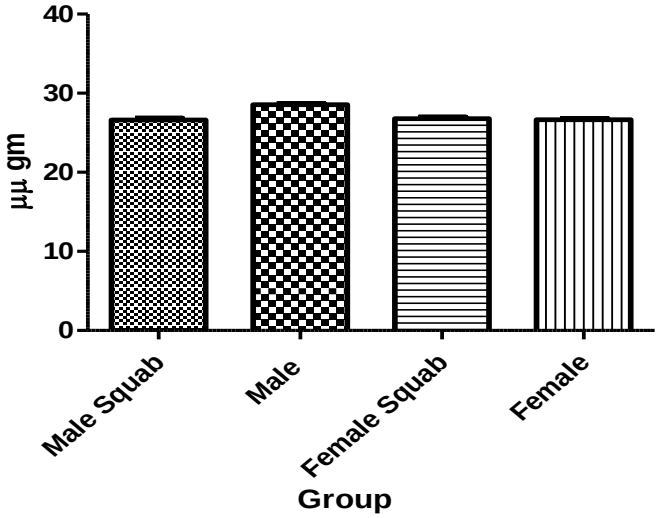


Fig.5. MCH Levels. The data are presented as mean ± S.D, n = 6, significance at P< 0.001.

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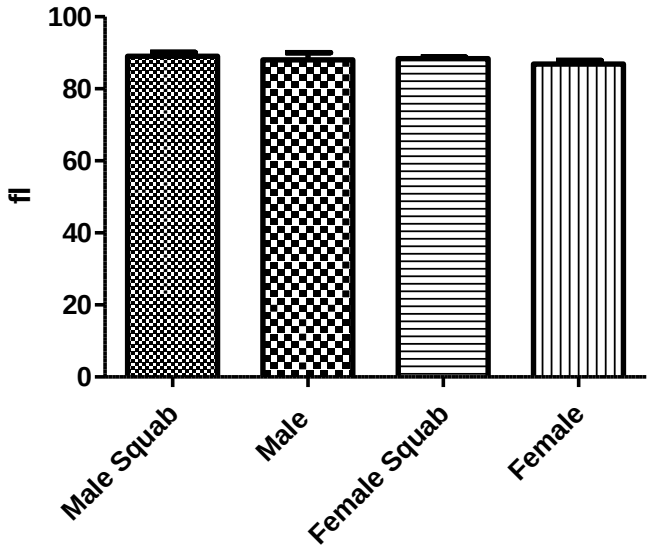


Fig.6. MCV Levels. The data are presented as mean ± S.D, n = 6, significance at P< 0.001.

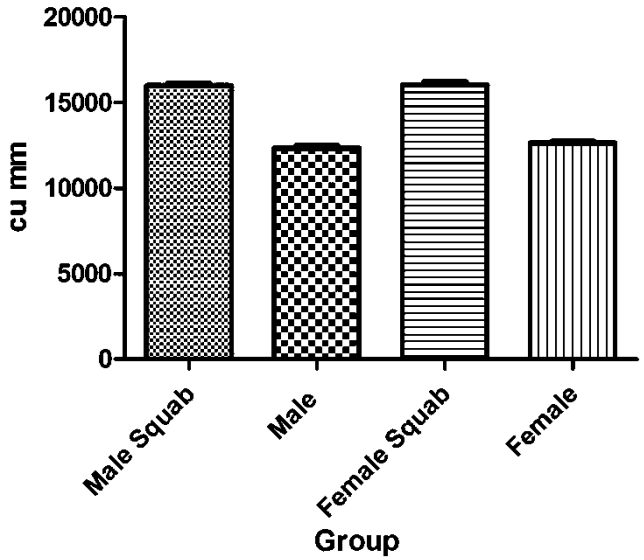


Fig.7. WBC Counts Levels. The data are presented as mean ± S.D, n = 6, significance at P< 0.001.

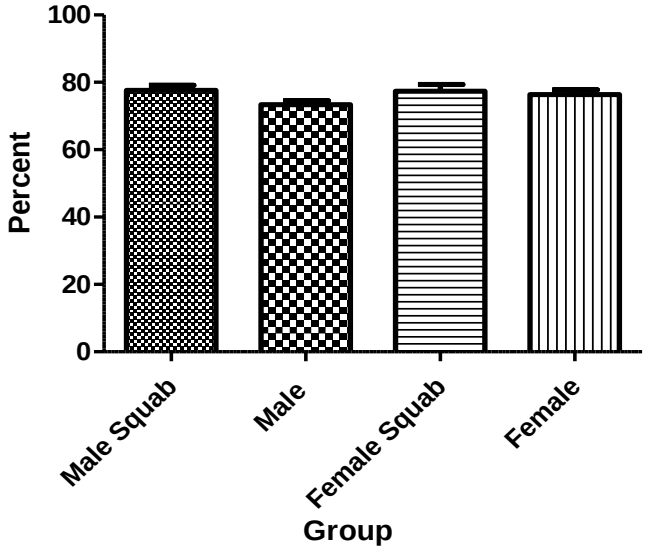


Fig.8 Neutrophil Counts Levels. The data are presented as mean ± S.D, n = 6, significance at P< 0.001.

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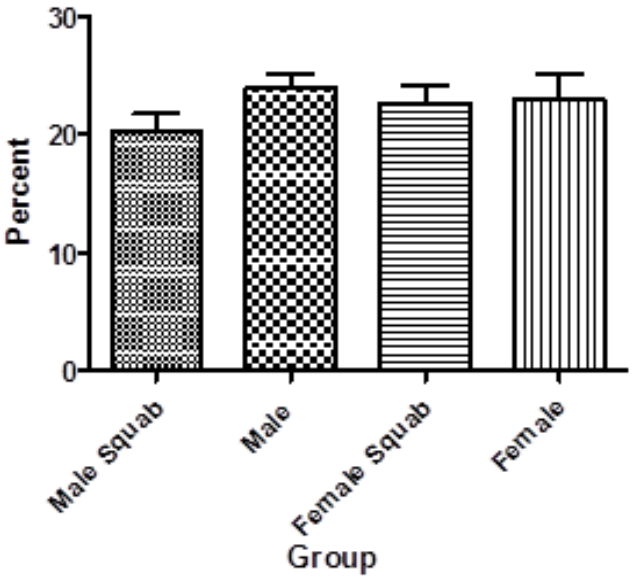


Fig.9 Lymphocyte Counts Levels. The data are presented as mean ± S.D, n = 6, significance at P< 0.001.

**DISCUSSION**

Males are larger and heavier than the females. Males coo more, while females peep and squeak more. Male pigeons perform an attractive dance following the female, while female watches it and shows her acceptance by simply dropping the wings down before mating. Females lay eggs, but males do not upon mating. Usually, males incubate eggs during the morning session, whereas female takes it over for the rest of the time including afternoon and night.

Present research has been designed to find out variation corpuscular haematological parameters related to growth, development and behaviour of the domestic or feral pigeon. Feral pigeons (Columba livia), also called city doves and street pigeons, are derived from domestic pigeons that have returned to the wild (Alodan, and Mashaly, 1999). The domestic pigeon was originally bred from the wild Rock Dove, which naturally inhabits sea-cliffs and mountains. Rock, domestic, and feral pigeons are all the same species and will readily interbreed. The species is generally monogamous, with two squeakers (young) per brood (Bermudez and Brown, 2003; Bonneaud et al 2008). Both parents care for the young for a time.Pigeons are usually gray, but can have several color phases, including reddish-brown, tan, mottled and white. They generally have two black bars on the wing, a broad black band on the tail, a whitish rump and red feet. Their average weight is 370 grams and average length is 28cm. sound (Bosman and Hockey 1986).

**CONCLUSION**

The present study significantly shows the haematological correlation with the behavioural changes. We found significant changes in RBC Count, ESR, and haematocrete in relation to age of pigeon.

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# A REVIEW ON REPORT OF HUMAN DEVELOPMENT AND VIEW ON HOME ECONOMICS FOR INDIA (YEAR 2013-15)

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## ABSTRACT
*In Human development India ranked with 130 than other countries in the world now study deal with report of UNDP (United Nation Development Program) and focuses on the suggestion of the report. Thrash out some points linked with cause of the situation after studying report in different angles suggest some points on improvement in human life in the India. Enhancement in human development is connected with some key points such as contribution, public good, health, security and Empowerment with reducing inequality. This paper discusses on paper and suggests sustainability ideas after studying report which is helpful to the human development, also consultations on the improvement in home economics with studied report. At the end of December 2015 India improve their index by five points means there is increase in some effective elements of the human development measures paper is focusing on that points. Study reflects various author views related to the Human development report and premeditated symptoms affected on home economics in various levels such as lower, middle, upper levels.*

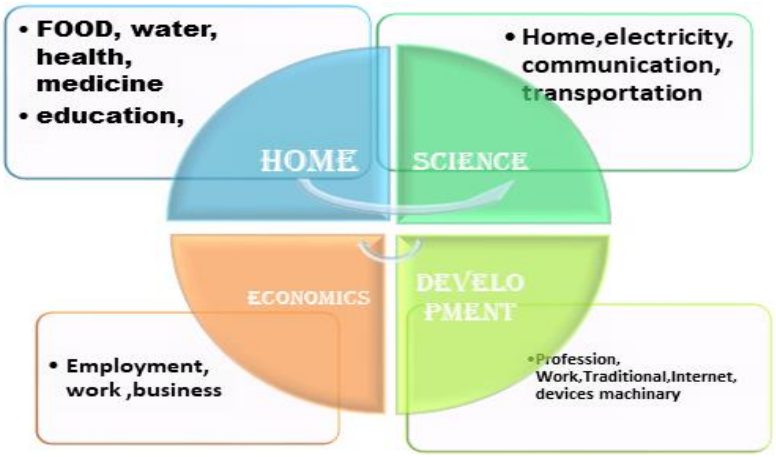
*Keywords: home economics, human development, element, India, world, science*

## INTRODUCTION
As per study concentrating on news from (Times of India) dated: 14thDecember 2015 India ranked 130th position in Human development index out of 188 countries. In between 2009 to 2014 gains in 6 positions and its HDI value is 0.609 in comes in medium human development category. As per Press trust of India and Times of India report since 1980- 2014 HDI value increased from 0.362 to the 0.609, an increase of 68.1 percent or an average annual increase of about 1.54 percent. Life expectancy also increased from 53.9 years to 67.9 years due to improvement in medical facility and effective home economics. Gross national income increased from 1255 USD to 5497 of its 338 percent since 1980. As per home science it covers with five areas food, nutrition, human development (economics), family studies and Fabric and apparel, and resource management also in modern days extended to the transportation and communications. Each and every person should get good and hygienic food, education, home utilities for peoples in his life for that purpose report concentrated on elements.

**Review with different angles correlated to the home science elements**

## OBJECTIVES
1) Study on Different angles of the home science and affecting elements in the report
2) Different views related to the improvement in economical condition.
3) To study on Urbanization and home-science in human development.
4) To study on importance of communication in human development.

**FIG: 1: DIAGRAMMATICAL REPRESENTATION OF ELEMENTS:**




**Courtesy: A view on UNDP report**

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**Human development view**

Human development is process of enlarging people's choices as they acquire more capabilities and enjoy more opportunities to use capabilities. Human development implies the peoples for shape their lives with their economic growth and covers the goals. Human development is development of the peoples through improving capabilities improving their lives. Peoples should actively participate in process that shape lives. Human development is directly proportional with work it enhances human life with providing income and reduces poverty. Improves quality equipments in the life for daily support implies various opportunities to the peoples. It keeps good health, improve knowledge, penetrate different skills in working class improve economical power of the peoples. This report is focusing on the human development sub-elements, which affected on the economics of the country. Improvement in the Human Capital improves human Index of the country where education and awareness are the major two security components.

** **Technologies (Communication, Transportation) for home and human development:**

New technologies for Human development in this book also mentioned the ideas for development with its main indicators. Facilities and services successfully spread over the world with technologies advancement is going on in the world but lot of the work force is applied in this sector. Digitization and reconstruction of transportation modification in the channels improves work force with improvement in the economical condition of the human development program. Digital India, restrictions on direct money transaction impacts on the Economy and improved job availability for peoples. Human development is parallel with the nature and conservation due to this innovation in technologies has to concentrate on the project of low harmfulness to the Nature and Human. The current era has described as the information age in this sector digital technology improved humankind in all way. Due to digital entry of digital technology in large manner lot of the domains changed in human sector also thoughts and behavior is changed.

**Work and human development:**

Given the centrally of creativity and innovation in the world of work, attention is shifting to types of workplaces and working conditions. Key factor of worker engagement is creativity; some companies have set for creative work. Link between work and human development is not automatic subject to various conditions with societal and individuals. Human development is dependent on Quality of work for the safeness, livelihood, training, social dialogue and progression. Enhancing human development through work needs concrete policies and an agenda for action for specific group and actions.

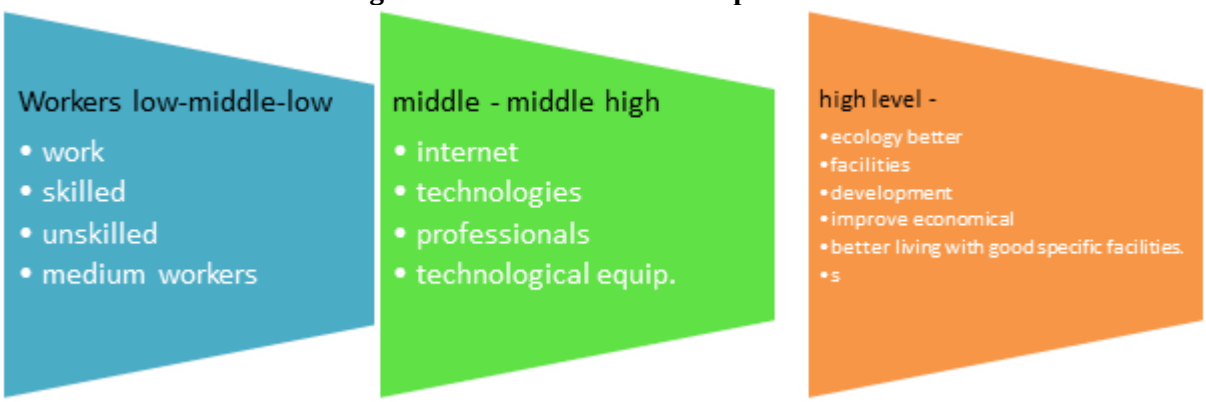
**Policy options for enhancing human development through work**

1) Strategies for creating work opportunities
2) Formulating national employment, Crises in work. **Ensuring workers: well being**
1) Rights and benefits, social protection, addressing inequalities, defining quality of work. **Strategic targeted actions:**

- Sustainable work, balancing work , undertaking group specific initiatives, outside work

Agenda of work, human and human potential remains unused. Above all things mentioned related to the work and human development for HDI index who is better in work have good returns and his economical conditions better than other peoples. In 1948 throughout the world only 3 million peoples have full day full work but in 2013 it increased vastly due to this urbanization increased got work to skilled and unskilled labors with good daily wages improvement in the yearly income of the peoples.

**Fig: 2 Work and human development**



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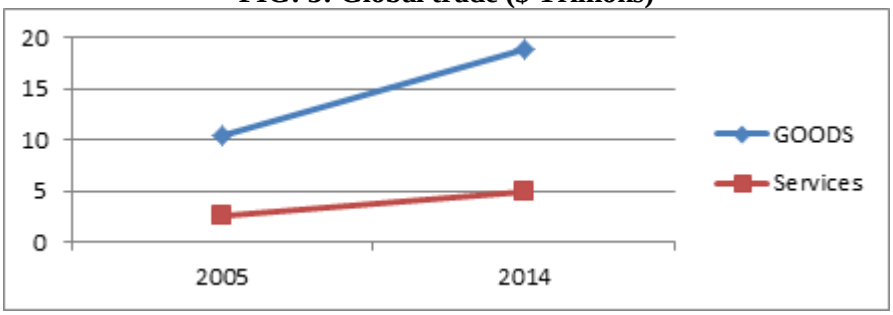
**Designed by author: Human development profile wise. Work- human development diagram**
Interpretation: As per above diagrammatical representation and economical differentiation home science, home economics differ in their living ideas in all countries. Whose work profile is low their power of purchasing is low. Job description is another point related to the facilities in their home. Human development is totally dependent on the requirements primary, secondary, second-secondary, tertiary etc. Human development reached to the highest income then requirements like, LED TV, DISH connection, INTERNET, WIFI system, swimming tank, Club house, sport ground, meeting hall, Air conditioned house, and better-beautiful furniture are the major requirements. In third stage for middle level some requirements dropped in Primary level.

**Sustainability (education, Skill Development), fertility and Mortality (Poverty):-**
Here in fight against poverty is concentrated for world India is also fought against Poverty since 1950 but in last three decades united nation takes aggressive steps against poverty for Human development. In India lot of the schemes entered by the previous Prime ministers since 1950 and till a date work in progress Pt. Jawaharlal Nehru, Lalbahadur Shastri, Indira Gandhi, Rajiv Gandhi, P V Narsinhgrao and Atalbihari Bajapai in regular manner for improvement in living standard of the peoples under poverty line. Lot of the educational facilities (school near to the home, Night colleges, free books and school material, teacher facility given the poor peoples, school at sugar factory (Sakahr Shala), Gurukul (Aashram) school for category pupils) provided for their improvements and its positive effect reached to the Government. One of the components of home science is the Education which impacts on the home economics. After 70 years drastic change in the Indian economy with per head income increased in, living style of each and every community in India moderated, lot of the families were covered by the different type of insurance policies. Peoples comes under tribe area and backward classes got jobs in Government sectors have got good salaries and their next generation also get good jobs in private sectors with good salaries.

**FIG: 3: Global trade ($ Trillions)**




**Courtesy: UNDP 2015 web version by Amazon**

**Interpretation:** Since 1990, 2 billion peoples have been lifted out of low human development, poverty reduced by more than billion. In this transformation digital world interfered and services concentrated by the peoples and lot of the job opportunities available in all sectors such as Information technology, Industrial sector, E-commerce, in banking etc sectors. It impacts on the home economics of the peoples services reached from 2.5-4.9 $ Trillion and goods purchasing reached from 10.5-18.9 $ Trillions within 10 years E-commerce properly penetrated in home.

Now a day's business to consumer direct transportation also interacted directly with services from Amazon, flip kart, shop clues etc. worldwide which impacts on home economics. Human development index is depending on three dimensions out of which decent standard of living is one of the factors which were improved by the knowledge and healthy life since previous some years.

**Implication of Ecommerce:**
As per focusing on the report; behavior of business and consumers ICT applications and services expanding across the chain as information gathering, agreement, transaction finally delivery. Changes were done by the service sectors for consumers and accepted by the platforms for transactions and transformation.

Fig: 4: New online purchase by consumer

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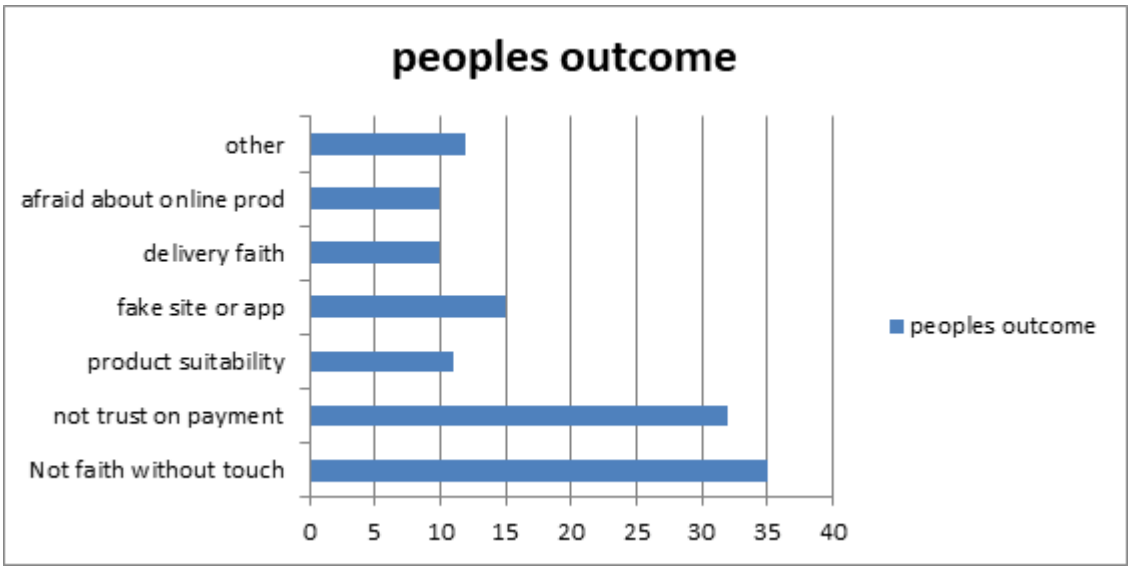


Courtesy: survey of Advertising agency for online in India

Interpretation: As per above survey done peoples can choose multiple options for purchasing of online home equipments in home. Only taken data of consumer not purchasing products online, they choose shops or marts for purchasing equipments till 2010, but from 2013 lot of the purchasers aware about the products and keep trust on online purchasing.

