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## A STUDY ON ROLE OF TECHNOLOGY ON EFFECTIVENESS OF KNOWLEDGE MANAGEMENT TOOLS APPLIED IN THE SELECTED SERVICE INDUSTRY OF NAGPUR CITY

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### ABSTRACT

*In knowledge management, technology plays another hoax to people and the communications between them. Though, tools and techniques also have their place. The platform for executing knowledge management that you select must have essential knowledge management tools and at the same time they should be user friendly and easy to drive. This study is based on the banking sector of Nagpur city and for the study purpose one branch of each bank is randomly selected since it was difficult to cover all the branches of all the banks. The data is collected majorly from primary sources i.e questionnaire, personal interactions etc. from the sample element categorized into three levels namely Middle level Management, Front Level Management and Individual contributors and conclusions were drawn.*

*Keywords: Knowledge Management, Banking Sector, Nagpur and role of technology*

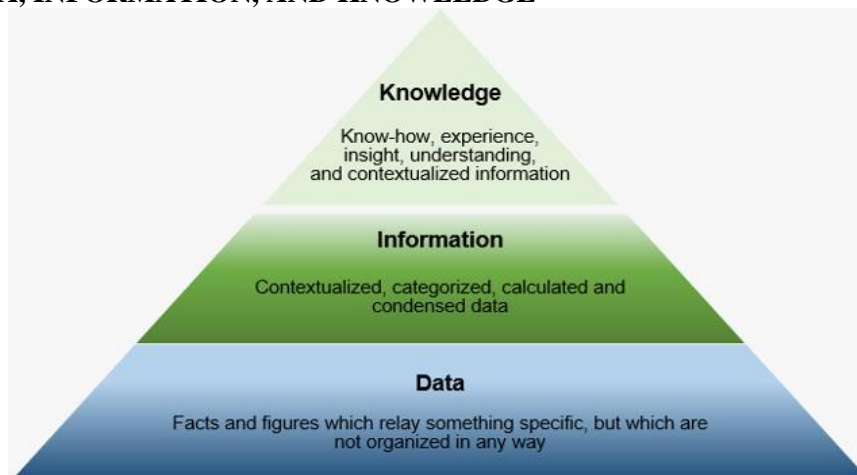
### INTRODUCTION

Knowledge management is essentially about getting the right knowledge to the right person at the right time. This in itself may not seem so complex, but it implies a strong tie to corporate strategy, understanding of where and in what forms knowledge exists, creating processes that span organizational functions, and ensuring that initiatives are accepted and supported by organizational members. Knowledge management may also include new knowledge creation, or it may solely focus on knowledge sharing, storage, and refinement.

It is important to remember that knowledge management is not about managing knowledge for knowledge's sake. The overall objective is to create value and leverage and refine the firm's knowledge assets to meet organizational goals.

(Source: <http://www.knowledge-management-tools.net/knowledge-information-data.html>)

### DEFINING DATA, INFORMATION, AND KNOWLEDGE



Source: <http://www.knowledge-management-tools.net/knowledge-information-data.html>

**Data:** Facts and figures which relay something specific, but which are not organized in any way and which provide no further information regarding patterns, context, etc.

**Information:** For data to become information, it must be contextualized, categorized, calculated and condensed (Davenport & Prusak 2000). Information thus paints a bigger picture; it is data with relevance and purpose (Bali et al 2009). It may convey a trend in the environment, or perhaps indicate a pattern of sales for a given period of time. Essentially information is found "in answers to questions that begin with such words as who, what, where, when, and how many" (Ackoff 1999).

IT is usually invaluable in the capacity of turning data into information, particularly in larger firms that generate large amounts of data across multiple departments and functions. The human brain is mainly needed to assist in contextualization.

**Knowledge:** Knowledge is closely linked to doing and implies know-how and understanding. The knowledge possessed by each individual is a product of his experience, and encompasses the norms by which he evaluates new inputs from his surroundings (Davenport & Prusak 2000).

"Knowledge is a fluid mix of framed experience, values, contextual information, expert insight, and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the mind of the knowers. In organizations it often becomes embedded not only in documents or repositories, but also in organizational routines, practices and norms."

## KM Tools

### An overview of the types of KM tools available on the market today

- Groupware systems & KM 2.0
- The intranet and extranet
- Data warehousing, data mining, & OLAP
- Decision Support Systems
- Content management systems
- Document management systems
- Artificial intelligence tools
- Simulation tools
- Semantic networks

(Source: <http://www.knowledge-management-tools.net/knowledge-information-data.html>)

## UNIVERSE OF THE STUDY

**A) Service sector** is that portion of the economy that produces intangible goods. The **service sector** provides a **service**, not an actual product that could be held in your hand. Activities in the **service sector** include retail, banks, hotels, real estate, education, health, social work, computer **services**, recreation, media, communications, electricity, gas and water supply.

(Source: <http://www.igi-global.com/dictionary/service-sector>)

**B) Definition of Nagpur City** - Nagpur is a city in the central part of India. In Maharashtra State.

### C) Given below is the type of service sector considered for this study

**Banking sector of Nagpur city**– Under this an individual can deposit his or her money and can get return in the form of interest and also borrowers can get loan by paying interest to bank periodically.

(Source: <http://www.letslearnfinance.com/types-of-financial-services.html>)

### Banking

List of Public Sector Banks	List of Old Private Sector Banks	List of New Private Sector Banks
Allahabad Bank	Catholic Syrian Bank Ltd.	Axis Bank Ltd.
Andhra Bank	City Union Bank Ltd.	Development Credit Bank Ltd
Bank of Baroda	Dhanalakshmi Bank Ltd.	HDFC Bank Ltd.
BOI	Federal Bank Ltd.	ICICI Bank Ltd.
BOM	ING Vysya Bank Ltd.	IndusInd Bank Ltd.
Bharatiya Mahila Bank Limited	Jammu & Kashmir Bank Ltd.	Kotak Mahindra Bank Ltd.
Canara Bank	Karnataka Bank Ltd.	Yes Bank Ltd
Central Bank of India	Karur Vysya Bank Ltd.	
Dena Bank	Lakshmi Vilas Bank Ltd.	
Oriental Bank of Commerce	Nainital Bank Ltd.	
PNB	Ratnakar Bank Ltd.	
Syndicate Bank	South Indian Bank Ltd.	
Union Bank	Tamilnad Mercantile Bank Ltd.	
UCO Bank		
Vijaya bank		
IDBI.		

**Total Banks - 36**

### SAMPLE ELEMENT

- (i) Middle level Management – Departmental head, Branch/Zonal/Regional Manager/executive
- (ii) Front Level Management – Supervisor, Desk officer, Office Manager/executive
- (iii) Individual contributors – Salesman, Clerical staff

### SAMPLE SIZE

Hierarchy	Designations	No. of respondents
Middle level Management	Departmental head, Branch Manager	2
First Level Management	Supervisor, Desk officer, Office Manager	5
Individual contributors	Salesman, Clerical staff	5
	Total	12

There will be approximately total 36 banks from the service sector deliberately selected by cluster sampling as a population and out of these banks 12 respondents as per the above mentioned classification will be selected from each organization.

**Therefore actual sample respondents =  $36 * 12 = 432$**

Note: one branch of each bank is randomly selected for this study; it was difficult to cover all the branches of all the banks.

### SAMPLING METHOD

Cluster sampling is used in statistics when **natural groups** are present in a population. The whole population is subdivided into clusters, or groups, and random samples are then collected from each group.

Cluster sampling is typically used in market research. It's used when a researcher **can't get information about the population as a whole**, but they can get information about the clusters.

### NULL HYPOTHESIS OF THE STUDY

Technology does not play a significant role in effectiveness of KM tools in service industry of Nagpur city.

In order to test this hypothesis One-way ANOVA test is applied.

**ANOVA-** The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of three or more independent (unrelated) groups. This guide will provide a brief introduction to the one-way ANOVA, including the assumptions of the test and when you should use this test.

**Dependent variable: Effectiveness of KM tools:** it includes the sub variables Expertise management, Informal discussions, water cooler chats, tea time breaks, Learning by observation, Mentoring buddy system; Learning by being told, Action learning; On the job (OTJ) learning, Social software where a query is made and several people respond, Using software that documents while you are working, Social media, Knowledge repository, Incentives.

**Independent variable: Role of technology:** it includes the sub variables Artificial Intelligence, Groupware, Intranet, Content management system, Decision support, Document Management Systems, Data Warehousing/Mining

**ANOVA table**

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Expertise management	Between Groups	9.113	8	1.139	1.405	.192
	Within Groups	342.866	423	.811		
	Total	351.979	431			
Informal discussions, water cooler chats, tea time breaks	Between Groups	4.547	8	.568	.607	.772
	Within Groups	395.932	423	.936		
	Total	400.479	431			
Learning by observation	Between Groups	5.703	8	.713	.814	.591
	Within Groups	370.482	423	.876		
	Total	376.185	431			
Mentoring buddy system; Learning by being told	Between Groups	8.519	8	1.065	.821	.584
	Within Groups	548.555	423	1.297		

	Total	557.074	431			
Action learning	Between Groups	5.844	8	.730	1.024	.417
	Within Groups	301.823	423	.714		
	Total	307.667	431			
Social software	Between Groups	6.920	8	.865	.873	.539
	Within Groups	418.931	423	.990		
	Total	425.852	431			
Software that documents while you are working	Between Groups	2.414	8	.302	.320	.958
	Within Groups	398.917	423	.943		
	Total	401.331	431			
Social media	Between Groups	2.897	8	.362	.432	.902
	Within Groups	354.915	423	.839		
	Total	357.813	431			
Knowledge repository	Between Groups	3.045	8	.381	.380	.931
	Within Groups	424.175	423	1.003		
	Total	427.220	431			
Incentives	Between Groups	5.650	8	.706	.906	.512
	Within Groups	329.896	423	.780		
	Total	335.546	431			

This is the table that shows the output of the ANOVA analysis and whether there is a statistically significant difference between our group means. We can see that all the significance values are above 0.05. And, therefore, there is no statistically significant difference in the mean of Effectiveness of KM tools and Role of technology.

From the above calculations we can accept null hypothesis which says “Technology does not play a significant role in effectiveness of KM tools in service industry of Nagpur city” and reject alternate hypothesis “Technology plays a significant role in effectiveness of KM tools in service industry of Nagpur city.”

#### THIS MAY BE DUE TO THE PROBABLE FOLLOWING OBSERVATIONS

As far as artificial intelligence which is one of the effective IT tools in implementing KM practices there was much eagerness about it a few years ago, but it has not continued with the same pace and thus could not stand up to the expectations of the people. This may be because certain IT tools like, Expert systems for example, which were designed to capture human decision-making and to make the correct decisions in certain circumstances, have not been so successful due to constantly changing requirements. Similar is the case with, intelligent decision support systems, and expert systems.

In one of the study conducted by Alan Frost M.Sc., 2010 - Updated 2017, KM is about managing people, culture, and organizational practices & structures. Effective KM initiatives are therefore never exclusively technology driven. However, in combination with comprehensive practice, KM tools are vital at providing support to KM initiatives and at facilitating interaction, exchange of ideas, locating experts, and storing knowledge in both structured and unstructured forms. While it can be said that these tools were not absolutely necessary when KM peaked at the turn of the last century, today they are a necessary competitive advantage within knowledge sharing.

He further quoted that if IT is used right - as a supporting and enhancing mechanism for sound, existing KM practices - it can be a very valuable tool indeed.

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**AN EMPIRICAL STUDY OF DISPUTES IN INDIAN ORGANIZATIONS**

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**ABSTRACT**

*Organizational Disputes is, no doubt, an inevitable; yet; an integral part of each and every Organization, irrespective of its Scale whether big, medium or small. But, the significance and Impact of a dispute for an organization, no doubt, depend upon the nature of the operations and the scale of the organization, to a great extent. These Disputes may be related either to major, may be scarce Organizational Resources; at times, like Finance, Raw Materials, Key Personnel, etc. or to the minor factors like Demarcation of work between two distinct Departments or Sections, Allotment of Designation,*

*According to the Code of Industrial Relations introduced in United Kingdom in 1972, disputes are of two kinds, namely, Disputes of Right and Disputes of Interest. In this Research paper, the Researcher has illustrated the second category of Disputes, namely, Disputes of Interest which relate to the claims or contentions by the employees or proposals by the Management about the terms and conditions of employment. It is quite natural and normal; various causes of Organizational Disputes differ from an Organization to Organization, strictly depending upon the Nature and the Operational Scale of the Organization. Therefore, Generalization about various causes of Organizational Disputes is simply not possible, in practice. In this Research Paper, the Researcher has attempted to study the nature of Organizational Disputes and has commented on the current attitude of the managements and the workers to deal with the disputes and other differences of opinion.*

*Keywords: Disputes of Interest, Scarcity of Resources, Voluntary Arbitration, Collective Bargaining*

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**INTRODUCTION**

Organizational Disputes is, no doubt, an inevitable; yet; an integral part of each and every Organization, irrespective of its Scale whether big, medium or small. If, at all, any Organization would ever claim that there are no organizational conflicts, it can comfortably be concluded that such an Organization is, as a matter of fact, not functioning, quite actively. Of course, Significance and Impact of a Dispute for an Organization, no doubt, depend upon the Nature of the Operations and the Scale of the Organization, to a great extent.

These Disputes may be related either to major, may be scarce Organizational Resources; at times, like Finance, Raw Materials, Key Personnel, etc. or to the minor factors like Demarcation of work between two distinct Departments or Sections, Allotment of Designation, to mention a few.

**RESEARCH PAPER OBJECTIVES**

**The Objectives of the Research Paper are as follows.**

1. To Study the Nature of Disputes in Indian Organizations
2. To Ascertain current attitude of the managements and the workers to deal with the Disputes and other Differences of Opinion within Indian Organizations.

**RESEARCH PAPER SCOPE**

The Scope of the Organizational Disputes, referred to, in the Research Paper extends not only to all the Disputes those take place within the Indian Organizations but also to those Disputes which take place in different Departments within the Organization or even within the Departments between different Sections of a specific Department.

The Scope of the Research Paper also extends to ascertain the current attitude of the managements and the workers to deal with the disputes and other differences of opinion.

**RESEARCH PAPER METHODOLOGY**

The Methodology adopted for writing the Research Paper is as follows.

1. The Research Paper is based both on Secondary Data and Primary Data.

**SOURCES OF DATA**

**Secondary Data** – They include a book and different websites, the details of which are mentioned in the Section, of ‘Categorized Bibliography,’ located at the end of the Research Paper.

**Primary Data** - They include Researcher’s Observations, Experiences and the Judgments of Factual Situations in various Organizations in last thirty years.

2. Several inferences, were arrived at and personal views were formed after applying logical interpretations.
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## REVIEW OF LITERATURE

As a matter of fact, in this Research Paper, the Researcher has emphasized the disputes which take place, in general, between the two or more organizational members, may be working at the same or different hierarchal levels. Strictly technically; that is legally speaking, such kind of disputes can certainly be interpreted as Industrial Disputes, if they take place within an 'Industry,' as contemplated within the meaning of *Industrial Disputes Act, 1947* by virtue of the definition of the term 'Industrial Dispute.' This Act defines an 'Industrial Dispute' in *Section 2 -k as any dispute or difference between employers and employers or between employees and employees or employers and employees, which is connected with the employment or non-employment of the terms of the employment or with the conditions of work of any person.*

Furthermore, as it is mentioned in the book titled, '*Dynamics of Industrial Relations in India*', authored by **C. B. Mamoria**, "The workers have realized, of late, that most of their demands can be satisfied if they resort to *concerted and collective action*; while the employers are aware of the fact that they can resist these demands. This denial or refusal to meet their genuine demands has often led to dissatisfaction on the part of the workers, to their distress and even to violent activities on their part, which has hindered production and harmed with both the workers and the employers."

In another book titled, '*Social Aspects of Industry*', authored by **Patterson**, he has stated, "Industrial strife constitutes militant and organized protests against existing industrial conditions. They are the symptoms of Industrial Unrest in the same way that boils are a symptom of a disordered body." According to the *Code of Industrial Relations introduced in United Kingdom in the year 1972*, forty six years earlier, disputes are of two kinds, namely, *Disputes of Right* and *Disputes of Interest*. In this Research paper, the Researcher has illustrated the second category of Disputes, namely, Disputes of Interest which relate to the claims or contentions by the employees or proposals by the Management about the terms and conditions of employment. It may necessarily not, at all, be out of place to point out over here that according to several provisions of *Industrial Disputes Act, 1947* as well as on the basis of various *Precedents* (Judicial Decisions) of different Hon. Courts and Industrial Tribunals, it can be inferred that Industrial Disputes can be raised on many *Material Issues*. Besides Non-industrial factors Management attitude towards the workers is equally significant while investing varying causes of Industrial Disputes.

Tripartite Machinery, namely *The Indian Labor Conference, The Standing Labor Committee, the Industrial Committees, The Central Implementation and Evaluation Committees, the Committee of Conventions*, composed of the representatives of the employers, employees and the government is already well established for consultations and discussions on different questions affecting workers. Moreover, there exit the *Code of Discipline* and *Voluntary Arbitration* for the settlement of the Industrial Disputes. For the same purpose, some industries also allow *Workers' Participation in Managerial Decision Making*. At the same time, there is *Statutory Machinery*, provided under Industrial Disputes Act, 1947, which consists of *Works Committee, Conciliation Officers and Boards of Conciliation, Labor Courts, Industrial Tribunals and National Tribunals*.

## MAJOR CAUSES OF ORGANIZATIONAL DISPUTES

As it is pointed out earlier, it is quite natural and normal; various causes of Organizational Disputes differ from an Organization to Organization, strictly depending upon the Nature and the Operational Scale of the Organization. Therefore, Generalization about various causes of Organizational Disputes is simply not possible, in practice. However, after experiencing and observing a number of Disputes those have resulted in many Organizations in last several years, one of the common causes for such conflicts is the *Scarcity of Resources*.

Organizational Resources can be classified into two different categories namely, Financial and Personnel, for convenience and simplicity.

Let us discuss each of these categories of Resources in detail one by one in the following lines.

### (a) Financial Resources

Every Departmental Head, more often than not, demands more funds than those which are actually needed for running a particular project, smoothly (that is devoid of friction) and successfully. Although he claims that he has attempted his all the best for preparing a budget realistically, he tends to highlight certain indirect expenses relatively more. This kind of *Defensive Mentality* or *Psychological Tendency* emerges basically because of the fear or insecurity as regards shortage of funds, especially, in cases of contingencies. Really, he feels pride in refunding the Advance obtained for the Project and completing it in fewer amounts than what had already been sanctioned by the Management. This is also one of the reasons as to why the top Managements of some Industries are observed highly meticulous and critical while sanctioning the budget even for a minor project involving relatively less amount.

Moreover, when the funds readily available at the disposal of the Managements are scarce, the Management intends to allocate only that much amount of the funds to a specific Department which is indeed of utmost essence or actual use for the specific project. In the process, a Departmental Head who obtains fewer funds from the Management as compared to his expectations, as pointed out in the Budget for the Project, he thinks that the management is favoring other Departments at the cost of genuine requirements of his own Department. The decision arrived at by the Management of sanctioning fewer funds to a specific Department might have been arrived at on rational, sound as well as realistic basis, still, a Departmental Head who is dissatisfied at the Management's such a Decision may not, at all, think on these lines and may think exactly contrary to what the Management had thought of. Sometimes, while communicating informally and unofficially inadvertently (without any specific intent) he expresses his dissatisfaction or discontentment against the Decision of the Management of sanctioning fewer funds, that too, overtly, may be, as a part and parcel of loose talk. This turns out to be the sufficient cause to create a dispute within different Departments of the Organization. It is needless to state that this kind of Inter- Departmental Dispute ultimately leads to several undesirable and unwarranted disadvantages for the Organization itself, especially in the long run.

**(b) Personnel Resources**

Every Departmental Head wants to have Effective (Doing right things) and Efficient (Doing things rightly) subordinates in his Department, especially for the Key Positions and Key Functions. However practical and sound Recruitment and Selection Strategies of an Industry may be; hiring excellent or ideal personnel for each and every position is simply not possible for multiple reasons. For example, Inadequacy of Funds, Non-availability of desirable and suitable Man Power, Industry Location, Salary and Wage Structure and Administration, Unwillingness on the part of the workers to join a particular Industry for no favorable Personnel Policies like working conditions, facilities, amenities, scope for advancement or promotion, to mention a few.

Sometimes, it happens quite accidentally that one of the Departments gets all skilled (as desired by the Departmental Head) workers whereas at the same time some other Department does not get all skilled workers (in fact, the proportionate percentage of skilled, semiskilled and unskilled workers may vary depending upon situational factors prevailing at that time). On such occasions, a Departmental Head who has not got all skilled workers, as aforesaid, thinks that the Top Management is not caring for his Department as much it is caring for the other Department which has obtained all skilled workers.

There is, no doubt, some substance for development of this type of thinking on the part of the concerned Departmental Head. It is true that from the contemplation of Top Managements, all the Departments do not enjoy the same importance, thus, priority. They attach relatively more importance and hence pay more attention to a Department which fetches direct benefits rather than indirect benefits to the Organization. No doubt, this seems sound as well as logical.

Even if there are one or more semiskilled or unskilled workers in a Department which does not lead to direct or immediate benefits to the Industry, in fact, it does not make much more difference in the subsequent Departmental Performance or End Departmental Result because some other skilled workers of the same Department compensate for low efficiency of their weak associates leading to poor level work. However, this acts as one of the causes of creation of Organizational Inter Departmental Dispute.

**RESEARCHER'S OBSERVATIONS REGARDING TREATMENT OF DISPUTES IN ORGANIZATIONS**

It may not be out of place to point out over here that the consequences of the Disputes on the Organization, as a whole and in the long run, related to major issues, in general, are more serious and vice versa. Also, at the same time, it is not an exaggeration of a fact to state that in some Organizations, sometimes, disputes related even to major issues are either ignored or treated as if those disputes are related to minor issues. On the contrary, in respect of some organizations, it is observed that big issues are created, unnecessarily, out of the disputes related to minor matters in order to hold some unwanted employees to ransom.

The machinery provided by the government for the resolution of Industrial Disputes is more often than not, insufficient, in its nature. It is a fact that government's Conciliation Machinery has settled the Industrial Disputes, no doubt, but, taking into consideration the number of disputes pending before Conciliation Officers and the Boards of Conciliation, the proportionate number of such disputes is almost negligible. Also, both the important elements to the dispute, namely the employer and the worker, really have very little faith or confidence on this Machinery. At the same time, the number of Conciliation Officers is relatively very low, at present, in comparison with their actual work load which is increasing at an alarming rate, in India. The most surprising fact is that many such Officers are not able to discharge their duties and shoulder their responsibilities properly because of poor training received for the same.



**MANAGEMENT AND WORKER ATTITUDE TOWARDS DISPUTES AND DIFFERENCE**

On account of a number of latest developments, particularly in the Industrial field in India, the relationship between the employers and the workers has changed. Wherever the managements of different Industries have taken initiatives and have encouraged the workers to share the responsibility, the workers have indeed responded favorably to the call of the employers and have qualitatively contributed towards increased industrial productivity. *Especially after taking into consideration the cumbersome procedural formalities associated with initiating the dispute and slow process of machinery movement consequently delaying the result, the area of Industrial Relations has revolutionary transformed, of late, from Adjudication to Persuasion, Moral Pressure, Voluntary Arbitration, Compromise, etc.*

Both the managements of the Industries as well as the workers have rationally realized that their mutual interests are inextricably interwoven or interrelated and interdependent and not independent. They are of the view that they themselves should help each other, as *Self-help is the best help*, instead of depending on external help – whether the State or Trade Union or (Ruling or Dominant) Political Party. When such kind of conducive environment consisting of *Free and Frank flow of communication throughout the industry right from top to bottom, Mutual Trust and Confidence, Development of Collective Bargaining, Ready Willingness to abide by the agreements entered into, Recognition of growing strength of Trade Unions reflected in the ability to maintain better working conditions; Welfare Amenities; fair wages for the workers; better management and worker relations and a determination that all the disputes or differences in the opinions would be merrily settled through the means of Voluntary Arbitration*, prevails within the industry, naturally, harmonious industrial Relations develop.

**RESEARCH PAPER LIMITATIONS**

**This Research Paper, just like other Research Papers has the following limitations.**

1. As the Research study for this Paper is based on Human Views, that is, Views of the Researcher, all the limitations of Human Views have direct and deep impact on various Views formed and Inferences arrived at by the Researcher in this Research Paper.  
(At the same time, it may, necessarily, not, at all, be out of place to point out, over here that those views and inferences are based on fully considered, well balanced and sound judgment of past Factual Situations, Observations and Experiences in different Organizations last thirty years.)
2. Various views expressed in this Research Paper are partially based on Organizational Observations and Experiences of the Researcher. As a result, full concurrence with all the personal views as well as personal opinions of the Researcher is neither possible nor expected in practice.
3. Besides the Causes mentioned in the Research Paper, there are many more Causes of Inter- Organizational Conflicts. However, for want of the length of the Research Paper, only the Major Causes have been included therein.

**SCOPE FOR FUTURE RESEARCH**

During the course of the study of this Research Paper, the researcher found out that there is an ample scope and adequate potential for research in future for the following topic related to Organizational Disputes.

1. An Analytical Study of Causes for Slow Administration of Justice in Conciliation Machinery of India

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5. [www.naukarihub.com](http://www.naukarihub.com)
6. [www.smallbusiness.chorn.com](http://www.smallbusiness.chorn.com)
7. [www.theglobeandmail.com](http://www.theglobeandmail.com)
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**CURE CLUSTERING: SUITABLE FOR VIDEO DATA**

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**ABSTRACT**

*Clustering, in data mining, is a useful technique for discovering interesting data distributions and patterns in the underlying data. Clustering, in data mining, is useful for determining groups and recognizing interesting distributions in the fundamental data. Usual clustering algorithms either favor clusters with spherical shapes and similar sizes, or are easily broken in the presence of outliers. A clustering algorithm called CURE that is more robust to outliers, and identifies clusters having non-spherical shapes and wide variances in size. CURE achieves this by representing each cluster by a certain fixed number of points that are generated by selecting well scattered points from the cluster and then shrinking them toward the center of the cluster by a specified fraction. Having more than one delegate point per cluster allows CURE to adjust well to the geometry of non-spherical shapes and the shrinking helps to reduce the effects of outliers. To handle large databases, CURE employs a combination of random sampling and partitioning. A random sample drawn from the data set is first partitioned and each partition is partially clustered. The partial clusters are then clustered in a second pass to yield the desired clusters. In experimental results confirm that the quality of clusters produced by CURE is much better than those found by existing algorithms. In additional, they demonstrate that random sampling and partitioning enable CURE to not only outperform existing algorithms but also to scale well for large databases without sacrificing clustering quality.*

*Keyterms: Data Mining, Cluster, Centroid, Hierarchical Clustering, CURE*

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**1. INTRODUCTION**

Information retrieval (IR) is the area of study concerned with searching for documents, for information within documents, and for metadata about documents, as well as that of searching structured storage, relational databases, and the World Wide Web. There is overlap in the usage of the terms data retrieval, document retrieval, information retrieval, and text retrieval, but each also has its own body of literature, theory, praxis, and technologies. IR is interdisciplinary, based on computer science, mathematics, library science, information science, information architecture. Content-based video analyzing and retrieval are important technologies, which have been an international research focus in recent ten years. It is needed urgently the advanced technologies for organizing, analyzing, representing, indexing, filtering, retrieving and mining the vast amount of videos to retrieve specific information based on video content effectively, and to provide better ways for entertainment and multimedia applications.

**1.1 Image Retrieval**

Image mining requires that images be retrieved according to some requirement specifications. The requirement specifications can be classified into three levels of increasing complexity .

- (a) Level 1 comprises image retrieval by primitive features such as color, texture, shape or the spatial location of image elements.
- (b) Level 2 comprises image retrieval by derived or logical features like objects of a given type or individual objects or persons.
- (c) Level 3 comprises image retrieval by abstract attributes, involving a significant amount of high-level reasoning about the meaning or purpose of the objects or scenes depicted.

**1.2 Research issues in image mining**

The goal of image indexing is to develop techniques that provide the ability to store and retrieve images based on their contents . Some of the potential applications of image and video indexing are: multimedia information systems , digital libraries , remote sensing and natural resources management , movie industry and video on demand. By definition, image mining deals with the extraction of image patterns from a large collection of images. Clearly, image mining is different from low-level computer vision and image processing techniques because the focus of image mining is in extraction of patterns from *large* collection of images, In image mining, the goal is the discovery of image patterns that are significant in a given collection of images. Differences between relational databases versus image Databases.

**1.2.1 Absolute versus relative values**

In relational databases, the data values are semantically meaningful. For example, age is 35 is well understood. However, in image databases, the data values themselves may not be significant unless the context supports

them. For example, a grey scale value of 46 could appear darker than a grey scale value of 87 if the surrounding context pixels values are all very bright.

**1.2.2 Spatial information** (Independent versus dependent position) another important difference between relational databases and image databases is that the implicit spatial information is critical for interpretation of image contents but there is no such requirement in relational databases. As a result, image miners try to overcome this problem by extracting position-independent features from images first before attempting to mine useful patterns from the images.

**1.2.3 Unique versus multiple interpretations.** A third important difference deals with image characteristics of having multiple interpretations for the same visual patterns

## 2. CATEGORIES OF CLUSTERING ALGORITHMS

There are four main categories of clustering algorithms: partitioning, density-based, grid-based, and hierarchical.

### 2.1.1 Partitioning algorithms

Construct various partitions and then evaluate them by some criterion (k-means, k-medoids)

### 2.1.2 Hierarchical algorithms

Create a hierarchical decomposition of the set of data (or objects) using some criterion (AGNES, DIANA)

### 2.1.3 Density-based

Based on connectivity and density functions – grow a cluster as long as density in the neighborhood exceeds a threshold (DBSCAN, CLIQUE)

### 2.1.4 Grid-based

Based on a multiple-level grid structure (i.e., quantized space) (STING, CLIQUE)

### 2.1.5 Model-based

A model is hypothesized for each of the clusters and the idea is to find the best fit of the data to the given model (EM)

## 3. CLUSTERING ALGORITHM SUITABLE FOR VIDEO DATA

Current Video data mining techniques emphasize on pattern discovery. Clustering in data mining is a discovery process that groups a set of data. Out of the four clustering approaches, Hierarchical algorithms are best suited for video data mining due to its simplicity and efficiency. They produce a nested sequence of clusters, with a single all-inclusive cluster at the top and single point clusters at the bottom.

### Hierarchical Techniques

Hierarchical clustering algorithms produce a nested sequence of clusters, with a single all inclusive cluster at the top and single point cluster at the bottom. It is classified agglomerative or divisive. The agglomerative (bottom up) approach repeatedly merges two clusters, while the divisive (top down) approach repeatedly splits a cluster into two. Agglomerative clustering method does not suit video data mining application due to following reasons – they do not scale well, time complexity of at least  $O(n^2)$ , where  $n$  is the number of total objects, can never undo (backtrack) what was done previously and do not give rise to dead-end solutions. Divisive clustering method is suitable for statistical analysis. This method cannot be used for video data mining as they can never undo. Hence a best suited clustering algorithm for video data mining would be to integrate Hierarchical clustering with another clustering technique.

There are many different variations of agglomerative hierarchical algorithms, these algorithms primarily differ in how they update the similarity between existing clusters and the merged clusters. The similarity between two clusters is measured by the similarity between the centroids/medoids of the clusters. The similarity between two clusters is measured by the similarity of the closest pair of data points belonging to different clusters. CURE has been proposed to remedy the drawbacks of both of these methods while combining their advantages. The similarity between two clusters is measured by the similarity of the closest pair of the representative points belonging to different clusters.

The clusters with the closest pair of representatives are the clusters that are merged at each step of CURE's hierarchical clustering algorithm. This enables CURE to correctly identify the clusters and makes it less sensitive to outliers.

### The algorithm is given below

The running time of the algorithm is  $O(n^2 \log n)$  and space complexity is  $O(n)$ .

The algorithm cannot be directly applied to large databases. So for this purpose we do the following enhancements

**Random sampling:** To handle large data sets, we do random sampling and draw a sample data set. Generally the random sample fits in main memory. Also because of the random sampling there is a trade off between accuracy and efficiency.

**Partitioning for speed up:** The basic idea is to partition the sample space into  $p$  partitions. Then in the first pass partially cluster each partition until the final number of clusters reduces to  $np/q$  for some constant  $q \geq 1$ . Then run a second clustering pass on  $n/q$  partial clusters for all the partitions.

For the second pass we only store the representative points since the merge procedure only requires representative points of previous clusters before computing the new representative points for the merged cluster. The advantage of partitioning the input is that we can reduce the execution times.

**Labeling data on disk:** Since we only have representative points for  $k$  clusters, the remaining data points should also be assigned to the clusters. For this a fraction of randomly selected representative points for each of the  $k$  clusters is chosen and data point is assigned to the cluster containing the representative point closest to it.

#### 4 .EXPERIMENTAL RESULTS

Here cure experimented with five different data files .The first stage given video file is converted as image file. By consider the pixel value as the common factor, the clustering is performed. Video file is converted image file by consider the image height and with, index parameters. From this video clips to archive better performance remove the repeated data set by using the grey value of the image and threshold value [Tab 1]. With available data set for different video file[cartoon, graphics, news, movie ,natural].From the experiment result confirm that CURE best for some of the video files only[cartoon, and graphics ], movie,natural,news video files it not scale well. Definitely, improvement is needed for those video file.

#### 5 .CONCULUSION AND FURTUE WORK

Data mining describes a class of applications that look for hidden knowledge of patterns in large amount of data. Most of data mining research has been dedicated text databases and relatively less work has been done for the multimedia data mining.The current status and the challenges of video data mining which is a very premature field of multimedia data mining. Results obtained so far look promising but we need to improve several aspect in our research work.

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frame	value
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \145.bmp	17320874
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \146.bmp	17964267
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \147.bmp	18608012
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \148.bmp	19007717
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \149.bmp	19422327
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \150.bmp	19898512
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \151.bmp	20300463
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \152.bmp	20552418
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \153.bmp	21017728
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \154.bmp	21313259
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \155.bmp	21753461
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \156.bmp	22026854
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \157.bmp	22240212
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \158.bmp	22205344
D:\Video1\Video Frame Comparision Using CURE Algorithm\bin\Frames \159.bmp	22329771
	0

**Fig-1: Grey Scale Values: for removing duplicates**

id	frame	numclus	time
1	0	35204	3:17:55 PM
2	1	35175	3:18:01 PM
3	2	29162	3:18:07 PM
4	3	29762	3:18:14 PM
5	4	30475	3:18:20 PM
6	5	30975	3:18:26 PM
7	6	31351	3:18:33 PM
8	7	31867	3:18:39 PM
9	8	32339	3:18:45 PM
10	9	32427	3:18:52 PM
11	10	32482	3:18:58 PM
12	11	32440	3:19:04 PM
13	12	32842	3:19:11 PM
14	13	32964	3:19:17 PM
(AutoNumber)	0		

**Fig-2: Video Name: Movie**

id	frame	numclus	time
1	0	320	3:55:08 PM
2	1	326	3:55:09 PM
3	2	322	3:55:09 PM
4	3	323	3:55:09 PM
5	4	320	3:55:09 PM
6	5	318	3:55:09 PM
7	6	321	3:55:10 PM
(AutoNumber)	0		

**Fig-3: Cartoon**

id	frame	numclus	time
1	0	221	4:03:02 PM
2	1	259	4:03:03 PM
3	2	208	4:03:03 PM
4	3	209	4:03:03 PM
5	4	244	4:03:04 PM
6	5	224	4:03:04 PM
7	6	221	4:03:04 PM
8	7	199	4:03:05 PM
9	8	215	4:03:05 PM
10	9	214	4:03:05 PM
11	10	196	4:03:06 PM
12	11	210	4:03:06 PM
13	12	223	4:03:06 PM
14	13	202	4:03:07 PM
15	14	202	4:03:07 PM
16	15	202	4:03:07 PM
(AutoNumber)	0		

**Fig-4: Natural**

	id	frame	numclus	time
	1	0	15674	4:05:45 PM
	2	1	15738	4:05:52 PM
	3	2	15752	4:06:00 PM
	4	3	15801	4:06:08 PM
	5	4	15853	4:06:16 PM
	6	5	15778	4:06:23 PM
	7	6	15840	4:06:31 PM
	8	7	15899	4:06:39 PM
	9	8	15888	4:06:47 PM
	10	9	16009	4:06:54 PM
	11	10	16061	4:07:02 PM
	12	11	16083	4:07:09 PM
	13	12	16054	4:07:17 PM
►	(AutoNumber)	0		

Fig5: News

	id	frame	numclus	time
	1	0	35999	4:10:08 PM
	2	1	36131	4:10:12 PM
	3	2	36725	4:10:16 PM
	4	3	37921	4:10:21 PM
	5	4	37967	4:10:25 PM
	6	5	39122	4:10:29 PM
►	(AutoNumber)	0		

Fig-6: Graphics

Results of CUIRE For Different Video Files				
S.No	Video	Frames count	Cluster	Milli Sec
1	2	1	4	240
2	2	2	4	300
3	2	3	4	240
4	2	4	4	240
5	2	5	4	240
6	2	6	4	240
7	2	7	4	240
8	2	8	4	240
9	2	9	4	240
10	2	10	4	240
11	2	11	4	300
12	2	12	4	240
13	2	13	4	240
14	2	14	4	240
15	3	1	4	300
16	3	2	4	240
17	3	3	4	300
18	3	4	4	300
19	3	5	4	240
20	3	6	4	300
21	3	7	4	300
22	3	8	4	240

Fig-7: Performance tab for different Video files (No of cluster, Time taken)

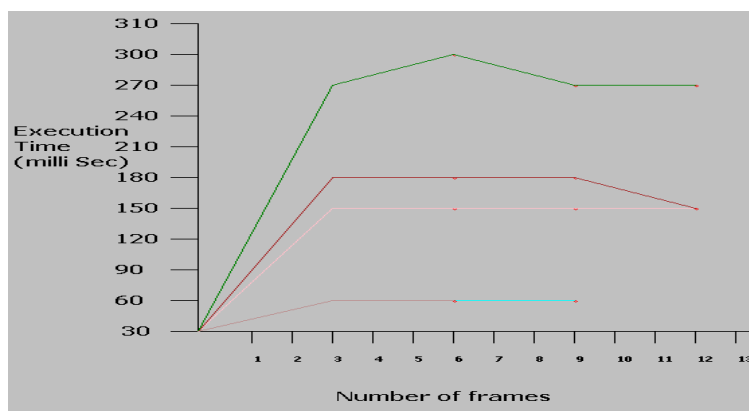


Fig-2: Comparison Graph different files.

- Cyan- cartoon
- Brown- Graphics
- Rosy brown-News
- Red- Movie
- Green- Natural

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**A STUDY ON EVENT BASED MARKETING –WINNING CUSTOMER’S PERCEPTION**

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**ABSTRACT**

*Event based marketing (EBM), let's understand what's happening around us in this so called busy world. Did you notice that every other day your phone pop-ups with some new offers from the bank in which you have an account, or recently you have won a lucky draw from a large electronic store and got a brand new television for free and you also heard that newly launched JIO is offering you a discounted plans for the net users. In all the cases you will see that companies are involving the customers in their marketing activities. There comes the sole purpose of the event based marketing. EBM is very different from the traditional marketing activities, traditional marketing focuses customer's as a whole and promotes through channels like advertisement, print media and offers. But in EBM it's something different, we can EBM an extension to the Customer relationship management. It involves the customer's in this business activity and reaps the revenues it targeted for.*

*Keywords: Event based marketing, marketing strategy, inventiveness, Brand equity, traditional marketing.*

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**OBJECTIVES OF THE STUDY**

- ❖ To monitor the event based marketing impact on customer's perception about products.
- ❖ To study the Brand building of the companies and creating positive mouth publicity.
- ❖ To study the relation between sales and brand.
- ❖ To study the impact of EBM on brand recognition in total market.

**RESEARCH METHODOLOGY**

Secondary data is collected from journals, articles, pamphlets and websites.

**NEED FOR THE STUDY**

Event-based marketing can improve brand recognition and drive profits quickly and efficiently. If you really want to be effective though, it's time to think outside of the box and step beyond the realm of holiday-only events. Instead, start thinking about defining an event on a broader scale. An event could be a purchase of a product, a blog share, a birthday, an address change, a large withdrawal from a bank account, a marriage, a pregnancy, and a change in season, a news story, or even a social trend. Depending upon your customer base, the events that you'll use as triggers – or reasons to reach out to your customer base – will vary greatly.

**INTRODUCTION**

Event marketing defines as “The process of developing a themed exhibit, display, or presentation to promote a product, service, cause, or organization leveraging in-person engagement”. Events offer a unique opportunity for brands and organizations to showcase their business and personality, educate their customers and engage with them on a different level.

Giving customers an alternate experience of your brand can make a lasting impression and have a number of benefits. Direct marketing, where businesses reach out to customers and potential customers through emails, ads, promotional letters, commercials, and other means that allow direct communication with the customer, is very different from event-based marketing. Event-based marketing often referred to as EBM, bases marketing strategies directly off of an event in a customer's life. An event can be something basic and predicted, like an end-of-contract, or something more detailed and personal, like a marriage.

Event-based marketing is a more personalized form of marketing and can help to form personal connections with the customers. Not only needs that, but a great event-based marketing strategy allows you to respond to your customers' at precisely the right moment.

“Event based marketing (also called trigger marketing and event initiated marketing) is a form of marketing that identifies key events in the customer and business lifecycle. When an event occurs a customer specific marketing activity is undertaken. It is an extremely targeted form of marketing and has good action rates because it is initiated when a customer is more likely to be active in a decision process”.

An event can be something basic and predicted, like an end-of-contract, or something more detailed and personal, like a marriage. Event-based marketing is a more personalized form of marketing, and can help to form personal connections with the customers. Not only needs that, but a great event-based marketing strategy allows you to respond to your customers' at precisely the right moment.

**THE EVENT BASED MARKETING FRAMEWORK WORKS LIKE THIS**

Once you've thought about the multitude of events that may be part of your event-based marketing strategy, you'll have to start formulating a plan as to how you can respond effectively to these events.

- **Understand your customer:** It should be pretty straightforward – the first thing you should think about when planning which events to respond to and how to respond appropriately to chosen events is your customer. If you're not already using analytics to gather data about your customer base, it's time to start.
- **Timing or occasion is everything:** When it comes to event-based marketing, an effective response is dependent upon great timing. Depending upon the event, the length of time that will be required to yield positive buyer behavior will vary greatly.
- **Creativity works:** Most big companies, and many small businesses, are already using event-based marketing. For example, there aren't many businesses out there that don't offer some sort of back-to-school or holiday sale. Because everyone's already doing it, it's important that you do it differently – or better – than your competitors. When designing and implementing an event-based marketing strategy, make sure you think out of the box, and aim for inventiveness.
- **Promote yourself:** If we have a great idea of a fantastic marketing strategy that's event-based, make sure you don't keep it to yourself. One of the biggest components of marketing is self-promotion, so make sure you use as many tools as possible to get your company name and idea(s) out there. Social media tools, such as Facebook, Twitter, LinkedIn, Instagram, and YouTube are all essential when it comes to event-based marketing. Additionally, make sure you're updating your own website and blog often, consider paid ads, and engage in link sharing with a variety of other businesses. Also, make sure that all your content is shareable – each piece of content on your website should have buttons for sharing on Facebook, Tweeting, or emailing. And, each piece of content should have a call to action that encourages a reader to share.
- **Constant reworking:** Once you've implemented an event-based marketing strategy, constantly analyzing its effectiveness and making adjustments where necessary is important. By accessing data about the effectiveness of your event-based marketing campaign, you can eliminate the guesswork in the future, and further develop the most advantageous means of reaching your customers.

**A COMPARISON BETWEEN TRADITIONAL MARKETING & EVENT BASED MARKETING**

Difference Points	Traditional Marketing	Event Based Marketing
Underlying philosophy	Focus is more on broadcasting and information to the audience.	Focus is more on interaction and creating an experience. The goal is to engage the audience.
Approach	Mostly a unidirectional approach	Usually a multipronged approach
Information flow	The information flow is one way as in you want the audience or the customer to read, listen or view your message.	Here you would interact with the customer and thus you would expect the customer to respond or reply in some way or the other, this creates a lasting positive impression on the customers.
Buying Decisions	The decision making process largely falls in the buyers hands. You expect the potential customer to think over and make the buying decision	Since there has been some level of interaction, there is some form of emotional connection developed between the brand and the customer
Memory	There is a lot of repetition and hope the repetition will help get the brands message through to the audience.	The quality and richness of experience offered plays a huge role. The more vividly the customer can recall the positive experience.

**TYPES OF EVENTS TO CONSIDER IN YOUR EBM STRATEGY**

There are a lot of events that happen in a customer's life; however, despite the many events that marketers could take advantage of, most marketers stick to holidays alone. If you really want to be effective though, it's time to think outside of the box and step beyond the realm of holiday-only events. Instead, start thinking about defining an event on a broader scale. An event could be a purchase of a product, a blog share, a birthday, an address change, a large withdrawal from a bank account, a marriage, a pregnancy, a change in season, a news story, or even a social trend. Depending upon your customer base, the events that you'll use as triggers – or reasons to reach out to your customer base – will vary greatly.



- **Responding Effectively to Events:** Once we have thought about the multitude of events that may be part of your event-based marketing strategy, you'll have to start formulating a plan as to how you can respond effectively to these events.
- **Think about Your Customer:** It should be pretty straightforward – the first thing you should think about when planning which events to respond to and how to respond appropriately to chosen events is your customer. If you're not already using analytics to gather data about your customer base, it's time to start. By analyzing when your customers are most likely to buy, what events trigger a purchase, and what the demographics of your customer base are, you'll have a better idea of how (and when) to respond.
- **Timing is Everything:** When it comes to event-based marketing, an effective response is dependent upon great timing. Depending upon the event, the length of time that will be required to yield positive buyer behavior will vary greatly. For example, if the event is a new company merger, consumer purchasing might not occur for weeks – or even months – later. If the event is a holiday, though, buyer response might be instantaneous and occur within hours.
- **Know How You'll Respond:** The way that you respond to an event is another big thing to consider. When an event occurs that triggers buyer response, what will your marketing approach be? A blog post? A contest? A sale? An email? A Facebook status update? A commercial or video? Often times, designing a marketing strategy response on the fly is difficult, if not impossible. Knowing exactly how you're going to respond for a given event in advance is highly recommended. Using data about your customer base, you can market to customers in the way that they respond to best, whether that be in the form of videos, sales, promotions, contests, blogs, or something else entirely.
- **Aim for Inventiveness:** Most big companies, and many small businesses are already using event-based marketing. For example, there aren't many businesses out there that don't offer some sort of back-to-school or holiday sale. Because everyone's already doing it, it's important that you do it differently – or better – than your competitors. When designing and implementing an event-based marketing strategy, make sure you think out of the box, and aim for inventiveness. If your competitor is offering 10 percent off during the holidays, how can you improve your strategy to attract more customers.
- **Promote Yourself:** If we have a great idea of a fantastic marketing strategy that's event-based, make sure you don't keep it to yourself. One of the biggest components of marketing is self-promotion, so make sure you use as many tools as possible to get your company name and idea(s) out there. Social media tools, such as Face book, Twitter, LinkedIn, Instagram, and YouTube are all essential when it comes to event-based marketing. Additionally, make sure you're updating your own website and blog often, consider paid ads, and engage in link sharing with a variety of other businesses.
- **Keep Track:** Once if we have implemented an event-based marketing strategy, constantly analyzing its effectiveness and making adjustments where necessary is important. By accessing data about the effectiveness of your event-based marketing campaign, you can eliminate the guesswork in the future, and further develop the most advantageous means of reaching your customers.

### THE IMPORTANCE OF EVENT-BASED MARKETING

Event-based marketing can improve brand recognition and drive profits quickly and efficiently. The two above are a great example of different events that companies effectively responded to. When designing your own event-based marketing campaign, remember that the whole point of event-based marketing is to use consumer behavior and events to identify marketing and profit-making opportunities. before, during, and after an event can exponentially increase the reach, influence, and conversion opportunities of your business.

1. **Brand Exposure:** A properly marketed event can attract lots of media attention, especially if it's charity-related. Pay close attention to other local events and see which media representatives are attending and promoting them. Get names and contact information for your own event. Try to come up with an angle that will make your event stand out from the crowd. All of the marketing efforts you put towards your event will also benefit your brand, as even those who don't attend will remember the promotion and may stop in later to check out your business.
2. **Increase Foot Traffic and Sales :** On the day of the event you're sure to see a swarm of foot traffic, as people flock to your business for our sale or promotion or to participate in your event. Be sure we prepared to handle the volume, with extra staff on hand to keep things running smoothly. We are not only see greater sales during the event, but if you make a good impression then you stand to gain many more regular customers.

- 3. Reach a Targeted Audience :** If our event is centered on a particular product or service, then those who attend will be potential customers that are particularly interested in that product or service. For instance, if we have a salon who specializes in hair extensions and we put on a demonstration where people can see the products and how they're emplaced, ask questions and explore the options, then you'll likely attract anyone within a 30 mile radius who is interested in getting hair extensions. By tailoring your event to the type of customers you hope to attract, you are able to target your desired demographic exclusively.
- 4. Interact With Your Customers :** When hosting an event, we have the opportunity to meet and interact with your customers on a personal level, and market to them directly. They'll get to see your products or services first hand, and meet the person behind the business. This creates a memorable impression and establishes a relationship you can't achieve through any other form of marketing.
- 5. Make Valuable Connections :** In the process of hosting an event, we bound to make a slew of valuable contacts and connections as you go about the marketing process. From news media contacts to caterers to neighboring business owners, your virtual rolodex is going to swell with business cards from a variety of important people about town. The next time you host an event – or help a neighboring business to host an event – you'll be ready!
- 6. Boost Your Local SEO Campaign With Valuable Citations:** As we promote your event, naturally list it on every local calendar that gets published, online and in print. Each time the event is listed, your business name, address, and phone number will also be listed, giving you valuable citations that will boost your rating with local search engines.
- 7. Get Lots of Valuable Web Page Links :** Make sure that wherever your event is listed online, you include a link back to your website, which will benefit your local SEO campaign immensely and boost your search engine ratings.
- 8. Social Media Benefits :** Be sure to leverage social media before, during, and after your event, to create a buzz that will have them tweeting to beat the band. Encourage attendees to check in at your event, take photos, and post them to Face book, Twitter, Yelp, and Foursquare. Create a hashtag for your event and promote it well in advance, then post it prominently on your big day so that customers will remember to use it for their social media posts.
- 9. Get Positive Reviews :** A fabulous, memorable event is a great way to pick up some positive reviews on Yelp, Google+, and others. While Yelp frowns on anyone directly asking for reviews, it is acceptable to post a "Find us on Yelp" sign in your store.
- 10. Get Material for Your Blog Posts:** If you maintain a blog, you undoubtedly have days where you find yourself struggling to come up with compelling subject matter. Hosting a local event will give you volumes of content for your blog before, during, and long after your event – and then you can start planning next year's event. Be sure to ask your readers for feedback and ideas for the next on.