**CONCLUSION**

Human development is all about improvement in human choices it focuses on richness of human lives means richness in economical conditions. As per world level calculations 40% peoples are working and remaining fully depend on their work and input to the family. Knowledge is the thing in human development which is also calculated in this report for improvement in their economical conditions. Linkage between work and human development are synergistic providing income and livelihood it generate equitable growth in peoples life. Work enhances human development generates, expands productivity, improves satisfaction by generating work yields.

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# TRANSIENT FAULT AND RESTORATION TIME PERIOD ANALYSIS IN A POWER SYSTEM NETWORK

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**ABSTRACT**
*In this paper, extensive short circuit studies were simulated to analyze the fault currents recovery time in power system network based on the nature of fault. Usually, a power system operates under balanced conditions with all equipment's carrying normal load currents and also the bus voltages inside the prescribed limits. This condition can be disrupted because of fault within the system.In actual practice power system network is subject to fault and interrupt the power flow. These faults become inevitable and made the damages to the service providers and also to the consumers. In general the faults can be of temporary faults and permanent faults. Based on the faults severity the restore mechanism retains to energize the supply in case of temporary fault and kept in a trip condition if the fault is permanent.*

## 1. INTRODUCTION

The modern electric power sector over the last decade has brought about the need for efficient generation and transfer (transmission and distribution) of electric power to load centres. The mode of power transfer is usually via overhead lines. However, overhead lines (including underground cables) are subject to the forces of nature and other uncontrollable factors, thus liable to faults. A very important component of power system design is the provision of adequate protection to detect and isolate faulty elements in the power system. Hence the fault analysis studies become a vital to determine the safety measures and it is essential to safety of the public. Also to operate the power system network in stable and safeguard of equipments the need of protection in a precise way is mandatory. After the isolation of the faulty segment, it is important to investigate the root cause and nature of the fault and to schedule the recovery time to get back the system in normal operating condition.

In general the power system networks are equipped with circuit breaker to operate when prone to faults.. Based on the nature of faults the tripping and reclosing of the system is decided. If the faults are of temporary the de energising had takes place after a short time interval. On the other hand if a fault is of permanent the trip of the line continues until clear the faults.

Most of the faults in a power system network are transient in nature. It is a short duration discontinues of power supply and then restored. These faults which temporary affect the insulation and dielectric properties of the equipments. Transient faults may occur due to tree contact, lighting strike and conductor clashing. Discontinue of power had not take place even the fault exist is refer to as persistent fault. Such faults can be often found in cables due to mechanical damage.

## 2. STUDY OF FAULTS

Faults can be defined as the flow of a massive current through an improper path which could cause enormous equipment damage which will lead to interruption of power, personal injury, or death. In addition, the voltage level will alternate which can affect the equipment insulation in case of an increase or could cause a failure of equipment start-up if the voltage is below a minimum level. As a result, the electrical potential difference of the system neutral will increase. Hence, People and equipment will be exposed to the danger of electricity which is not accepted.

Faults usually occur in a power system due to insulation failure, flashover, physical damage or human error. These faults may either be three phases in nature involving all three phases in a symmetrical manner, or may be asymmetrical where usually only one or two phases may be involved. Faults may also be caused by either short-circuits to earth or between live conductors, or may be caused by broken conductors in one or more phases. Sometimes simultaneous faults may occur involving both short-circuit and broken-conductor faults (also known as open-circuit faults).

### 2.1 Classification of Faults

In common the electric networks are subject to fault when the abnormality occurs in the circuit. Faults can be of series faults and shunt faults. The series faults are mainly of broken between the conductors. Because of line open these faults are referred to as open circuit faults. These faults can be further analysed as open conductor faults, two conductor open fault and three conductor open fault. These faults are characterised by increase in voltage and frequency and fall in current in the faulted phase.

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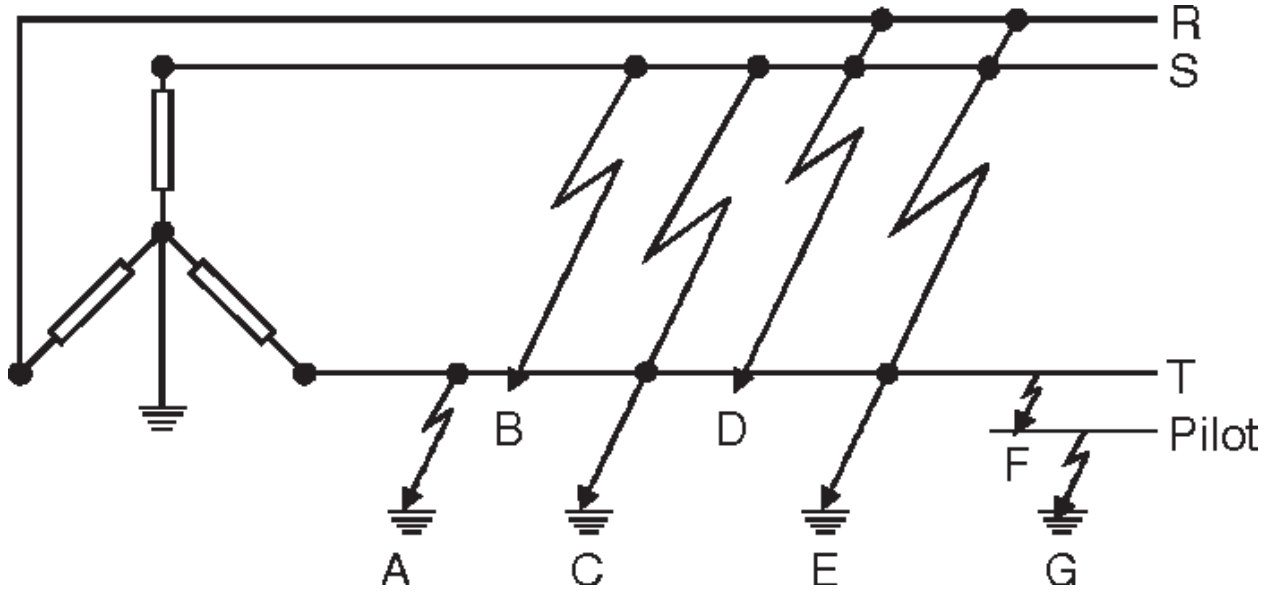


Fig 1

From the above fig.1 the faults in the systems be

| S.No | Type of Fault | Notation |
|---|---|---|
| 1 | Line to Ground | A |
| 2 | Double Line | B |
| 3 | Double Line Ground | C |
| 4 | Three Phase Fault | D |
| 5 | Three Phase Ground Fault | E |

The shunt type of faults involves short circuit between conductor and ground or between the conductors. These faults are characterised by increase in current and fall in voltage and frequency. Further this fault can be of symmetrical and unsymmetrical fault.

**2.2 Symmetrical Fault:**

The faults which involve all the three phases is known as the symmetrical fault. Such types of fault remain balanced even after the fault. The symmetrical faults mainly occur at the terminal of the generators. The fault on the system may arise on account of the resistance of the arc between the conductors or due to the lower footing resistance. The symmetrical fault is sub-categorized into line-to-line-to-line fault and three-phase line-to-ground-fault

**2.2.1 L – L – L Fault**: Such types of faults are balanced, i.e., the system remains symmetrical even after the fault. The L – L – L fault occurs rarely, but it is the most severe type of fault which involves the largest current. This large current is used for determining the rating of the circuit breaker.

**2.2.2 L – L – L – G Fault**: The three-phase line to ground fault includes all the three phase of the system. The L – L – L – G fault occurs between the three phases and the ground of the system. The probability of occurrence of such type of fault is nearly 2 to 3 percent.

**2.3 Unsymmetrical Fault**

The fault gives rise to unsymmetrical current, i.e., current differing in magnitude and phases in the three phases of the power system are known as the unsymmetrical fault. It is also defined as the fault which involves the one or two phases such as L- G, L – L, L – L – G fault. The unsymmetrical makes the system unbalanced. It is mainly classified into three types. They are

Single Line-to-ground (L – G) Fault

Line-to-Line Fault (L – L)

Double Line-to-ground (L – L – G) Fault

**2.3.1 L- G Fault**: The single line of ground fault occurs when one conductor falls to the ground or contact the neutral conductor. The 70 – 80 percent of the fault in the power system is the single line-to-ground fault.

ISSN 2394 - 7780

**2.3.2 L – L Fault**: A line-to-line fault occurs when two conductors are short circuited. The major cause of this type of fault is the heavy wind. The heavy wind swinging the line conductors which may touch together and hence cause short-circuit. The percentage of such type of faults is approximately 15 – 20%.

**2.3.3 L – L -- G Fault**: In double line-to-ground fault, the two lines come in contact with each other along with the ground. The probability of such types of faults is nearly 10 %.

The symmetrical and unsymmetrical fault mainly occurs in the terminal of the generator, and the open circuit and short circuit fault occur on the transmission line.

**3. MATLAB Simulink Model:**

**S**imulations were carried out in the MATLAB to model the circuit and for result analysis. MATLAB features a family of add-on application-specific solutions called toolboxes Very important to most users of MATLAB, toolboxes allow you to learn and apply specialized technology. Simpower Systems is a modern design tool that allows scientists and engineers to rapidly and easily build models that simulate power systems. It uses the simulink environment, allowing you to build a model using simple click and drag procedures. In this model the components of three phase source, three phase transformer, RLC load, three phase fault and VI measurement were access from the simpower system library and grouped. The parameters and rating of the circuit components is listed below.

| | | | |
|---|---|---|---|
| Three Phase Source**:** | System Voltage :11Kv | | Frequency:50Hz |
| | Source Resistance:0.8929Ω | | Source Inductance:0.01658H |
| Three Phase Fault**:** | Fault Resistance:0.001 Ω | | Ground Resistance:0.01 Ω |
| | Transition Time: 1/50 , 5/50 | | Snubber Resistance: $1x10^6$ Ω |
| Three Phase Transformer**:** (2 winding) **Δ/ Y** | Nominal power:100Mva | | Frequency:50Hz |
| | Magnetization Resistance :500 Ω | | Magnetization Inductance :500 H |
| | Winding1: | | |
| | $V_1(p_h- p_h)$ | $R_1$(P.U) | $L_1$(P.U) |
| | 11Kv | 0.002 Ω | 0.08H |
| | Winding 2: | | |
| | $V_1(p_h- p_h)$ | $R_1$(P.U) | $L_1$(P.U) |
| | 0.4Kv | 0.002 Ω | 0.08H |
| Three Phase RLC Load**:** | $V_{rms}$: 0.4KV | Frequency:50 Hz | Inductive Reactive Power($Q_L$):100 |

**3.1 Simulation Model:**

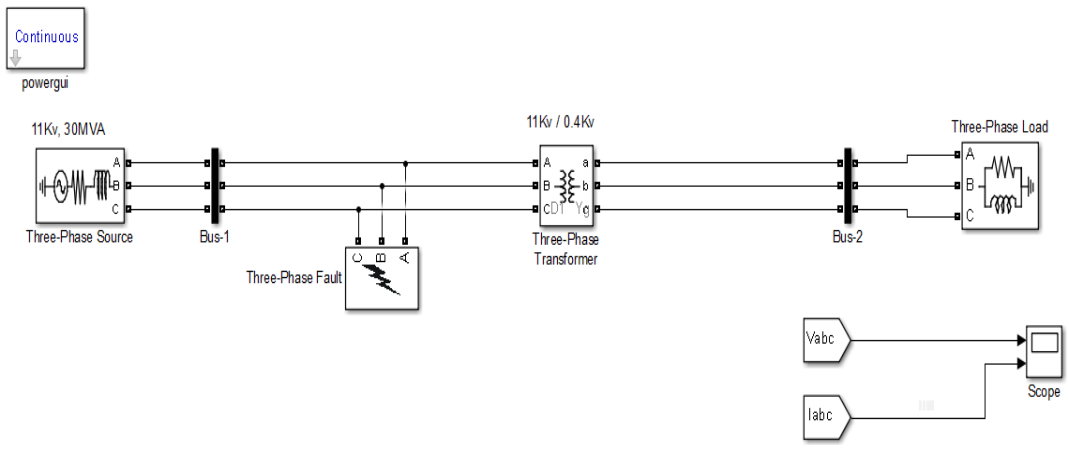


Fig-2

ISSN 2394 - 7780

## 4. RESULTS

A different scenario of without fault and with fault has been created between the sources and the transformer, the respective three phase voltages in the first channel and three phase currents in second channel waveforms were illustrated.