## EVENT BASED CAMPAIGNS

When implementing an event based abandoned cart campaign, we can record many more events like

- ❖ User adds item to cart
- ❖ User starts checkout process
- ❖ User confirms shipping details
- ❖ User confirms billing details
- ❖ Payment successful
- ❖ Payment unsuccessful
- ❖ User successfully checks out

## CONCLUSION

Event Marketing aims to be Experiential Marketing but fails at making the necessary connection sometimes. Too many a times a company will spend too much money on setting up a table handing out free samples without going beyond this. I have worked many events of this type, but I have also worked many events that encouraged interaction through a memorable experience. The key is interaction, whatever the form may be. A free sample may be effective, but not nearly as effective as it would be with more interaction. Interaction

creates a connection and is important for any type of success. Event based management is a form of marketing that identifies key events in the customer and business lifecycle. When an event occurs a customer specific marketing activity is undertaken. Event-based marketing can improve brand recognition and drive profits quickly and efficiently. EBM PUMPS good amount of sales in form of relation building and point of sales when retailing is considered. Marketing events have longevity beyond the actual event, seeking to propel the message to wider audiences and stakeholders through media as word of mouth. It enhances the relationship as compared to many other forms of marketing communication, marketing events, rich in relational qualities provide a positive vehicle to facilitate prospective clients who want to display their loyalty in mere future.

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**A STUDY ON FACTORS INFLUENCING RESEARCH INTEREST AMONG ENGINEERING AND MANAGEMENT STUDENTS WITH REFERENCE TRICHY DISTRICT**

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**ABSTRACT**

*The paper intends to explore the factors influencing research interest among Engineering and Management students in Trichy district. The paper describes the relationship between research interest with role institution and environment, effects on individual traits of the students and awareness about research funding agencies. 278 Engineering and Management students of Trichy district were chosen using Convenience Sampling. A structured questionnaire was administered to collect primary data and journals, funding agency websites were used for collecting secondary data. Descriptive analysis, Correlation and Multiple Regression analysis were used to analyse the primary data. It was found that there was a significant relationship between the role of institutions & environment, effects of individual traits of the students and impact of awareness about research funding agencies.*

*Keyword: Research Interest, Engineering students, Management students, Trichy District.*

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**1. INTRODUCTION**

In current situation, many countries are promoting and developing research oriented field. The research interest by students has been improved lot than yearly stages but the support which they are receiving is the most difficult situation to improve practically. The research work carried in and around the region of Tamil Nadu needs to be developed. There are many of factors which affects the interest of students. Sometime the support of institutions, families, financially background, etc. becomes the cause for decrease in research interest of the students.

**2. REVIEW OF LITRATURE**

Ali Sibtain Farooq Sheikh, *et al.* (2013) stated that the research experiences early in the medical student's education are an important factor for attracting a greater number of doctors to careers with a research component. The researcher concluded that the student had lack of interest with the research oriented. The sample size was 122. The tools used were descriptive statistics and ANOVA.

Emma Finch, *et al.* (2013) stated that to determine whether initiatives encouraging clinicians to undertake research have been effective. Speech pathologists have previously been shown to be interested in conducting research within their clinical role. The researcher concluded that the benefits of research were not properly utilized. The sample size was 158. The tools used descriptive statistics.

Ledley and Lovejoy, (1993), stated that the study was undertaken to characterize the professional activity of a cohort of young paediatricians who completed an academically oriented residency program, to analyse factors which influenced their interests, career choices, and research activity, and found that the efforts taken by the persons could achieve in research oriented area. The sample size is 155 and tool used was descriptive statistics.

**3. METHEDOLOGY**

**The main objectives of the paper were**

- To analyse the role of institutions & environment in influencing research interest.
- To understand the effect of individual traits in influencing the research interest.
- To apprehend the impact of awareness about research funding agencies influencing research interest.

278 Engineering and Management students of Trichy district were chosen using Convenience Sampling. A structured questionnaire was administered to collect primary data and journals, funding agency websites were used for collecting secondary data. Descriptive analysis, Correlation and Multiple Regression analysis were used to analyse the primary data.

#### 4. DATA ANALYSIS AND INTERPRETATION

##### 4.1. Descriptive Analysis

Table-4.1

Gender	Frequency	Percent
Male	157	56.5
Female	121	43.5
<b>Total</b>	<b>278</b>	<b>100.0</b>
Stream	Frequency	Percent
Engineering	192	69.1
Management	86	30.9
<b>Total</b>	<b>278</b>	<b>100.0</b>
Standard of Living	Frequency	Percent
Lower Class	79	28.5
Middle Class	152	54.6
Upper Class	47	16.9
<b>Total</b>	<b>278</b>	<b>100.0</b>

The table 4.1 shows that respondents were 56.5% of male, the respondents were 69.1% of engineering and the respondents were 54.6% from middle class

##### 4.2. Effects of Individual Traits

H<sub>0</sub>: There is no relationship between effects of individual traits in influencing the research interest.

H<sub>1</sub>: There is relationship between effects of individual traits in influencing the research interest.

Table-4.2

Correlations							
		Research Interest	Research Skills	Self interest	Topic Knowledge	Health Issue	Personal Issue
Research Interest	Pearson Correlation	1	.185**	.080*	.064	.048	.091*
	Sig. (2-tailed)		.002	.016	.008	.427	.030
Research Skills	Pearson Correlation	.185**	1	.333**	.320**	.220**	.086
	Sig. (2-tailed)	.002		.000	.000	.000	.151
Self interest	Pearson Correlation	.080*	.333**	1	.349**	.275**	.143*
	Sig. (2-tailed)	.016	.000		.000	.000	.017
Topic Knowledge	Pearson Correlation	.064	.320**	.349**	1	.387**	.343**
	Sig. (2-tailed)	.008	.000	.000		.000	.000
Health Issue	Pearson Correlation	.048	.220**	.275**	.387**	1	.274**
	Sig. (2-tailed)	.427	.000	.000	.000		.000
Personal Issue	Pearson Correlation	.091*	.086	.143*	.343**	.274**	1
	Sig. (2-tailed)	.030	.151	.017	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

The table 4.2 shows that the coefficient of correlation between the research skills and research interest is identified to be at +0.185\*\*, this shows that there is a positive correlation among the variables, therefore it can be stated that there is a significant influence of research skills in influencing the research interest.

Similarly, the coefficient of correlation between the self-interest and research interest is identified to be at +0.080\*, this shows that there is a high positive correlation among the variables, therefore it can be stated that there is a significant influence of self-interest in influencing the research interest.

Similarly, the coefficient of correlation between the topic knowledge and research interest is identified to be at +0.064, this shows that there is a high positive correlation among the variables, therefore it can be stated that there is a significant influence of topic knowledge in influencing the research interest.

Finally, the coefficient of correlation between the personal issue and research interest is identified to be at +0.091\*, this shows that there is a positive correlation among the variables, therefore it can be stated that there is a significant influence the personal issue in influencing the research interest.

Therefore,  $H_0$  is rejected. Hence there is relationship between effects of individual traits such as by research skills, self-interest, topic knowledge and personal issues in influencing the research interest.

#### 4.3 Role of Institutions & Environment in Influencing Research Interest

$H_0$ : There is no relationship between role of institutions & environment in influencing the research interest.

$H_1$ : There is relationship between role of institutions & environment in influencing the research interest.

Table-4.3

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.803 <sup>a</sup>	.792	.765	.312
a. Predictors: (Constant), Encouragement, Industry Gap, Stipend, Scholarship, Availability of Guide			

ANOVA <sup>b</sup>					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	17.875	5	3.575	5.421	.000 <sup>a</sup>
Residual	177.412	269	.660		
Total	195.287	274			
a. Predictors: (Constant), Encouragement, Industry Gap, Stipend, Scholarship, Availability of Guide					
b. Dependent Variable: Research Interest					

The ANOVA table shows that the  $p$  value is  $< 0.05$  which means the Null Hypothesis ( $H_0$ ) is rejected. The model summary shows that the  $r^2$  value is 0.792. Results have shown that 79% (the value of R) variations in dependent variable i.e. role of institution and environment influences the research interest.

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.098	.518		4.053	.000
	Industry Gap	.165	.077	.126	2.156	.032
	Availability of Guide	-.029	.082	-.022	-.350	.727
	Scholarship	-.059	.070	-.052	-.840	.402
	Stipend	.319	.072	.275	4.400	.000
	Encouragement	.046	.043	.066	1.057	.292
a. Dependent Variable: Research Interest						

The coefficient table shows that the individual significant value which had impact on research interest with role of institutions & environment by industry gap and lack of stipend. There is the  $p$  value  $< 0.05$  which shows the industry gap had 0.126 and the stipend variable had 0.275. That means those variables were significant and supports the institutions and environment which leads to reject null hypothesis ( $H_0$ ).

Based on the coefficient, the regression equation can be stated as,

$$Y (\text{Research Interest}) = 2.098 + 0.126 (\text{Industry gap}) + 0.275 (\text{Stipend})$$

#### 4.4. Impact of Awareness about Research Funding Agencies in Influencing Research Interest

H<sub>0</sub>: There is no relationship between impact of awareness about research funding agencies in influencing the research interest.

H<sub>1</sub>: There is relationship between impact of awareness about research funding agencies in influencing the research interest

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.794 <sup>a</sup>	.755	.637	.396
a. Predictors: (Constant), Understanding about funding schemes, Promotion, Funding Schemes, Financial Crisis, Govt. Awareness			

ANOVA <sup>b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.749	5	5.550	8.758	.000 <sup>a</sup>
	Residual	151.451	239	.634		
	Total	179.200	244			
a. Predictors: (Constant), Understanding about funding schemes, Promotion, Funding Schemes, Financial Crisis, Govt. Awareness						
b. Dependent Variable: Research Interest						

The ANOVA table shows that the  $p$  value is  $< 0.05$  which means the Null Hypothesis (H<sub>0</sub>) is rejected. The model summary shows that, the  $r^2$  value is 0.807 results have shown that 80% (the value of R) variations in dependent variable i.e. impact of awareness about research funding schemes influences research interest.

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.414	.425		3.328	.001
	Financial Crisis	.085	.052	.106	1.635	.103
	Funding Schemes	.189	.072	.161	2.623	.009
	Govt. Awareness	.033	.062	.034	.529	.597
	Promotion	.110	.059	.112	1.866	.043
	Understating funding schemes	.224	.063	.232	3.561	.000
a. Dependent Variable: Research Interest						

The coefficient table shows that the individual significant value which has strong impact on research interest with awareness about research funding agencies. The  $p$  value  $< 0.05$  which shows the funding schemes variable had 0.161, the promotional activity variable had 0.112 and the Understating funding schemes variable had 0.232. That means those variables were highly significant and supports the awareness about research funding agencies which leads to reject null hypothesis (H<sub>0</sub>).

Based on the coefficient, the regression equation can be stated as,

$$Y = 1.414 + 0.161 (\text{Funding Schemes}) + 0.122 (\text{Promotion}) + 0.232 (\text{Understanding Funding Schemes})$$

#### 5. CONCLUSION

Thus, there was significant relationship between the role of institutions & environment in influencing research interest. There was a significant relationship between the effects of individual traits in influencing the research interest where research skills, self-interest, topic knowledge and personal issues had highly significance. There is relationship between impacts of awareness about research funding agencies influencing the research interest where funding scheme, promotional activity and understating funding schemes had highly significance.

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**A STUDY ON PERFORMANCE OF SEWA IN GUJARAT**

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**ABSTRACT**

*Microfinance is an option to resolve this problem of poor people. Microfinance is the provision of a broad range of financial services such as deposits, loans, payment services, money transfers, and insurance to poor and low-income households and, their micro enterprises. Microfinance is an approach that has been proven to empower people around the world to pull themselves out of poverty. Relying on their traditional skills and entrepreneurial instincts, recipients of small loans, other financial services, and support from local organizations called microfinance institutions (MFIs) to start, establish, sustain or expand very small self-supporting businesses. A key to microfinance is the recycling of loan rupees. As each loan is repaid usually within six months to a year the money is recycled as another loan, thus multiplying the value of each rupee in defeating global poverty, and changing lives and communities. Under SEWA's members the community itself designs and implements all community SEWA helps women members in rural communities to build and operate their own forming cooperatives and district level federations, as a result of which the collective bargaining power and create alternative sources of employment, and security for their families.*

*Keywords: Microfinance, SEWA*

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**INTRODUCTION**

The concept of microfinance is not new. Savings and credit groups that have operated for centuries include the "susus" of Ghana, "chit funds" in India, "tandas" in Mexico, "arisan" in Indonesia, "cheetu" in Sri Lanka, "tontines" in West Africa, and "pasanaku" in Bolivia, as well as numerous savings clubs and burial societies found all over the world<sup>2</sup>.

Microfinance is also the idea that low-income individuals are capable of lifting themselves out of poverty if given access to financial services. While some studies indicate that microfinance can play a role in the battle against poverty, it is also recognized that is not always the appropriate method, and that it should never be seen as the only tool for ending poverty.

**DEFINITION**

Microfinance, according to Otero (1999, p.8) is "the provision of financial services to low-income poor and very poor self-employed people". These financial services according to Ledgerwood (1999) generally include savings and credit but can also include other financial services such as insurance and payment services.

The Asian Development Bank (2000) defines microfinance as the provision of broad range of services such as savings, deposits, loans, payment services, money transfers and insurance to poor and low income households and their micro-enterprises. This definition of microfinance is not restricted to the below poverty line people but it includes low income households also.

**THE HISTORY OF MICROFINANCE**

Formal credit and savings institutions for the poor have also been around for decades, providing customers who were traditionally neglected by commercial banks a way to obtain financial services through cooperatives and development finance institutions. One of the earlier and longer-lived micro credit organizations providing small loans to rural poor with no collateral was the Irish Loan Fund system, initiated in the early 1700s by the author and nationalist Jonathan Swift. Swift's idea began slowly but by the 1840s had become a widespread institution of about 300 funds all over Ireland. Their principal purpose was making small loans with interest for short periods. At their peak they were making loans to 20 per cent of all Irish households annually.

The concept of the credit union was developed by Friedrich Wilhelm Raiffeisen and his supporters. Their altruistic action was motivated by concern to assist the rural population to break out of their dependence on moneylenders and to improve their welfare. From 1870, the unions expanded rapidly over a large sector of the Rhine Province and other regions of the German States. The cooperative movement quickly spread to other countries in Europe and North America, and eventually, supported by the cooperative movement in developed countries and donors, also to developing countries.

**INDIAN SCENARIO**

There are very few reliable aggregate data available for the Indian microfinance market and no comprehensive database or directory of microfinance institutions<sup>30</sup>. However, India presents an obvious scope for microfinance

in general and housing finance in rural India. Urban sector has traditionally been less attractive to the microfinance institutions as compared to the rural areas:

- 1) High migration in urban areas increases the default risk of microfinance portfolio, unsecured.
- 2) MFIs operating in urban area suffer comparison with commercial banks on interest rates.
- 3) Various methodologies of group formation and peer pressure are not as successful in urban areas as in rural areas.
- 4) Urban population mostly have a tendency of service or organized employment as compared to self employment in rural areas thereby increasing the probability of loan being utilized for consumption purposes in urban areas.

### **LITERATURE REVIEW**

Hartarska (2005) defined microfinance as the provision of small scale financial services to low income people. Microfinance is an effective tool to fight poverty by providing financial services to those who do not have access to or are neglected by the commercial banks and other financial institutions (Dokulilova et al, 2009).

Rosenberg (2009) has found a profitable Microfinance institution generates excess funds which can be used for reinvestment and expansion of the institution. The growth and survival of these institutions depends on fund availability to cover for the operating costs as well as for the loans offered to the clients. Microfinance institutions which do not generate enough income from its operations depend on subsidies from donors to cover for operating costs and financing costs.

Srinivasan (2006) has numerous studies done across the world; it is generally believed that various microfinance initiatives have been able to make a difference in the target population's lives. However, increasing doubts have been raised over the financial sustainability of microfinance institutions. MFIs need to be economically viable and sustainable in the long run but economic implications of long term sustainability are not being considered.

Bogan (2009) investigated the relationship between capital structure and sustainability of MFIs and found that increased use of grants by large MFIs decreases operational self sufficiency. Asset size is significantly and positively related to sustainability. However, the country level macroeconomic indicator variables (GDP and inflation) are not significant determinants of operational sustainability.

### **RESEARCH METHODOLOGY**

#### **Research Objective**

- To Know How SEWA significantly Generated Employment through Various Activities in Gujarat.

#### **Research Design and Data**

The Study was done by applying descriptive research. I have conducting research by using data on SEWA. Data sources used in study are balance sheet, profit and loss account. Data are collected from website of SEWA.

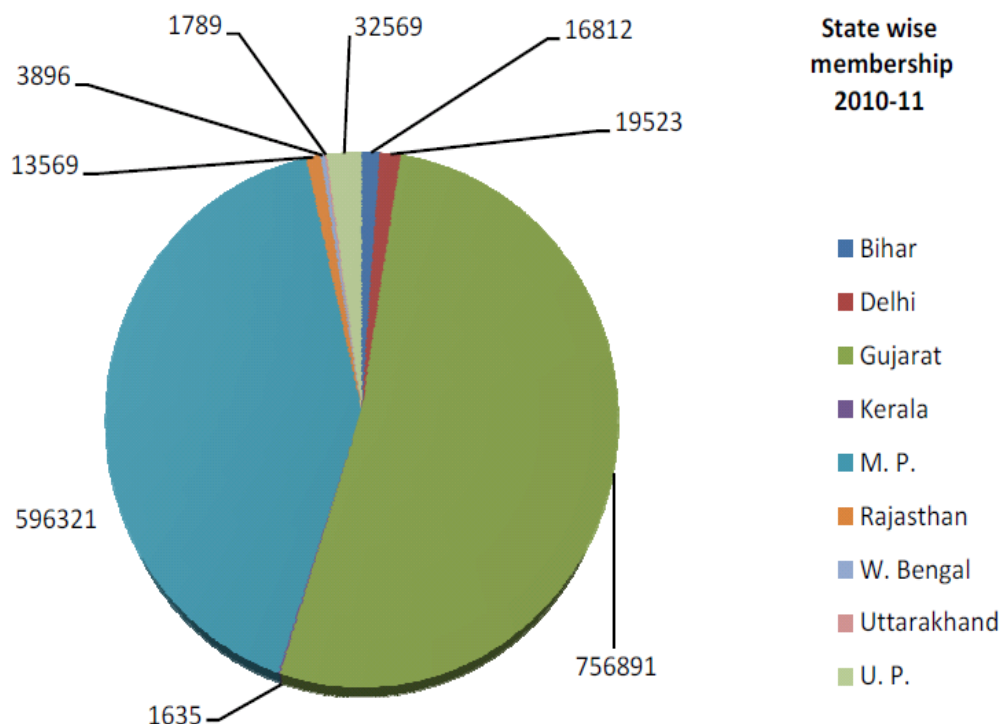
### **HYPOTHESIS OF THE STUDY**

- $H_0 =$  *There is no significantly Generated Employment through Various Activities in Gujarat by SEWA.*
- $H_1 =$  *There is significantly Generated Employment through Various Activities in Gujarat by SEWA.*

### **ABOUT SEWA**

SEWA began organizing workers in the villages of Ahmedabad district from 1979. Gujarat government had announced minimum wages for agricultural laborers. Initially, rural workers of SEWA were organized to execute traditional union strategy nothing but struggle for minimum wages. The organizers of this union were attracting legal cases followed. As a result of the union action the village women who constitute total village work force lost whatever low paid work they had, forget about getting.

### SEWA'S MEMBERSHIP IN DIFFERENT STATES

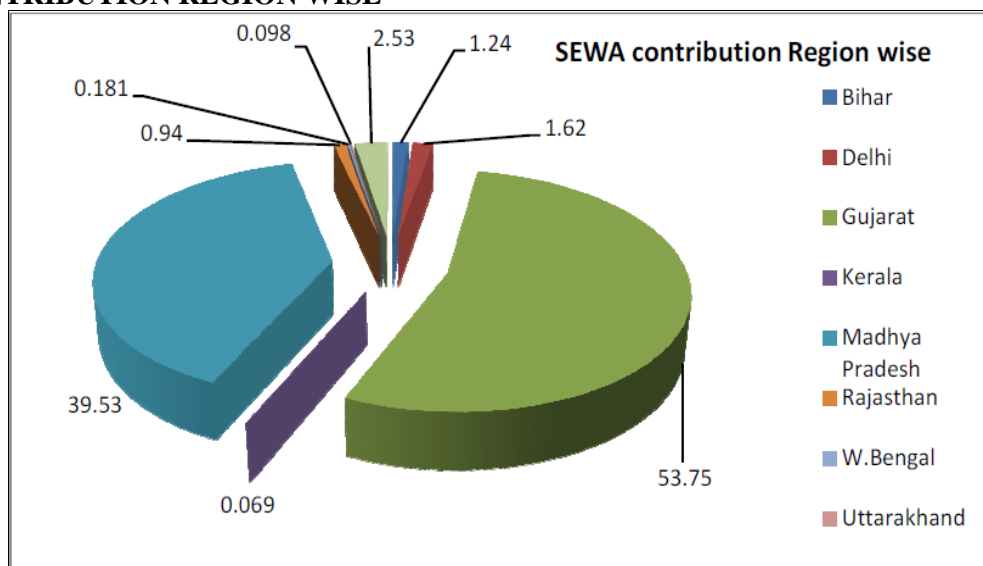


### SEWA'S RURAL ACTIVITIES

District	Main Activities
Ahmedabad	Dairy, agriculture, nursery-raising, rural marketing of members' products via sewa's brand: —Rudi
Gandhinagar	Dairy, paper-picking, marketing —Rudi
Mehsana	Animal husbandry, nursery-raising, marketing —Rudi
Sabarkantha	Agriculture, Nursery-raising, hand-pump repair, marketing Rudi
Vadodara	Poultry, Nursery-raising
Kheda-Anand	Tobacco-processing, agriculture, weaving, nursery-raising
Kutch	Embroidery, animal husbandry, marketing —Rudi
Banaskantha	Embroidery, animal husbandry, agriculture, salt manufacturing, gum collection, nursery-raising marketing by Rudi
Surendranagar	Salt manufacturing, construction, marketing by Rudi
Panchmahal	Livelihood for communal violence-affected women

Source: Annual report of SEWA

### SEWA CONTRIBUTION REGION WISE



**SEWA SIGNIFICANTLY GENERATED EMPLOYMENT THROUGH VARIOUS ACTIVITIES IN GUJARAT  
(Rs in lakhs)**

Particulars	Years							
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
New Employment Generated	29.58	34.46	37.45	38.89	45.78	48.12	52.13	55.14
Helped Women Regain Work	2.69	3	3.11	3.56	4.02	5.6	5.7	6.3
Increase in Price of Waste	0.69	0.72	0.76	0.81	0.86	0.95	1.1	1.3
Government Assistance	4.56	5.25	5.69	5.98	6.35	6.36	6.98	7.2
New Employment Generate	6.45	7.618	8.12	8.79	9.32	10.1	10.98	11.45
Assistance to Regain Work that had been stopped or lost	36	47	55	61	67	72	75	81
Wage Increases	267.58	315.51	385.45	412.56	465.12	496.1	512.3	560.3
Welfare Assistance	24.2	26.1	29.5	32.45	36.54	39.1	45.1	48.12
Bonus	6.56	7.61	7.98	8.35	9.32	10.12	12.01	12.36
New employment generated	58.96	63.5	68.75	72.45	77.68	80.12	85.13	88.35
Wage increases	13.24	16.21	18.75	20.31	23.56	25.12	29.12	32.15
Bonuses	1.4	1.5	5.86	6.57	7.85	8.14	9.15	10.12
Total	451.91	528.478	626.42	671.72	753.4	801.83	844.7	913.79

Source: Annual Report SEWA

The above Combine study contents Employment Generated through Waste Paper-Pickers, Manual Laborers and Home-based workers from the year 2006-07 to 2013-14. The amount is shows in Lakhs of rupees. The statically work related to Hypotheses testing through ANOVA test is calculated below to understand performance and consistency.

### HYPOTHESES TESTING

Here ANOVA: One-way test is recommended

### SUMMARY

Groups	Count	Sum	Average	Variance
New Employment Generated	8	341.55	42.69	80.66
Helped Women Regain Work	8	33.98	4.25	1.99
Increase in Price of Waste	8	7.19	0.90	0.04
Government Assistance	8	48.37	6.05	0.77
New Employment Generate	8	72.83	9.10	2.91
Assistance to Regain Work that had been stopped or lost	8	494	61.75	229.36
Wage Increases	8	3414.92	426.87	10150.35
Welfare Assistance	8	281.11	35.14	75.11
Bonus	8	74.31	9.29	4.34
New employment generated	8	594.94	74.37	106.59
Wage increases	8	178.46	22.31	41.26
Bonuses	8	50.59	6.32	10.83

### ANOVA

Source of Variation	Sum of Squares	Degree of freedom	Mean Square	F	F-table value
Between Groups	1237253	11	112477.5	126.09	1.905
Within Groups	74929.53	84	892.018		
Total	1312182	95			

F –Calculation > F- table

126.09 > 1.905

The calculated value of F is greater than the table value.