### 4.1 Without Fault

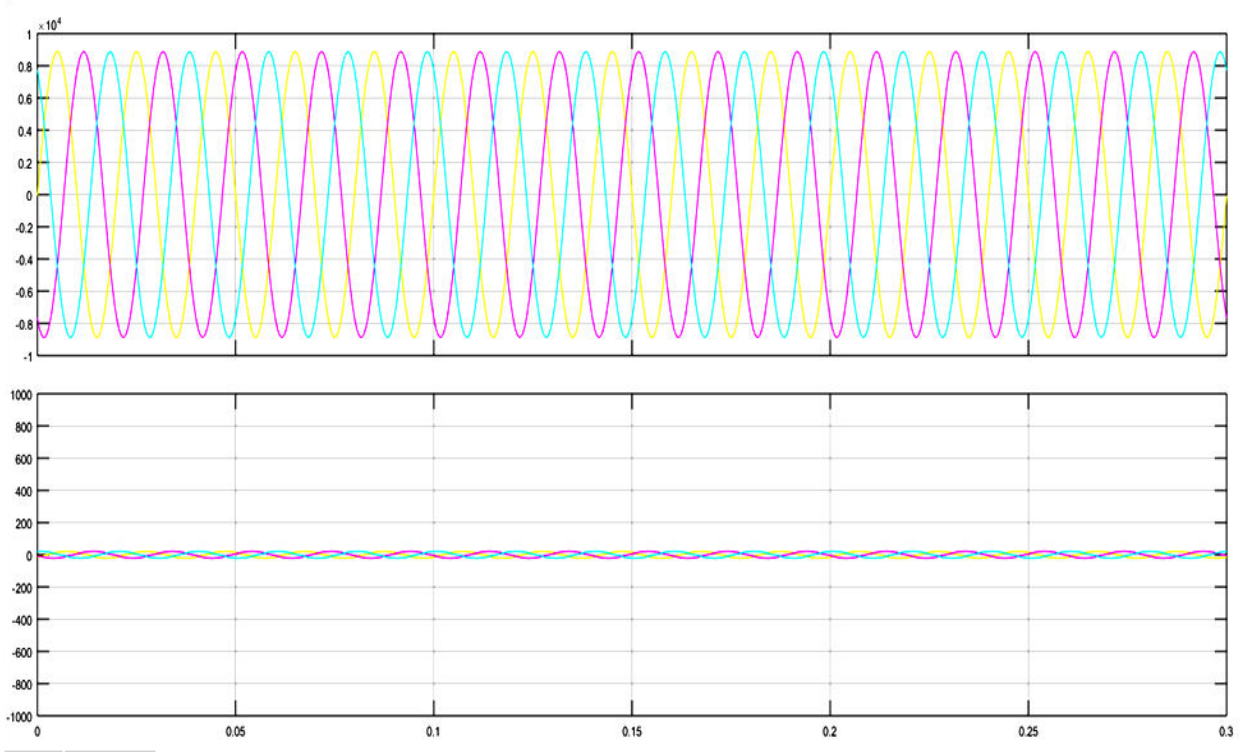


Fig-3: $V_{abc}$ & $I_{abc}$

### 4.2 Three Phase Fault

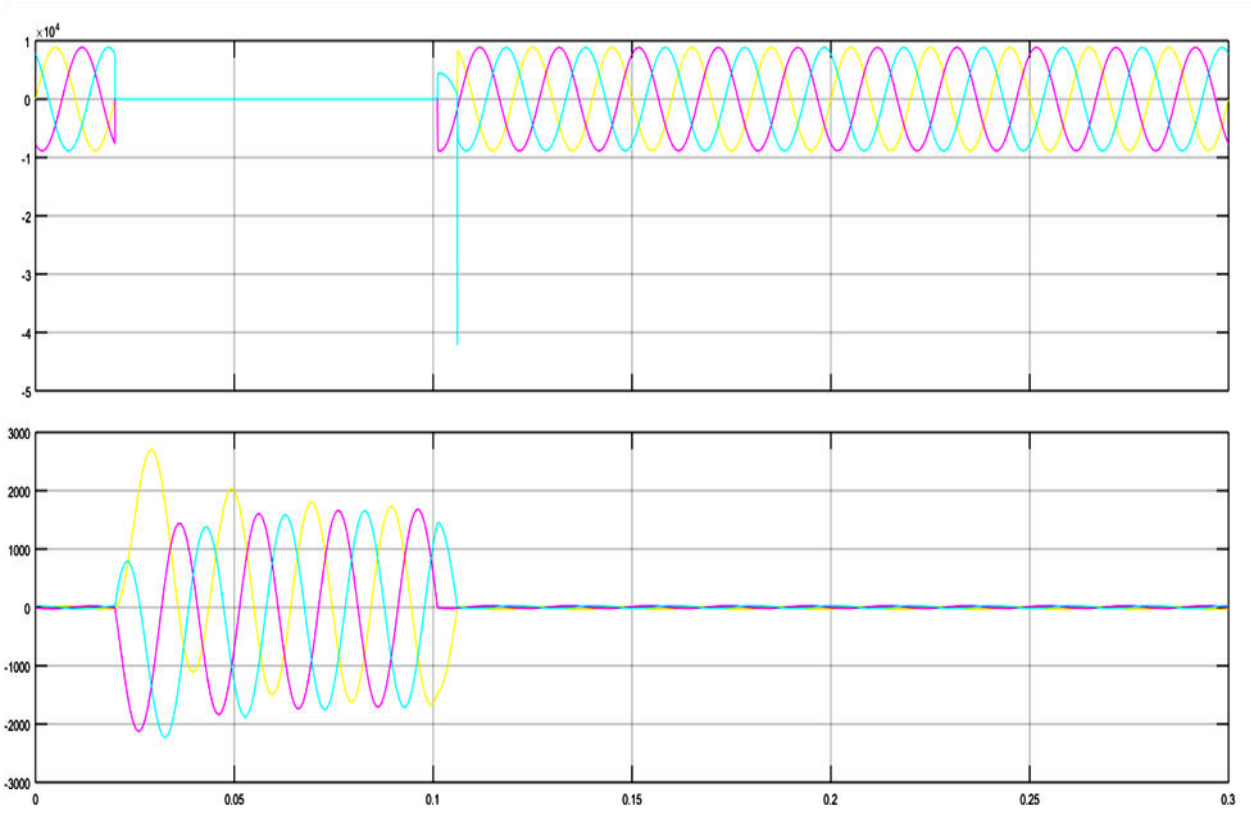


Fig-4: $V_{abc}$ & $I_{abc}$

ISSN 2394 - 7780

### 4.3 Three Phase Ground Fault

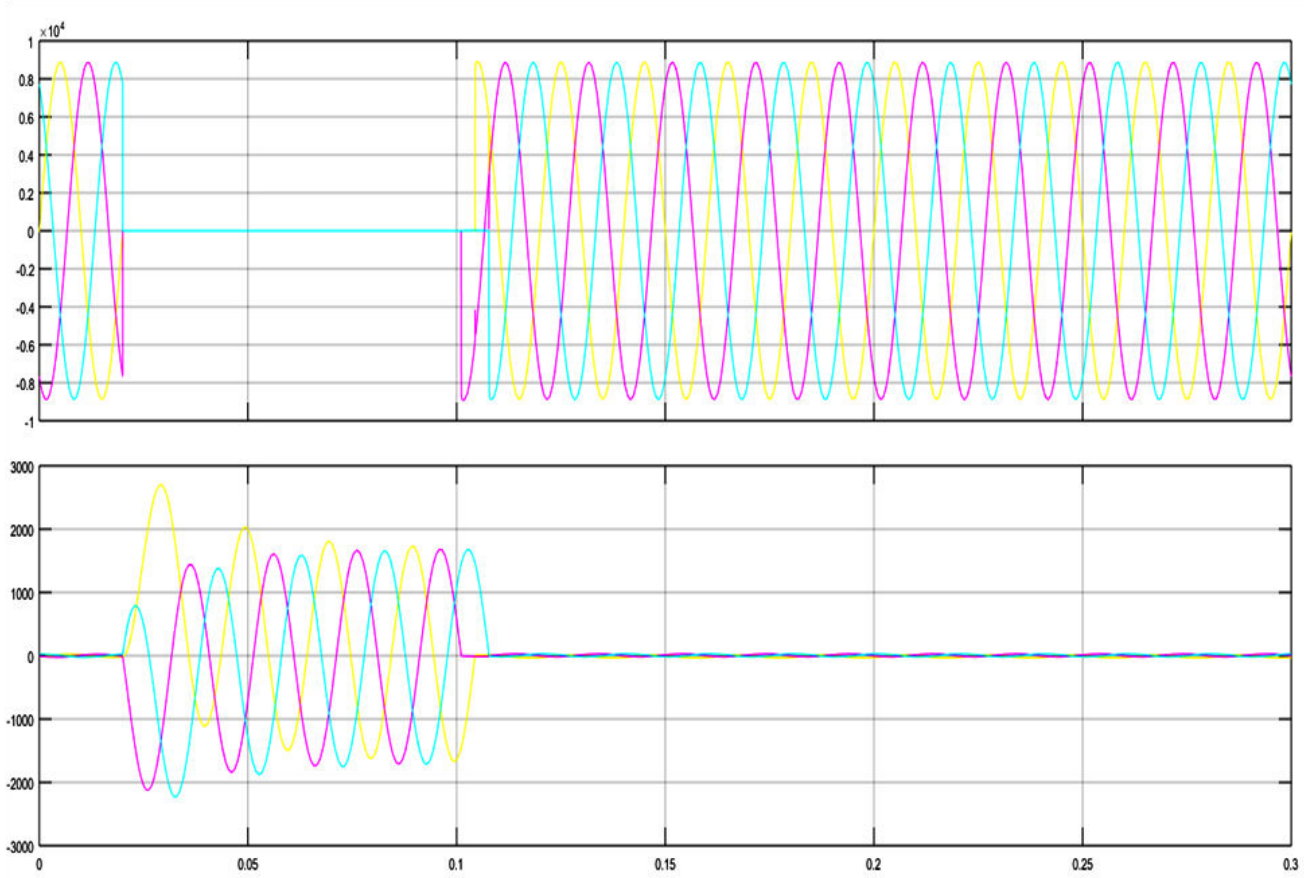


Fig-5: $V_{abc}$ & $I_{abc}$

### 4.4 Single Line to Ground

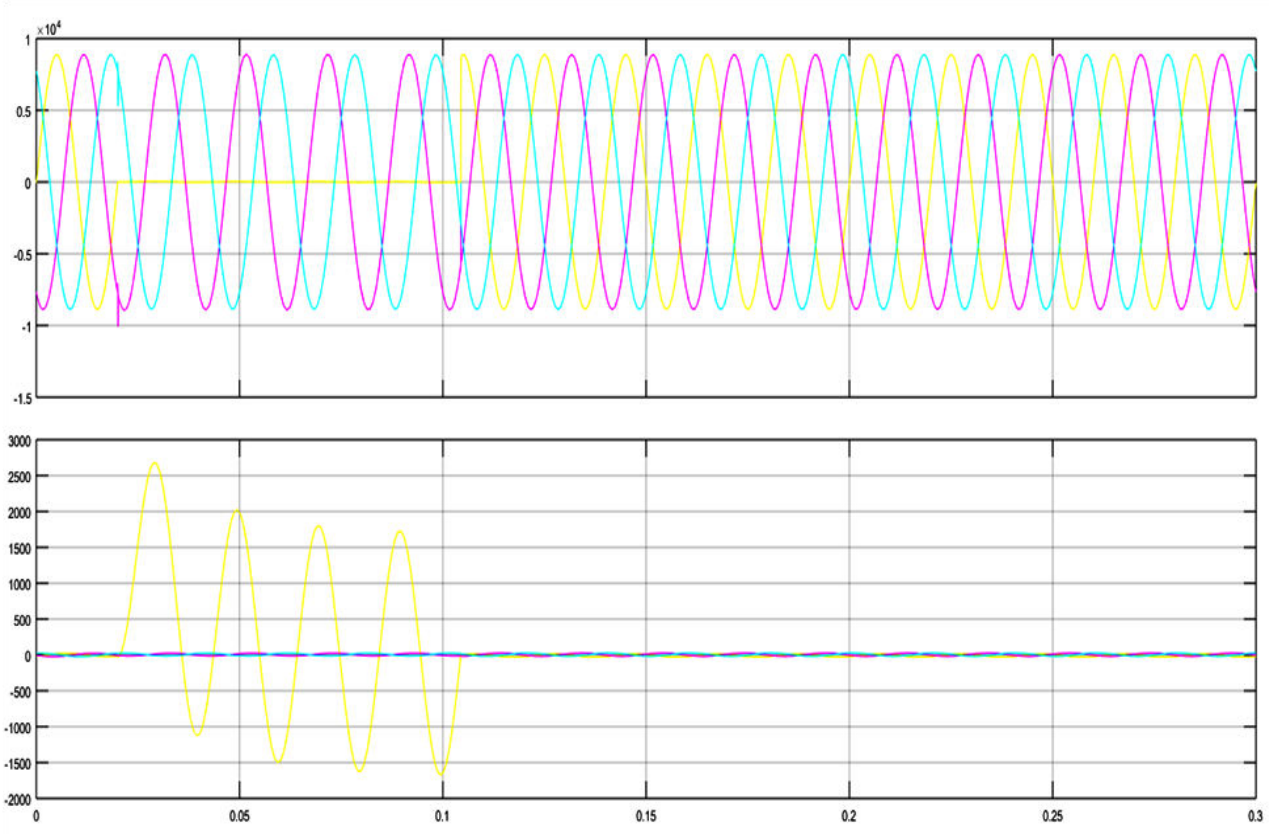


Fig-6: $V_{abc}$ & $I_{abc}$

ISSN 2394 - 7780

### 4.5 Double Line Fault:

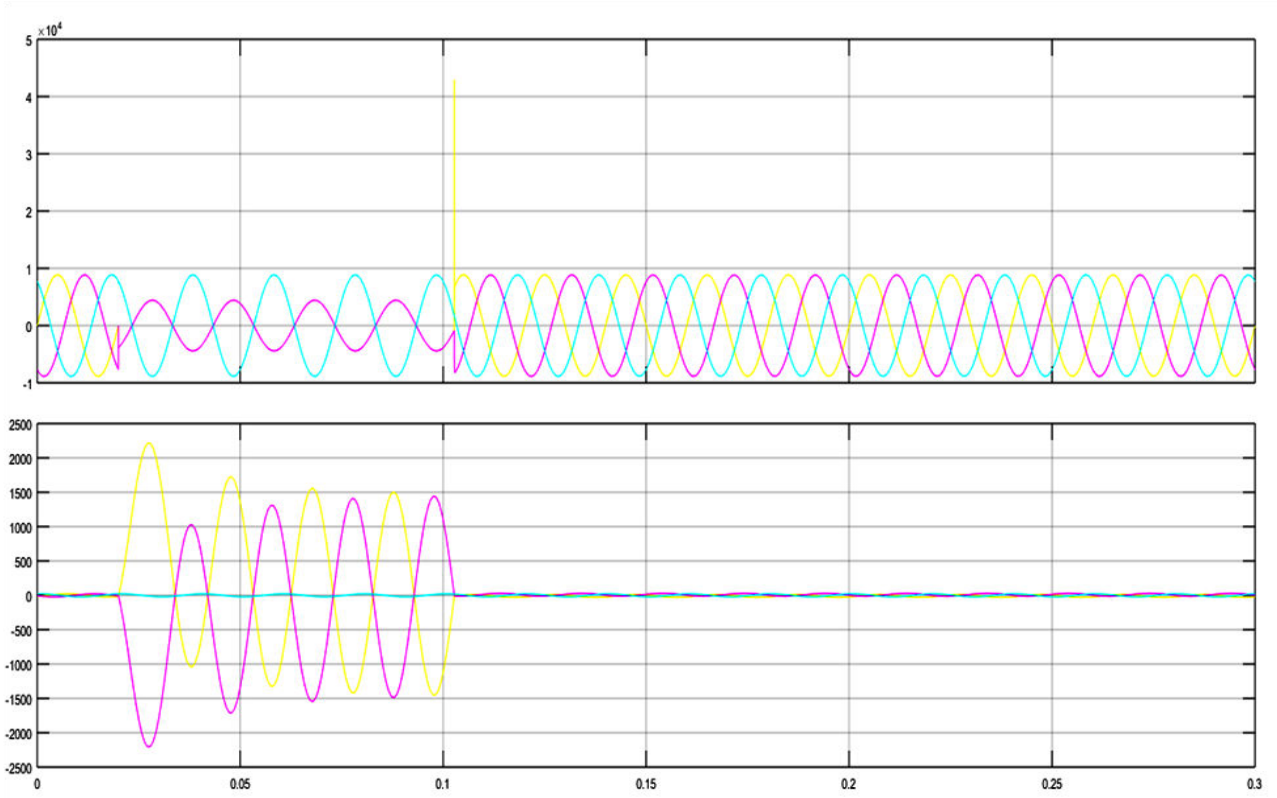


Fig-7: $V_{abc}$ & $I_{abc}$

### 4.6 Double Line to Ground Fault:

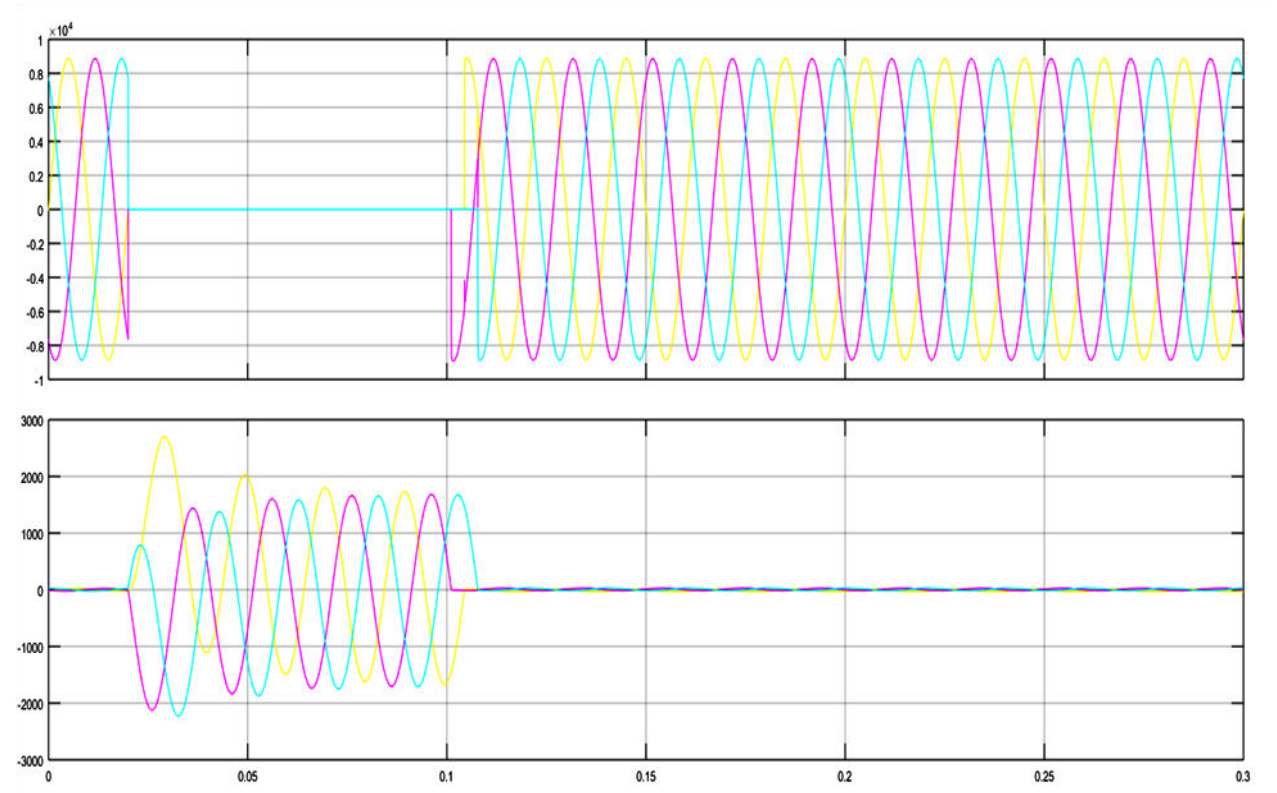


Fig-8: $V_{abc}$ & $I_{abc}$

## 5. CONCLUSION

Different types of faults have been simulated in the electrical network .The fault currents variation and restoration time period were analysed.

ISSN 2394 - 7780

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# EFFECT OF SUPERCONDUCTING MAGNETIC ENERGY STORAGE UNITS AND SUPER CAPACITOR ENERGY STORAGE UNITS IN AN INTERCONNECTED HYDRO – HYDRO POWER SYSTEM

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## ABSTRACT
*The main objective of Automatic Generation Control (AGC) is to balance the total system generation against system load and losses so that the desired frequency and power interchange with neighbouring systems are maintained. Any mismatch between generation and demand causes the system frequency to deviate from its nominal value. Thus the high frequency deviation may lead to system collapse. Therefore, it is necessary to include the active controller such as Superconducting Magnetic Energy Storage (SMES) Units or Super Capacitor Energy Storage (SCES) Units to maintain the nominal system frequency. This paper presents the effect of energy storage units (such as SMES & SCES units) in an interconnected two area hydro power system considering Proportional - Integral (P-I) controller. The proposed work consists of two area interconnected hydro power system with SMES units and also for the system with SCES units has been designed to improve the dynamic performance of the system. Integral Square Error (ISE) technique is used to obtain the optimal Proportional - Integral gain settings. The simulation result shows that the Load Frequency Control in an interconnected hydro power system with SCES units is better than that of the hydro power system with SMES units. The two area interconnected hydro power system with SCES units is considerably improved the system dynamics such as peak overshoot, settling time and frequency oscillations as compared to that of the system with SMES units & without energy storage units.*

*Keywords: Automatic Generation Control, SMES units, SCES units, P-I Controller.*

## 1. INTRODUCTION
Automatic Generation Control or Load Frequency Control (LFC) is a very important issue in power system operation and control, for supplying reliable and good quality of power supply to the consumers. Maintaining frequency and power interchanges with interconnected control areas at the scheduled values are the main task of a Load Frequency Control. Energy storage units play a vital role in damping out the oscillations due to sudden changes in the power system. A lot of research work has been made in this area are as follows.

A dual mode two layered fuzzy logic controller were designed and implemented for two-area thermal reheat interconnected power system with super capacitor energy storage units. Fast – acting energy storage devices can effectively damp electromechanical oscillations in a power system. A power system with a SMES unit of 4 – 6 MJ capacity would reduce the maximum deviation of frequency and tie-line power flow by about 40% in power areas of 1000 – 2000MW capacity is analyzed. A fuzzy logic controller for Automatic Generation Control (AGC) in an interconnected thermal power system including SMES units has been studied. Real time simulation of AGC for interconnected power system is presented and a new control strategy for digital controller is developed. Proportional Integral (PI) controller design using Maximum Peak Resonance Specification (MPRS) has been implemented to maintain frequency and the power interchange and also proved that effective and efficient method to control the overshoot, settling time and maintain the stability of the system. Application of energy storage units in an interconnected hydro power system using integral controller is analyzed and also proved that the system with SMES units is significantly improved the system dynamics. Effect of SMES unit in a restructured power system considering Governor Dead Band (GDB) non – linearity is examined. A simulation model for load frequency control in an interconnected hydro power systems using fuzzy - Proportional Integral Derivative (PID) controller is presented and proved that fuzzy logic controller yields better control performance. Load frequency control in an interconnected two area hydro-hydro system has been studied. AGC of an interconnected four area hydro-thermal system using Superconducting Magnetic Energy Storage (SMES) unit is examined. Automatic generation control of a two area hydro thermal system under traditional scenario by considering the effect of Capacitive Energy Storage (CES) and Thyristor Controlled Phase Shifter (TCPS) is proposed and the simulation result shows that the dynamic performance of the system is greatly improved by using TCPS and CES unit in the system. A comprehensive digital computer model of a two area interconnected power system including the Governor Dead Band (GDB) non-linearity, steam reheat constraints and the boiler dynamics is developed. The improvement in AGC with the addition of a small capacity SMES unit is studied.

ISSN 2394 - 7780

## 2. TRANSFER FUNCTION MODEL OF TWO – AREA INTERCONNECTED HYDRO POWER SYSTEM

A two area system consists of two single area systems, Connected through a power line called tie-line, is shown in the Fig.1. Each area feeds its user pool, and the tie line allows electric power to flow between the areas. Information about the local area is found in the tie line power fluctuations. It is conveniently assumed that each control area can be represented by and equivalent turbine, generator and governor system. Fig.1 shows the block diagram representing the two area interconnected hydro power system. This model includes the conventional Proportional - Integral controller gains ($PI_1$, $PI_2$). Each power area has a number of generators which are closely coupled together so as to form a coherent group. Such a coherent area is called a control area in which the frequency is assumed to be same.

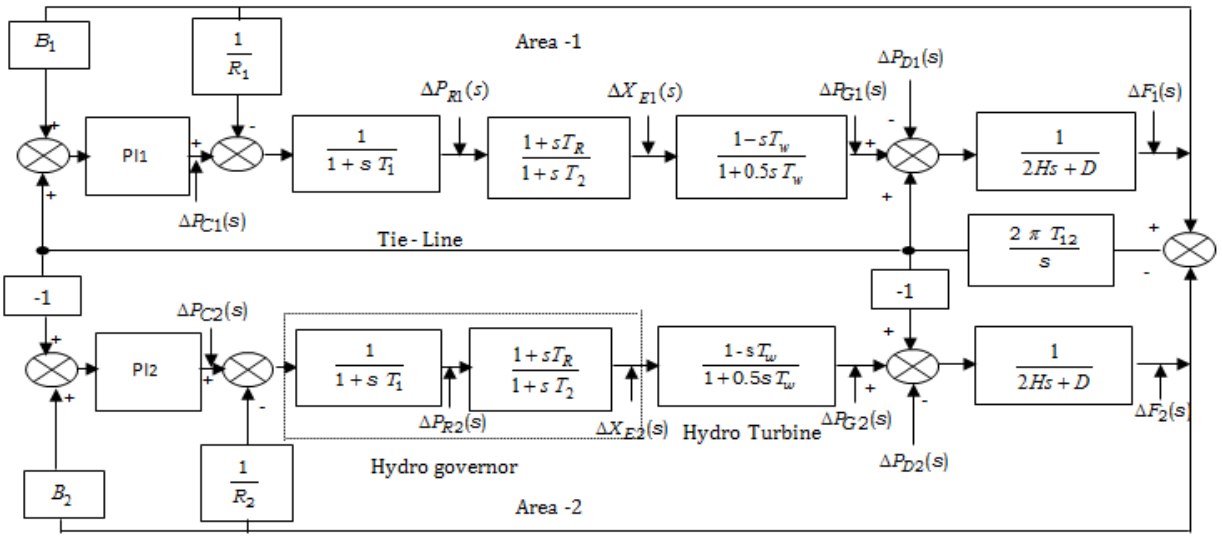


Fig.1 Transfer Function Model of two area interconnected hydro power system

## 3. SMES UNIT

The Fig.2 shows the basic configuration of a SMES unit in the power system. The superconducting coil can be charged to a set value (which is less than the full charge) from the utility grid during normal operation of the grid. The DC magnetic coil is connected to the AC grid through a Power Conversion System (PCS) which includes an inverter/rectifier. Once charged, the superconducting coil conducts current, which supports an electromagnetic field, with virtually no losses. The coil is maintained at extremely low temperature (below the critical temperature) by immersion in a bath of liquid helium.

When there is a sudden rise in the demand of load, the stored energy is almost immediately released through the PCS to the grid as line quality AC. As the governor and other control mechanisms start working to set the power system to the new equilibrium condition, the coil charges back to its initial value of current. Similar is the action during sudden release of loads. The coil immediately gets charged towards its full value, thus absorbing some portion of the excess energy in the system, and as the system returns to its steady state, the excess energy absorbed is released and the coil current attains its normal value. The operation of SMES units, that is, charging, discharging, the steady state mode and the power modulation during dynamic oscillatory period are controlled by the application of the proper positive or negative voltage to the inductor. This can be achieved by controlling the firing angle of the converter bridges.

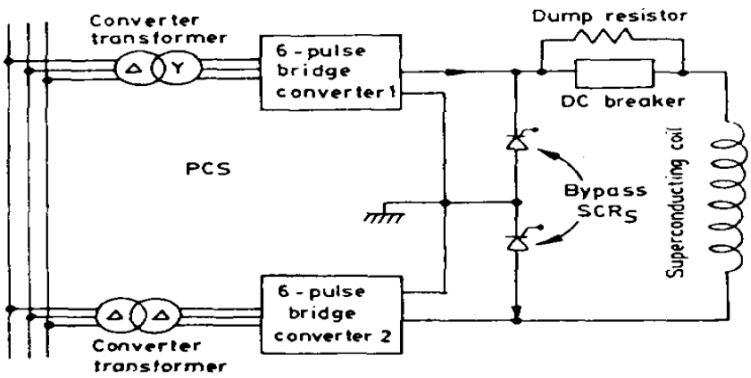


Fig.2 Configuration of SMES unit

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Neglecting the transformer and the converter losses, the DC voltage is given by

$$E_d = 2V_{do}\text{Cos}\alpha - 2I_dR_c \quad (1)$$

Where, $E_d$ = DC voltage applied to the inductor (KV)

$\alpha$ = firing angle (degree)

$I_d$ = current through the inductor (KA)

$R_c$ = equivalent commutating resistance (Ω)

$V_{do}$ = maximum open circuit bridge voltage of each six pulse convertor at α=0 degree (KV).

The inductor is initially charged to its rated current, $I_{do}$ by applying a small positive voltage. Once the current has attained the rated value, it is held constant by reducing voltage ideally to zero since the coil is superconducting. A very small voltage may be required to overcome the commutating resistance.

The energy stored at any instant,

$$W_L = \frac{1}{2}(LI_d^2), \text{MJ} \quad (2)$$

Where, L = inductance of SMES, in Henry

$I_d$ = current through the inductor (KA).

In LFC operation, the $E_d$ is continuously controlled by the input signal to the SMES control logic. The inductor current must be restored to its nominal value quickly after a system disturbance so that it can respond to the next load disturbance immediately. Thus, in order to improve the current restoration to its steady state value the inductor current deviation is used as a negative feedback signal in the SMES control loop. Based on the above discussion, the converter voltage deviations applied to the inductor and the inductor current deviations are described as follows:

$$\Delta E_{di}(S) = \frac{K_{SMES}}{1+ST_{dci}}U_{SMESi}(S) - \frac{K_{id}}{1+ST_{dci}}\Delta I_{di}(S) \quad (3)$$

$$\Delta I_{di}(S) = \frac{1}{SL_i}\Delta E_{di}(S) \quad (4)$$

Where

$\Delta E_{di}(s)$ = Converter voltage deviation applied to inductor in SMES unit

$K_{SMES}$ = gain of control loop SMES

$T_{dci}$ = convertor time constant in SMES unit

$U_{SMES}$ = control signal of SMES unit

$K_{id}$ = gain for feedback $\Delta I_d$ in SMES unit

$\Delta I_{di}(s)$ = inductor current deviation in SMES unit.

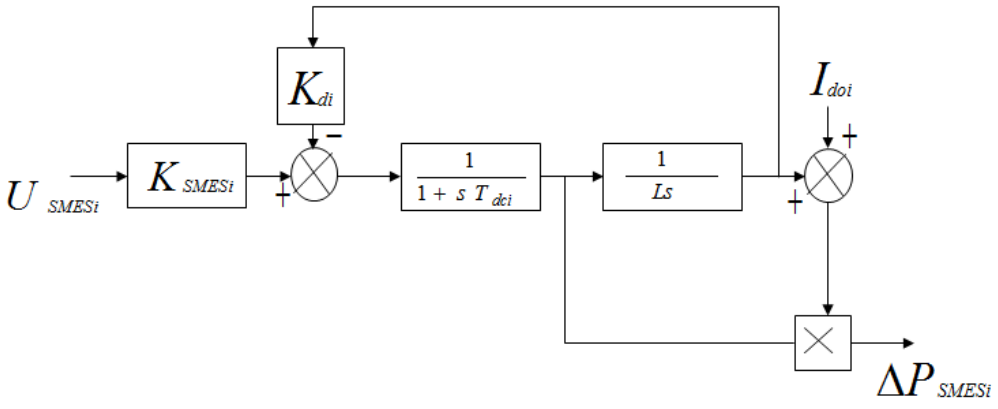


**Fig.3** Block Diagram of SMES Unit

ISSN 2394 - 7780

The $ACE_i$ is defined as follows:

$$ACE_i = B_i \Delta F_i + \Delta P_{tie,\, i} \quad (5)$$

Where

$B_i$ = Frequency bias in area i

$\Delta F_i$ = Frequency deviation in area i

$\Delta P_{tie,i}$ = Net tie line power flow deviation in area i.

The deviation in the inductor real power of SMES unit is expressed in time domain as follows:

$$\Delta P_{SMES,i} = \Delta E_{di} I_{doi} + \Delta I_{di} \Delta E_{di} \quad (6)$$

Where,

$\Delta P_{SMESi}$ = Deviation in the inductor real power of SMES unit in area i.

This value is assumed to be positive for transfer from AC grid to DC. Fig. 3 shows the block diagram of SMES unit.

**4. SCES UNIT**

The block diagram of Super Capacitor Energy Storage (SCES) Unit is shown in Fig.4. Either frequency deviation or Area Control Error (ACE) can be used as the control signal to the SCES unit ($\Delta error_i = \Delta f_i$ or $ACE_i$). $E_{di}$ is then continuously controlled in accordance with this control signal. For the $i^{th}$ area, if the frequency deviation $\Delta f_i$ (i.e., $\Delta error_i = \Delta f_i$). Of the power system is used as the control signal to SCES, then the deviation in the current, $\Delta I_{di}$ is given by

$$\Delta I_{di} = \frac{1}{1 + ST_{DCi}} [K_{SCESi} . \Delta f_i - K_{vdi} \Delta E_{di}] \quad (7)$$

If the tie-line power flow deviations can be sensed, then the Area Control Error (ACE) can be fed to the SCES as the control signal (i.e., $\Delta error_i = ACE_i$). Being a function of tie-line power deviations, ACE as the control signal to SCES, may further improve the tie-power oscillations.

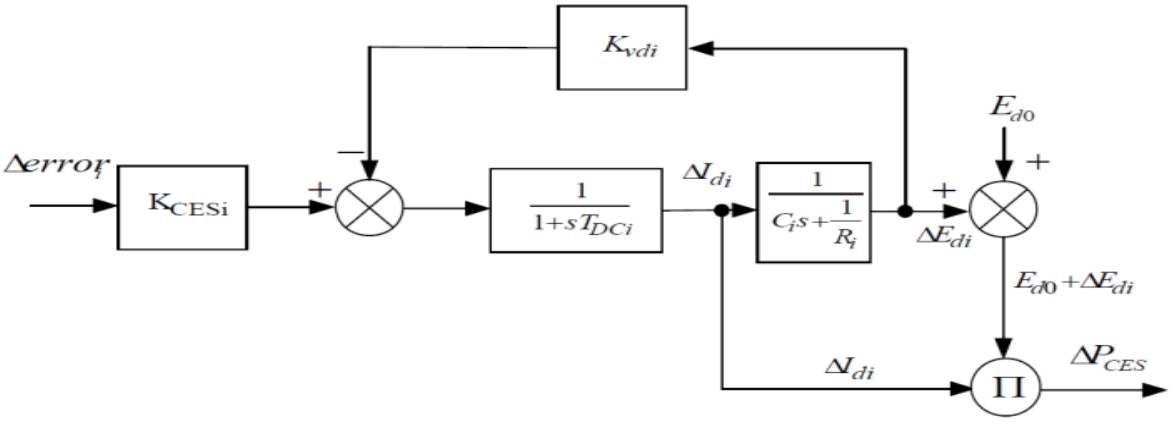


Fig.4 Block Diagram of SCES Unit

Thus, ACE of the two areas are given by

$$ACE_i = B_i . \Delta f_i + \Delta P_{tie\ ij} ; \quad i, j = 1, 2 \quad (8)$$

Where, $\Delta P_{tie\ ij}$ = The change in tie-line power flow out of area i to j.

Thus, if $ACE_i$ is the control signal to the SCES, then the deviation in the current $\Delta I_{di}$ would be

$$\Delta I_{di} = \frac{1}{1 + ST_{DCi}} [K_{SCESi} . \Delta ACE_i - K_{vdi} \Delta E_{di}]; \quad i, j = 1,2 \quad (9)$$

ISSN 2394 - 7780

The control actions of Super Capacitor Energy Storage units are found to be superior to the action of the governor system in terms of the response speed against, the frequency fluctuations.

## 5. CONVENTIONAL PI – CONTROLLER

Proportional – Integral (PI) controller is a feedback controller which drives the plant to be controlled with a weighted sum of errors (difference between the output and desired set point) and the integral of that value.

The controller output is given by $\Delta K_P + K_I \int \Delta dt$ (10)

Where, $\Delta$ = The set point error

$K_P$ = Proportional gain

$K_I$ = Integral gain

The integral term in a PI – controller causes the steady – state error to be zero for a step input.

For conventional PI – controller the gains $K_P$ & $K_I$ have to be determined by using Integral Square Error (ISE) criterion. The objective function used for this technique is

$$J = \int_0^t (\Delta F_1^2 + \Delta Ptie_1^2)\, dt \quad (11)$$

The optimum values of $K_P$ for the system with and without energy storage units are found to be 0.8, 0.9, 0.3 and the optimum values of $K_I$ for the system with and without energy storage units are found to be 0.04, 0.05, & 0.02 respectively.

## 6. SIMULATION MODEL & RESULTS

The fig.5 (a, b & c) shows the simulation diagram of Load Frequency Control in an interconnected hydro - hydro power system without & with energy storage units.

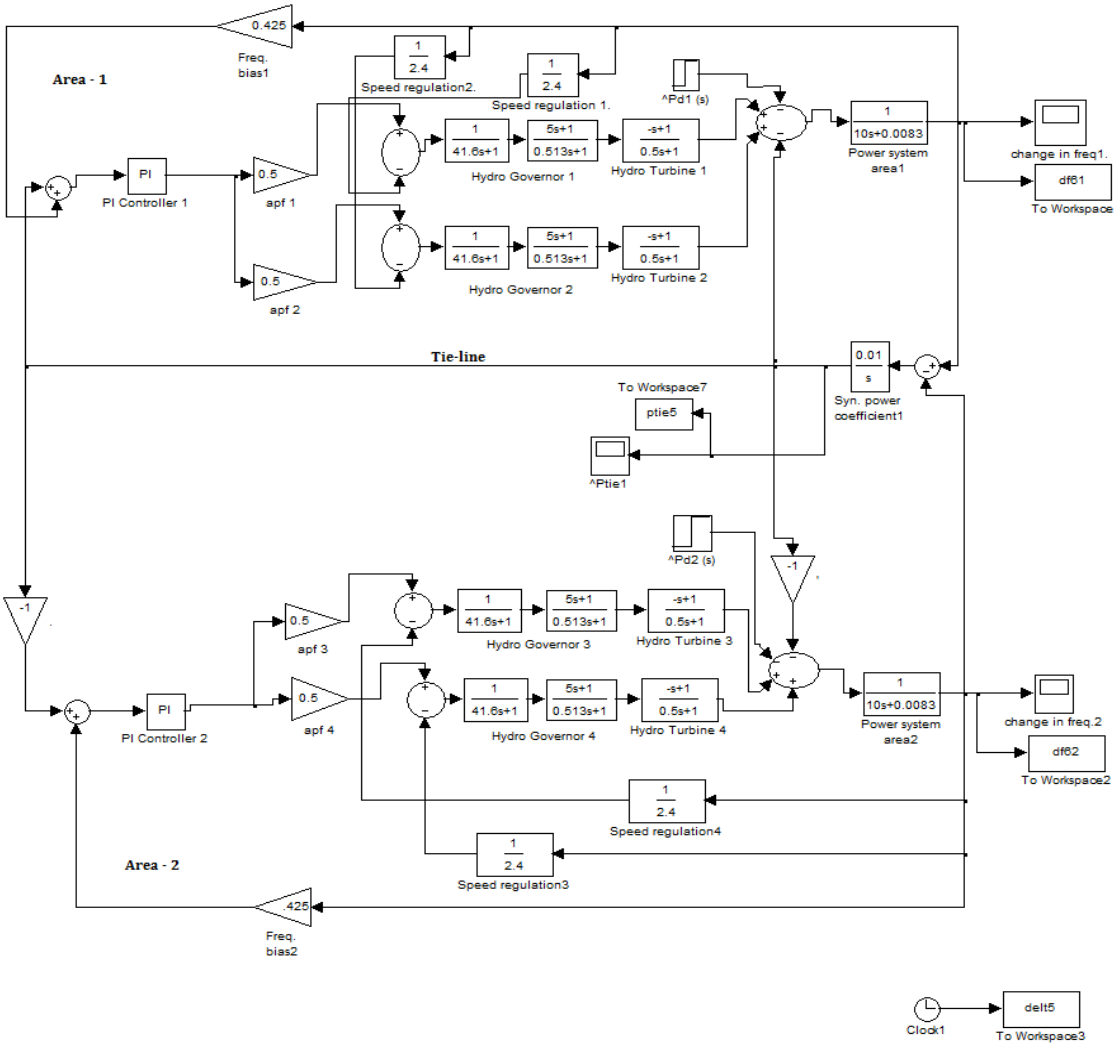


**Fig.5 (a)** Load frequency control in an interconnected hydro - hydro power system without SMES & SCES units

ISSN 2394 - 7780

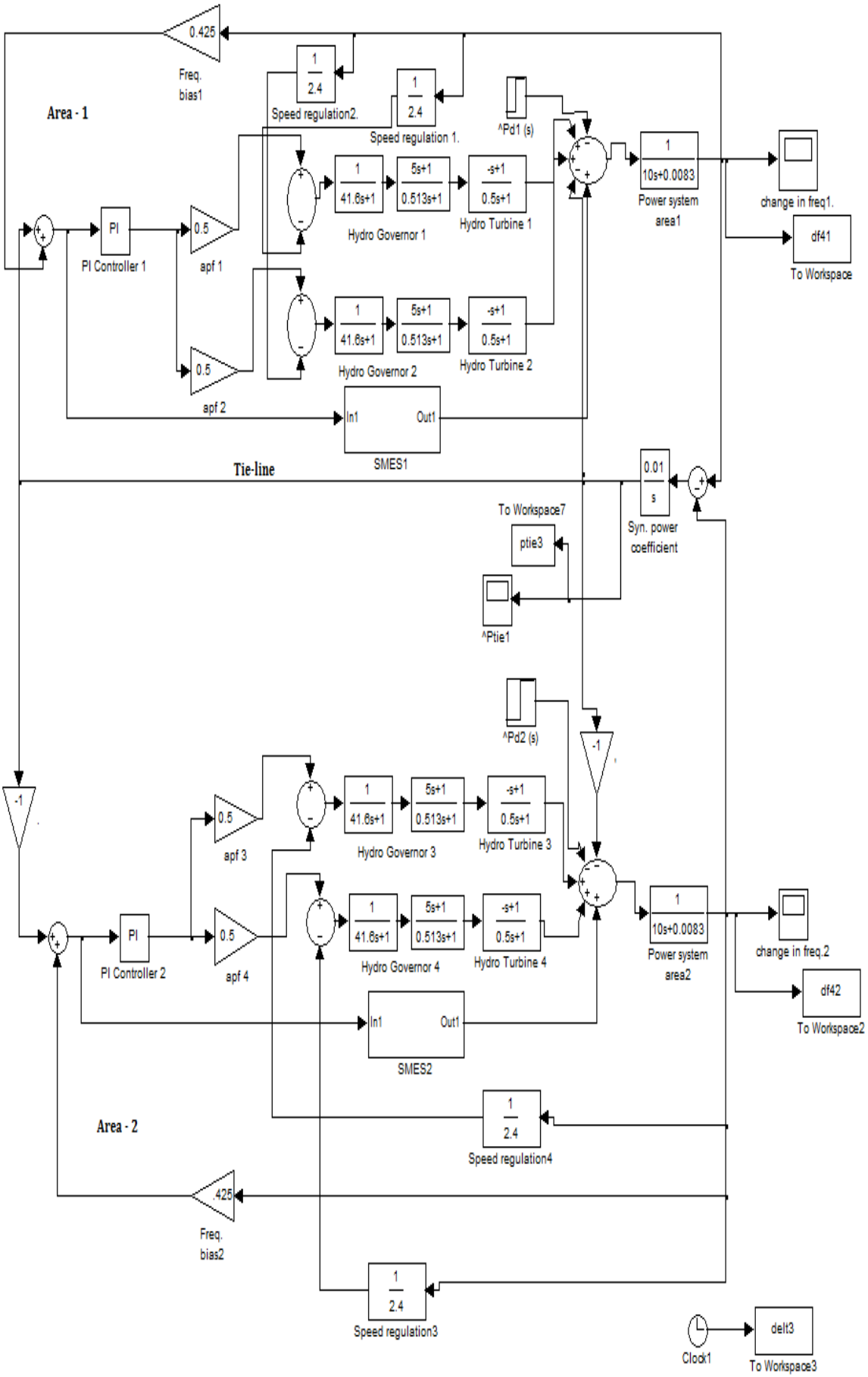


**Fig.5 (b)** Load frequency control in an interconnected hydro - hydro power system with SMES units

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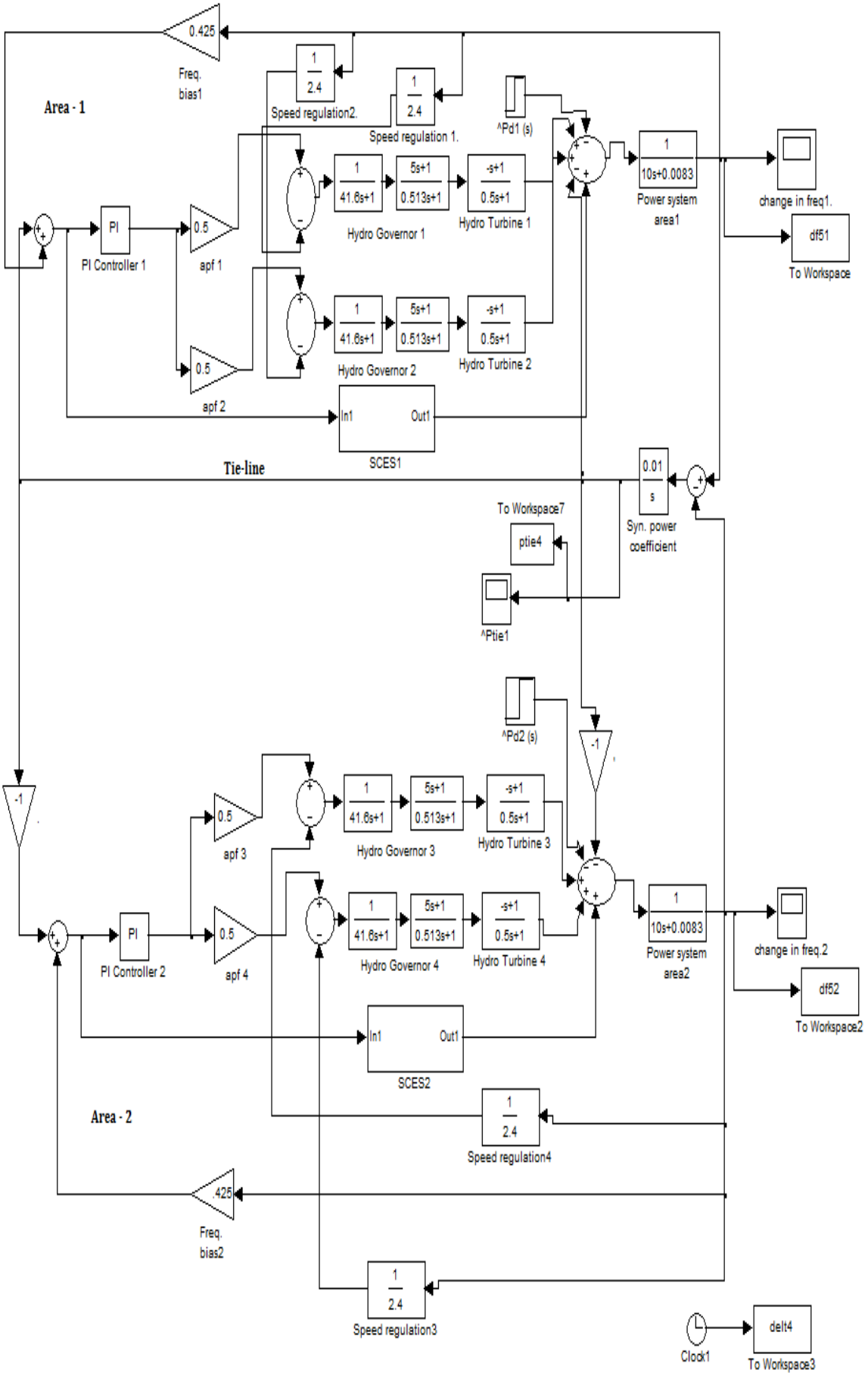