Hence,  $H_0$  is rejected

### **RESULT OF HYPOTHESES TESTING BY ANOVA TEST**

$H_1$  = *There is significantly Generated Employment through Various Activities in Gujarat by SEWA.*

### **INTERPRETATION**

Hypothesis result shows that SEWA Significantly Generated Employment through Various Activities in Gujarat through various activities from the year 2006-07 to 2013-14. Activities performance growth rate was increased in positive manner. I recommend from my study that the way SEWA Significantly Generated Employment through Various Activities and carry the increasing growth rate in the same manner. Provide more employment opportunity through various activities.

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- [www.basixindia.com](http://www.basixindia.com)

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**CHITOSAN STRUCTURE MODIFIED INTO CHITOSAN SULFONATE IN THE FORM OF MEMBRANE FOR ETHANOL FUEL CELL APPLICATIONS**

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**ABSTRACT**

*In this study, sulfonated chitosan membranes that will be applied as a direct ethanol fuel cell (DEFC) membrane were prepared by crosslinking reaction with sulfosalicylic acid (SSA) as acid reagent. The functional groups, physical characteristics, membrane morphology, degree of swelling (DS), ion exchange capacity (IEC), and proton conductivity of the sulfonated membranes were investigated. The infrared spectroscopy of the membranes proved that crosslinking reaction was successful and chitosan was sulfonated. The amount of SSA concentration in the membranes will give different membranes color and fragility. From the morphology observation, the membranes are dense membrane type. Meanwhile, based on the IEC measurement, the addition of SSA at certain concentration increases the IEC value. Moreover, DS and proton conductivity measurements indicated that DS and proton conductivity increased with the SSA concentration. By increasing the SSA concentration, DS of the membranes in ethanol and water were increased to about 61.25% and 62.5%, respectively. The highest proton conductivity was obtained at SSA concentration of 20%.*

*Keywords: Membrane, Chitosan Sulfonate, Fuel Cell, Ethanol*

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**INTRODUCTION**

Direct alcohol fuel cell (DAFC) is a sub category of the proton exchange membrane fuel cell (PEMFC) that directly convert the chemical energy stored into electricity (Li *et al.*, 2009, Abdullah *et al.*, 2014). DAFC primarily uses alcohol as fuel. The most studied alcohols are methanol and ethanol (Antolini and Gonzalez, 2010). Methanol and ethanol have very good energy densities (We) of 6 and 8 kWh/kg, respectively, and are comparable to hydrocarbon and gasoline energy densities of 11 – 11 kWh/kg (Chu and Shul., 2010). In the liquid fuel option, ethanol have many advantages compared with methanol, including its non-toxicity, natural availability from biomass resources, renewability, a higher power density, zero greenhouse contribution to the atmosphere, and its established production in infrastructure (Song and Tsiakaras., 2006, Lamy *et al.*, 2004, Alzate *et al.*, 2011). Hence, DEFC has recently received increased attention. Although DEFC is still new in the market, it play role as one of the green energy source in the new era and appear as a good choice for producing sustainable energy for portable applications such as EOS Direct Ethanol Fuel Cell, bio-energy discovery kit, and DEFC powered vehicle (Kamarudin *et al.*, 2013, Pereira *et al.*, 2014).

The main component of a DEFC is a membrane-electrode assembly (MEA) that consists of a proton-exchange membrane (PEM) sandwiched between a cathode and an anode (Thiam *et al.*, 2011, Thiam *et al.*, 2007). Proton conductivity is the fundamental characteristic considered when a membrane is evaluated as a potential membrane for fuel cell applications (Peighambardoust *et al.*, 2010). Moreover, this characteristic is also a crucial criterion for evaluating DEFC performance (Soboleva *et al.*, 2008). In this device, PEM is responsible for proton migration from the anode to cathode (Basile *et al.*, 2006). This membrane provides the key function of conducting proton from anode to cathode and prevents reactant crossover (Djilali., 2007, Unveren *et al.*, 2010). In the DEFC, energy is resulted from directly catalytically oxidized of liquid ethanol at anode and produces proton and electron. Protons diffuse through a PEM to the cathode, where they combine with electrons to produce electrical energy with water and carbon dioxide as byproducts. As a result, a closed circuit that generates electrical energy is formed (Deluca *et al.*, 2016). The membrane used for the fuel cell must be able to effectively conduct protons, stable at high temperatures, has a high absorption of the water and is able to store water in the membrane (Mukoma *et al.*, 2004).

Until now, protons conductive membranes are widely used are Nafion<sup>®</sup> manufactured by Du Pont. Nafion<sup>®</sup> that have high proton conductivity, mechanical properties, chemical stability, and good thermal as a condition of the fuel cell membrane. However, the high cost of production and a fairly high alcohol crossover constrain the use of Nafion<sup>®</sup> (Alzate *et al.*, 2010, Sung *et al.*, 2011). Therefore, at this time developed a new material that is expected to replace the function of Nafion<sup>®</sup> in fuel cells. One of the studied materials is chitosan, a natural substance found in the shells of marine animals such as shrimp and crab.

Chitosan is a natural polymer that is considered as a material polymer exchange membrane (PEM) fuel cell due to having high hydrophilicity, easily modified, and has good thermo-chemical stability (Hasani *et al.*, 2011). Good water absorption on the membrane will reduce the resistance so that the proton conductivity increases

(Peighambardoust *et al.*, 2010). Proton conductivity of the unmodified chitosan membrane is very low, around  $10^{-9}$  to  $10^{-6}$   $\text{Scm}^{-1}$  (Wan *et al.*, 2006). Although chitosan membrane proton conductivity is lower than Nafion 117 membrane proton conductivity, chitosan membrane proton conductivity can be increased significantly by modifying the hydroxyl or amino group chemically or physically.

The structure of chitosan can be modified into chitosan sulfonate through sulfonation reaction, one of them with a cross belt reaction (crosslinking). The presence of  $\text{NH}_2$  or  $\text{OH}$  groups on the chitosan structure allows crosslinking reaction with sulfonate groups of the crosslinking reagent containing sulfonate groups. One of the crosslinking reagent that has investigated using of compounds such as sulfonic acid groups sulfosuccinate. Sulfonate chitosan membrane is one of the membranes that were developed as a membrane for fuel cell. In addition, chitosan membranes sulfonate easy to make and inexpensive, has a high selectivity, and has good thermal stability than that of the commercial membranes such as perfluorinated sulfonic acid Nafion membranes (Caetano *et al.*, 2013, Dashtimoghadam *et al.*, 2010). However, chitosan membrane sulfonate still has lower proton conductivity than Nafion membrane. Proton conductivity of Nafion 117 membrane is about  $2.6 \times 10^{-2}$   $\text{Scm}^{-1}$ , whereas chitosan membrane proton conductivity is about  $1 \times 10^{-3}$  sulfonate  $\text{Scm}^{-1}$  (Wan *et al.*, 2006).

The degree of cross-linking reagent which appropriate for sulfonation process will increase the proton conductivity (Wan *et al.*, 2003). Performance testing of the sulfonate membrane for fuel cell membranes was studied by Dastimoghadam *et al.* It was found that the maximum power density of chitosan membrane sulfonate at a concentration of 2 M methanol fuel feed and at operating temperature of  $60^\circ\text{C}$  DMFC was  $41 \text{ mWcm}^{-2}$ . Sulfonate chitosan membrane proton conductivity resulting from a few studies that have been done, which is about  $10^{-4}$  to  $10^{-2}$   $\text{Scm}^{-1}$  can still be applied as a membrane for fuel cell. Based on the power density and proton conductivity of chitosan membrane sulfonate, the membrane is very promising for application as membranes for fuel cells (Wan *et al.*, 2006, Xiang *et al.*, 2009).

The aim of this study is to make sulfonated chitosan membrane that will be applied as a membrane in the direct ethanol fuel cell (DEFC) by using crosslinking reaction with sulfosalicylic acid reagent and glutaraldehyde. The physical and chemical properties of the prepared membrane is characterized and compared to that of commercial Nafion<sup>®</sup> 117 membrane.

## METHODOLOGY

### Materials

Chitosan (degrees of deacetylation of 84.39%) from crab shell with industrial grade specifications that have meet qualification as a raw material for membrane fabrication was used in this study. Sulfosalicylic acid (p.a) was used as a crosslinking reagent in the process of sulfonation of chitosan into chitosan sulfonate. All chemicals were obtained from Merck and used as received.

### Membrane Preparation

The preparation of sulfonated chitosan membranes consisted of three steps: preparation of chitosan solution, followed by sulfonation process, then membrane casting. In the first step, chitosan solution was prepared by dissolving 2% chitosan in acetic acid solution and stirring at room temperature for 24 hours to obtain a homogenous chitosan solution. The second step is preparation chitosan sulfonate solution by sulfonation process. The sulfonation process was performed by adding acid reagent in various concentration (0, 5, 10, 15, and 20%) into a homogenous chitosan solution. Then, the solution was stirred at room temperature for 24 hours. In this process, sulfosalicylic acid (SSA) was used as the acid reagent. Finally, the mixture solutions resulting from sulfonation process was cast onto the top of melamine plate with surface area of  $110 \text{ cm}^2$ . To obtain membrane with desired thickness, the volume of solution in the casting process was varied. The sulfonated chitosan membranes were obtained then characterized by physical and chemical instrumentation.

### Membrane Characterizations

The functional groups of the membranes were evaluated using Fourier transform infrared (FTIR) spectrometer (FTIR Shimadzu 8400). The top surface morphology of the membrane was investigated by scanning electron microscope (SEM, JEOL-JSM-6510LV). The measurements of degree of swelling (DS) of the membranes were conducted by immersing membranes in water and ethanol 3%. The ion exchange capacity (IEC) of the membrane was measured by a titrimetric analysis. Proton conductivity was measured by Precision LC that was conducted in the Chemistry Department ITB laboratory.

## RESULT AND DISCUSSION

In this study, sulfosalicylic acid (SSA) was chosen as acid reagent in sulfonation process. Based on the acid structure, SSA has a sulfonate and carboxylate groups. Therefore, it is expected that the crosslinking reaction in

the sulfonation process occurs between the sulfonate groups of SSA and anime-free hydroxyl groups of chitosan. The reaction between chitosan and SSA in the sulfonation process is shown in Figure 1.

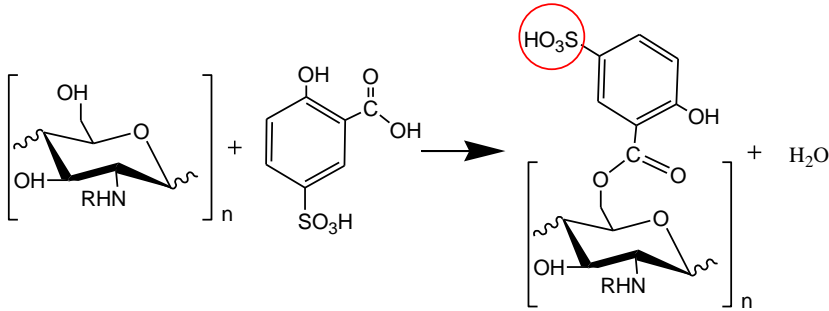


Figure-1: Sulfonation reaction between chitosan and SSA

The presence of sulfonate groups that resulted from crosslinking reaction in the sulfonation process can be observed from FTIR spectra of the sulfonated membranes. The FTIR spectra of sulfonated chitosan membrane with different SSA content are shown in Figure 2. The peak at 1176.58 cm<sup>-1</sup> is the characteristic absorption bands of OH group in sulfonic acid. Meanwhile, the peak at 1124.50 cm<sup>-1</sup> could be ascribed as the stretching vibration of sulfoxide in sulfonic acid (Tsai *et al.*,2010). The result suggests that the crosslinking between SSA and chitosan was successful and chitosan was sulfonated.

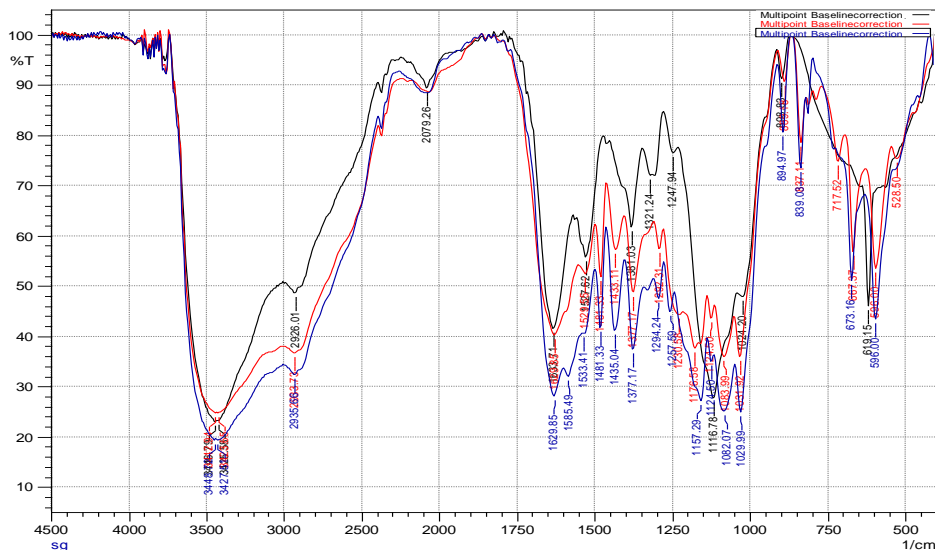


Figure-2: FTIR spectra of sulfonated chitosan membranes at various SSA concentration (10, 15, and 20%)

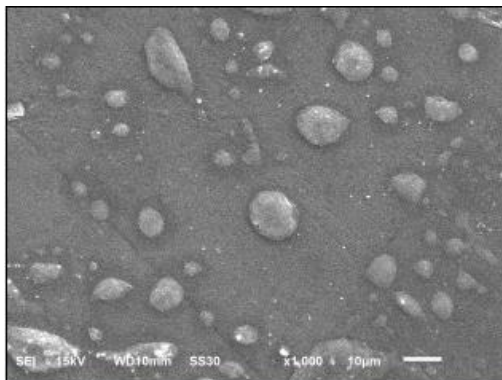
The physical properties of the pure and sulfonated chitosan membranes were summarized in Table 1. From the observation, it appears that different concentrations of the SSA in the membranes will give different color membrane appearances and membrane fragility. With increasing of the SSA concentration, the membranes color changes from transparent to white and nontransparent. This may indicate the presence of conjugated double bounds that resulted from crosslinking reaction between SSA and chitosan (Wan *et al.*, 2003). Meanwhile, the color of Nafion® 117 membrane color is transparent. All samples in this study have average thickness ranging from 0.10 to 0.15 mm, which is this thickness approaching the thickness of the Nafion® membrane.

Table-1: Physical Properties of Sulfonated Chitosan Membranes

Membrane Code	Membrane Specification	Physical Properties	
		Color	Fragility
M-1	Pure Chitosan	transparent-yellowish	not fragile
M-2	Chitosan + SSA 5%	transparent-orange to bright red	fragile
M-3	Chitosan + SSA 10%	transparent-reddish	little fragile
M-4	Chitosan + SSA 15%	white-orange to bright red	not fragile
M-5	Chitosan + SSA 20%	nontransparent-white- orange to bright red	not fragile
Nafion® 117	-	transparent-yellowish	not fragile



The SEM morphology image of the top surface of sulfonated chitosan membrane is shown in Figure 3. It was observed that crystals of crosslinking reagent were homogenously dispersed in the membrane. Moreover, no pore formation or cracks were observed. These results can be indicated that no phase separation occurred during crosslinking reaction. The similar solubility and surface tense of chitosan ionomer and chitosan sulfonate in the chitosan sulfonate solution make the reactant reacting freely during the crosslinking process (Xiang et al., 2009, Haryadi *et al.*, 2010). Therefore, the sulfonated membrane is dense and homogenous.



**Figure-3: The SEM morphology image of the sulfonated chitosan (magnification 1000 x)**

One of the important characteristics of the membrane that can be applied as PEMFC membrane is proton-exchange capacity. The value of proton-exchange capacity can be obtained by measuring ion exchange capacity of the membrane. Ion exchange capacity (IEC) indicates the amount of the protons transferring from anode to cathode. The values of IEC measurement is presented in Table 2. The results show that increasing of SSA concentrations did not give significant effect to the IEC values. However, the addition of SSA at certain concentration increases the IEC value. The increasing of IEC indicates that there is a bond between sulfonate groups and hydroxyl groups or between amine groups and chitosan. The bond between sulfonate groups and hydroxyl groups in the membrane makes proton easier to leave than that of only hydroxyl groups. Crosslinking reaction can be occurred at hydroxyl groups free, but it is possible that sulfonation reaction also occurred in amine groups free.

**Table-2: DS, IEC, and Proton Conductivity of Sulfonated Chitosan Membranes**

SSA Concentration (%)	DS (%)		IEC (meq/g)	Proton conductivity (S/cm)
	Ethanol 10%	Water		
5	33.33	85.71	1.75	-
10	20	26.32	0.2456	$6.04 \times 10^{-8}$
12.5	29.03	34.38	0.5054	$1.01 \times 10^{-7}$
15	40	34.78	0.4219	$4.82 \times 10^{-8}$
20	61.25	62.5	0.32	$4.09 \times 10^{-6}$
Nafion	8.17	8.62	0.96	$5.9 \times 10^{-3}$

Table 2 shows values of DS, IEC, and proton conductivity of sulfonated chitosan membranes at different SSA concentrations. According to the DS measurement results, all samples have greater DS both in ethanol 10% and in water than that of Nafion membrane. As seen, by increasing the SSA concentration, DS of the membranes in ethanol 10% and water are increased to about 61.25% and 62.5%, respectively. Moreover, proton conductivity of the membranes is increased with increasing of SSA concentration. The largest proton conductivity was obtained at SSA concentration of 20%. However, compared to Nafion® 117 membrane, the sulfonated chitosan membranes with various SSA concentration, its characteristics need to be improved. Considering these results, it needs a further study to improve characteristic of sulfonated chitosan membrane by modifying operating and reaction conditions in the membrane preparation process. Hence, the membranes can meet the characteristics of the fuel cell membranes.

## CONCLUSION

The sulfonated chitosan membranes with various SSA concentrations have been prepared using crosslinking process. From the FTIR analysis, the results suggest that crosslinking reaction was successful and chitosan was sulfonated. According to physical observations, the amount of SSA concentration in the membranes will give different membranes color and fragility. With increasing of the SSA concentration, the membranes color changes from transparent to white and nontransparent. While from the morphology observation, the membranes are dense and homogenous in structure. It was also found that the addition of SSA at certain concentration

increases the IEC value. Moreover, with increasing the SSA concentration, DS and proton conductivity of the membranes were increased. By increasing the SSA concentration, DS of the membranes in ethanol 10% and water are increased to about 61.25% and 62.5%, respectively. In addition, the highest proton conductivity was obtained at SSA concentration of 20%.

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## COMMITMENT AND IMPLEMENTATION OF ENVIRONMENT SUSTAINABLE PRACTICES IN INDIAN AUTOMOBILE INDUSTRY

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### ABSTRACT

*The present paper explores the current state of sustainable green practices by leading automobile firms in India. The research was conducted through in-depth interviews with senior executives of 10 leading automobile firms. A study of their Sustainability reports and literature review from secondary sources was also done. This research highlights the interplay between the automobile firms, the Government and the Consumer for implementation and execution of environment sustainable practices, policies and initiatives. During the research it was seen that Government is determined to support Automobile companies in their green initiative to reduce the carbon footprint and encourage the shift to fuels efficient and environmental friendly technologies. However for the Indian consumer it is still a long road ahead owing to their psyche in buying behavior focused on price sensitivity and value for money, lack of awareness about their role in the overall environmental impact and lack of confidence in the infrastructure that would push the shift to use of a green technology. A survey was conducted amongst 150 car owners within the age group of 22-45 in Delhi (NCR) to assess their willingness to buy Green Automotive. The survey highlighted reasons for unwillingness in consumer buying behavior towards green automotive in India. Its imperative that Sustainable Production and Sustainable consumption go hand in hand. Sustainable practices entail costs that the consumer is not ready to bear at present. The focus of this paper is to extend the research on sustainable practices in Indian Automobile sector by comparing how leading Indian automobile firms fare on 24 major green practices adopted globally in order to curb carbon emissions and reduce carbon footprint. This paper also explores the reasons of why there is a gap in adopting sustainable green practices in India as compared to developed economies.*

**Keywords:** Environment Sustainability, Growth, Automobile Industry, Profitability, Sustainable consumption.

### INTRODUCTION

With 10 million trees cut everyday, 50 to 100 species become extinct on a daily basis and our natural resources depleting at an alarming rate our concern for future and Sustainable green practices couldn't be less. Environment sustainability has become the mantra for organizations worldwide to secure a happy future for generations to come. Automobile Industry is in one of their most challenging phase ever as on one hand the sector is one of the major contributors to the economy, It contributes 7% to GDP and 45% to manufacturing GDP, also 13 % of excise revenue and employs 19 million people directly and indirectly but on the other it's one of the major sources of fossil fuel depletion and air pollution owing to its technological procedures, use of Internal Combustion Engine (ICE in vehicles) and treatment of industrial wastes that have serious socio-economic and environmental implications. Add to this a large domestic consumer base and low competitive value chain cost leads to vicious circle of More Profits driven by More Cars – More consumption – More emission that needs to be addressed urgently and with long term vision of being sustainable and profitable. On the surface it looks like they are growing at a steady phase with 88 million units sold in 2016 a profit margin 4.8 % higher than last year. But internally they are most vulnerable to the constantly changing environment scenario (Katayama and Bennett ,1996) focused on the cost competitiveness of Automobile industry and how because of the competition , firms are practicing competitive advantage through lower cost, In order to counter Predatory price competition and low profit margins. Processes like Lean management and Business process re – engineering (BPR) were developed to increase the efficiency of the manufacturing process and increase the production . Increase in production lead to increase in consumption in India as our domestic demand is very high. This is mainly due to the smallest proportion of vehicular population i.e 20/1000 .As compared to 500/1000 for Europe and 100/1000 for China. Our vehicular potential is huge and the most which makes India a very lucrative country to invest in by foreign automobile companies. Our growth potential has been predicted to be 10 % annually. Looking at the immense potential Government of India and SIAM have made their Automotive mission plan 2016-2026 which projects a revenue of \$300 bn and an employability of 65 million people directly and indirectly by the sector.

Increased efficiency , Increase demand has led to Increased consumption In Indian Automobile Industry. But Increase in consumption also leads to Increase in the use of resources which is happening in India (Wackernagel & Rees , 1996). Besides being a biggest contributor to GDP , Automobile industry is also one of

the biggest contributor to Air pollution. Vehicular pollution constitutes 30% -35 % of our total Air pollution. High consumption of Non renewable energy , Usage of raw material with high carbon footprint , lack of appropriate waste and water management practices , Tailpipe carbon emission of Cadmium , Lead , hexavalent chromium and Mercury , Use of Internal combustion engine and fossil fuel and lack of End of life measures for vehicles in terms of Landfill sites has created a sense of Urgency for the Industry at large to work for sustainable solutions.

Lighter vehicles reduce tailpipe emissions but have dismantling issues. JIT improves environmental performance in manufacturing but increase energy use during logistics (Van Hoek, 2002) . Therefore a constant need for environmental innovation is required. Technology , Research and development are the key and should be a continuous process for sustainable production . This also raises a concern for market which is willing to pay for these practices. Sustainable production practices and strategies are dependent on Sustainable consumption( Baldasaere & Campo , 2016).

Economy belongs to society which in turn belongs to the ecological environment . Profit , People and Planet all are interdependent on one another .Sustainable practices lead to growth and welfare which inturn leads to profitability ( Klendorf et.al , 2005). People and Planet–should be in sync. only then Growth , welfare and profitability would happen. Therefore Sustainable Production and Sustainable consumption should be in sync for sustainable practices to happen profitably.

Environment management practices have grown from pollution control and risk management in 1970's to pollution management and then subsequent implementation of systemic product , process management and emergence of Life cycle analysis (Beamon , 1999) . Post 2005 sustainable green practices have been incorporated in the strategic objectives of Automobile firms. But still there is a gap between “ What to do – How to Do “.

It is also seen that companies talk about their compliance of ISO 4001 , OHAS 18001 or SA8000 Certification in European countries , but its not mentioned about India or other Asian market . This is despite the fact that India being one of the highest contributor in Vehicle sales (Baldasaere, Campo ,2016). This can be due to the fact that though the Indian Automobile firms have sustainability in their strategic objective they must also believe in its realization.