Fig.5 (c) Load frequency control in an interconnected hydro – hydro power system with SCES units

ISSN 2394 - 7780

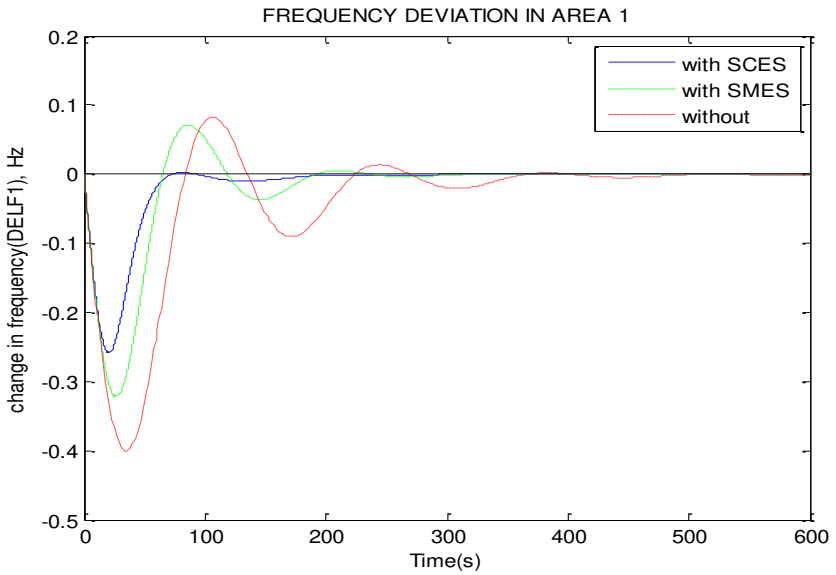


Fig .6 (a) Frequency Response of Area-1 ($\Delta f_1$)

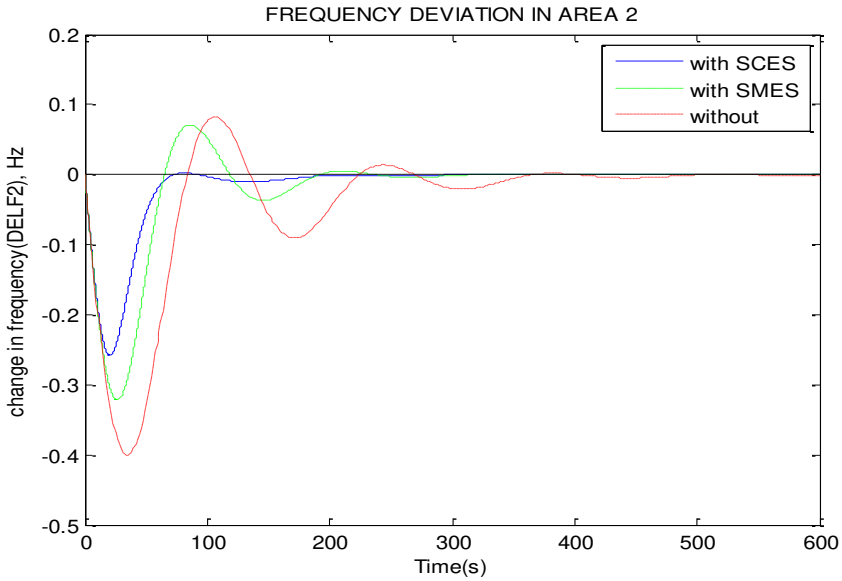


Fig. 6 (b) Frequency Response of Area-2 ($\Delta f_2$)

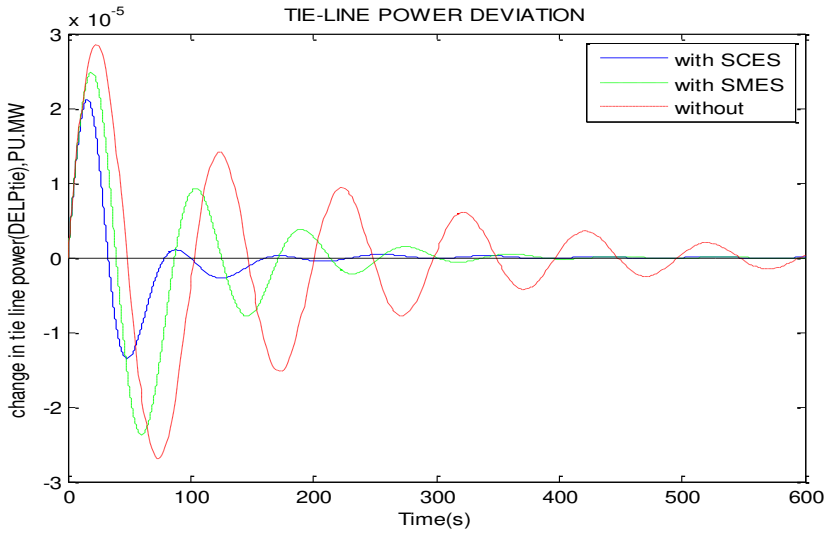


Fig.6 (c) Tie line power deviation of area-1 & area-2 ($\Delta p_{tie\ 1,\ 2}$)

ISSN 2394 - 7780

Fig.6 (a, b, & c) shows the simulation results of two area interconnected hydro - hydro power system with SCES & SMES unit and also for without energy storage units, considering Proportional - Integral controller. Fig.6 (a & b) shows the frequency response of area-1 (i.e. $\Delta f_1$) and area-2 (i.e. $\Delta f_2$) for the system with SCES and SMES unit and also for the system without energy storage units. And the fig.6 (c) shows the tie line power deviation ($\Delta p_{tie\ 1,2}$) for the system with and without energy storage units. Thus, from the simulation results, we say that the dynamic performance (such as frequency oscillations, peak overshoot and settling time) of the hydro – hydro power system is significantly improved when the SCES units are incorporated in a system.

## 7. CONCLUSION

In this paper, effect of SMES & SCES units in an interconnected hydro – hydro power system has been proposed. The power system model consists of identical hydro units with and without energy storage units (SMES & SCES units) are considered for this study. And the system performance is observed for 1% step load disturbance. In addition to this, Integral Square Error technique is used to determine the conventional PI – controller gains. The dynamic response of the hydro – hydro power system with & without energy storage units are analyzed using MATLAB software. The simulation results show that the two area interconnected hydro power system with SCES units has significantly improved the system dynamic performance (such as peak overshoot, settling time and frequency oscillations) than that of the system with SMES units and the system without energy storage units.

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# B. R. AMBEDKAR'S PHILOSOPHY AND ITS FUTURE VISION

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**ABSTRACT**
*Most people are acquainted with Dr Bhimrao Ambedkar as a Dalits' Masiha, an oppressed-down emancipator. Some gave him the title of 'Indian Constitution architect. Many call him India's social reformer. Some people call him a social scientist and activist. He's my dad's in economics, Amartya Sen said. At the same time, he's new Buddha for some of his admirers.The very name Dr. Ambedkar evokes both the intense love and extreme hate, a profoundly divisive character of his age and still today. There is a beautiful parable, so I'm confident that you must have read it one time or the other and that connection is to Buddhism, Jainism and Hinduism, which you get in Indian religious literature.Six blind men never saw an elephant in the parable. By feeling it, they attempt to explain the elephant.A blind man approaches the elephant's neck, telling him that the elephant is a pillar. And the other touches the elephant's ear and says the elephant*

*Keywords: Ambedkar, Caste, Philosophy.*

## 1. INTRODUCTION

The foremost revolutionary theorist of our time was Dr. B. R. Ambedkar. His political theory is linked to major political streams like socialism, conservativeness, marxism, and communityism. At the same time, in his authentic and indigenous way, he distances himself from these prevailing political practises[1, 2]. The philosophy of Ambedkar is mainly ethical and theological. Social precedes politics for him. Social morality is fundamental to his philosophy of politics. His vision of democracy internalizes in its true spirit the ideals of liberty, independence and brotherhood [3]. The purpose and the means of this ideal became democracy for him. That was the end, and in the end, he saw democracy as coterminous with gaining rights, prosperity and brotherhood. Around the same time, democracy was also the path to fulfil this ideal. Ambedkar says: Democracy is a mode of a social organization rather than a type of government [5,6,7,8]. In terms of the life associated with the people shaping society, the origins of democracy must be sought for in a social connection." This essay may address the political theory of Dr. Ambedkar with a particular reference to democracy [9, 10].

## 2. EDUCATIONAL PHILOSOPHY OF DR BHIMRAO RAMJI AMBEDKAR

**"The education that makes us neither competent nor teaches us lessons of equality and morality is no more education." – Dr.Bhimrao Ramji Ambedkar.**

One of the makers of modern India, Dr.Bhimrao Ramji Ambedkar. Dr. Ambedkar was born in a rural poor and impoverished household, and in his lives was seen as impossible for citizens to achieve such heights. He is considered to be one of India's most educated people. Doctor Ambedkar earned an Economics PhD from the renowned London School of Economics and the famous Columbia University. Dr. Ambedkar, as a professional author, writer and educated scholar, is world-famous. Besides, he had total jurisdiction in matters like education, sociology, constitutional analysis, moral science, theology and ideology, and not only economics and law. The lives of Dr. Ambedkar is positively affected by Mahatma Buddha, Jyotiba Phule, Sahu Ji Maharaj, esteemed instructor Professor John Dewey, Elvin Seligman, and Booker T. Washington. Ambedkar, a philosophy in itself which has been associated with lifelong education. To understand the nature and progress of knowledge in our society, it is essential to study his ideas for teaching.

### 2.1 UNIVERSALIZATION OF EDUCATION

Dr Ambedkar has been an eminent supporter of John Dewey's mentor's view on education democratization. Because of the social inequality in India, a large part of India remained deprived of the right to education for a long time. DrAmbedkar considered that education is every person's birthright and that no one can be denied this right. A democratic country should, therefore, without discrimination, give everybody in its society the right to education.

### 2.2 SOCIAL EMANCIPATION

The goal of education itself is to transform the person socially, economically and politically. Dr Ambedkar strongly opposed castes, impassiveness, social discrimination, social inequality, women's inequality, etc. He saw education as extremely important in order to eliminate social and social inequality in Indian society and to promote equality, brotherhood, coexistence and mutual acceptance in society. He believed that education is a weapon of social change, not only the birthright of every man."

ISSN 2394 - 7780

### 2.3 WOMEN EDUCATION

He gave a lecture at Nagpur on 20 July 1942, saying, "I measure community progress by the degree of advancement women have achieved." He said that if half the citizens in the country stay uneducated, then no country in the world will advance India. Dr. Ambedkar was a keen advocate of women's education as a sincere patriot and social reformer. He was well aware that it is highly important for women to be trained in order to advance society and the country's growth. He noted that 'education for women is just as important as it is for men. It's a lot of progress you know how to learn and compose."

### 2.4 RELIGION AND CULTURE IN EDUCATION

Most scholars claim that Dr Ambedkar has rejected religion and culture but that he has also supported Karl Marx's common quotation, which considers 'Religion as the Opium of the Citizens.' However, he was strongly objected in the name of faith to social inequality and traditions. He emphasized that faith is important, "what good things I have within myself, or what benefits my education offers to society, I owe them the religious feelings in me, I desire a religion, but in the same religion, I do not want hypocrisy.

## 3. SOCIAL PHILOSOPHY OF DR. B. R. AMBEDKAR

As per B. B. R. Ambedkar, "Groups still make up the business. Their base can vary. They may be economical, intellectual or social, but a person still belongs to a class in society. This is a common reality, and early Hindu civilization should not, and we know it was, have been an exception to this law. What was the class which for class and caste, was first to become the caste are neighbours next door, and it's just the range which divides them? A caste is a community that is enclosed."

As to the root of the Caste, B. Ambedkar said: "What is the class that has elevated the "closure" around itself. The analysis of caste origin can provide us with a response to the question? In Hindu culture, the traditions at issue were present. These rigid customs may be learned only from one caste: the Brahmins who hold the highest status within Hindu society's social hierarchy, and since their prevalence is derived from their observance in non-Brahmin castes, they are either not strict or total. If these customs are derivative in the non-Brahmin castes, it needs no reason to show which community is the parent of the caste organization. Tight conformity with this tradition and the priestly class social supremacy of all ancient civilizations are enough to show that they were created and preserved through this artificial means through these "unnatural institutions."

This class trait is often typical to other cultures. Ambedkar said of the groups present in Hindu society, "Hindu society as a whole consisted of the {1} Brahmins, or the priestly class and the first known, the {2} Kshatriya, and the military class, and {3} the Vaishya or the merchant class and {4} Shudra, or the artisanal menial class. Particularly remarkable is that this was basically a status structure in which people might adjust their classes as eligible and thus, classes changed their workers. In several periods in Hindu culture, the priestly community was socially segregated from the majority of the population and became a caste unto itself through a closed-door strategy. The other parties, some in broad numbers, some in minutes, are subject to the rule of social separation of labour. The community of Vaishya and Shudra is the initial plasma of the inchoate that was the root of today's many castes. The Kshatriya community should have divided into soldiers and managers because the military occupation is not very quickly subdivision.

He went on to claim, "This subdivision of culture is very common. It is widespread. The unnatural part about these subdivisions, though, is that they have abandoned the open-door character of the class structure and become castes. The question is: have they been pressured to shut and endogamous or have they locked their doors on their own? I claim that there is a twofold response: some have closed the door, some have closed the door. The first is a psychological explanation, and the second is mechanical, but it is complementary, and both are required to understand the whole process of caste creation."

But that's the fast history of Indian castes. But was the caste system harmful? The response to this query is quite relevant. As mentioned above, four groups were primarily available in India. In time, a fifth class, one new class, that is to say, Ati-Shudra or Dalits, arose from the shudra class, which was less than Varna 4. In the religious texts, the citizens under the fourth Varna, called Shudras, were adequately deteriorated, so the condition of those who were another step underneath the shudra can be imagined. That is why the Dalits have a different tag, "outcaste" or "Untouchables." Dalits have been stripped of universal human rights, their right to education and have been sanctified by books on the religious rule. Here are two verses of the texts of the Hindu religion: now when a Sudra hears the Veda deliberately, the ears are packed with (molten) tin or lake. The Vedas have become the Hindus' first holy texts. To be specific, Hindus, or Brahmins, called the Vedas sacred and thus unfailing. Another verse is that the Sudra (Vedic text) recites, its tongue is cut off.

ISSN 2394 - 7780

Ambedkar provided several facts regarding the pathic state of untouchables. He states, "The untouchables were not authorized to use the street under the law of the Peshwas in Maratha country if a Hindu did not come along to pollute the Hindu from his shadows. It was necessary that the untouchable have a black thread as a sign or label on its handle or in its neck to stop the Hindus polluting it by accident. The untouchable was to take, stretching out of his waist, a broom in Poona, the capital of the Peshwa, from behind the dust he treads so that the Hindu could not go through it. In Poona, the untouchable was pulled into a pot of earth, which was hanging in his neck everywhere he went, and to keep his spit dropping on the ground could contaminate a Hindu who might inadvertently get into it." Intact objects cannot use public wells, carry clothes or ornaments, or consume whatever sort of food that they choose. Even longer is the record of massacres. This list is lowered, though not depleted, in post-independent India.

Too few social reformers battled these abuses and unnatural bodies. Jyotirao Mahatma, Jyotirao Phule and B. Savitribai Phule and Shahu Shahu Maharaj. They were primarily R. Ambedkar. Ambedkar argues that caste is not centred on labour division. The worker is split. Caste is often a negative institution as an economic organization. He urges the Hindus, in line with democratic values, to annihilate the caste which constitutes a significant obstacle to social unity and create a new social order founded on the ideal of democracy, equality and fraternity. He is in favour of inter-caste marriage as one of the remedies. However, he emphasizes that the belief in "shastras" is the root cause of caste maintenance. He then implies that by the thralling force of "shastras" every man and woman is liberated, his/her mind is purified of the pernicious ideas based on the "shastras." In his view, culture must be founded on reason and not on atrocious caste system customs.

It is evident from the above debate that caste is a closed and Accessible method. Class is an open system. Education may take a person from Caste to Class, that is, to an accessible society. An individual is confined to only his traditional career in caste's structure. There is, therefore a limited scope to be created. However, a person may develop as he or she can in class if he or she is freely willing. And this transition can only be brought on my schooling. Ambedkar has stressed the value of teaching. "Education, organization and agitation," he added. Here he provided education primary importance. "The backward classes have come to understand that schooling, after all is the biggest material gain they can struggle for. We - forgo material advantages for civilization, but we cannot give up our privileges and resources to take maximum advantage of the highest schooling. That from the viewpoint of the lessons which have just learned that their life is dangerous without schooling, the value of this issue is very much impacted." He nevertheless managed to educate himself well in this culture of discrimination.

## 4. POLITICAL PHILOSOPHY OF DR. B. R. AMBEDKAR

### 4.1 AMBEDKAR ON DEMOCRACY

In his convictions and actions, Dr. Babasaheb Ambedkar is known as the protagonist of democracy. Many thinkers gave many definitions of democracy and meaning. The fact is, however, that democracy is not just a form of government, but a way of life. According to Walter Bagehot Democracy, "Government by debate."3 Ambedkar defines democracy in a much more concrete way. Abraham Lincoln's most widely known definition of democracy as a people government for the people and the people." "Democracy is a form and method of government that brings about revolutionary changes in people's economic and social life without bloodshed."4 Dr. Ambedkar also defined democracy as democracy is a way to live in connection with one another. According to Ambedkar, democracy means fundamental changes in the social and economic life and acceptance of those changes by the people, without resorting to dispute and bloodshed. In the context of social relations, democracy must also be investigated in terms of the associated life between people that are the society." He wanted to establish not only in Indian political life but also in social and economic life the principle of a single man, one vote and one value. He wanted to be accompanied by social democracy in political democracy. In contrast to many others whose discourse on democracy is limited to political and institutional matters, he attached central importance to social aspects of democracy. The social connection between individuals was paid more attention to Ambedkar than the separation of powers and constitutional democratic safeguards. The concept of power in his thinking is directly related to the power of society and politics. He was aware of the social and economic inequalities that corrode the Indian people's national consciousness. "We must also make social democracy for our political democracy," Ambedkar said.

### 4.2 PARLIAMENTARY DEMOCRACY

Ambedkar claims that "parliamentary democracy has all the characteristics of people's government, people's government, the people's and the people's governments." "There is the constitutional power of representative democracy to speak the voice of the people; the government is subordinate to the Legislature and obliged to respect the Legislature. In addition to the statute and the executive, the judicial authority regulates them and

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retain them within the defined limits." "Parliamentary democracy was not standing still," says Ambedkar. Three forms have been advanced. Next, it started by applying universal suffrage to equal political freedom. Secondly, the concept of fair opportunity for society and the economy has been accepted. Thirdly, it admitted that the state could not be kept in regulation by an anti-social enterprise."

### 4.3 POLITICAL DEMOCRACY

i) Ambedkar claims that there are four grounds for political independence. They are: I "The guy is the end.

ii) The individual is entitled to some inalienable rights that the Constitution shall grant to him.

iii) No person shall be obliged, as a condition of reception of a privilege, to give up any of his constitutional rights.

iv) The State shall not assign powers of government to private citizens."

In a democracy, all these aspects are absolute. The primary aim of the democratic government could, therefore, according to Dr. Ambedkar, be the well-being of people. The individual's independence, political equality, social development and human rights are fundamental constitutional guarantees that shape the core decent democratic values of Ambedkar in political democracy. For him, the strategy relates to the social system of a society for which the political plan is pursued. Democratic democracy and independence are nothing but the same social patterns and beacons since the democratic system rests on social order—the political structure.

"There is a tremendous political influence on the social system, he notes.

It will shift in its operating. It may annul or even make a candle of it. It is, therefore, necessary that the citizens accept the ground plan that social ties are; democracy should be treated as both a social and a political method before passing any opinion on any policy partnership scheme even preparing economic reforms."Democracy's soul," he notes, "is one man's doctrine and one value." The identity of an individual in political and social relationships has inherent meaning in this theory. The sum of democracy, he said, ultimately resides of the economic benefit of all citizens living in a given country, as well as their political realization. This implies the financial well being of the people without which democracy has for him, little meaning at all." Otherwise, democracy destroys its own essence and soulless democracy, unrelated to individual ambitions.

## 5. FUTURE VISION OF AMBEDKAR'S PHILOSOPHY

The contributions of Dr. Ambedkar are the foundation for much of the modern aspects of a welfare state and a vibrant society. The proposal was laid down for elections, settlement of labour wars, health and labour funds, temporary fund, holidays payable to factory employees, creation of a service of eight hours against 12 hours, tripartite working hours meeting, professional education scheme, qualified workers, Indian statistical law, allocations to minorities and Dalits, etc. Dr. Ambedkar's position was crucial in drafting the constitution for the region. In the Indian constitution that forms the bulwark of Indian democracy and politics, his vision for a modern, equal and egalitarian community is enshrined. The constitution guarantees and security, including the freedom of faith, elimination of intouchability and the rule against all kinds of oppression, a weaker section reserve, women' s rights, etc was provided for a broad spectrum of civil liberties for individual people. Article 15(2) 17, 23 & 24 of section III of the Constitution ensures the security of the human freedoms and allows them enforceable against the State as a body by the Supreme Court. A well-formed structural constitution for the nation is the characteristic of parliamentary democracy together with the federal system. The constitution allows for a territorial system through its special foresight that can be turned into a unitary one if appropriate. In Article 17 of Section III and IV of this Constitution on the untouchableness of minority rights, and in Article 30, the method called for the realistic and praiseworthy incorporation of multiple segments of society. Likewise, protecting discrimination/reservation is a benevolent effective vision for the country for these groups. Whilst not questionable by the court for violations, the directive concepts of state policy cannot be overlooked because they are the fundamental reason for the elected authorities who bear duty to the citizens. At the beginning of the preamble to the constitution, the country of India is a projection visualised by its manufacturer Dr. Ambedkar. In order to promote equal voting and fair play, the autonomous election commission has been enshrined as a promise of purity and fair democratic standards, and it is firmly taking power off the Executive. In his terms, he described India's progressive constitution as it is practicable, resilient and powerful enough to keep India united in time of peace and battle. Indeed, if the current Constitution renders it wrong, it is not that we have a weak Constitution. I will assure you that. What we would have to tell is that men are foul" In the extraordinary constitution, a thriving democracy and impartial autonomous institutions, the life, works and message of Dr B. R. Ambedkar, the main visionary for India, is established. It is for all Indians to put together and dedicated

ISSN 2394 - 7780

efforts to reflect his vision. In modern times, Indians still have to convert his vision into faithful efforts that are an adequate homage to that great nation visionary of Ambedkar.

Ambedkar has all the key political practises of his period under his control. The three major democratic traditions of left, conservative and progressive political ideology gave birth to his political philosophy. He has transcending all these practises, which is remarkable about him. While cultivated in the liberal tradition, he differentiates. He varies from liberal philosophers such as Nehru in certain ways. He appears to be Conservative though following the Buddhist faith, but it is obviously seen that by his assault on Gandhi and the Hindu social order he is not conservative. He appears to be progressive at some stages (Marxist). However, he holds on gaps in his interpretation of the Indian culture in the Marxist way of thinking. However, Ambedkar's biggest issue is the release of the Dalits, the citizens of Indian society's lower strata. From this stage alone, he approached every democratic tradition. This has repercussions for defining the principles of Indian society's reconstruction. In other terms, Ambedkar's political thinking needs a whole different vocabulary and the present political language struggles to evaluate or appreciate his ideology. Dalit protests spread quickly throughout the world. From "untouchable" to "Dalit," we can see the politicisation of these people. Studied by the Dalit movement, the dalitisation of the culture is declared an antidote to the existing social order. In the current sense, the problems confronting the campaign are numerous. In the Dalit movement, the mobilisation and acceptance of the comparatively less established subcasts in the Dalit group are a longstanding concern. The rise of the Hindu right and the active support of some Dalit groups is another issue which the Dalit movement had to contend with. Furthermore, with the continuing wave of globalisation and public sector privatisation, the Dalits are further oppressed and resources diminish. Under that sense, the relevance of the ideology of Ambedkar for the potential political Dalit struggles needs to be measured.

Ambedkar wanted the citizens to nurture the ideals of democracy and equality within themselves; only education is possible. He saw schooling as a path to reach the doors of light and perception and eradicate dark and misguided areas. Ambedkar illustrated secular social liberation school. The basic subject of his educational philosophy is the inculcation among boys and girls of all colours of the ideals of democracy, liberty, brotherhood and fairness. Via his educational theory, I shall see how it is best to enlighten citizens from ignorance by experiencing total freedom of learting without the restrictions of any caste, religion and ethnicity.

## 6. CONCLUSION

For the entire growth of the pupil, Dr. Ambedkar found the instructor important. He figured we might produce successful students if we had good teachers. He was really supportive of the teachers and helped the teachers. In his belief, the instructor is the pioneer in cultivating a balanced and full human personality. A successful instructor should be constructive and fair to all sectors of society. He suggested that teachers be tested solely during placement in schools or colleges for their credentials and other skills.

In conclusion, Dr Ambedkar's educational theory is the synthesis of ancient and contemporary schooling. Dr. Ambedkar's contribution is significant as he emphasized the need for education in a broad spectrum of Indian society, which has been deprived of education for a long time. At the time of constitution construction, Dr. Ambedkar was influential in formulating numerous educational laws and the social empowerment of the underworld people. It is necessary to remember that culture never will grow holistically if a substantial portion of society is deprived of education. It is essential to cross the social divide; else there will be no social peace in society. Accordingly, Dr. Ambedkar stressed how the state ought to provide citizens with compulsory quality education and professional training in order to create social and economic balance in our society and make progress for our country.

Dr. Ambedkar's confidence in democracy was unshakeable. In his conception of usage With fewer community, democracy has a unique position that it described as one person, one vote;" and is defined as one vote, one value." Ambedkar's concept of democracy had such a tone: democracy means empowerment for everybody to engage in his/her decision-making process, democracy means independence, fair opportunity and brotherhood. He described parliamentary democracy as "voting by the people in favour of their owners and handing over the rights of ruling over themselves" His template

It seems strictly people-oriented from democracy. He showed that the bookish conceptions of equality was harmful to the socially dominated disabled classes and recommended a radical shift to the idea of equality. The plan was to eradicate injustice. This very definition of equity is the foundation of his theory of positive discrimination.

Without social and economic democracy, Dr. Ambedkar sincerely claimed that political democracy could not thrive. In his definition of democracy, he felt that democratic democracy is not an end per se but the most

ISSN 2394 - 7780

effective form of attaining public social and economic values. It must be stressed that his grandeur resides in the radicalism of his conceptions, his perception of human existence without some form of exploitation; not in the solutions or appliances, he offered under the prevalent conditions of his day. Therefore, embedding is of considerable importance to Indian culture even today in search of social justice, the abolition of untouchability, dignity and independence and genuine democracy. The main note to political philosophy is egalitarian socialism, and the best way to accomplish that is constitutionalism.

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# NON-ALIGNED MOVEMENT- CONTEXT AND RELEVANCE

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***"For too long we of Asia have been petitioners in western courts and chancelleries. That story must now belong to the past. We propose to stand on our own feet and to cooperate with all others who are prepared to cooperate with us. We do not intend to be the playthings of others."***

**- Jawaharlal Nehru at Asian Relations Conference in Delhi, 1947**[1]**.**

If one has walked through the streets of **Lutyen's** Delhi, will come across the signs of the streets named after figures of the Non-Aligned Movement (NAM). Figures or leaders like Gamal Abdel Nasser, Joseph Broz Tito appears as markers and pointers of the recognition of the movement on the one hand and a third world perspective on the other. Though these leaders, movements and their contexts have changed today with passage of time and change in world order yet these names on the streets signify a past of a movement that opened a new dimension in the realm of international politics. The Ministry of External Affairs' website does mention about the movement in detail, but the movement in spirit seems to be dying today as many of the countries which did not align with power blocks like the United States and Soviet Union, now are firmly aligned with either of the two, or have turned into authoritarian regimes. Meetings of the NAM continue to be held where 120 countries composing the largest block of third world countries come together to discuss some of the important issues of trade, culture, politics, and economy while at the same time aligning themselves with either the United States or the Soviet Union.

The Ministry of External Affairs' website defines the movement as

The Non-Aligned Movement (NAM) was created and founded during the collapse of the colonial system and the independence struggles of the peoples of Africa, Asia, Latin America and other regions of the world and at the height of the Cold War. During the early days of the Movement, its actions were a key factor in the decolonization process, which led later to the attainment of freedom and independence by many countries and peoples and to the founding of tens of new sovereign States. Throughout its history, the Movement of Non-Aligned Countries has played a fundamental role in the preservation of world peace and security.[2]

Further, the detailed history of the movement is noted with great clarity where the ministry also clarifies that NAM was not an organization but a movement of newly independent postcolonial nations of Africa, Latin America and Asia who came together to make a movement and not present their aim as an organization, it was so decided in order to overcome bureaucratic entanglements. However, one of the important issues that emanate from the experience of the Non-Aligned Movement is that the newly independent countries would strive to corner the two power blocks from infringing on the sovereignty of Asian, African and Latin American countries, would unitedly fight against injustices like Apartheid and colonial expansion and subjugation in other parts of the world. After the cold war, the wars on the sovereignty of Iraq, Afghanistan, Palestine, Syria and Black peoples struggle in South Africa could not be resisted by the Non-Aligned countries due to various power politics as many of these countries which were formerly part of the movement either supported the war publicly or endorsed without speaking about its consequences for the vast majority of the populations. The continuing violations of the territorial integrity of the third world countries by the United States and the inability by the Non-Aligned Members to defend the collective aspirations of freedom from external aggression and violence may be seen as a sign that the movement has either failed or morphed into a politics of national interest where nations no longer are concerned about the injustices elsewhere beyond their territories.

If we look at the historical conditions in which this movement emerged, we would be able to find how decolonized countries came together to form a movement of neutrality where postcolonial nations would not align with either power blocks which happened to be caught in the cold war and nuclear arms race. This phenomenon of banding together of erstwhile colonized countries of Asia, Africa and Latin America has been a phenomenal event which ran parallel and many a times, counter to cold war hegemonic narratives. One of the reasons why the Non-Aligned Movement has not become an important discourse in the realm of international

[1] See https://www.indiatoday.in/magazine/cover-story/story/19760731-colombo-non-aligned-summit-to-discuss-broader-aspects-of-theory-of-non-alignment-824039-2014-06-18

[2] See https://mea.gov.in/in-focus-article.htm?20349/History+and+Evolution+of+NonAligned+Movement

ISSN 2394 - 7780

politics is that the discourse heavily shifted on the narrative of cold war on a global scale, while NAM was reduced to a localized phenomenon of postcolonial nations struggling from within. Non-Aligned Movement did not have a comprehensive charter or doctrines on its own. It remained a fluid movement defying the normative structures of organization making like EU, G7 or G20.

Bandung Conference of 1955[3], drew the principle of the Non-Aligned Movement as a movement, was formalized by signing the Declaration of Brijuni dated 19 July 1956[4]. The Declaration's signatories were Egypt's president, Gamal Abdel Nasser, Yugoslavia's president, Josip Broz Tito, and India's first prime minister Jawaharlal Nehru. The Declaration maintained that the peace cannot be obtained with separating one country from the other but working towards a common goal, holding the aspiration of freedom, justice and universal expansion of ideal conditions for countries to share a general cause of humanity so that wars could be avoided by sitting together. The movement as the experience of a colonial wound of subjugation, slave trade, domination by European countries like France, Britain, Belgium, Dutch and later America and Soviet Union became a paramount event which brought these many countries under the umbrella of a shared history of exploitation of natural resources along with the exploitation of labour. The movement though conceived in terms of total isolation from power blocks could not manage to hold on to the principle of neutrality and Non-alignment even during the cold war. India, though it maintained neutrality, it was closer to the policy of Soviet socialism during its post independent phase. Some of the interventions made by Postcolonial India for the rights of the countries like Hungary and vocally speaking against apartheid regimes in South Africa and Palestine were base on the Universal principles of justice for the oppressed nationalities. According to Surjit Mansingh

"The revolution in Hungary began on the night of 23 October, 1956. It evoked spontaneous sympathy and admiration in India. The first official comment on the Budapest events came from Prime Minister Nehru, who in his press conference of 25 October referred to the 'national uprising' in Hungary. He touched on recent events in Eastern Europe, particularly Poland, implying that developments in Hungary would follow a similar pattern of national democratization. The use of Soviet troops and arms to stamp out the rebellion caused international revulsion, shared by Indians and their Prime Minister, who 'intensely disliked' the stationing and use of foreign troops in any country and felt that human dignity and freedom was outraged when force of modern arms was used to suppress peoples and to gain political objectives. The Hungarian episode was brief but tragic. Its impact on an already explosive international situation - Egypt was invaded by Israel on 29 October and the British and the French forces came in on 30 October - was profound, and India's policy towards this latest hot dispute in the cold war was significant for its content as well as for its interpretation by Western public opinion."[5]

Also, during the Suez Crisis when Gamal Abdel Nasser nationalized the canal in 1956[6], India came up with Nehru-Eisenhower doctrine of ceasefire maintaining that peace, not war should be the decisive criteria for India's foreign policy. Though Nehru didn't defend Nasser's nationalization directly, but he tried to defend peace as a foreign policy norm for the postcolonial nation like India. Nehru didn't want all of this to escalate into a crisis where nations would be once again at the brink of a war akin to Second World war. Many of the interventions made on behalf of India on the questions of Iran and Vietnam, India's policy in its early days of the Non-Aligned Movement was considered to be idealistic where national interest was attuned to the interest of third world countries. Further, Cuba as one of the members of the Non-Aligned movement made great efforts to attune itself to the cause of the movement. An example of this cause is the Cuban combat troops in Angola that greatly helped to foster friendships like these in the event of an oppressive regime. Cuba helped Angola in combating colonialist strategy of South Africa's racist regime.

Cuba also went on to establish military advisory missions and economic and social reform agendas. In the 1976 conference of the Non-Aligned Movement, Cuba was applauded for its internationalism due to which the forthcoming meeting of the Non-Aligned countries was scheduled to be in Havana in the leadership of Fidel Castro, becoming a very powerful figure in the decolonization movement and the politics of the non alignment. The conference in September 1979 brought the Cubans to an international stage as it struggled itself historically against the U.S. expansionist policy. Cuba's closeness with the Soviet Union for strategic reasons, perhaps

[3] See https://theconversation.com/explainer-history-of-the-asian-african-conference-lives-on-39505

[4] See https://www.smrikve.com/istria/books/smrikve/places/west-istria/brijuni/page-8/

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ideological brought forward this rift with the politics of non alignment. The invasion of Afghanistan in December 1979[7] by the Soviets opened the Pandora's box. As Afghanistan being an active member of the Nonaligned Movement, Cuba voted against the resolution condemning Soviet aggression under pressure from the Kremlin. This is one example where the movement even when it tried to work together by not aligning itself, found itself caught up in cold war quagmire.

NAM After Cold War

As the Non-Aligned Movement was formed as an intention to remain distant from the cold war politics by not joining with any power blocks, it has found itself struggling to uphold the policy of neutrality even when the cold war has ended. Owing to the questions of minorities and internal problems of remaining together as a nation, Yugoslavia broke into three nation states separated on the lines of ethnicity, its membership suspended. The successor states of Yugoslavia- Serbia, Bosnia, Herzegovinia showed little or no interest for the membership of NAM, though they have observer status. By 2004, Malta and Cyprus ceased being members of NAM and took the membership of the European Union. Belarus remains the only remaining member of the Movement representing from Europe. Azerbaijan and Fiji joined the movement in 2011[8]. One of the reasons why these nations could not hold themselves together from within is that the questions of race, religion, caste and oppression became a major divisive factor in the context of postcolonial regimes. Egypt for Example, which remained one of the important and promising members of the movement found itself beset by the problems of authoritarianism and militarization of the country from within. The Arab Spring made this faultline visible. On the questions of national minorities, many of these nations failed in upholding the idea of freedom and justice from within. From being upholders of sovereignty, freedom and justice beyond borders, leaders of these countries began to suspect their own minorities on the one hand, and punitive measures brought about to control the populations became a major factor where these countries could not uphold a unified sense of nationhood.

Since the ending of the Cold War rivalry between the United States and the Soviet Union leading to the collapse of the Soviet Republic, the Non-Aligned Movement has been forced to look at itself and reinvent its relevance in the current international system. A major question that NAM confronts is this- whether its foundational doctrines, basically national independence, territorial integrity, and the struggle against colonialism and imperialism, may be applied to contemporary global politics? The movement, in the past though has focused on principles of multilateralism, equality, and mutual non-aggression for the Global South, the sustainability of the movement in the present political, economic and cultural landscape where neoliberalism has become a core ideology coupled with interest of the national elites, any attempt at reinventing NAM would require significant redefinition of the core content of global politics that is 'national interest'. Though these countries have regrouped themselves via new blocks like IBSA, BRICS, SCO and so on, the ideal internationalism which protected the poorer people of these countries from violence and damage to their economic lives remains a significant issue to deal with. The multiplicity of ways in which the countries of Global South have aligned themselves either due to pressure or debt to the developed countries, the global vision of justice and universal claim for emancipation of these countries has been lost today. While agreements on basic issues has been firm, taking right actions and resolutions concerning pertinent international issues has been a cause of debate as the Non-Aligned Movement distanced itself away from the policy of neutrality owing to the myriad ways in which they became economically dependent on exploiting countries of the north via a system of internationalization of debt economy.