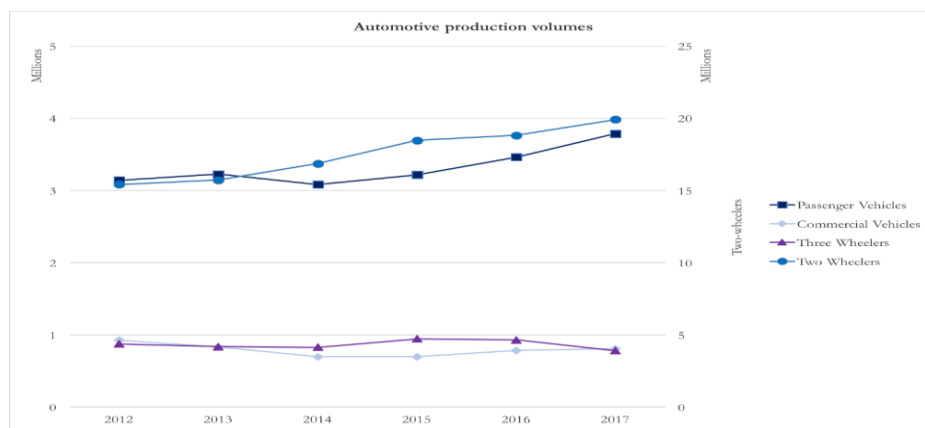
The purpose of this study is to find solution to fill the gap between sustainable production and sustainable consumption practices in Indian automobile industry. The research paper realizes that sustainable production practices and sustainable consumption are directly proportional to each other. Without one the other cant be implemented effectively. India being one of the front runners in Paris climate change Agreement summit (2016) is bound to focus on Sustainable green practices to reduce carbon emissions. Automobile industry being the prime contributor to the nation's economy in terms of GDP and employability has to set an example for the rest of the industries in the country. Therefore the research is based on top 10 automobile firms in India. Indepth interviews were taken from their senior executives to understand the deficit between commitment and implementation of sustainable green practices in the industry. The papers explores the role of sustainable consumption and the mindset of Indian consumers towards Sustainable green practices. Further we also examined the interplay of Government , Corporate and Consumer towards Sustainability in Indian Automobile industry. The outcome of the study was that the Government has started giving push through regulations and various policies to promote sustainable measure , but corporates are not complying fully to it as the ROI through sustainable practices is not met by sustainable consumption in India. In the process we explored various initiative which can be taken by the industry to fill the deficit between commitment and implementation.

The chapter is organized as follows the next section provides the Need of sustainable practices in Indian Automobile Industry. This section also talks about the interconnectedness of Government , Corporate and Consumer. Following this the research methodology adopted for the study is mentioned. This is followed by Important green practices for a sustainable environment being adopted by Automobile firms in India. Next section provides the findings and analysis of the study about the deficit in the commitment and implementation of the green practices and reasons for the same. In conclusion and suggestions we give a way forward for the reader to think on.

#### **THE NEED FOR ENVIRONMENT SUSTAINABLE PRACTICES IN INDIAN AUTOMOBILE INDUSTRY**

Last two decades have seen phenomenal rise of Automobile sector in India. It has become one of the biggest contributors to the Indian economy in terms of GDP and employability of manpower. The same has been due to two factors namely rise of Indian middle class and increase in their disposable incomes and buying capacity. Also post liberalization relaxation on foreign exchange and equity has helped the sector to sore new heights.

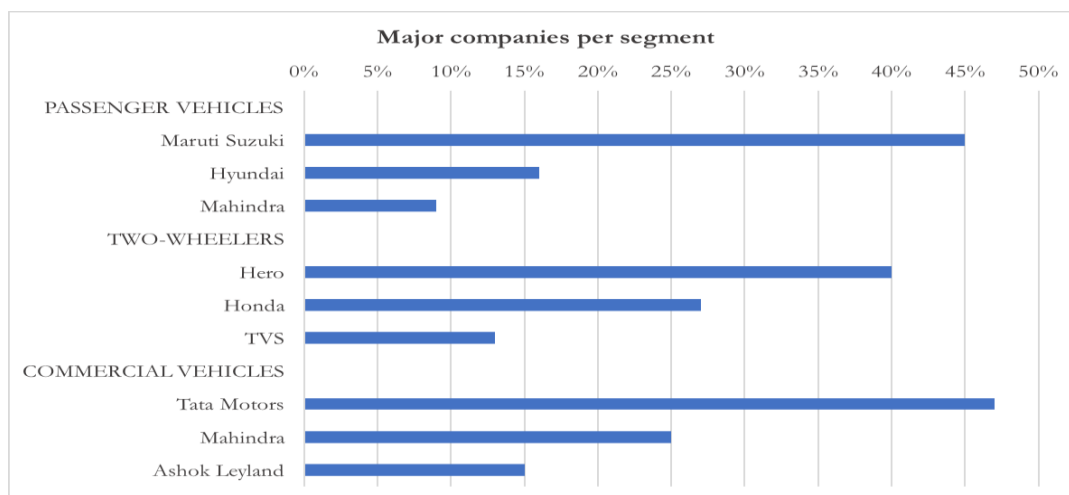
There are Challenges galore for Indian Automobile sector .Besides being one of the major contributors to our GDP it is also responsible for 30%-35% of total air pollution of our country according to 2016 version of WHO database. Therefore it needs to shift its focus from, Cost feasibility, Customer satisfaction and quality requirements to Environmental Initiatives: Safety Requirements: Competitive Pressures: Customer Expectations. There is a powerful link between forces of change influencing Indian Automobile industry. The concerns have to be addressed consistently and strategically to ensure sustainability and profitability. High consumption of Non renewable energy , Usage of raw material with high carbon footprint , lack of appropriate waste and water management practices , Tailpipe carbon emission of Cadmium , Lead , hexavalent chromium and Mercury , Use of Internal combustion engine and fossil fuel and lack of End of life measures for vehicles in terms of Landfill sites has created a sense of Urgency for the Industry at large to work for sustainable solutions. Last 7 years have seen awareness of Green design, green manufacturing, green supply chain and reverse logistics practices and compliance of ISO4000 and ISO4001 norms in the industry. The main focus is to reduce carbon footprint and become an environment sustainable industry by 2030. Dominant and the most appealing thing about Indian automobile industry is its growth and future potential for growth as compared to the rest of the world. Figure ( 1)



**Figure-1: Last 5 years Growth in Automobile industry in India**

Source : Survey Ernst & Young (May ,2017)

Domestic demand is one of the main factor due to which the industry has grown, mainly due to demography of our country where 66% population is below 35 years of age. We have the smallest proportion of vehicular population i.e. 20 vehicles out of 1000 people. As compared to 500/1000 for Europe and 100/1000 for China. The same has been based out of a study conducted by E&Y. Our vehicular potential is huge and the most which makes India a very lucrative country to invest in by foreign automobile companies. Our growth potential has been predicted to be 10 % annually. Looking at the immense potential Government of India and SIAM have made their Automotive mission plan 2016-2026 which projects a revenue of \$300 bn and an employability of 65 million people directly and indirectly by the sector. In spite of high competition the main players in the industry have a share of more than 40 %.



**Figure-2: Market share of dominant players in Indian Automobile Industry.**

Source : Survey Ernst & Young (May ,2017).

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**GOVERNMENT INITIATIVES AND POLICY FOR SUSTAINABILITY**

80% of our import bill comes from Petroleum. Vehicular pollution caused is around 30-35% of total air pollution. Government of India has come up with lot of regulation and policies to curb the carbon footprint in the country. India has signed Paris climate agreement this year due to which it is obliged to bring down its carbon emissions by 2030. The Goal to reduce carbon footprint consist of: Reduce India's emissions intensity per unit of GDP 33% to 35% of 2005 levels by 2030; Achieve "about" 40% installed electric power capacity from non-fossil fuels by 2030; Create an additional "carbon sink" of 2.5 to 3 billion tons of CO<sub>2</sub> equivalent through afforestation by 2030. To achieve this goal Government has fast tracked certain plans which are: Advancement of BSVI Norms. Special focus on "End of Life" or scrappage policy for vehicles: Faster and Advance Manufacturing of Electric Vehicles: National Electric Mobility Mission Plan (NEMMP) envisages putting 6 million electric vehicles on roads by 2020 and aims to make the country an all-electric vehicle market by 2030. Government is also promoting Shared mobility. This will lead us to save \$60bn of petrol and diesel cost. It would also help us in reducing 1 Giga tonne of carbon emissions by 2030. Tax regulation of Rs 200. On per ton of coal. Also government has cut subsidies and raised taxes on oil and gasoline. India has begun to focus on what it will cost to make the transition to clean energy and on the role of the private sector and outside financing necessary to make the shift. In its Intended Nationally Determined Contribution (INDC), India has placed a price tag of USD 2.5 trillion on its needs for clean energy capital between 2015 and 2030. Government has come up with a Green Urban transport scheme which has an investment of Rs.25000 crores. This aims at betterment and growth of Indian transport on a low carbon path by substantial reduction in pollutants and emissions. Energy Efficiency Services Ltd. a venture of Ministry of Power has floated a tender for requirement 10,000 electric sedan cars along with 4000 electric charging station to promote EV's.

**CORPORATE INITIATIVES AND SUSTAINABLE PRACTICES**

Globally Automobile industry is going through a change due to requirement of vehicles with low carbon footprint. All over the world Governments have responded to these Geo-political forces and market forces by imposing stronger environmental regulation on OEM's (Original equipment Manufacturers) for emission control and fuel economy. These regulations differ from one country to another adding complexity to the mix of vehicles offered by OEM's worldwide. But in a price conscious economy such as India the shift towards green vehicles is slow unless pushed by a continuous Government mandate and reforms. Although Major players are already equipped with necessary infrastructure and expertise to develop greener and cleaner but they don't find it lucrative unless the green revolution takes momentum. The same can happen by Government interventions, changes in legislation – And it achieves market scale required for commercial viability. In India mostly Manufacturers are opting for Dual –fuel technology than battery powered alternatives. This is due to lack of recharge stations. Also Manufacturers of four wheelers and commercial vehicles are emphasising the importance of Internal Combustion Engine (ICE) before investing heavily on other technologies. Government is highly promoting green sustainable practices during the design, manufacturing and End of life phase. It has come up with lot of policies and programmes to promote the conduct of Green practices in Automobile industry in India. Companies like Maruti Suzuki, Mahindra & Mahindra, Tata Motors and BMW India have understood the need of the hour and incorporated green sustainable practices to curb carbon footprint and the use of renewable sources in Automobile industry. Most of the companies have incorporated it in their strategic objectives post 2005. But only few companies follow it on a continuous and persistent basis.

**THE RESEARCH METHODOLOGY**

The objective of our study is to further study the state of sustainable green practices in Indian Automobile companies. The research was conducted on 10 leading Automobile firms in India chosen through purposive sampling which had incorporated sustainability in their strategic objective. The research highlights the gap between commitment to sustainable green practices and Implementation on a grass root level. Also in addition to studying sustainability reports and websites of the selected firms we did detailed in depth interviews of senior executives of the firm. They were directly responsible for the sustainability initiatives taken by the firm. The respondents were sincere and honest in answering the questionnaire as they believed the research would help them in giving insights for filling the gap. Top 10 firms were selected on the basis of purposive sampling. In depth interviews were taken from July 2017 to Oct 2017. This was done through semi structured questionnaire.

We also interviewed 150 car owners in Delhi NCR. These individuals were interviewed on the basis of closed ended questionnaire. Questions were asked about their buying behaviour towards Green and sustainable vehicles and an opinion was asked about their awareness towards contribution to the ecosystem. These respondents were between 22- 45 age group.

The 10 Automobile firms selected for the research were shown in

**Table-3**

<b>Firms Taken for Research</b>
<b>Maruti Suzuki India Ltd</b>
<b>Mahindra &amp;Mahindra</b>
<b>Tata Motors</b>
<b>BMW India</b>
<b>Honda</b>
<b>Hyundai</b>
<b>Suzuki</b>
<b>Yamaha</b>
<b>Ford India</b>
<b>Fiat India</b>

### FINDINGS AND ANALYSIS

It was seen during the indepth interviews of senior executives of 10 leading Automobile firms that though all of them have included sustainability in their strategic objectives very few of them actually practiced all the important practices in their day to day functioning. Indian Automotive firms mainly focused on Tailpipe emissions whereas the same only contributed 20 % of the total vehicular pollution.

By reviewing Journals ( Meenes & Bennett , 2016 , Orsato ,2006 , Kleindorf et.al ,2005, Sarki 2001 ) and websites of world's top leading automobile firms we shortlisted 24 green practices mentioned in the below table for a environment sustainable future and to drastically reduce carbon footprint. These were as follows:

### EFFECTIVE GREEN PRACTICES FOLLOWED BY AUTO MAJORS WORLDWIDE TO REDUCE CARBON FOOTPRINT .

	<b>Green Practices</b>
<b>Green Design Practices</b>	<b>Design for Reuse and Recycling</b>
	<b>Design for Curbing waste /Water usage</b>
	<b>Design Impact Measures</b>
	<b>Use of Non toxic products in design.</b>
	<b>Check emission from stationary objects too.</b>
<b>Green Manufacturing</b>	<b>Use of Eco friendly raw materials</b>
	<b>Green Power Usage</b>
	<b>Use of Light weight raw materials to reduce VOC'S.</b>
	<b>Use of water based solvents and sprays for paint.</b>
	<b>Alternate Fuel technology</b>
<b>Green Supply Chain</b>	<b>Backward and Forward integration of suppliers for efficient Green logistics</b>
	<b>Green Transport</b>
	<b>Green Labelling</b>
	<b>Green Packaging</b>
	<b>Use of Reusable material</b>
<b>Green Transport</b>	<b>Constant check of Tailpipe emissions</b>
<b>End of life Practices</b>	<b>Vehicle Recovery Cooperation with customer</b>
	<b>Level of IT &amp; R&amp;D.</b>
	<b>Employee Training programmes on green practices</b>
	<b>Self regulation</b>
	<b>Scrappage policy</b>
	<b>Use of Landfills</b>
	<b>Management of Glass waste and Metal waste</b>
	<b>Reverse Logistics</b>

It was observed during the research that though all of the firms were committed to most of the practices but very few were followed . There was a huge Gap. For eg. In India we still are struggling with a End of life policy Law for Automobile firms. Use of landfills is a challenge for most of them. Integrating with suppliers both



forward and backward for logistics and sustainability is not happening. This is mainly due to the reason that Suppliers don't have funds to install green processes and practices. There is lack of training to manpower to self regulate these processes. Still some Automobile firms like Yamaha use paints which are not water soluble. Water and Waste management is a big issue with suppliers . We don't have a green supply Chain. The Green practices followed by 10 Automobile firms are :

	Green Practices	MarutiSuz	Mahindra	Tata Moto	BMW Indi	Honda	Hyundai	Suzuki	Yamaha	Ford India	Fiat
Green Design Practices	Design for Reuse and Recycling	Y	N	Y	Y	N	N	Y	N	N	N
	Design for Curbing waste /Water usage	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Design Impact Measures	Y	N	Y	Y	Y	N	Y	N	Y	N
	Use of Non toxic products in design.	Y	Y	N	Y	N	N	N	N	N	N
	Check emission from stationary object	N	N	N	N	N	N	N	N	N	N
Green Manufacturing	Use of Eco friendly raw materials	Y	N	N	Y	Y	N	N	N	N	N
	Green Power Usage	Y	N	N	N	N	N	Y	Y	N	N
	Use of Light weight raw materials to r	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Use of water based solvents and spray	Y	N	N	Y	Y	Y	Y	N	N	N
	Alternate Fuel technology	Y	Y	Y	Y	N	N	N	N	N	N
Green Supply Chain	Backward and Forward integration of	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Green Transport	Y	Y	N	N	N	N	N	N	N	N
	Green Labelling	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Green Packaging	N	N	N	N	N	N	N	N	N	N
	Use of Reusable material	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Green Transport	Constant check of Tailpipe emissions	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
End of life Practices	Vehicle Recovery Cooperation with cus	N	N	N	N	N	N	N	N	N	N
	Level of IT & R&D.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Employee Training programmes on gr	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Self regulation	N	N	N	N	N	N	N	N	N	N
	Scrappage policy	Y	N	N	N	N	N	N	N	N	N
	Use of Landfills	Y	N	N	N	N	N	N	N	N	N
	Management of Glass waste and Met	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Reverse Logistics	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

The percentage of Green Practices being followed is

Environment Sustainable Practices	Companies (%)
Maruti Suzuki India Ltd	83
Mahindra &Mahindra	54
Tata Motors	54
BMW India	67
Honda	58
Hyundai	45
Suzuki	66
Yamaha	45
Ford India	41
Fiat India	39

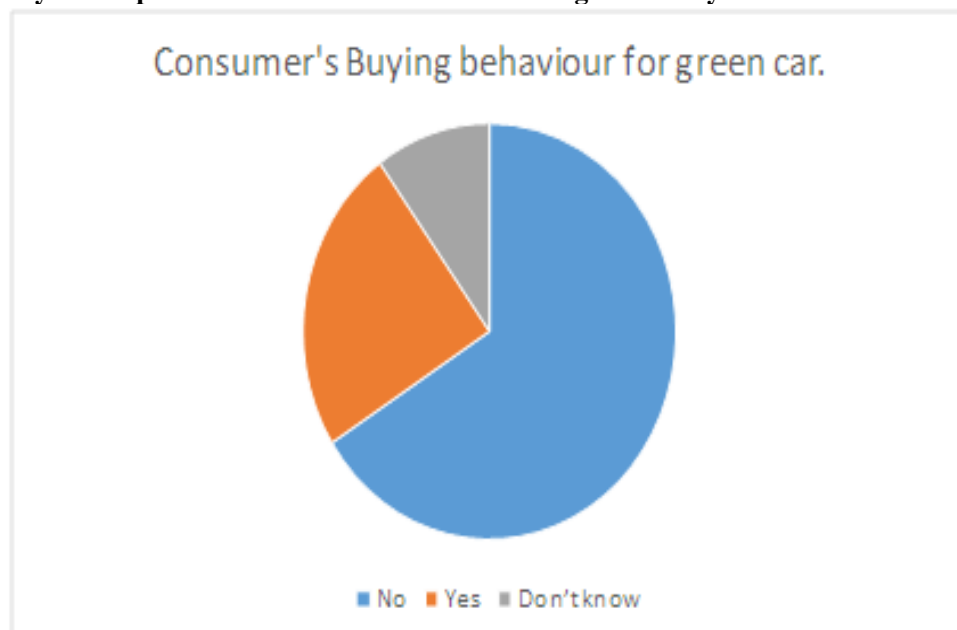


It was observed that out of top 10 Auto firms Maruti Suzuki India Ltd. was most compliant in following the green practices . It was also seen that companies such as Hyundai , Ford and BMW have different parameters for India and Developed countries. Lot of practices such as green designing , green procurement and landfill practices were not done here in India. Also companies like Yamaha need to innovate and comply to the latest green norms . They need to be more aware n contribute towards reducing carbon footprintresponsibly to save the environment for future generations.

Also during the research it was seen that for companies to be compliant and Implement the sustainable practices sincerely and effectively they need to believe in its realisation. They need to communicate the same to their consumers , Stake holders and Investors.

Consumer is the centerpiece of this industry. Sustainability and profitability are directly related by sustainable consumption. If there is sustainable consumption there is sustainable profitability. The lack of sustainable profitability is due to the lack of sustainable consumption practices in India. So we did a survey of 150 consumers of Automobile between the age group 22-45 in Delhi NCR to understand their buying behavior towards Green Automobile. Our questionnaire had. closed ended questions .

**During the survey the respondents attitude towards the willingness to buy Green Automotive was as follows**



The reasons of 66% Consumers not wanting to buy a green car was as follows



Lack of Infrastructure, less options for green automobiles, lack of driving pleasure and value for money were reasons given by Indian consumers.

According to our findings Consumers need to be more aware about the impact of these practices. They also need to be carbon footprint responsible. They need to be more aware of how their contribution and save and protect our environmental pollution. They need to educate about carbon emission, use and maintenance of vehicles and most importantly disposal of the same and its impact on the environment. Consumers also need to educate about shared mobility and its contribution towards saving the environment. Sense of responsibility should be generated in them. Then only they will realize the sense of urgency and contribute towards a sustainable future. The current challenges for both Companies and Consumers are :

**Infrastructure:** Lack of charging stations for electric vehicles is a cause of major concern. It is a cause of consumer's unwillingness to buy EV's. According to a survey done by McKinsey, 3,50,000 battery recharge stations are required only in Delhi NCR vis a vis 500 charging stations we have now. Also the condition of roads and transport system is not good. Traffic mismanagement and congestion is also a major cause of environment pollution.

**Supply Chain:** The problem in today's scenario is that the company abides to the environment norms but their dealers or suppliers don't. Therefore it's very important for every firm to have a Green procurement policy and green up their supply chain for a better and more sustainable future.

**End Of life /Obsolete vehicles:** They are the biggest challenge to the Environment. There are some 28 million vehicles in India that are at least a decade old. In the absence of an end of life policy most of such vehicles are now sold in the second hand market or even left to corrode, adding to pollution. Metals from scrapped vehicles can be recycled, increasing also the local availability of raw material.

## CONCLUSION AND SUGGESTIONS

Strategic Business Planning but with the ingredients of Social, Environmental and all Ethical consideration will define the future of Indian Automobile Sector. A coherent approach needs to be adopted by automobile industry, government and consumers. Once the consumer starts including environment in their buying decisions, which they should because environment in automobile actually means economy and savings, companies will be pushed to improve. Companies cannot afford to lose their market given the kind of cutthroat competition existing in India today. Consumers need to build on the research outcome of green rating project, and ask for emission and fuel efficiency performance of automobiles as their buying criterion along with price. Government on its part should come out with economic instruments as its major tool to regulate automobile companies. Pollution control body too needs a complete rethinking of its regulatory approach to this sector. Wastewater characteristics, solid/hazardous waste management, paint sludge incineration, dioxin and furans are some major aspects of automobile pollution during manufacturing process-regulations for which are either weak or non-existent. Downstream pollution checks and supply chain management are also some issues where regulatory bodies will have to do some soul searching. Automobile companies need to do a lot of rethinking. Extensive research and development, option of alternate fuels, clean technologies and quality control to oversee

adherence to product conformance will shape the future of automobile sector in India. Companies must come forward and be more active in shouldering their responsibilities in educating consumers regarding good and bad features of vehicles. Proactive dialogue between this sector and society in general could pave the way for long-term solution to the various pollution caused by the automobile sector. All stakeholders need to come together to improve the environmental performance of this sector. We have just made a start, a lot more needs to be done.

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**CONSUMER PREFERENCES FOR BRANDED SHOES IN SEMI URBAN AREA: WITH SPECIAL REFERENCE TO PALANPUR CITY**

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**INTRODUCTION**

India is the second largest footwear producer in the world, with footwear production accounting for approximately 9 percent of the global annual production means 22 billion paired as compared to china, which produces over 60 per cent of the global production. India annually produces 2.1 billion pairs of which 90 per cent are consumed internally while remaining are exported primarily to European nations which include United Kingdom, Germany, USA, Italy and France, as per market analysts. India is the third largest footwear consuming country in the world after China and USA, but with very little separating the three, India is very soon expected to be the second largest consumer as well.

One of the major recent trends in the Indian market is the changing of lifestyle and incomes. Many leading branded shoes companies have decided to increase production of branded shoes for the Indian consumers. Today, companies of branded shoes export or supply the footwear under the private labels of departmental stores, boutiques, shoe retail chain and mail order houses and facilitate production everywhere.

Today, domestic shoes markets face stiff competition in Indian market. The consumer's preference of shoes is still remained as open that need to be assessed. Since understanding of what consumers choices (like or dislike) and why they prefer branded or no-branded shoes, wholesalers and retailers, it will lead to more accurate marketing programs.

**REVIEW OF LITERATURE**

D'Mello (2003) in his study examines the plight of the workers in shoe manufacturing companies. The author has followed a case study method considering Phoenix India, a subsidiary of Reebok Shoes. The study brings to light the anomalies faced by the workers in these manufacturing units. The study also emphasizes on the fact that these anomalies are greater especially with the third world countries like India, where in corruption plays a major role. Therefore it becomes easier for these international players to corrupt the district magistrate to the police. As a result the Government of these developing countries turns a deaf ear to these workers.

Peter and Olson, (1993) mention that interactions between the people's emotions, moods, affection and specific feelings is called customer behaviour, in other words in environmental events which they exchange ideas and benefits each is called customer behaviour. Buying behaviour of people, who purchase products for personal use and not for business purposes.

Schiffinan and Kanuk (2004) define customer's behaviour as the behaviour that the customers display in searching for purchasing, using, evaluating and disposing of products and services that they expect will satisfy their needs. Customer buying behaviour incorporates the acts of individuals directly involve in obtaining, using and disposing of economics goods and service including the decision process that precede and determine these acts.

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Yee and Sidek (2008) investigated how the respondents are influenced by factors of brand loyalty towards sportswear brands. Previous research adopted seven factors to test in the Malaysian environment. The seven factors of brand loyalty are brand name, product quality, price, style, promotion, service quality and store environment. Brand name has shown strong correlation with brand loyalty. In order to increase customer satisfaction and drive them to be brand loyalists, marketers are encouraged to develop aggressive marketing programs. Questionnaires were distributed and self-administered to 100 respondents. Descriptive analysis, one-way ANOVA and Pearson Correlation were used in this study. The research results showed that there is positive and significant relationship between factors of brand loyalty (brand name, product quality, price, style, promotion, service quality and store environment) with sportswear brand loyalty. Study of more focused factors that are appropriate to the Malaysian environment is recommended in order to obtain accurate information.

Krishna (2012) focused on attitudes and behavior on the concept of the youth's buying behavior towards branded sports shoes, different consumers have got different decision making process. The buyer's ultimate

goal is to buy the product of qualitative, quantitative with low/best affordable price. In order to identify different kinds of consumer's behavior towards buying of different branded shoes and Nike sports shoe. Investigators have carried out buying behavior of youth and different kind of consumer behavior models, literature and theory of consumer behavior; and finally, analyzed and concluded.