Though the movement continues to see a greater role for itself in the domain of international politics, the poorer countries of global south continue to be exploited and pushed aside by superpowers along with their local regimes in a so called multicultural world beset by market fundamentalisms. Questions like non intervention by major powers continue to be puzzling as the NAM countries find themselves at crossroads owing to their weak economy which again is a result of not being able to steer the nations in economic and political terms by their leaders. Although in principle it opposes external aggression, interference domestic issues and threats by superpowers, but it has also shifted their attention on the issues like socio-economic challenges facing member states, especially the inequalities resulted by the coming of globalization and the implications of neo-liberal policies everywhere. The Non-Aligned countries has concentrated on the questions of hunger, development, social and economic inequalities as growing threats, both internally and externally.

[7] See https://www.theatlantic.com/photo/2014/08/the-soviet-war-in-afghanistan-1979-1989/100786/

[8] See https://www.rferl.org/a/azerbaijan_join_nonaligned_movement/24200776.html

ISSN 2394 - 7780

In the 16th NAM summit Iran took over from Egypt as the leader of the Non-Aligned Movement from 2012 to 2015 that took place in Tehran in August 2012. Iran's taking up the leadership of the NAM from Egypt was viewed as suspect as major world powers saw Iran to be developing its own technology for the nuclear programme. In an article titled, 'The 16th Non-Aligned Movement Summit: Beyond the Politics of Spectacle', its author Joelien Pretorius observes that "The Iranian propaganda machine kicked into action to present Iran and its nuclear programme as benign and respected in world politics but for the unjust impositions of the West." Pretorius continued to maintain that

"The principled position of NAM on non-proliferation, wielded against even its own members and states friendly to the NAM cause (Brazil and Argentina are NAM observers), could be used productively to contain Iran's nuclear weapons ambitions if this state does indeed have any. The West will benefit from harnessing the potential of NAM's influence on Iran in this arena, but it will require a look beyond Iran's use of the NAM chair for its own interests to acknowledging the positive role of the Movement in world affairs. It is after-all quite a feat for an organization that has been going for more than half a century to still get the highest ranking officials of 120 member states and 17 observer states to gather in a capital of a country branded a pariah by some of the most powerful states in the world."[9]

Pretorius is right in assessing NAM's role in combating nuclearization of the globe, but errs in assessing the role of first world nations in policing Iranian nuclear programme. Agreed, that Iran or any other nations shouldn't pursue nuclearization of its territory for dangerous ends, but it has all the rights to pursue and harness nuclear energy for peaceful purposes. Secondly, major powers do not talk about their own denuclearization and in fact aid nuclearization of its allies like Israel- this double standard of maintaining nuclearization for itself while not allowing third world countries to have nuclear programme based on peaceful purposes is the mark of not being able to trust owing to dominant nations' hegemony over technology.

Since India is a major component in defining the NAM from the beginning, the shift in the gaze of foreign policy in the neoliberal era has allowed the major binding issues of sovereignty, security, justice and freedom of third world countries to wither in the realignment of national interest along with major powers like the United States. Moreover, the binding visions of Nehru, Nkrumah, Nasser, Tito which shared a concept of sovereignty and justice for the third world seems to have died as leaders after them failed to understand the great powers' game of wealth accumulation coupled with predatory power. Pertinent questions do remain as to why each of these major nations which happened to be a part of the Non-Aligned Movement have done away with the questions of colonialism which has redefined itself beyond boundaries in terms of overarching market totalitarianism. Shared idealism that was a component of foreign policy making which came from shared vulnerabilities of nations has been overpowered by neoliberal dictates of wealth over universal justice. The major elements of the Non-Aligned Movement still remain in focus but they have been culled from its content and context. The nations which aspired for friendship and cooperation based on a shared history of oppression and suffering seem to distance themselves from the founding moment of their own foreign policy. New constraints, balances of power, rise of China, internal conflicts and wars within have caused an idea to collapse. The remnants of the movement still resonate here and there in historical enquiries of foreign policy making of the Non-Aligned countries. Beset by the many quagmires of international and geopolitical strategies the notion of an independent and free foreign policy making without constraints, and keeping in mind the suffering and legacy of the decolonization has been lost. Under the new regimes of technology, nuclear power, hard power, shifting strategies based on the realist assumption of self help and growing dissatisfaction at world scale has caused a vision to recede from the memory of nations.

[9] Joelien Pretorius, 'The 16th Non-Aligned Movement Summit: Beyond the Politics of Spectacle', E-IR, 2013

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# LANGUAGE, LITERATURE AND MEANING

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Language is a literary medium, and a literary work of art can be defined as a linguistic composition that is a circular whole made up of meanings which are relative and relational. Language, on the other hand, is essentially a communicative tool developed by man for the purpose of communication. It is assumed to be the carrier of sense. For a long time, the issue of meaning has troubled not only philosophers and linguists, but also literary theorists. The dilemma of the relationship between language and the universe has eluded philosophers and linguists alike. One fundamental issue is how we interpret truth and speak about it. Truth, like Einstein's Universe, tends to be different depending on where one is standing. It appears that one's universe's articulation dictates how one arrives at what one calls "truth." It seems to be a 'hen and egg? dilemma as to whether language determines the form of the world or the world determines the structure of language. Since we use language to categorise our perceptions, the way we see the world is affected by it to some extent. Perhaps learning about the world and learning about language are two sides of the same coin, and our world is influenced (at least in part) by our language. “The limits of my language mean the limits of my universe” (Wittgenstein 1961:115) and “Being that can be understood is language” (Wittgenstein 1961:115) are examples "(Gadamer 1975: xiii) stress the value of language in any effort to comprehend the world. Being willing to

On this topic, some linguists and philosophers have taken extreme positions. The world we live in, according to Sapir and Whorl, is "to a large degree unconsciously founded upon the group's language habits" (Language 5:207-214). A language is more than just a means of transmitting ideas; it is also a means of forming them "We dissect nature according to the rules defined by our native tongues.” As a result, they introduced a "modern theory of relativity" that states that "all observers are not guided to the same image of the universe by the same physical evidence unless their linguistic origins are identical or can be calibrated in some way" (1956:214).

However, the Sapir-Whorf thesis does not seem to be completely compelling. Even if we do not have the same picture of the world as speakers of different languages, the picture we have can be linked to and converted into the picture that others have to some degree. While we might never be able to completely grasp or comprehend the world-pictures of other languages, there is no denying that we do gain a decent understanding of them. If the photographs were entirely different, this would not be true. Again, considering the difficulties we face when translating from one language to another, we never absolutely fail in this endeavour. So, on the one hand, we have the Sapir-Whorf thesis that each language produces its own environment and therefore semantics, and on the other hand, one might argue that since components like "male" and "female" kinship relations and basic colours are found in all languages, they share certain semantic features.

In the world of semantics, there are a variety of significant unresolved controversial problems. In their book The Sense of Meaning, C K Ogden and I A Richards give up to twenty-two meanings of the term "meaning." They've also attempted to explain how a lack of consensus on simple words like "context" contributes to uncertainty and misunderstanding. However, we will focus on the use of ineaning when explaining what a term or expression means, and we will attempt to explain what it means for a word to have a clear meaning. As a consequence, our aim will be to explore what it means to know a language semantically. This topic is central to all other issues involving meaning. Before we can embark on some special inquiry into the issue of meaning, we must first have some understanding of linguistic meaning, even if it is just tacit. Let's take a look at those traditional sense hypotheses. Theories of Reference

## THEORIES OF REFERENCE

The bulk of meaning-making is driven by referential theories. This interpretation of meaning can be traced back to Plato. Cratylus insists in his dialogue that words are names or marks for things. The proper name is known as the typical unit of meaning in referential theories. They begin with the fact that we address stuff using natural language terms. Here's the name "Rama," and here's the guy who goes by that name. Here's the "tree," and there's the thing it's named after. Referential theories generalise this fact, arguing that every term must refer to something other than itself in order to have meaning. Non-noun terms are assimilated into this paradigm in some way. Referential theories are classified into two groups. The sense of a word can be identified in one of two ways: it can be identified with what it refers to, or it can be identified with the relationship between the word and its referent.

ISSN 2394 - 7780

In all of its variants, the principle leads to difficulties. Its first form can be shown to be untenable since two terms with different definitions can have the same referent. The argument is best demonstrated by Frege's famous illustration of "the morning star" and "the evening star." Both expressions refer to the same object, the planet Venus, but their meanings are different. In one case, two phrases can have the same referent and therefore the same meaning. However, in a different case, they can not have the same referent and thus have different meanings. For instance, consider the word "The phrases "on November 11, 1967" and "on the death anniversary of my grandmother" might have the same referent, but they would not if they were used by someone else. And, again, how does one know what an expression like "I" means when the referent changes with each speaker?

Owing to the above problems, the other interpretation of the referential theory connects an expression's meaning with the relationship between the expression and its referent. This version of the theory answers the pertinent question of what it is that causes an expression to refer to one referent rather than another, but it, like the first version, implies that any meaningful expression refers to something, and although it addresses the meaning of terms, mainly nouns, it says nothing about other linguistic signs. Prepositions and conjunctions do not tend to be linked to things or properties of things in the same way that a noun is linked to the object called. What does “and” or “if” or “about” say, for example? According to Bertrand Russell, such words have no meaning "in isolation," but only change the meaning of the entire sentence in which they appear. But this is clearly the theory's compulsion; otherwise, how could one be so blind to empirical facts? In some cases, a speaker can simply say "but" and convey a lot of detail. As a consequence, the argument that conjunctions and prepositions have meaning in a radically different way than nouns and verbs is unacceptably false. We should be able to have a description of meaning that is applicable to both.

Referential theories of meaning also believe that truth is divided and sliced independently of language, and that its constituent elements are ready to be called and labeled. As we've already noticed, this is a doubtful assumption. We may be able to avoid these problems if we believe that only certain terms refer to objects, and that the meaning of other words is extracted from these object-words. Bertrand Russell makes this suggestion once more (1940:19). He assumes that there are two types of vocabulary: "object words" and "dictionary words." Object words are learned by referring to objects, while dictionary words' definitions must be learned in terms of object words. However, this idea is also manipulative. We are certainly defining an object when we refer to it, but much more is needed for the specification of the qualities that differentiate it from other objects. It's debatable whether one can completely comprehend the object-words of any language without first getting an understanding of how to categorise the truth of the language in question. As Wittgenstein observes. “To grasp an ostensive meaning, I must already be a master of a language.”(1940:23-63).

Another theory that influences the language the understanding of language is the referential theory that establish a clear correlation between words and objects, while conceptual theories do not allow this assumption. They focus on the inner link between conscious ideas or concepts and speech actions, and meaning is described as a relationship's formula. The version suggested by Ogden and Richards in their book The Sense of Meaning is one of the most well-known. Words and things are connected in this way by conceptual or ideational units.

This viewpoint removes some of the pitfalls associated with referential theories. Categorization and classification, for example, do not have to be natural or universal, but can be conceptual. However, this perspective has its own collection of issues. The issue is deciding how to describe an idea. Assume, for the sake of argument, that when we hear the word "text," we think of a book; however, the question remains as to what kind of book: a holy book, a novel, a picture book, a dictionary, and so on. If bookness is a general term, it's difficult to see how a single book might be mentioned.

Is there a pre-established extra-linguistic universe of concepts or a Platonic world of ideas that exists independently of language and ensures that words have meaning? However, if the ideas are subjective, each speaker can attach a different idea to a phrase, resulting in a different meaning. In order to prevent this dilemma, the existence of inter-subjective common ideas is proposed. But how can subjective ideas of different people be compared? Since we can only learn about another person's thoughts through communication, and communication involves the presence of meaning. Only each person has direct access to his or her own ideas. So, how do we come up with these universal inter subjective ideas without presuming meaning?

We don't find answers to sense questions by searching for ideas and definitions in people's heads. We have a public consensus about what words mean because language is a collective phenomenon. The complexities of philosophical theories of meaning are said to be solved by behavioural theory. Its model can be summarised as follows: Sense = Measurable context. Leonard Bloomfield, an American linguist, is generally regarded as the

ISSN 2394 - 7780

father of the behaviourist theory of meaning. The "context of a linguistic form," he says, is "the situation in which the speaker utters it and the answer that it elicits in the hearer" (1935:139).

As a result of the stimulus, an audible response is made, The basic speech act that, through expression, serves as an effective stimulus for B. A speaker receives a stimulus's' from the outside world or from his own organism, which causes him to respond with the sound 'r'. The Stimulus – Response hypothesis has been legitimized in this way.

However, if we embrace this account of meaning, the question of how to describe what happens within the hearer between stimulus receipt and response arises. Again, a phrase may be used in a number of ways, and there appears to be little in common between all of them that distinguish the sense of the word. Similarly, in order to assess the sense of an utterance, reactions to an utterance may be so diverse that it may be difficult to pinpoint their common features.

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# SUGAR INDUSTRY AND ETHANOL AS AN ALTERNATIVE FUEL IN INDIA: NEW WAY OF ECONOMIC GROWTH IN AGRICULTURE OF INDIA

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## ABSTRACT
*The sugar industry plays a significant role in the agricultural sector of India, contributing to the country's economic growth. However, the industry faces challenges such as overproduction, fluctuating sugar prices, and environmental concerns. To address these challenges and explore sustainable avenues for growth, this research paper focuses on the utilization of ethanol derived from sugarcane as an alternative fuel in India.*

***Keywords:*** *Sugar industry, Ethanol, Alternative fuel, Economic growth, Agriculture, India.*

## INTRODUCTION
The sugar industry plays a significant role in the agricultural sector of India, contributing to the country's economy and providing employment opportunities. In recent years, there has been growing interest in utilizing sugarcane for the production of ethanol, an alternative fuel, as a means to promote economic growth in agriculture. This paper explores the potential of ethanol production from the sugar industry as a new pathway for economic growth in India's agricultural sector.

## OBJECTIVES OF THIS STUDY ARE AS FOLLOWS:
1. To assess the potential of the sugar industry in India for ethanol production.
2. To evaluate the economic benefits of ethanol production as an alternative fuel in the agricultural sector.
3. To analyze the environmental implications and sustainability of ethanol production.

## SCOPE AND METHODOLOGY
This study focuses on the sugar industry in India and its potential for ethanol production. The research methodology involves a comprehensive review of existing literature, data analysis, and case studies. Primary data will be collected through interviews and surveys conducted with key stakeholders, including sugar mill owners, farmers, policymakers, and experts in the field of agriculture and renewable energy.

## OVERVIEW OF THE SUGAR INDUSTRY IN INDIA
The sugar industry in India is a significant contributor to the country's agricultural sector and economy. India is the second-largest producer of sugar globally, following Brazil. The industry comprises a large number of sugar mills located across different states, providing direct and indirect employment to a substantial number of people.

Production and Consumption Trends Sugarcane is the primary raw material for sugar production in India. The country has favorable agro-climatic conditions, which support the cultivation of sugarcane. Uttar Pradesh, Maharashtra, and Karnataka are the leading sugarcane-producing states in India.

## CHALLENGES AND ISSUES
Despite the growth potential, the sugar industry in India faces several challenges and issues:

**a. Cyclic Nature:** The sugar industry operates in a cyclical manner, with periods of surplus and deficit. This cyclic nature can lead to price fluctuations, impacting the profitability of sugar mills and the income of sugarcane farmers.

**b. Cane Price Arrears:** Delayed payments or arrears to sugarcane farmers by sugar mills are a recurring issue in the industry. This can lead to financial distress for farmers and affect their willingness to continue sugarcane cultivation.

**c. Low Productivity:** The average sugarcane yield in India is lower compared to other leading sugar-producing countries. Factors such as outdated farming practices, lack of mechanization, and limited access to quality inputs contribute to low productivity levels.

**d. Water Management:** Sugarcane cultivation requires significant water resources, and water management practices in the industry are often inefficient. This can lead to water scarcity issues and environmental concerns, particularly in water-stressed regions.

ISSN 2394 - 7780

**e. Policy and Regulatory Framework:** The sugar industry in India is influenced by government policies and regulations, including cane pricing, sugar export/import policies, and ethanol blending mandates. Frequent changes in policies and regulatory uncertainties can impact the industry's stability and long-term planning.

**f. Diversification and Value Addition:** The industry has traditionally focused on sugar production, but there is a need to diversify and explore value-added products such as ethanol. Limited diversification hampers the industry's ability to adapt to changing market dynamics and capitalize on new opportunities.

**Ethanol as an Alternative Fuel:**
Ethanol is a renewable biofuel that can be used as an alternative to traditional fossil fuels like gasoline. It is primarily produced through the fermentation of biomass such as corn, sugarcane, or cellulosic feedstock. Ethanol can be used as a fuel additive to enhance the octane rating of gasoline or as a standalone fuel in flex-fuel vehicles designed to run on blends of ethanol and gasoline.

**1 Production Process and Technology:**
The production of ethanol involves several steps, including feedstock preparation, fermentation, distillation, and dehydration. The specific production process can vary depending on the type of feedstock used. Here is a general overview of the production process:

1. **Feedstock Preparation:** The feedstock, such as corn or sugarcane, is harvested and processed to extract the starch or sugar content that can be converted into ethanol. For cellulosic feedstock, additional steps like pretreatment and enzymatic hydrolysis are required to break down the cellulose into fermentable sugars.
2. **Fermentation:** The extracted sugars are mixed with water and yeast or other microorganisms in fermentation tanks. The microorganisms convert the sugars into ethanol through a process called anaerobic fermentation. The fermentation process typically takes a few days to complete.
3. **Distillation:** After fermentation, the resulting mixture contains a low concentration of ethanol along with water and other impurities. Distillation is used to separate the ethanol from the mixture. The mixture is heated, and ethanol, having a lower boiling point than water, vaporizes. The vapor is then condensed and collected.
4. **Dehydration:** The collected ethanol still contains a small amount of water, which needs to be removed to achieve a higher ethanol concentration. Dehydration can be done through various methods, including molecular sieves, azeotropic distillation, or membrane technologies.
5. **Denaturing (optional):** Ethanol produced for fuel use may undergo a denaturing process, where small amounts of substances like gasoline or natural gasoline are added to make it unfit for human consumption. Denaturing helps in preventing the diversion of ethanol from its intended fuel use.

**Economic Benefits:**
**a. Job Creation:** Ethanol production and its supply chain create employment opportunities in agriculture, biomass processing and manufacturing, transportation, and distribution sectors. This helps stimulate local economies and provides income for individuals and communities.

**b. Domestic Energy Production:** Producing ethanol domestically reduces dependence on imported fossil fuels, thereby improving energy security and reducing trade deficits.

**c. Diversification of Agriculture:** Ethanol production provides an additional market for agricultural products, such as corn, sugarcane, and cellulosic feedstock. This diversification can stabilize farm incomes and support rural communities.

**d. Price Stability:** Ethanol production can contribute to stabilizing fuel prices by reducing reliance on volatile oil markets. This can benefit consumers by mitigating sudden price spikes and promoting more predictable fuel costs.

**Environmental Benefits:**
**a. Reduced Greenhouse Gas Emissions:** Ethanol, when burned as fuel, releases fewer greenhouse gas emissions compared to gasoline. It has a lower carbon footprint because the carbon dioxide emitted during combustion is offset by the carbon absorbed by the plants during growth. This helps mitigate climate change and reduce global warming potential.

**b. Improved Air Quality:** Ethanol burns cleaner than gasoline, resulting in reduced emissions of pollutants such as particulate matter, nitrogen oxides, and volatile organic compounds. This contributes to improved air quality and reduces the negative impacts on human health and the environment.

ISSN 2394 - 7780

**c. Renewable Resource:** Ethanol is produced from renewable biomass, such as plants and crop residues. Unlike fossil fuels, which are finite resources, biomass can be sustainably grown and harvested, ensuring a continuous supply of feedstock for ethanol production.

**d. Reduced Dependency on Fossil Fuels:** Ethanol serves as an alternative to gasoline, reducing the consumption of fossil fuels. By promoting the use of ethanol, countries can decrease their reliance on oil imports, enhancing energy independence and reducing vulnerability to geopolitical risks and price fluctuations.

**e. Waste Utilization:** Ethanol production can utilize agricultural residues, forestry waste, or other organic materials that would otherwise be discarded or left to decompose. By converting these waste materials into fuel, ethanol production contributes to waste reduction and promotes a circular economy approach.

**Renewable Resource:** Ethanol is indeed produced from biomass, which is a renewable resource. This is one of the significant advantages of ethanol as an alternative fuel.

Biomass refers to organic matter derived from plants, crops, agricultural residues, forest residues, and other renewable sources. These biomass feedstocks can be grown and harvested repeatedly, making them renewable resources. In contrast, fossil fuels like gasoline and diesel are derived from finite resources such as petroleum, which take millions of years to form and cannot be replaced within a human timeframe.

Moreover, the use of renewable biomass for ethanol production has the potential to significantly lower greenhouse gas emissions compared to fossil fuels. During the growth of plants used as biomass feedstocks, carbon dioxide is absorbed from the atmosphere through photosynthesis. This carbon is then stored in the plant's tissues. When the biomass is converted into ethanol and burned as fuel, the carbon is released back into the atmosphere as carbon dioxide. However, because the carbon was originally sourced from the atmosphere, the process can be considered carbon-neutral.

The renewable nature of biomass feedstocks used in ethanol production also means that their cultivation can be managed sustainably. Practices such as crop rotation, responsible land use, and sustainable farming techniques can ensure the long-term availability of biomass without depleting natural resources or causing excessive environmental harm.

**Reduced Greenhouse Gas Emissions:** When ethanol is burned as fuel, it releases carbon dioxide (CO2) into the atmosphere, just like gasoline. However, the key difference lies in the carbon cycle associated with ethanol production. The carbon dioxide emitted during ethanol combustion is offset by the carbon dioxide absorbed by the plants during their growth.

During photosynthesis, plants take in carbon dioxide from the atmosphere and convert it into organic matter, including the sugars that can be used to produce ethanol. This process effectively captures and stores carbon from the atmosphere. When the biomass is then converted into ethanol and burned as fuel, the same amount of carbon dioxide is released back into the atmosphere. As a result, the net emissions of carbon dioxide from the entire life cycle of ethanol are relatively lower compared to fossil fuels like gasoline.

The lower carbon dioxide emissions from ethanol contribute to mitigating climate change by reducing the net amount of greenhouse gases in the atmosphere. By using ethanol as a fuel, we can reduce the overall carbon footprint of transportation and other sectors that rely on liquid fuels.

It's important to note that while ethanol has lower carbon dioxide emissions, it may have higher emissions of other air pollutants such as nitrogen oxides (NOx) and volatile organic compounds (VOCs) compared to gasoline. However, technologies and regulations are continuously improving to address these concerns and minimize the environmental impact of ethanol production and use.

**Energy Security:**

1. **Reduced Vulnerability to Oil Price Fluctuations:** Global oil markets are subject to price volatility influenced by various factors such as geopolitical tensions, natural disasters, and changes in oil supply and demand. By producing ethanol domestically, countries can diversify their energy sources and reduce exposure to sudden and significant fluctuations in oil prices. Ethanol production provides an alternative fuel option that is less susceptible to global oil market dynamics, promoting price stability and reducing the impact on the domestic economy.
2. **Decreased Reliance on Geopolitically Unstable Regions:** Many countries heavily depend on oil imports from regions that may be politically unstable or prone to conflicts. Reliance on such regions for oil supply can pose risks to national security and economic stability. Domestic ethanol production reduces this

ISSN 2394 - 7780

dependency on foreign oil, mitigating the potential impacts of geopolitical risks and disruptions in oil supply chains.

3. **Enhanced Energy Independence:** By producing ethanol domestically, countries can become more self-reliant in meeting their energy needs. This reduces their reliance on foreign nations for fuel supply, which can have strategic implications. Increased energy independence contributes to national sovereignty and reduces the potential influence of external factors on a country's energy security.
4. **Economic Benefits:** Domestic ethanol production creates job opportunities and stimulates economic growth in the agriculture, processing, transportation, and related sectors. This contributes to the development of a robust domestic industry and improves the country's overall economic resilience.
5. **Diversification of Energy Sources:** Relying solely on fossil fuels like oil for energy needs poses risks in terms of resource depletion, environmental impact, and long-term sustainability. Ethanol production diversifies the energy mix by utilizing renewable biomass resources. This diversification reduces the dependence on a single energy source and contributes to a more sustainable and resilient energy system.

It is important to note that achieving complete energy independence is often challenging, and a diversified energy portfolio that includes a mix of renewable and conventional energy sources is desirable. However, domestic ethanol production plays a significant role in reducing reliance on imported oil, improving energy security, and providing countries with greater control over their energy future

1. **Rural Development:** Ethanol production can stimulate rural economies by creating jobs in agriculture, feedstock production, processing plants, and related industries. It can provide income opportunities for farmers and support local communities.
2. **Improved Air Quality:** Ethanol has lower emissions of pollutants such as particulate matter, nitrogen oxides, and volatile organic compounds compared to gasoline. Its use can help improve air quality and reduce smog formation in urban areas.
3. **Octane Enhancement:** Ethanol has a high octane rating, which means it can be used as an additive in gasoline to boost its octane level. Higher octane fuels can improve engine performance and efficiency.

**Integration of Ethanol Production with the Sugar Industry:**
The integration of ethanol production with the sugar industry involves utilizing sugarcane as a feedstock for ethanol production, alongside the traditional production of sugar. This integration provides several potential benefits for farmers, rural development, and overall energy security.

**1. Potential Benefits for Farmers and Rural Development:**
**a. Diversified Income:** Integrating ethanol production with the sugar industry allows farmers to diversify their income streams. Instead of solely relying on the sale of sugarcane for sugar production, farmers can also sell their crops to ethanol production facilities. This diversification provides farmers with additional revenue sources, reducing their vulnerability to fluctuations in sugar prices and promoting economic stability.

**b. Job Creation:** The integration of ethanol production with the sugar industry can create additional employment opportunities in rural areas. Ethanol production requires the establishment of processing plants, which, in turn, generate jobs in plant operations, maintenance, transportation, and related services. This job creation stimulates rural economies, increases income opportunities, and contributes to overall rural development.

**c. Increased Demand for Agricultural Products:** Ethanol production creates an additional market for sugarcane, driving up demand for agricultural products. This increased demand can incentivize farmers to expand their cultivation areas and increase crop yields. Consequently, it can lead to higher agricultural productivity, improved land utilization, and potentially better financial returns for farmers.

**d. Value-Added Products:** Ethanol production from sugarcane can result in value-added products. For instance, during the production process, by-products like bagasse (fibrous residue) can be used as a feedstock for electricity generation or converted into bio-based products, such as animal feed or bio-based materials. These value-added products can contribute to additional revenue streams for farmers and further support rural development.

**2. Energy Security and Reduced Dependence on Fossil Fuels:**
**a. Domestic Energy Production:** Integrating ethanol production with the sugar industry enables countries to produce their own fuel domestically. This reduces reliance on imported fossil fuels, enhances energy security,

ISSN 2394 - 7780

and decreases vulnerability to fluctuations in global oil prices and supply disruptions. By producing ethanol locally, countries can strengthen their energy independence and reduce the economic risks associated with reliance on foreign oil.

**b. Renewable Energy Source:** Ethanol derived from sugarcane is a renewable energy source, as sugarcane is a plant-based feedstock that can be sustainably grown and harvested. This renewable nature of ethanol production aligns with efforts to transition to cleaner and more sustainable energy systems. It reduces greenhouse gas emissions and contributes to mitigating climate change compared to fossil fuel alternatives.

**c. Lower Carbon Footprint:** Ethanol produced from sugarcane has a lower carbon footprint compared to fossil fuels. During the growth of sugarcane, the plants absorb carbon dioxide from the atmosphere through photosynthesis. This carbon is then stored in the plant's biomass, which is ultimately converted into ethanol. When ethanol is used as a fuel, the carbon dioxide released during combustion is offset by the carbon absorbed during sugarcane growth, resulting in a net reduction of greenhouse gas emissions.

**d. Sustainable Resource Management:** Integrating ethanol production with the sugar industry promotes sustainable resource management. It optimizes the utilization of sugarcane crops, ensuring that both sugar and ethanol production benefit from the available feedstock. This integrated approach maximizes the value derived from agricultural resources, minimizes waste, and contributes to the efficient use of land and water resources.

**Challenges and Opportunities:**

**1. Regulatory and Policy Framework:**
**a. Regulatory Uncertainty:** The ethanol industry operates within a complex regulatory environment that includes fuel standards, blending requirements, tax incentives, and sustainability criteria. Uncertainty or inconsistency in regulations can create challenges for ethanol producers and investors. Clear and stable policies are needed to provide a conducive environment for ethanol production and encourage long-term investment.

**b. Incentives and Support:** Governments can play a crucial role in promoting ethanol production by providing incentives such as tax credits, grants, loan guarantees, and research funding. An effective policy framework that supports the growth of the ethanol industry can attract investments, foster innovation, and create a favorable market environment.

**c. Sustainability Standards:** Ethanol production should adhere to sustainability standards to ensure responsible sourcing, land use, and environmental practices. The development and implementation of robust sustainability certifications and regulations can enhance the credibility of ethanol as a renewable fuel and address potential environmental and social concerns.

**2 Infrastructure and Investment Requirements:**
**a. Production Facilities:** Establishing ethanol production facilities requires significant investments in infrastructure, including processing plants, storage facilities, transportation networks, and distribution systems. Upgrading existing facilities or building new ones may be necessary to meet the growing demand for ethanol.

**b. Distribution and Retail Infrastructure:** Expanding the distribution and retail infrastructure for ethanol-blended fuels, such as E10 (10% ethanol and 90% gasoline), E15, or higher blends, requires investments in fueling stations, tanks, pumps, and blending equipment. Ensuring widespread availability of ethanol-blended fuels is crucial to promote market demand and consumer adoption.

**c. Feedstock Availability:** Ethanol production relies on a consistent and sustainable supply of feedstock, such as corn, sugarcane, or cellulosic biomass. Ensuring an adequate and reliable supply of feedstock requires appropriate agricultural practices, efficient logistics, and collaboration between farmers, suppliers, and ethanol producers.

**3 Market Demand and Awareness:**
**a. Consumer Awareness:** Increasing consumer awareness and understanding of the benefits of ethanol as an alternative fuel is essential for market demand. Educating consumers about the environmental, economic, and energy security advantages of ethanol can drive consumer acceptance and preference for ethanol-blended fuels.

**b. Automotive Industry Collaboration:** Collaboration with the automotive industry is crucial for promoting the use of ethanol-blended fuels. Encouraging the production and adoption of flex-fuel vehicles (FFVs) capable of running on higher ethanol blends can expand the market for ethanol and provide consumers with fuel options.

ISSN 2394 - 7780

**c. International Market Access:** Expanding export markets for ethanol can provide opportunities for growth and market diversification. Developing trade agreements and ensuring a level playing field for ethanol exports can help ethanol producers access global markets and create new business opportunities.

**d. Technological Innovation:** Continued research and development efforts are needed to improve ethanol production processes, enhance feedstock efficiency, and explore advanced technologies such as cellulosic ethanol. Innovation can lead to cost reduction, increased production efficiency, and improved environmental performance, making ethanol more competitive in the market.

**Case Studies and Success Stories:**

**1 Existing Ethanol Production Initiatives in India:**
**a. Ethanol Blending Program:** India has implemented an Ethanol Blending Program (EBP) to promote the use of ethanol in transportation fuels. Under this program, ethanol is blended with gasoline to produce ethanol-blended fuels such as E5, E10, and E20. The government has set blending targets and provides incentives to encourage ethanol production. This initiative has led to increased ethanol production in India and reduced the country's dependence on imported fossil fuels.

**b. Sugar Industry Integration:** The Indian sugar industry has been actively involved in ethanol production. Many sugar mills have set up distilleries to produce ethanol from sugarcane molasses, a byproduct of sugar production. The integration of ethanol production with the sugar industry has provided additional revenue streams for sugar mills, supported rural development, and contributed to energy security.

**c. Cellulosic Ethanol Initiatives:** India has also made progress in developing cellulosic ethanol production technologies. Cellulosic ethanol is produced from agricultural residues, forest residues, and other non-food biomass sources. Various research and development projects have been undertaken to explore the commercial viability of cellulosic ethanol production, which can further enhance the sustainability and scalability of ethanol production in India.

**6.2 Economic Viability and Scalability:** a. Cost Competitiveness: The economic viability of ethanol production depends on factors such as feedstock availability, processing efficiency, and government policies. In some cases, ethanol production from certain feedstocks may be cost-competitive with gasoline. For example, Brazil has successfully scaled up sugarcane-based ethanol production, which has become economically viable due to favorable climate conditions, efficient production processes, and supportive policies.

**b. Infrastructure Development:** The scalability of ethanol production requires the development of a robust infrastructure, including production facilities, storage, transportation, and distribution networks. Investing in infrastructure is crucial to accommodate increased production volumes and ensure the availability of ethanol-blended fuels across the country.

**c. Technology Advancements:** Technological advancements play a significant role in improving the economic viability and scalability of ethanol production. Research and development efforts focus on enhancing feedstock yields, improving production processes, and developing cost-effective conversion technologies. Advancements in these areas can lead to higher production efficiency, reduced costs, and increased scalability of ethanol production.

**d. Market Demand:** The growth and scalability of ethanol production depend on market demand for ethanol-blended fuels. Government policies, consumer awareness, and automotive industry collaboration play vital roles in driving market demand. Increasing consumer preference for cleaner and sustainable fuels, along with supportive policies and infrastructure, can create a favorable market environment for ethanol and contribute to its economic viability and scalability.

**Policy Recommendations:**

**1. Supportive Regulatory Frameworks:**
**a. Clear and Stable Policies:** Governments should establish clear and stable regulatory frameworks that support ethanol production, blending, and distribution. This includes setting blending targets, fuel quality standards, and sustainability criteria. Consistent and predictable policies provide certainty to investors and encourage long-term commitments to the ethanol industry.

**b. Streamlined Permitting and Approval Processes:** Governments should streamline permitting and approval processes for ethanol production facilities, ensuring that they are efficient and transparent. Simplified procedures can reduce bureaucratic delays and facilitate timely establishment of ethanol plants, fostering industry growth.

ISSN 2394 - 7780

**c. Mandates and Targets:** Implementing mandates or targets for ethanol blending in transportation fuels can drive market demand and provide a stable market for ethanol producers. Gradually increasing blending targets over time encourages investments in production capacity and infrastructure development.

**2 Infrastructure Development:**

**a. Expansion of Distribution Networks:** Governments should collaborate with industry stakeholders to expand the availability of ethanol-blended fuels by supporting the development of distribution networks. This includes ensuring an adequate number of fueling stations with ethanol blending equipment, storage facilities, and appropriate labeling for consumers.

**b. Investment in Storage and Transportation:** Governments can support investments in storage facilities and transportation infrastructure to handle increased ethanol production and distribution. Adequate storage capacity and efficient transportation networks are essential to ensure a reliable supply chain and prevent bottlenecks.

**c. Flex-Fuel Vehicle Deployment:** Governments can incentivize the deployment of flex-fuel vehicles (FFVs) capable of running on various ethanol blends. This includes providing tax incentives, subsidies, or other financial incentives for the purchase of FFVs, as well as collaborating with automotive manufacturers to promote the production and availability of FFVs in the market.

**3. Financial Incentives:**

**a. Tax Incentives and Subsidies:** Governments can provide tax incentives and subsidies to support ethanol production, blending, and infrastructure development. This can include tax credits, grants, loan guarantees, or preferential tax treatment for ethanol producers, distributors, and retailers. Financial incentives can help reduce the initial investment costs and improve the economic viability of ethanol projects.

**b. Research and Development Funding:** Governments should allocate funds for research and development activities related to ethanol production, including improving feedstock yields, developing advanced conversion technologies, and enhancing production efficiency. Funding research initiatives can drive technological innovation and cost reduction in the ethanol industry.

**4. Public Awareness Campaigns:**

**a. Consumer Education:** Governments can launch public awareness campaigns to educate consumers about the benefits of ethanol as an alternative fuel. This includes highlighting its environmental advantages, energy security benefits, and its role in reducing greenhouse gas emissions. Consumer education can create a demand pull for ethanol-blended fuels and drive market adoption.

**b. Stakeholder Engagement:** Governments should engage with industry stakeholders, including farmers, ethanol producers, fuel distributors, and automotive manufacturers, to promote awareness and collaboration. Building partnerships and fostering dialogue can help address challenges, align interests, and create a supportive ecosystem for ethanol production and use.

**c. Sustainability Promotion:** Governments should emphasize the importance of sustainability in ethanol production. Promoting sustainable sourcing practices, responsible land use, and environmental stewardship can enhance the credibility of ethanol as a renewable fuel and address any potential concerns related to its production.

## CONCLUSION:

In conclusion, ethanol as an alternative fuel offers several economic and environmental benefits. It is produced from renewable resources, reducing dependence on finite fossil fuels and diversifying energy sources. The use of ethanol contributes to reduced greenhouse gas emissions, as the carbon released during combustion is offset by the carbon absorbed during plant growth. Ethanol production enhances energy security by reducing reliance on imported oil and allows countries to produce their own fuel domestically, reducing vulnerability to oil price fluctuations and geopolitical risks.

The integration of ethanol production with the sugar industry brings additional benefits, including potential advantages for farmers and rural development. It diversifies income for farmers, creates jobs, and stimulates rural economies. Moreover, it contributes to energy security by reducing dependence on fossil fuels.

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35. Academic Databases: Utilize databases like Google Scholar, JSTOR, or Science Direct to search for scholarly articles and research papers on the sugar industry and ethanol in India. Keywords you can use include "sugar industry India," "ethanol production India," "biofuels India," and related terms.
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Fox, S. (1984). Empowerment as a catalyst for change: an example for the food industry. *Supply Chain Management*, *2*(3), 29–33.

Bateson, C. D.,(2006), 'Doing Business after the Fall: The Virtue of Moral Hypocrisy', Journal of Business Ethics, 66: 321 – 335

- **Multiple author journal article:**

Khan, M. R., Islam, A. F. M. M., & Das, D. (1886). A Factor Analytic Study on the Validity of a Union Commitment Scale. *Journal of Applied Psychology*, *12*(1), 129-136.

Liu, W.B, Wongcha A, & Peng, K.C. (2012), "Adopting Super-Efficiency And Tobit Model On Analyzing the Efficiency of Teacher's Colleges In Thailand", International Journal on New Trends In Education and Their Implications, Vol.3.3, 108 – 114.

- **Text Book:**

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2007). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies* (3rd ed.). New York: McGraw-Hill.

S. Neelamegham," Marketing in India, Cases and Reading, Vikas Publishing House Pvt. Ltd, III Edition, 2000.

- **Edited book having one editor:**

Raine, A. (Ed.). (2006). *Crime and schizophrenia: Causes and cures.* New York: Nova Science.

- **Edited book having more than one editor:**

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Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38-48. Retrieved from http://ojs.lib.swin.edu.au/index.php/ejap

- **Unpublished dissertation/ paper:**

Uddin, K. (2000). A Study of Corporate Governance in a Developing Country: A Case of Bangladesh (Unpublished Dissertation). Lingnan University, Hong Kong.

- **Article in newspaper:**

Yunus, M. (2005, March 23). Micro Credit and Poverty Alleviation in Bangladesh. *The Bangladesh Observer*, p. 9.

- **Article in magazine:**

Holloway, M. (2005, August 6). When extinct isn't. *Scientific American, 293*, 22-23.

- **Website of any institution:**

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