Yoh, Mohr and Gordon (2012) investigated factors that influence Korean teens' athletic footwear purchase. Four hundred and fifty-six teens participated in the study. Throughout the review of related literature and the conduction of a pilot study, seven characteristics were considered; price, color, style, brand name, comfort, quality, and celebrity endorsement. ANOVA procedures indicated that gender played a significant role in the purchasing behavior of Korean teens. Male teens stated that comfort and quality are the most important factors while female teens revealed that style and color are more important factors than any other factor. Marketers and advertising managers of athletic shoes companies should utilize the findings of this study to communicate with teen consumers more effectively.

### OBJECTIVES OF THE STUDY

1. To study the consumer preferences of branded shoes in the city of Palanpur.
2. To analyze the selected factors of consumer preferences.

### HYPOTHESIS

H0: There is no significant difference between price of branded shoes and between income groups.

### RESEARCH METHODOLOGY

The descriptive research used to understand the preferences of consumers towards branded shoes. A structured questionnaire was used and respondents were contacted in Palanpur city.

### SAMPLING

**Population of the Study:** Population study is really important to identify in the research study. All the actual consumers (Students, Businessman and Employees) are taken from the population for the research.

**Sampling Frame:** It was quite difficult to identify the sampling frame. Unlike other researches where a telephone directory or a map can be the sampling frame.

**Sample Unit:** The semi-urban consumers are the primary unit of analysis.

**Sample Size:** The sample size of 200 respondents was selected from different location of Palanpur city.

**Sample Element:** The study is carried out in Palanpur city only. Only consumer of Palanpur city were considered as element.

**Sampling Techniques:** The researcher has applied Non-probability sampling (convenience sampling) technique is carried out in various stages.

### DATA COLLECTION

**Primary Data:** The primary data was collected through the field survey. A structured questionnaire is used as a data collection tool.

**Secondary Data:** As a part of the research, secondary data have been collected from various Journals, Magazines, Proceedings of Seminars and Conferences.

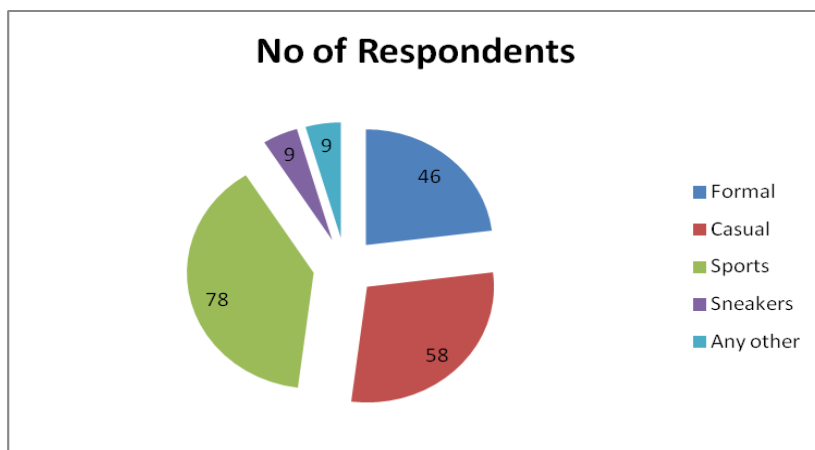
### ANALYSIS AND INTERPRETATION OF DATA

The Statistical Packages for Social Sciences (SPSS) is used to analyze the collected data. Frequency distribution, correlation and One-Way ANOVA and other test have been applied on the findings to examine the hypotheses

### DATA ANALYSIS AND INTERPRETATION

#### 1. Types of shoes liked to wear by consumers.

Particulars	No of Respondents	Percentage
Formal	46	23
Casual	58	29
Sports	78	39
Sneakers	09	45
Any other	09	45
Total	200	100

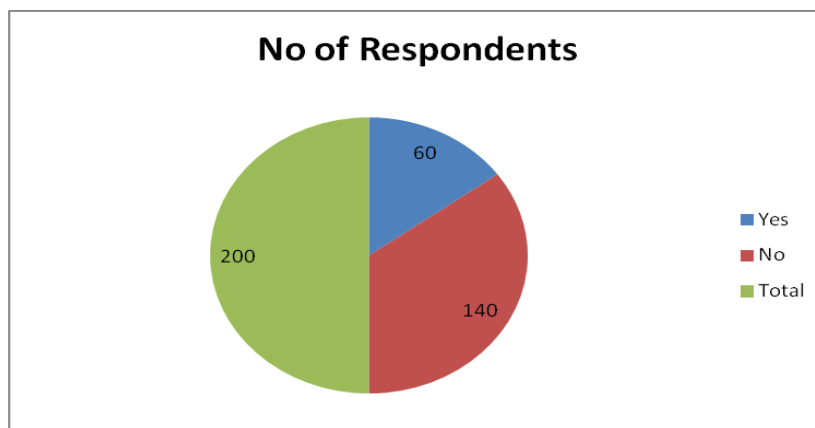


The above pie chart shows that 78 respondents wear sports shoes, 58 respondents wear casual shoes and only 9 respondents wear sneakers and others.

## 2. Selection or Choices of Branded Shoes

Particulars	No of Respondents	Percentage
Yes	60	30
No	140	70
Total	200	100

Palanpur is a semi urban area of Banaskantha District. Most of the people come from rural areas. They are not so financial sound. From the above table, it is found that 70 percent respondents do not prefer to purchase branded shoes. Only 30 percent respondents preferred to purchase branded shoes.



## 3. Consumers Aware About the Different Brands of Shoes.

Particular	No of Respondents
Nike	31
Puma	22
Reebok	39
Adidas	21
Red Tape	05
Lee Copper	02
Action	18
Power	10
Campus	30
Woodland	10
Fila	05
Franco Leone	Nil
Metro	07
HRX by Hrithik	Nil
Bacca Bucci	Nil
<b>Total</b>	<b>200</b>



The above table revealed that 39 respondents were aware about Reebok brand. 31 respondents were aware about Nike and only 2 respondents were aware about Lee Cooper brand.

**4. Factors considered by consumers while purchasing branded shoes. Rating on a scale of 1-5 Where 1- Most important 2- Important 3- Neutral 4- Less important 5- Least important.**

Factors	Mean Score
Price	4.25
Quality	4.10
Design	3.36
Image	2.26
Comfortless	1.67
Service	3.24
Availability	3.55
Style	3.45

The above table shows that all the factors are important in consumer preferences. Price factor have a highest mean score with 4.25, quality have a 4.10 but comfortless have only 1.67. It is concluded that consumers given preference to “Price” factor while they purchasing branded shoes.

**Table: One-Way ANOVA**

Descriptive				
Price of Shoes				
	N	Mean	Std. Deviation	Std. Error
Less than 10,000	5	3.40	1.817	.812
10,000 to 20,000	7	4.00	1.155	.436
20,000 to 30,000	13	4.54	.967	.268
30,000 to 40,000	47	4.55	.928	.135
40,000 to 50,000	87	4.28	1.031	.111
Above 50,000	41	4.05	1.117	.174
Total	200	4.28	1.062	.075

ANOVA					
Price of Shoes					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.990	5	2.198	1.999	.080
Within Groups	213.330	194	1.100		
Total	224.320	199			

Robust Tests of Equality of Means				
Price of Shoes				
	Statistic <sup>a</sup>	df1	df2	Sig.
Welch	1.439	5	23.006	.248
a. Asymptotically F distributed.				

The above One-Way ANOVA disclosed that F value is 1.999 and p value is .080 which is more than significance value .05, so null hypothesis is accepted and alternative hypothesis is rejected. Finally it is concluded that “There is no significant difference between price of branded shoes and between income groups”.

## CONCLUSION

From this research paper, it can be concluded that today there are two or three exclusive showrooms of branded shoes, however most of the consumer from Palanpur city preferred to go with local shops of shoes. Only those

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consumers who have good income flow to prefer branded shoes for their family members. Today, the taste, preferences and life style of consumers of Palanpur have been changed so we tested hypothesis with statistical test. One-Way ANOVA disclosed that F value is 1.999 and p value is .080 which is more than significance value .05, so null hypothesis is accepted and alternative hypothesis is rejected.

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**INTRAPRENEURSHIP AS A INNOVATIVE STRATEGY FOR TALENT RETENTION IN PRIVATE BANKING SECTOR, THANJAVUR**

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**ABSTRACT**

*Today's employees have demands that reach compensation. Employees want to innovate and they want to grow. The essential attribute of an organisation which ennobles intrapreneurs is that which emboldens and bring about adequate creative ideas to make blooming opportunities for all its employees in a magnificent manner. One of the possibly excellent way to keep the talented staff in the organisation is through intrapreneurship. The main reason employee quit their jobs is to start their own enterprises because their innovative ideas are not recognised in the company. Some of the major activities in intrapreneurship includes resource acquisition, idea generation and designing a new product or another recombination of resources. This research covers private banking sector in Thanjavur. Employees of various private banks in Thanjavur were interviewed and found that there is a strong relationship between intrapreneurship and talent retention. This study examined how best an organisation can retain and manage talented employees to ensure survival and growth in private banking sector.*

*Keywords: Intrapreneurship, Talent Retention, Entrepreneurial Skills, Innovative Strategy*

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**1. INTRODUCTION**

Intrapreneurship is kind of magnifying a new project with the contraption of company which is purely practised by the talented employees. Intrapreneurship is entrepreneurship practised by employees within an organization (Antonic and Hisrich 2002). Employees devotion towards work makes company grow in a good position. When employees feel they are not treated well or their views were not accepted, talented employees find a new job which results in company's profit drop in this competitive world. Organisations that fail to promote and encourage intrapreneurial initiatives of its workforce are likely to lose employees with distinctive competencies (Ireland et al. 2009, Armstrong and Tylor 2014, Simon and Barr 2015). To augment employees performance, organisation centralizes use of knowledge, which is a key to success for individual and improvement in company's profit. Failing to keep employees and finding new ones cost big time and a lose for a company. Its costly to lose good employees (Flitz-enz,jac (1997). It is important to encourage professionals with entrepreneurship that minded the freedom to innovate, explore new ideas and take challenges over the limits of organisations. Continue success of any organisation is dependent on the employees' contribution and commitment (Baum and Kokkronikal, 2005). To retain talented employees, every company should adopt intrapreneurship which motivates employee as a result in organization development. Talent of an employee plays a major role in an organizational success. The term intrapreneurship is a relatively new name for entrepreneurship, commonly referred to as entrepreneurship within an organisation area (Antonic, 2007). It is worthy to note that organisations with concentration of employees with distinctive competencies, suitable working environment and well structured organisational settings should encourage employees with intrapreneurial skills to innovate and implement ideas that will make organisations attain sustainable competitive advantage (Domingo et al. 2012, Lutfihak et al. 2010). However, Innovation plays major role to be an intrapreneur within the organisation. Innovation of an intrapreneur helps to develop an organisation. Talented employees need a recognition and support from the organisation which results in retention of talented employees. These studies ensure intrapreneurship is the best way to retain employees in an organisation.

**2. LITERATURE REVIEW**

Literature search was conducted which focused on intrapreneurship and retaining talented employees.

Halim et al. 2017, Kacperczyk 2012, Simon and Barr (2015), found that the intrapreneurial opportunities that the employees can take advantage of are: generation of new business ideas that will position the organisation for sustainable competitive advantage; encouragement of employees' commitment and involvement in taking new initiatives; productive engagement of employees' distinctive competencies or capabilities in generating fresh insight; empowering employees to go beyond the normal schedule among others. Gertz and Baptista (1996), stated that the firm comes out with enough resources for chances seeking and chances development is more harmful.

Qureshi et al. 2015, Vargas-Halabí et al. (2017), states that Intrapreneurship is being perceived to be one of the dynamic approaches that helps organisations to attain a better competitive position.

Adeyeye et al. 2015, Antoncic and Hisrich 2003, Sebor and Theerapatvong (2010), states that Engagement of employees via empowerment, involvement, autonomy, relationships and adequate reward system are likely to compel employees to generate new ideas, skill and innovation in the pursuits of opportunities that can reinforce the organisational overall strategic goals and performance.

Stockley (2013), defined talent retention as the mindful, thoughtful approach embark on to fascinate, improve, attract and retain people with the skills and abilities to meet current and future contingencies of the organizations.

Azami (2013), stated that intrapreneurship motivates employees to come up with distinctive business initiatives without necessarily taking formal permission from the management

Bhardwarj and Sushil Momaya 2007, Urbano and Turro (2013), stated that employees who are intrapreneurially invigorated have strong desire to take initiatives in the pursuit of new business opportunities.

Ma et al. (2016), stated that intrapreneurs in the organisations possess the capability to create, recognise, and take new opportunities at their disposal that will enable them to create and add value to the organisation

### 3. RESEARCH METHODOLOGY

This paper mainly comprises of a descriptive research.

#### A. OBJECTIVE

- 1) To identify the factors influencing intrapreneurship
- 2) To measure the impact of Intrapreneurship on Talent Retention

#### B. RESEARCH DESIGN

Sample size: Samples of 86 employees were selected to evaluate intrapreneurship on talent retention in 14 private banks, Thanjavur.

Sampling Technique: Convenience sampling was used to collect data from the employees of 14 private banks.

#### C. TOOLS FOR DATA COLLECTION

- Primary data were collected through personnel interview using questionnaire.
- Secondary data was collected from previously published records, statistics, research reports and documents. And also from books, periodical and websites.

#### D. TOOLS FOR DATA ANALYSIS

Regression analysis is used to measure the impact of Intrapreneurship on Talent Retention. Simple Percentage Analysis is used to identify the factor influencing intrapreneurship.

### 4. RESULTS AND FINDINGS

Inorder to find the factors influencing intrapreneurship, simple percentage analysis was used and some of the factors like innovation, rewards and recognition, risk taking, motivation to create new projects, encouraging entrepreneurial skills are strongly agreed by most of the employees in private banking sector, Thanjavur. This shows that these are the factors influencing intrapreneurship.

To measure the impact of intrapreneurship on talent retention regression analysis is used.

$H_0$ : There is no impact of intrapreneurship on talent retention

$H_1$ : There is a impact of intrapreneurship on talent retention.

#### REGRESSION

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.983	.183		5.380	.000
Entrepreneurial skills Encouraged	.764	.050	.837	15.213	.000

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.968	.938	.933	2.54

Regression table represents relationship between intrapreneurship and talent retention of the employee's  $p < 0.000$ , which is less than 0.05, and indicates that, overall, the regression model statistically significant predicts the outcome variable. There is an impact of Intrapreneurship on Talent Retention. From the above analysis it's clear that intrapreneurship within the company helps talented employees to retain in the same company.

## **5. CONCLUSION**

This study has identified innovativeness, risk-taking, company encourage entrepreneurial skills are some of the key factor that influence intrapreneurship and some of the way to retain talented employees. Organisation should adopt the best strategy for motivating and encouraging entrepreneurial skills among the existing talented employees. Allowing innovativeness in organisation helps employees to use their imagination and helps in organisation growth. Employees are able to transfer their knowledge into unique idea to invent and innovate. One of the best way to lead in the competitive market is to encourage entrepreneurial behaviour. From the analysis, it was very clear that intrapreneurship plays a major role in retaining talented employees. At the same time, more opportunities should be provided employees to take a decision and enhance their decision. Organisation should challenge their employees by providing them with freedom to innovate and carve out space for them to take experiment.

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**WOMEN REFORMERS IN MODERN INDIA: QUEST FOR EQUALITY**

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The quest for equality of women has been intrinsic to discourse on women's rights in India. Women's question of equality in colonial India stressed on women's emancipation and was raised within the broader agenda of social and political reform. Equality has been a concept that exercised a powerful emotional appeal in the struggle of women to free themselves from exploitation and oppression. Women have not only claimed that they are equal to men in capacity and moral worth but they have demanded equal rights and equality of opportunities, so that they could attain some measure of success in improving the condition of women.

The late 18<sup>th</sup> century began with campaigns for societal reform and issues relating to women were tackled with a broad agenda of change. It was marked by the endeavors of the social reformers to introduce legislative changes to redeem this situation. Following this, the nineteenth century proved to break the age old traditional practices affecting women like sati, child marriages, early widowhood and restrictions on it, and lack of women's education. There was a common concern for rooting out social evils or undesirable social and cultural practices. This is a time when few remarkable and articulate women, amidst the prevailing socio- cultural conditions decided to renegotiate individual freedoms and carve emancipatory spaces for themselves, through their literary narratives. During this time, these women writers and reformers set their own patriarchal beliefs and through their works attempted in breaking or dismantling the conventional role that women till now were known to perform.

Nineteenth century women like Pandita Ramabai, Anandibai Joshee, Kashibai Kanitkar, Ramabai Ranade and Tarabai Shinde, despite being in an era of early marriages and limited formal education for women, were able to transgress and venture into the public sphere and contested against the existing patriarchal society through their writings, thus emphasizing gender equality in multifaceted ways. Their works, thoughts and experiences have pioneered feminist writing and created an image of women crossing from the private into the public sphere. The political and socio-cultural public spheres at this time were defined by gender bias and caste bias which was clearly mentioned by these women thinkers. It was evident in their narratives that women could enter the public sphere only if they could first access the modern male zone as a stepping stone.

In brahmanical patriarchy, the relationship between caste and gender is crucial; ultimately the degree to which the sexuality of women is controlled is the degree to which caste group is regarded as maintaining the purity of blood and can thereby establish its claims to be high. This is the key to understand gender in the eighteenth and nineteenth century. The sexuality of all women was closely monitored and they were according to the norms of each caste. The questions about women about legitimate wifehood, remarriage, ascetic widowhood without remarriage, tonsure, excommunication for lapses, and when and how women must marry were all regulated by the community headed by the brahmanas and then remained ultimately of the state's concern. Women lived under continuous and combined surveillance of the community and the state.<sup>1</sup>

The female world in Maharashtra had been conventionally limited to the household, which was a focal point of female subordination as their roles were restricted to reproduction, domestic labor and maintaining good kinship relations. The process of generating within the household was an important aspect which helped women to negotiate between the public and private world. The educated women during this time demonstrated their acquiescence in the changes recommended by the male social reformers, their help to disseminate the reformed ideas within the female world and also socialize the new generations into the new norms.<sup>2</sup> The discourse on equality and reforms of women rested on their resistance to traditional patriarchal practices, which essentially narrowed down to lack of women's education. Education, therefore, acted as a tool to fashion a new class of women and had a potential to convert them into moral beings in a changed social order.

The feminist movement has all along had male interventions in support in the form of public voices and reformers. Women on the contrary have spoken for themselves and passed through this stage and have engaged in persistent questioning and seeking equality from an exclusivist approach by men and society. Pandita Ramabai raised issues related to social injustice and gender discrimination. In her book 'High Caste Hindu

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<sup>1</sup> Uma Chakravarti, *Rewriting History- The Life and Times of Pandita Ramabai*, Zubaan, Kali for Women, 1998, New Delhi, pp. 17-18.

<sup>2</sup> Ibid, pp.201.

Women', Pandita Ramabai took the stance of a feminist defiance thus beginning a discourse on sex discriminatory doctrines and practices in Hinduism.<sup>1</sup> She fulfilled feminist aspirations for women of her own generation and was known to be a social and religious revolutionary, who put the empowerment of women in the spiritual and substantive or real domains. She also mobilized women for reform through her Arya Mahila Samaj but reinstated that in reality, it was the task of men to eradicate the evil customs in our society as she felt that without the involvement of men, women will not be able to attain the ultimate stage of reform. When we look at the social history of Maharashtra, the role of women reformers are instrumental in intense struggle for the benefit of women and for equal participation in making the reform initiatives of men successful through the 'exercise of their agency'.<sup>2</sup> Other women of her times describe Pandita as an enlightened Hindu who had sought western educational opportunities and known to have a personality of a conventional wife and an educated, modern feminist. However, many call her a Christian emancipator of 'oppressed Hindu womanhood'. Pandita Ramabai's role as a mother was discussed amidst her social reform discourse precisely to emphasize upon valorization of motherhood by Indian women that was taken as an essentialised gender role and provided true fulfillment of womanhood. This was the reason why she chose to advice women on motherhood in her *Stri Dharma Niti*.<sup>3</sup>

Women's voices were pertinent in understanding and resolution of their problems and a standpoint for their inclusion into the reform effort. Their agitation for educational and political rights facilitated their needs and aspirations of attaining modernity and equality. This would enable them to think independently and despite their being devoted wives could become their husbands' equals. For Kashibai Kanitkar and Anandibai Joshee, who wished to become professionally qualified and compete with men for jobs, highlighted the basic patriarchal position on education and resonated the need for female education along with the social reformers of their time. Kashibai spoke for herself and Anandibai Joshee and regarded education as a gift by their husbands who bestowed them the opportunity. While Kashibai devoted her education to propagate the gains of women's education and enliven her vision of a gender egalitarian society, Anandibai Joshee became the first woman doctor and swore to offer women good healthcare. Meera Kosambi analyses Anandibai Joshee's emergence from a rigid patriarchal mould and her awareness of women's subordination within marriage and in society, reflected in her decision to receive medical education to become self reliant and her wish to ban child marriage. Joshee, on facing opposition in her wish to study medicine, said "we must put up with this inconvenience until we have a class of educated ladies to relieve these men".<sup>4</sup> Kashibai Kanitkar's biography of Anandibai is a gendered, partially feminist, nationalist projection of her, including elements of self projection. Her sole agenda was promotion of women's education, especially professional education, acting as a means of social reform and a significant step towards gender equality in Maharashtra. Thus as described by Meera Kosambi, we see, that Anandibai's life- her shared social disabilities, individual privileges, her compromises and contestations, her defeats and transcendences and the tensions underlying these make her a somewhat uneasy feminist because the obstacles that came her way and not because her beliefs were less strong.

Kashibai Kanitkar's life and journey was marked by her literary fictional works in which she describes the dilemmas of women who were caught between their husbands' expectations of an educated wife and their family's insistence on respecting convention and being confined to home. Kanitkar along with her husband campaigned for the 'Age of Consent' bill and signed a resolution that they would not allow a bride below 12 years of age. Kashibai's educational efforts met success and resulted in her interaction with leading personalities of the time, like R.G. Bhandarkar, Justice M.G. Ranade, B.G. Tilak, Justice K.T. Telang, N. G. Chandarvarkar and Swami Vivekanand. Kashibai was also in contact with Pandita Ramabai, Ramabai Ranade, Anandibai Joshee and was one of the four women delegates from Bombay Presidency to the National Congress and the Social Conference held in Mumbai in 1889. Through her creative writings 'Rangarao' and 'Palkicha Gonda', she projected the coercive nature of patriarchy and she equated men's total power over women just like colonial control over Indian and thus created a spirit of rebellion. Kashibai despite her awareness regarding the

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<sup>1</sup> Meera Kosambi, *Crossing Thresholds- Feminist Essays in Social History* Permanent Black, Ranikhet, 2007, p.5.

<sup>2</sup> *Ibid*, p.12.

<sup>3</sup> Meera Kosambi, 'Women Emancipation and Equality: Pandita Ramabai's Contribution to the Women's Cause', *Economic and Political weekly*, Vol. 23 No. 44 (Review of Women's Studies), October 1988, pp.WS 38-49.

<sup>4</sup> Cited in dall, anandi bai, pp. 84-85.

inevitability of gender discrimination in the social structure saw it as unjustifiable and avoidable in future as she tackled with the concept of gender as a social construct and her efforts lay in exposing injustices and initiating a change and her pursuit for some kind of gender equality. She was enlightened by a consciousness of the 'sisterhood of women' and associated this bond with the first generation of educated women in Maharashtra. Her kind of feminism, that followed a subversive strategy to maintain a silence yet located within her dream or utopia of women's empowerment and gender equality, did not begin a movement but was survived in the lives of numerous women of later generations. Kashibai's example of a women who attained her skills of writing through her sheer determination, focuses on a breakthrough of traditional taboos against female literacy and this exuded her desire for dignity and respect within the power relationship and forms of a patriarchy.<sup>1</sup>

Caught in a regional and national turbulence of the colonial nineteenth century, was a woman's courageous contestation of unjust Hindu practices. Rakhmabai's legal protest against child marriage became a subject of the social reform discourse. Rakhmabai refused to be controlled and defied the domestic social order and stressed on her plea for British legal interference in social transformation. Child marriage as a custom came into critical focus when Rakhmabai, who was married to Dadaji Bhikaji Thakur at the age of eleven refused to join him and continued to live with her parents, and was sent a legal notice by her husband for the restitution of conjugal rights. Dadaji aimed at material gain in this act and the case came up for trial in Bombay high Court, in which Rakhmabai specified her grounds of refusal to stay with her husband and wrote letters in *The Times of India* regarding her case.<sup>2</sup>

The initial judgment considered the rights of restitution claimed by Rakhmabai's husband as immoral and unjust because it was claimed to be acquired by a custom of child marriage. However, this earlier decision was reversed and based on a justification that marital offence was made by the complaining party. The case came to the High Court and the judgement reiterated the earlier order and ordered Rakhmabai to live with her husband or face imprisonment temporarily. This controversy highlighted the undefined, contested social space in India in the name of Hindu law and how a woman by refusing to give in to the legal laxity struggled to defy the oppressive Hindu custom owing to her education and restored the dignity of womanhood. Her protest depicted her revolutionary character that she articulated through her published letters and the legal stand that she undertook was thus, supported by social reformers. She pushed the boundaries of women's participation in reform and asserted gender equality amidst a patriarchal backlash for her intrusion into a male domain.

Finally, I discuss in my paper the writings of Tarabai Shinde, a transgressor known for verbal militancy, attacked the male double standards of morality in her famous Marathi writing 'Stri Purusha Tulana, that addressed directly and confrontationally to male readers. Tarabai spoke from a position of patriarchal convention but opposed the incongruities that existed in the social structure, whereby men were unwilling and unable to submit to, and contest male attribution of certain vices to women. According to her, these vices, only handful women and most men were guilty of. Tarabai's demand for gender equality required uniform standards of morality for men and women, based upon common human emotional and sexual needs, but within the traditional framework.<sup>3</sup> She does not call for a change in the sexual division of labour and definitely not for any blending of gender roles. Tarabai exposed the patriarchal setup and stereotypes women were subjected to, and this appeared almost a century before Simone De Beauvoir's *The Second Sex*, the foundation stone for feminist discourse.<sup>4</sup>

For women to attain equality with the so called westernized men, education became a major tool of their modernization process. Women's position needed to be improved and their condition ameliorated and this embarked upon a quest for equality. This can also be understood in terms of a protectionist role of the social reformers in the nineteenth century movement, seeking protective legislation for women. There was a common concern for rooting out social evils or undesirable social and cultural practices. In the writings of the women I

<sup>1</sup> Sarojini Vaidya, Shreemati Kashibai kanitkar: Atmcharitrani Charitra, Popular Prakashan, Bombay , 1991, p.75.

<sup>2</sup> Meera Kosambi, Crossing Thresholds- Feminist Essays in Social History Permanent Black, Ranikhet, 2007, p.245.

<sup>3</sup> Meera Kosambi, Crossing Thresholds- Feminist Essays in Social History Permanent Black, Ranikhet, 2007, p.45.

<sup>4</sup> "Remembering Tarabai Shinde: Breaking caste, patriarchy and glass ceilings" found at <https://feminisminindia.com> >



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discussed, it is recognized that they all reveal a powered relationship between women who were hierarchically placed and how women were complicit with men in oppressing other women. Women try to grapple with why women consented to certain practices which degraded them.<sup>1</sup> We can also say that while women sought to express themselves outside the discourses of men and establishing their own, tried to bring out the patriarchal power of the society. Despite their attempt to move out of boundaries and express their critique of patriarchy in the nineteenth century, they were unable to control the structures of inequalities

Women reformers along with their male counterparts drew a patriarchal image of the ideal women, as ideal wife and mother. Pandita Ramabai, Anandibai Joshi, Kashibai Kanitkar, Ramabai Ranade and Tarabai Shinde, through their distinctive voices, emerged as modern women who were educated and self-reliant and did not leave any stone unturned to move towards women's equality. Through their own life experiences of travel abroad and exposure to modern education and ideas, they sought to prove that women could live on equal terms with men. Their writings proved their concerted efforts to build a 'wave' or a movement evolving feminist consciousness, and depicting the challenges that they faced with the social compulsions of patriarchy. These women's enunciations revealed the ripples of feminism and equality as an underlined theme, without actually making an effort to formulate a common agenda or push for change in unison of their thoughts. They brought into light the pervasiveness of the patriarchal image of women in the male worldview, and also raised persistent fear of western influence and creating independent, equal existence of Indian women instead of submerging their identity in their husbands and conforming to pressure or demands of orthodox conventions of society. Thus the significant question that I want to end this paper with, is whether the contributions of women reformers of the nineteenth century in their claim of an equal status, and access to education has established inimitable roots of feminism and, builds up a solidarity on women's equality and actually creates the possibilities of a more equal social system.

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<sup>1</sup> Uma Chakravarti, *Rewriting History- The Life and Times of Pandita Ramabai*, Zubaan, Kali for Women, 1998, New Delhi, pp. 286-87.

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**MEANING OF WORK: AN ESSENTIAL REQUISITE FOR ENHANCED EMPLOYEE COMMITMENT**

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**ABSTRACT**

*Today employee commitment has become an important strategic aspect for the organization. It is not only important to have the best and the most talented employees but it is equally necessary to be able to retain them for long term benefits to both the organization and its people. The purpose of this paper is to review the findings of research papers of various authors to find out the relationship between the meaning of work and employee commitment in the organization. Three parameters were taken as key factors in understanding meaning of work namely, leadership (contingent award, intellectual stimulation, management by exception, Laissez-faire leadership, idealized influence, inspirational motivation and individual consideration), and personality (Internality, externality-others, externality-chance). The findings of the research a positive relationship between employee commitment and meaning of work.*

*Keywords: Employee commitment, Meaning of work, Leadership, Personality*

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**I. INTRODUCTION**

Albert Einstein once said: “Three Rules of Work: Out of clutter find simplicity; from discord find harmony; In the middle of difficulty lies opportunity.” Work and its meaning have always been an issue of discussion in the world. This is not limited to the domains of science; the corporate world too is not untouched. Organizations today are struggling hard to know and to understand the “**Meaning of Work**” so as to increase the productivity thereby contributing to increase the bottom line. Though Einstein made it clear in his rules its true meaning but then things said and done at his time are far different now. With rapid change in the working conditions throughout the world with 24/7 work life, being tied to the job via inescapable wires of technology all day and every day. And if this work is purposeless it loses its existence and even the best doer gets tired and loses interest.

Allocating responsibility, building a varied and interesting work environment and particularly permitting autonomy all supplemented considerably to enhanced level of work centrality. The focus here is on the needs that affect the working environment, it is important to understand first what work means to people from different backgrounds. For most people, the basic meaning of work is tied to economic necessity (money for food, housing, and so forth) for the individual and for society. However, the additional connotations of work are more subjective, especially about what work provides other than money - achievement, honor, social contacts etc. Along with the industrialization of the societies, work was organized in a scientific manner. Constant effort is done in order to maximize the efficiency of operations and the productivity of workers. People were then treated as if they were an extension of the machine and expendable spare parts; they were asked to exert simple, narrow skills, and their performance was closely monitored by foremen dedicated to the hierarchy. But the changing times have brought the organizations into a state where they need to focus on what is exactly required by an employee, to fulfill their needs to the fullest so as to increase organizational effectiveness and attainment of organizational goals. And in order to accomplish this task they first need to define “what is work” actually.

Meaning at work and of work can be derived out of several factors both primary and secondary. The primary meaning factors being from the work they do. For example if their purpose is to save environment, their need for meaning through their work must be satisfied while secondary factors are more highly valued, they satisfy meaning quotient in a multi-faceted way. Organizations today in this competitive world can not perform at peak level unless each employee is committed to the organization’s objectives and works as an effective team member. And thus employees doing everyday work and doing it independently is no longer important and not even required. Organizations today want their employees to be completely committed so as to give their best. Through this research it is expected to find out whether Meaning of Work does have any significance effect on Employees Commitment.

Meaning of work has been measured via three parameters i.e. Leadership, Personality and employee engagement while Employee commitment is measured by keeping Affective commitment, Normative commitment and Continuance Commitment in mind. Four questionnaires (MLQ-6S, LOCI, Gallup and Meyer and Allen) were used on a sample of 70 employees of telecom sector in India. All the questionnaires are well established with high psychometric properties from the research previously conducted. Research shows a statistically significant relationship of employee commitment and meaning of work.

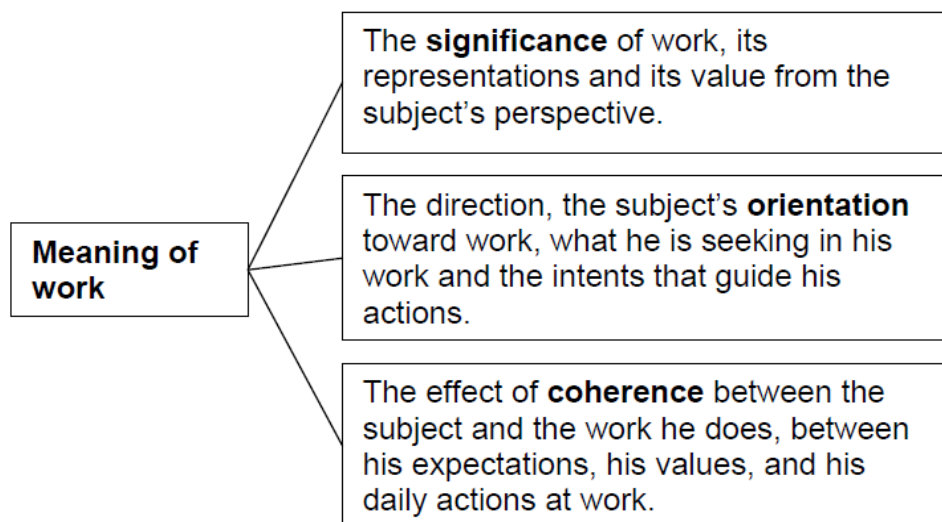
## II. MEANING OF WORK AND EMPLOYEE COMMITMENT

### MEANING OF WORK

Work has evolved a lot since the Industrial Revolution. Partly due to the progress of sciences and technologies, major transformations happened in the organizational structure and culture, with their consequences on the organization of work. In the opinion of Joanne Ciulla<sup>5</sup>, if workers of the modern times were overworked, those of the post modern times are not only overworked but also over managed, employers appearing eager to try the “flavor of the day” in order to increase the financial performance of their companies. Although the frenetic movement of changes has been slowed during the recent years, many managerial fads still do a lot of damage to work and working conditions. Also, the globalization with its outsourcing, off-shoring, adds complexity to the problem of work.

**Work and the work instinct:** In psychology, an instinct is an innate and powerful tendency. So, the work instinct would be an innate and powerful tendency to exert one’s mental and physical powers, one’s skills and talents, in order to achieve something, to reach a goal, to create, to express one’s self, etc. Working is vital for human beings; it is a critical activity for the preservation of personal health. To the extent that the work organization allows, work can serve as a tonic for personal identity in that it helps boost self-esteem. When an individual does a meaningful work, he actually develops a sense of identity, worth, and dignity. By achieving meaningful results, he actually achieves himself, grows, and even, actualizes his full potential. Somehow, he has an opportunity to become who he is and to contribute to the improvement of his life conditions and of his community. Work becomes problematic when an individual cannot relate to it. Some would say that this experience is alienation. When one thinks of work, one often thinks of a job. But work is far more than a job. Although work certainly provides for basic subsistence needs and decent living conditions, this is not its only function. Work is, above all, an activity through which an individual fits into the world, creates new relations, uses his talents, learns and grows develops his identity and a sense of belonging. To work is to exert effort in order to make something, to achieve something, to produce a desired effect. Working is a meaningful way to prove one’s existence, and hopefully, that it is worth to be lived.

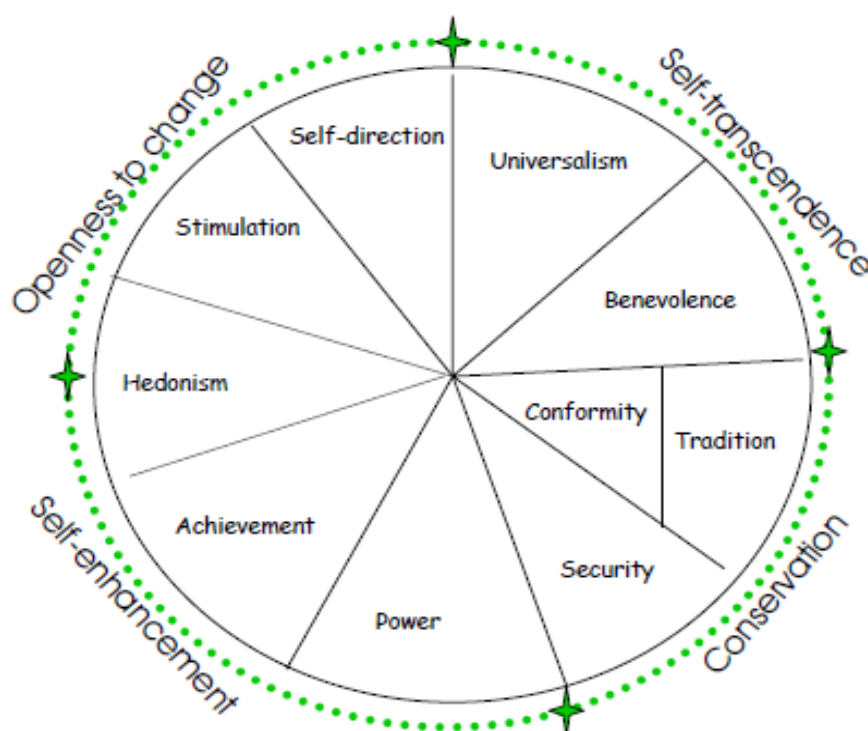
There are three major approaches to the study of meaning of work: the definitions of work, the orientations of work and the coherence of work. As such, we can define the meaning of work in three ways, as illustrated in Figure 1.



**Figure-1: Three definitions of the concept “meaning of work”**

**The significance of work:** The concept of “meaning of work” can be defined as the significance the subject attributes to work, his representations of work, and the importance it has in his life. This way of defining the meaning of work leads to identifying work definition models, as Meaning of Working International team members proposed it, or the centrality of work, as Morse and Weiss stated it.

**The work values:** The concept “meaning of work” can also be defined as one’s orientation or inclination toward work, what the subject is seeking in the work, and the intents that guide his actions. Super and Šverko have found 5 major orientations: autonomy, social advancement, self-achievement, social interactions and risk taking. Ros, Schwartz and Surkiss present a theory of work values, describing four axes: conservation, self-enhancement, openness to change and self transcendence. Each axis is defined by basic individual values, as shown in the figure 2.



**Figure-2: Structure of relations**

**The work coherence:** The concept “meaning of work” can be defined as an effect of coherence between the subject and the work he does, the level of harmony or balance he achieves in his relationship to work. The thoughts that one has about something else tend to organize themselves into balanced systems and, consequently, any incoherence leads to activities (intellectual, emotional, behavioral, etc.) to restore that balance. The model that seems to emerge from all the studies since 1997 features six factors: social purpose, moral correctness, achievement-related pleasure, autonomy, recognition, and positive relationships.

### EMPLOYEE COMMITMENT

Commitment, empowerment and trust go hand-in-hand. DINESH K VOHRA writes that it is the only way to achieve true corporate excellence

The success of any organization’s future business strategy depends a great deal on its employees’ commitment levels. It is for the organizational leadership to attract, motivate and retain committed people for future business objectives.

Organizational leadership needs to create the understanding that it is only an employee’s total commitment that will get translated into greater productivity and a very high level of quality service, which ultimately affects the bottom-line.

The three component model of commitment is the most widely investigated multidimensional conceptualization of employee commitment in the workplace (Meyer & Allen, 1991). The model comprises three components that have important consequences for membership decisions. *Affective commitment* represents an emotional attachment to, involvement in, and identification with the organization; *normative commitment* (NC) refers to a sense of loyalty driven by a feeling of obligation toward the organization; and *continuance commitment* (CC) is an attachment derived from the recognition of the costs associated with leaving and/or the perception of a lack of employment alternatives (Meyer & Allen).

### III. REVIEW OF LITERATURE

S. Antonio Ruiz-Quintanilla and Cornell University George W. England University of Oklahoma studied How Working is Defined: Structure and Stability, (1994). (CAHRS Working Paper Series. Paper 237.)

Studies on the meaning of work in eight countries were carried out by George England and a group of researchers who are called the Meaning of Work (MOW) International Research Team. Their research sought to determine a person's idea of the relative importance of work compared to that of leisure, community, religion, and family. They called this concept work centrality, defined as “the degree of general importance that working

has in the life of an individual at any given point in time.” The obvious general implication from these findings is that the higher the mean work centrality score, the more motivated and committed the workers would be. Alicia Bassuk and Marshall Goldsmith, who further studied on meaning of work found out that increasingly, leaders are focusing beyond effectiveness, productivity, and compensation, and are striving to find more meaning in their work. Historically, leaders sought opportunities in organizations that were stable, prestigious, and well-funded. They worked for one or two organizations before they retired. Today’s leaders change companies more frequently—in search not only of prestige and compensation, but also deeper meaning from their professional life. Itzhak Harpaz and Xuanning Fu, (*Human Relations* 2002; 55; 639). The structure of the meaning of work: A relative stability amidst change) focused that as work constitutes a pivotal and fundamental component in people’s lives, wide consensus exists among scholars that work and working are of profound importance to them (England & Harpaz, 1990; Harding & Hikspoors, 1995; Kaplan & Tausky, 1974; Mannheim & Dubin, 1986; MOW-International Team, 1987). In addition to its obvious economic functions, work has a powerful potential to fulfill other important roles and needs of the individual such as self-esteem, fulfillment, identity, social interaction and status.

*Work centrality as a life role* - Work is one of the most basic and important activities for people in modern society. The assertion that work plays a central and fundamental role in the life of individuals has been supported empirically in most industrialized countries (Brief & Nord, 1990; England & Misumi, 1986; Mannheim, 1993). Studies by Dubin and others (Dubin et al., 1976) were helpful in developing this concept, which refers to the degree of general importance that working has in one’s life at any given time (MOW-International Research Team, 1987). In general, work has been found to be of relatively high importance as compared with other areas of life (England, 1991; Ruiz-Quintanilla & Wilpert, 1991). It is usually considered to be of more importance than leisure, community and religion, and was found in several studies to be ranked second only to family (Harding & Hikspoors, 1995; Harpaz, 1999; MOW International Research Team, 1987). High work centrality has been found to be related positively with important organizational variables, such as job satisfaction, participation in decision-making (Kanungo, 1982) and longer job tenure (Dubin et al., 1975). GUYLAINE LANDRY ((*Université de Sherbrooke*), ALEXANDRA PANACCIO (*University of Illinois at Chicago*), CHRISTIAN VANDENBERGHE (*HEC Montréal, Montréal, Canada*) “Dimensionality and Consequences of Employee Commitment to Supervisors: A Two-Study Examination” *The Journal of Psychology*, 2010, 144(3), 285–312) Researched on the 3-component model of organizational commitment— affective, normative, and continuance—has suggested that continuance commitment comprises 2 subcomponents, perceived lack of alternatives and sacrifice. The authors aimed to extend that research in the context of employees’ commitment to their immediate supervisors. Through two studies, they examined the validity and consequences of a 4-factor model of commitment to supervisors including affective, normative, continuance-alternatives, and continuance-sacrifice components.

#### IV. RESEARCH METHODOLOGY

Methodology includes selecting standardized questionnaire to collect the responses of the employees of telecom sector in India. A comprehensive secondary data collection from vast information available on internet like articles, research papers etc. A rigorous analysis was done examining the relationship between meaning of work and employee commitment. Three parameters were taken as key factors in understanding meaning of work namely, leadership (contingent award, intellectual stimulation, management by exception, Laissez-faire leadership, idealized influence, inspirational motivation and individual consideration), and personality (Internality, externality-others, externality-chance) and employee engagement where as in employee commitment, three model of commitment was taken into account and thus affective, normative and continuance commitment were taken. Finally a study of relationship between them is found out.

#### V. FINDINGS

##### Findings of the study are given below

Table 1, 2 3 and 4 shows the correlation between meaning of work and its sub components & employees organizational commitment. Table 2 & 4 reveals a positive correlation between leadership and employee commitment and personality and employees’ commitment respectively while table 3 reveals a negative correlation between employee engagement and employees’ commitment.



**Table-1: Correlation between “Meaning of Work and Employee Commitment”**

		CONTINGENT AWARD	INTELLECTUAL STIMULATION	MANAGEMENT BY EXCEPTION	LAISSEZ-FAIRE LEADERSHIP	IDEALIZED INFLUENCE	INSPIRATIONAL MOTIVATION	INDIVIDUAL CONSIDERATION	INTERNALITY PERSONALITY	EXTERNALITY OTHERS PERSONALITY	EXTERNALITY CHANCE PERSONALITY	EMPLOYEE ENGAGEMENT	AFFECTIVE COMMITMENT	NORMATIVE COMMITMENT	CONTINUANCE COMMITMENT
CONTINGENT AWARD	Pearson Correlation Sig. (2-tailed) N	1 .070 70	.218 .070 70	.423** .000 70	.423** .000 70	.786** .000 70	.327** .006 70	.286* .017 70	.189 .117 70	.134 .270 70	.286* .017 70	.071 .557 70	.643** .000 70	.000 1.000 70	.124 .306 70
INTELLECTUAL STIMULATION	Pearson Correlation Sig. (2-tailed) N	.218 .070 70	1 .000 70	.645** .000 70	-.645** .000 70	.327** .006 70	.667** .000 70	.218 .070 70	.866** .000 70	-.408** .000 70	-.327** .006 70	.327** .006 70	.764** .000 70	.000 1.000 70	-.149 .219 70
MANAGEMENT BY EXCEPTION	Pearson Correlation Sig. (2-tailed) N	.423** .000 70	.645** .000 70	1 .000 70	-.500** .000 70	.423** .000 70	.645** .000 70	.423** .000 70	.224 .063 70	.000 1.000 70	-.423** .000 70	.423** .000 70	.423** .000 70	.500** .000 70	-.040 .744 70
LAISSEZ-FAIRE LEADERSHIP	Pearson Correlation Sig. (2-tailed) N	.423** .000 70	-.645** .000 70	-.500** .000 70	1 .000 70	.000 1.000 70	-.645** .000 70	-.423** .000 70	-.447** .000 70	.000 1.000 70	.845** .000 70	.000 1.000 70	.000 1.000 70	-.500** .000 70	.179 .139 70
IDEALIZED IN- FLUENCE	Pearson Correlation Sig. (2-tailed) N	.786** .000 70	.327** .006 70	.423** .000 70	.000 1.000 70	1 .000 70	.764** .000 70	.786** .000 70	.378** .001 70	.535** .000 70	-.286* .017 70	-.429** .000 70	.429** .000 70	.423** .000 70	.077 .525 70
INSPIRATIONAL MOTIVATION	Pearson Correlation Sig. (2-tailed) N	.327** .006 70	.667** .000 70	.645** .000 70	-.645** .000 70	.764** .000 70	1 .000 70	.873** .000 70	.577** .000 70	.408** .000 70	-.764** .000 70	-.327** .006 70	.327** .006 70	.645** .000 70	-.056 .643 70
INDIVIDUAL CONSIDERATION	Pearson Correlation Sig. (2-tailed) N	.286* .017 70	.218 .070 70	.423** .000 70	-.423** .000 70	.786** .000 70	.873** .000 70	1 .000 70	.189 .117 70	.802** .000 70	-.786** .000 70	-.643** .000 70	-.071 .557 70	.845** .000 70	.023 .847 70
INTERNALITY PERSONALITY	Pearson Correlation Sig. (2-tailed) N	.189 .117 70	.866** .000 70	.224 .063 70	-.447** .000 70	.378** .001 70	.577** .000 70	.189 .117 70	1 .003 70	-.354** .003 70	-.189 .117 70	.000 1.000 70	.756** .000 70	-.224 .063 70	-.133 .272 70
EXTERNALITY (OTHERS) PERSONALITY	Pearson Correlation Sig. (2-tailed) N	.134 .270 70	-.408** .000 70	.000 1.000 70	.000 1.000 70	.535** .000 70	.408** .000 70	.802** .000 70	-.354** .003 70	1 .000 70	-.535** .000 70	-.802** .000 70	-.535** .000 70	.791** .000 70	.113 .352 70
EXTERNALITY (CHANCE) PERSONALITY	Pearson Correlation Sig. (2-tailed) N	.286* .017 70	-.327** .006 70	-.423** .000 70	.845** .000 70	-.286* .017 70	-.764** .000 70	-.786** .000 70	-.189 .117 70	-.535** .000 70	1 .000 70	.429** .000 70	.286* .017 70	-.845** .000 70	.091 .456 70
EMPLOYEE EN- GAGEMENT	Pearson Correlation Sig. (2-tailed) N	.071 .557 70	.327** .006 70	.423** .000 70	.000 1.000 70	-.429** .000 70	-.327** .006 70	-.643** .000 70	.000 1.000 70	-.802** .000 70	.429** .000 70	1 .000 70	.429** .000 70	-.423** .000 70	-.057 .639 70
AFFECTIVE COMMITMENT	Pearson Correlation Sig. (2-tailed) N	.643** .000 70	.764** .000 70	.423** .000 70	.000 1.000 70	.429** .000 70	.327** .006 70	-.071 .557 70	.756** .000 70	-.535** .000 70	.286* .017 70	.429** .000 70	1 .000 70	-.423** .000 70	-.044 .720 70
NORMATIVE COMMITMENT	Pearson Correlation Sig. (2-tailed) N	.000 1.000 70	.000 1.000 70	.500** .000 70	-.500** .000 70	.423** .000 70	.645** .000 70	.845** .000 70	-.224 .063 70	.791** .000 70	-.845** .000 70	-.423** .000 70	-.423** .000 70	1 .000 70	.020 .870 70
CONTINUANCE COMMITMENT	Pearson Correlation Sig. (2-tailed) N	.124 .306 70	-.149 .219 70	-.040 .744 70	.179 .139 70	.077 .525 70	-.056 .643 70	.023 .847 70	-.133 .272 70	.113 .352 70	.091 .456 70	-.057 .639 70	-.044 .720 70	.020 .870 70	1 70

\*\*. Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

**Table-2: Correlation between “Leadership and Employee Commitment”**

	LEADERSHIP	COMMITMENT
LEADERSHIP Pearson Correlation	1	.556
Sig. (2-tailed)		.000
N	70	70
COMMITMENT Pearson Correlation	.556	1
Sig. (2-tailed)	.000	
N	70	70

\*\*. Correlation is significant at the 0.01 level (2-tailed).

**Table-3: Correlation between “Employee Engagement and Employee Commitment”**

		EMPLOYEE ENGAGEMENT	COMMITMENT
EMPLOYEE ENGAGEMENT	Pearson Correlation	1	-.009
	Sig. (2-tailed)		.944
	N	70	70
COMMITMENT	Pearson Correlation	-.009	1
	Sig. (2-tailed)	.944	
	N	70	70

**Table-4: Correlation between “Personality and Employee Commitment”**

		COMMITMENT	PERSONALITY
COMMIT- MENT	Pearson Correlation	1	.359*
	Sig. (2-tailed)		.002
	N	70	70
PERSONAL- ITY	Pearson Correlation	.359*	1
	Sig. (2-tailed)	.002	
	N	70	70

\*\*. Correlation is significant at the 0.01 level (2-tailed).

## VI. CONCLUSIONS

The research conducted shows that their positive relationship between employee commitment and meaning of work. Also it is very clear from the above tables that where personality and leadership show a positive relation with employee commitment, employee engagement shows a negative relation. To enhance the employees' commitment, leaders' need to depict the characteristics of intellectual stimulation and management by exception and must give personal consideration to their employees. Furthermore, the study shows that the personality of the employees also affects their commitment level.

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## VIII. ANNEXURES

### QUESTIONNAIRE

This questionnaire is designed to find out some of the values, beliefs and practices of the organizations. Questionnaire is divided in four parts each catering different aspects of your organization. Please read the statements carefully and indicate to what extent the statement is true for your organization. Please be frank and be assured that data is used for academic purposes only.

Please fill in your details

NAME:	
AGE:	
GENDER:	
ORGANIZATION:	
ROLE:	
NO. OF YEARS OF SERVICE:	
CONTACT DETAILS:	

### PART A

For statement 1 to 21 use the following key to your responses:

Mark 4:	Mark 3:	Mark 2:	Mark 1:	Mark 0:
Frequently, if not always	Fairly often	Sometimes	Once in a while	Not at all



S.No.	Statement	4	3	2	1	0
1.	I make others good to be around me.					
2.	I express with few simple words what we could do and should do.					
3.	I enable others to think about old problems in new ways.					
4.	I help others develop themselves.					
5.	I tell others what to do if they want to be rewarded for their work.					
6.	I am satisfied when others meet agreed upon standards.					
7.	I am content to let others continue working in the same ways always.					
8.	Others have complete faith in me.					
9.	I provide appealing images about what we can do.					
10.	I provide others with new ways of looking at puzzling things.					
11.	I let others know how I think they are doing					
12.	I provide recognition/rewards when others reach their goals.					
13.	As long as things are working, I do not try to change anything.					
14.	Whatever others want to do is OK with me.					
15.	Others are proud to be associated with me.					
16.	I help others find meaning in their work.					
17.	I get others to rethink ideas that they had never questioned before.					
18.	I give personal attention to others who seem rejected.					
19.	I call attention to what others can get for what they accomplish.					
20.	I tell others the standards they have to know to carry out their work.					
21.	I ask no more of others than what is absolutely essential.					

## PART B

For statement 1to 30 use the following key to your responses:

Mark 4: Strongly feel this way	Mark 3: Generally feel this way	Mark 2: Somewhat feel this way(and somewhat not)	Mark 1: Slightly feel this way	Mark 0: Hardly or never feel this way
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S.No.	Statement	4	3	2	1	0
1.	I can largely determine what matters to me in the organization.					
2.	The course of my career largely depends on me.					
3.	My success or failure depends mostly on the amount of effort I put in.					
4.	The persons who are important control most matters here.					
5.	To a large extent, my career depends on my seniors.					
6.	My effectiveness in this organization is mostly determined by senior people.					
7.	The organization or the job one joins are to a large extent, accidental happenings.					
8.	One's career is to a great extent, a matter of chance.					
9.	Success of a person depends on the breaks or chances he/she gets.					
10.	Successful completion of assignments is mainly due to my detailed planning and hard work.					
11.	Being liked by seniors or making a good impression usually influence promotion decisions.					
12.	Getting rewards in the organization is a matter of luck.					
13.	Success of one's plans to a large extent is, a matter of luck.					
14.	Getting promotion largely depends on my being in the right place at the right time.					
15.	Senior person's preference determines who could be rewarded in the organization.					
16.	My success, to a large extent, depends on my competence and hard work.					
17.	How much I am liked in the organization depends on my seniors.					
18.	It is a matter of luck that people listen to you.					
19.	If my seniors do not like me, I probably would not succeed in this organization.					

20.	Usually I am responsible for getting, or not getting, rewards.					
21.	My success or failure is mostly on those who work with me.					
22.	My promotion in the organization depends mostly on my ability and effort.					
23.	My experience is that most things in the organization depends mostly on my ability and effort.					
24.	My experience is that most things in the organization are beyond one's control.					
25.	I can work hard enough to get my suggestions accepted in the organization.					
26.	I am acceptable to others in my organization because I am lucky.					
27.	Generally, I determine what happens to me in the organization.					
28.	My acceptability to others will depend on my behavior with them.					
29.	My ideas get accepted if I make them fit with the desires of my seniors.					
30.	Pressure groups are more powerful (and control things) in the organization than individual employees.					

### PART C

For statement 1to 24 use the following key to your responses:

Mark 5: Strongly Agree		Mark 4: Agree	Mark 3: Neutral	Mark 2: Disagree	Mark 1: Strongly disagree				
S.No.	Statement	5	4	3	2	1			
1.	I would be very happy to spend the rest of my career with this organization.								
2.	I enjoy discussing my organization with people outside it.								
3.	I really feel as if this organization's problems are my own.								
4.	I think that I could easily become as attached to another organization as I am to this one.*								
5.	I do not feel like 'part of the family' at my organization.*								
6.	I do not feel 'emotionally attached' to this organization.*								
7.	This organization has a great deal of personal meaning for me.								
8.	I do not feel a <i>strong</i> sense of belonging to my organization.*								
9.	I am not afraid of what might happen if I quit my job without having another one lined up.*								
10.	It would be very hard for me to leave my organization right now, even if I wanted to.								
11.	Too much in my life would be disrupted if I decided I wanted to leave my organization now.								
12.	It wouldn't be too costly for me to leave my organization now.*								
13.	Right now, staying with my organization is a matter of necessity as much as desire.								
14.	I feel that I have too few options to consider leaving this organization.								
15.	One of the few serious consequences of leaving this organization would be the scarcity of available alternatives.								
16.	One of the major reasons I continue to work for this organization is that leaving would require considerable personal sacrifice — another organization may not match the overall benefits I have here.								
17.	I think that people these days move from company to company too often.								
18.	I do not believe that a person must always be loyal to his or her organization.*								
19.	Jumping from organization to organization does not seem at all unethical to me.*								
20.	One of the major reasons I continue to work for this organization is that I believe that loyalty is important and therefore feel a sense of moral obligation to remain.								
21.	If I got another offer for a better job elsewhere I would not feel it was								

	right to leave my organization.					
22.	I was taught to believe in the value of remaining loyal to one organization.					
23.	Things were better in the days when people stayed with one organization for most of their careers.					
24.	I do not think that wanting to be a 'company man' or company woman' is sensible anymore.*					

#### PART D

For statement 1 to 12 use the following key to your responses:

Mark 5: Strongly Agree		Mark 4: Agree	Mark 3: Neutral	Mark 2: Disagree	Mark 1: Strongly disagree				
S.No.	Statement	5	4	3	2	1			
1.	I know what is expected of me at work.								
2.	I have the materials and equipment.								
3.	At work, I have the opportunity to do what I do best every day.								
4.	In the last seven days, I have received recognition or praise for doing good work.								
5.	My supervisor, or someone at work, seems to care about me as a person.								
6.	There is someone at work who encourages my development.								
7.	At work, my opinions seem to count.								
8.	The mission or purpose of my company makes me feel my job is important.								
9.	My associates or fellow employees are committed to doing quality work.								
10.	I have a best friend at work.								
11.	In the last six months, someone at work has talked to me about my progress.								
12.	This last year, I have had opportunities at work to learn and grow.								

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**AN ANALYSIS INTO THE EFFICIENCY OF JAN DHAN YOJANA – A REVOLUTIONARY FINANCIAL INCLUSION PROGRAM**

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**ABSTRACT**

*“Pradhan Mantri Jan Dhan Yojana (PMJDY)” was the first social welfare scheme launched by the Prime Minister of India, Mr. Narendra Modi on 28 August 2014. The main objective of this scheme is to ensure universal access to banking facilities with at least one basic bank account for every household. This research paper includes financial inclusion, inclusive growth, threats and strategy of the scheme etc.*

*Keywords: Financial Inclusion, Financial Services, Banking habits*

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**INTRODUCTION**

Financial inclusion or inclusive financing is providing financial services at affordable costs for disadvantaged and low-income segments of society opposite to financial exclusion where those services are not available or affordable. An estimated 2.5 billion working age adults globally have no access to the various types of formal financial services provided by regulated financial institutions. Financial inclusion is an innovative concept which promote the banking habits and acts as facilitator in reducing the poverty and the launch of Pradhan Mantri Jan Dhan Yojana (PMJDY) by Government of India is in that direction. **Pradhan Mantri Jan-Dhan Yojana** (Prime Minister's People Money Scheme) (PMJDY) is National Mission for Financial Inclusion to ensure access to financial services, namely Banking Savings & Deposit Accounts, Remittance, Credit, Insurance, Pension in an affordable manner. This financial inclusion campaign was launched by the Prime Minister Narendra Modi on 28 August 2014. He had announced this scheme on his first Independence Day speech on 15 August 2014.

**OBJECTIVES OF THE STUDY**

- To study the need for financial inclusion in India.
- To discuss the salient features and basic pillars of PMJDY.
- To assess the progress made under the PMJDY.
- To make some suggestions for smooth functioning of this scheme

**KEY ELEMENTS OF PMJDY SCHEME**

1. **Universal access to banking facility:** Exclusions in financial sector will be reduced. District have been divided in to sub service area catering to 1000 to 1500 household for access to basic banking facility.
2. **Providing Basic Banking Accounts with overdraft facility and RuPay Debit card to all households:** Account holders have been provided a RuPay Debit Card and Facility of an overdraft to every basic banking account holder.
3. **Financial Literacy Program:** Financial literacy is an integral part of the Mission in order to let the beneficiaries make best use of the financial services being made available to them.
4. **Creation of Credit Guarantee Fund:** Creation of a Credit Guarantee Fund is to cover the defaults in overdraft accounts.
5. **Micro Insurance:** To provide micro- insurance to all willing and eligible persons by 14 August, 2018, and then on an ongoing basis.
6. **Unorganized sector Pension schemes like Swavalamban:** By 14 August, 2018 and then on an ongoing basis.

**PERFORMANCE OF THE SCHEME**

Run by Department of Financial Services, Ministry of Finance, on the inauguration day, 1.5 Crore (15 million) bank accounts were opened under this scheme. Guinness World Records Recognises the Achievements made under PMJDY, Guinness World Records Certificate says "The most bank accounts opened in 1 week as a part of financial inclusion campaign is 18,096,130 and was achieved by Banks in India from 23 to 29 August 2014". By 1 June 2016, over 22 crore (220 million) bank accounts were opened and 384.11 billion (US\$5.7 billion) were deposited under the scheme.

	Dec 14	Dec 15	Dec 16	May 17
Total Accounts	104.44	198.38	262.01	287.59
No. of Zero Balance Accounts(mn)	76.55	63.11	63.21	Na
Total balances (Rs. Mn)	85.534	292.235	710.366	641.632
Avg Balance in account (Rs.)	819	1473	2711	2231
Avg. Balance non zero accounts (Rs.)	3066	2160	3571	Na

Source: PM- Jan Dhan Website

The no. of accounts increased from 104 million to 288 million by May, 2017. But we need to analyse whether people are using these accounts or not. The average balance in the accounts increased and reached to maximum in December 2016. This is due to Demonetisation because many transfers were made both by households and those holding black money for conversion. But still the amount was just about 22 days of NREGA wages. After Demonetisation, money was withdrawn by around Rs. 500 per account. The no. of zero balance accounts decreased significantly from 73.3% in 2014 to 24.1% in 2016 but increased to 24.9 % in February 2017.

Before this scheme, RBI data on average size of deposits as of March 2014 shows that in rural areas, it was Rs 11,080/account, which rose to Rs 17,251 in semi-urban areas and Rs 36,056 in metro and urban areas. The average for the country was Rs 21,156/account. Two conclusions may be drawn here. The first is that the Indian banking system was doing an excellent job in terms of garnering funds from the business perspective and covered households. The second is that the present performance, even at its peak of Rs 3,571/account in 2016, is very low compared to the existing average. This raises questions about the savings capabilities in the country. Deposits in Jan Dhan accounts touched to Rs 64,564 crore by July 2017, of which over Rs 300 crore came in the first seven months of demonetization. Of these, 23.27 crore accounts were with public sector banks, 4.7 crore with regional rural banks and 92.7 lakh with private ones.

### THREATS OF PMJDY

1. There is big possibility of opening account under PMJDY from those who have account already. There is no check on the new account holder.
2. Regarding debit card implementation there may be slow roll out, logistics issue and possibility of misuse. In rural area network of ATM is less so people are not well versed with use of ATM.
3. No clarity if existing account holders would get 1 lakh accidental insurance coverage. It is also not cleared who is going to bear bill of insurance premium and cost to keep account running.
4. Even the cost of overdraft facility, and thereafter non recovery, no clarity that is bearing loss.
5. Creating new account is not a challenge but increasing transaction per account is a challenge. Existing saving accounts without *RuPay card* not to get other benefits.
6. Crores of Pradhan Mantri Jan Dhan Yojana (PMJDY) account-holders risk either having their accounts frozen or having charges imposed if they exceed four debit transactions in a month.
7. Vague wording of the Reserve Bank of India's guidelines on basic savings bank deposit accounts (BSBDA), which include PMJDY accounts, has led to banks conjuring up ways to cap free transactions.

### SUGGESTIONS

1. Under the PMJDY, each account holder are bound to get Rs. 5,000/- as overdraft loan without any collateral. If loan are not repaid then the overdraft facility of Rs. 15 crore is likely to become an economic burden on banks. It is, therefore, necessary to evolve basic guidelines for providing overdraft facility. A comprehensive pilot studies should be conducted in each district to assess the borrower's perception, the actual requirement, the use of overdraft facility and on-time
2. payment and settlement of draft loans. It is also suggested that the overdraft facility can be granted solely at the discretion of banks. "*Pradhan Mantri Jan Dhan Yojana (PMJDY)*" implemented in large scale requires determination and attitude towards success path. Very well said, root cause is 'financial untouchability' to eradicate poverty.
3. Managing a bank account and insurance coverage does not demand the person should be educated, it only required the basic knowledge which could be explained by anybody else.
4. Financial Inclusion requires sustained efforts over many years and emphasis on quality rather than quantity should be the priority. Government should review the speed at which it is currently targeting to achieve the goal of covering the whole India with bank accounts.

5. Certainly with a firm intent and infrastructural network of institutions the dream of financial services for all can be realized in the near future. A bold step in indeed required to withstand the heat of economic down surge and fight poverty, and the PMJDY is definitely a good fighting mechanism to check the poverty in India.

### **CONCLUSION**

The PMJDY is superior over the UPA's financial inclusion programme because the earlier programme had no focus on individual households. Further, there was no emphasis given on financial inclusion in urban areas. Again there was Know Your Customer ( KYC) norm to open an account which has restricted account opening. Lack of credit disbursement, untraceable business correspondents and maximum inactive accounts were some of the deficiencies in earlier schemes. The present PMJDY has addressed all the existing and possible deficiencies. This programme is in true sense one of the poverty alleviation programmes. Crores of poor people in India are still outside the organised financial system, despite the nationalisation of commercial banks long ago in 1969. Hence, this is the mission to eradicate poverty through the financial inclusion programme. The poor and the underprivileged people in rural, semi-urban and urban areas are expected to get all the benefits such as financial inclusion, financial stability and financial freedom through the PMJDY. But the question is that Do these households actually have money to save considering their low incomes? This is relevant because with gross economic deprivation, households hardly have anything left for saving. Do the households who have been given such accounts know how to operate them, has there been any awareness programme carried out to educate them on these benefits? Are the positive balances here only on account of the direct beneficiary here only on account of the direct benefit transfers of the government, where payments on NREGA or pensions or other subsidies made through these accounts? These questions are important as they do involve a cost which banks have to currently bear as these are no-frills zero cost accounts being provided to all and sundry. These accounts are an initiative shown by the public sector banks with their share being around 80%, followed by regional rural banks with 16-18%. Both have borne the cost of this scheme. Private sector banks have averaged around 3.2-3.5%. The leading states are UP, Bihar, West Bengal, Maharashtra, Manipur, Rajasthan, Chhattisgarh, Assam and Odisha. A thought worth pondering over is that if PSBs in the normal course were doing a good job of coverage and Jan Dhan has acted more as a channel for government transfers, the addition of small banks and payments banks would only make the canvas more competitive with each segment fighting for a limited piece. It does appear that we may have reached the end of the road where improvement can accrue only if incomes increase and having more institutions and schemes may not add a significant delta to the frame.

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**INDIAN BANKING IN THE DIGITAL ERA AND THE RELEVANCE OF INFORMATION SECURITY RISK MANAGEMENT SYSTEMS: A MACRO PERSPECTIVE**

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**ABSTRACT**

*Ever since the initiation of reforms in Indian banking in 1992, the sector has been growingly adopting the advances in the field of Information and Communication Technology (ICT). Constant adoption of ICT by banks in India has resulted in clear benefits to the banks like enhanced customer service, lower transaction costs, wider range of delivery channels and range of products, etc. The pace of ICT adoption by banks in India has been still higher in post-2010 scenario, particularly in respect of the use of financial technologies. In spite of the obvious benefits of ICT as above, there are growing instances of risks associated with ICT, particularly those associated with information security. Demonetisation (DeMo) process initiated in India in November 2016 that resulted in a surge in digital transactions, huge scam that occurred in Punjab National Bank (PNB) in February 2018, etc. all underscore the need for sound systems for management of information security, particularly cyber security. The central bank of the country viz. Reserve Bank of India (RBI) has been advising the banks to stay vigilant on security risks. In the aftermath of the recent PNB scam, the RBI has further tightened the security norms. In this context, this paper makes a macro level study of the need for robust information security risk management systems in Indian banks, particularly those related to cyber security management. The paper relooks the RBI initiatives in this regard and makes suggestions for management of information security risks.*

*Keywords: ICT, Financial Technologies, Information Security Risk, Cyber Security.*

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**1. INTRODUCTION**

Proliferation of Information and Communication Technology (ICT) throughout the entire organization has notably been one of the most important developments in organizations worldwide, over the last four decades. After the invention of microprocessors in early 1980s computing power have been growing at exponential rates, and the cost of acquiring and implementing information technology has been steadily declining too. The availability of low cost "personal computers" and "super mini computers" has given new options for software companies to come up with innovative and powerful applications which can run in massively networked environments whether it is wide area networks (WAN) or local area networks (LAN). With the emergence of this new type of computing environment companies are fast moving from the "Mainframe" computing era (wherein computing resources and data processing are concentrated at specific locations of the organizations) to decentralized information processing environments called "Distributed Computing" wherein data collection and processing are moved into multiple locations. Advances in technology has enabled the interconnection between different levels of an organization to a central location using different types of connectivity, like, telephone lines, satellite communication channels etc.

One industry which has embraced the advances in ICT in a big way is the Financial Services Industry (FSI), particularly Banking Services. Use of advances in ICT has enabled banking industry to come up with better and faster services to its customers at lower cost and hence to improve the operational efficiency and productivity. With the large-scale adoption of ICT a new type of risk has emerged for FSI companies viz. Information Security Risk, or the risk associated with ensuring the security of information under their control. So, management of information security has emerged as one of the topmost priorities of banks worldwide. Over the two decades, progressive banks across the globe have been giving added significance for addressing security concerns arising from greater use of ICT. Threats like cyber-terrorism, intentional sabotage by one's own employees, frauds and malpractices, viruses and malicious codes from external sources, unauthorized system access etc. are on the rise. All these suggest sound defense mechanisms to prevent disruption of business.

**2. LITERATURE REVIEW**

In his macro level study, Manoj P K (2007) [7], "ICT Industry in India: A SWOT Analysis" in *Journal of Global Economy*, has discussed the problems, prospects, opportunities and threats of ICT sector in India and has suggested strategies for its sustained growth. Another macro study by Manoj P K (2012) [14], "Information and Communication Technology (ICT) for Effective Implementation of MGNREGA in India: An Analysis" has noted the vital significance of ICT for faster, hassle-free, and transparent implementation of MGNREGA. Need

for ICT, its benefits, ICT success stories (e.g. MGNREGA in Rajasthan), challenges in ICT adoption etc. are discussed. Neeraja James and Manoj P K (2014) [17] in their paper “Relevance of E-Banking in the Rural Area – An Empirical Investigation” have studied the relevance of E-banking services with a focus on a rural area in Kerala and have suggested measures for better reach of banking in rural areas. An empirical study on e-CRM by Manoj P K, Jacob Joju, and Vasantha (2014) [16] “Impact of E-CRM on Commercial Banking: An Empirical Investigation with Reference to Private Sector Banks in Kerala” in *International Journal of Applied Financial Services & Marketing Perspectives (IJAFSMP)* has revealed that most of the customers of private sector have used CRM including different ICT-based services. Majority of customers and bank officials preferred e-CRM and ICT-based services and bank marketing. In a study by Jacob Joju, Vasantha S and Manoj P.K. (2015)[19], “E-CRM: A Perspective of Urban and Rural Banks in Kerala” in *International Journal of Recent Advances in Multidisciplinary Research*, the authors have compared the acceptance of e-CRM among the urban and rural customers. It has been noted that e-CRM is more accepted among the urban customers, and that rural customers have more preference of ‘human factor’ in the services than their urban counterparts. In his recent paper, Manoj P. K (2016) [22], “Bank Marketing in India in the Current ICT Era: Strategies for Effective Promotion of Bank Products” in *International Journal of Advance Research in Computer Science and Management Studies* the need for adoption of ICT for effective delivery of bank products is highlighted. Of the six bank marketing strategies suggested, the sixth strategy is about the effective use of e-CRM. Another field-based study on e-CRM by Jacob Joju, Vasantha S., & Sony Joseph (2016) [24], “E-Leveraging e-CRM for Future” in *Indian Journal of Science and Technology*, has pointed out the need for leveraging e-CRM in today’s competitive scenario for survival and growth of banks. Reserve Bank of India (RBI) publication authored by Maiti, Sasanka, S. (2017)[25], “From Cash to Non-cash and Cheque to Digital” has studied the impact of the RBI initiatives to promote non-cash (digital) mode transactions, the progress of such initiatives, and has noted that there has been ‘fundamental shift’ towards non-cash (digital) transactions in the ongoing era of Demonetisation (‘DeMo’) since 8 Nov. 2016.

A study by Lakshmi and Manoj P. K (2017) [27], “Rural Customers and ICT-based Bank Products A Study with a Focus on Kannur District Co-operative Bank and Kerala Gramin Bank” in *International Journal of Economic Research (IJER)* has noted the growing acceptance of ICT-based products among rural customers. While ICT adoption is required, equally important is staff training and their skill development. A ‘human touch’ needs to be ensured by bank staff in their services. Despite many studies on the impact of ICT on Indian banks, those on the management of information security or cyber security are less. This is the gap identified located for this study.

### **3. RELEVANCE AND SIGNIFICANCE OF THE STUDY**

Indian banking and financial system has been undergoing a paradigm shift ever since the initiation of banking sector reforms in 1992. This shift gained momentum in the latter half of 1990s. The implementation of the recommendations of Narasimham Committee I and II gave the much desired operational freedom to the functioning of banks to a large extent. In the deregulated environment a few very dynamic New generation Private sector Banks (NPBs) all of which having the latest technological base, and at the same time lesser social obligations by virtue of their enactments, emerged. On the other hand, the Foreign Banks (FBs) functioning in India which were already using high-end technology became much more active. These two types of banks viz. NPBs and FBs could provide superior customer service and hence attract more customers, by leveraging on their advanced technological base. In this scenario, Public Sector Banks (PSBs) and Old Private sector Banks (OPBs) which were lagging behind in respect of advanced technology started upgrading their technology to catch up with the NPBs and FBs, in order to equally competitive. By the early 2010s, when two decades have elapsed since the initiation of banking sector reforms in 1992, competition has become fierce in the banking and financial services industry. With a view to withstand competition, for providing superior customer service and also for cost advantages, all banks irrespective of their type and size have started embracing ICT in a big way. Financial technology (‘Fin Tech’) has already emerged as a means of new technology and innovation. Fin Tech seeks to compete with traditional financial methods in the delivery of financial services. Large scale adoption of Fin Tech solutions by banks over the last few years has further increased. In this context, it is relevant to study the need for information security management in Indian banks, particularly those related to cyber security, after considering the global developments and practices, the stipulations of international regulatory authorities, the RBI directives, and so on.

### **4. OBJECTIVES OF THE STUDY**

- (i) To study the relevance and significance of management of information system security particularly cyber security in the ongoing reforms era in Indian banking;



- (ii) To study the configuration of major information security implementation frameworks, with a focus on COBIT (Control Objectives for Information and Related Technologies);
- (iii) To study the trends in the management of information security, particularly cyber security, by Indian banks and the regulatory role by the central bank viz. the RBI; and
- (iv) To suggest strategies for effective adoption of information security systems by Indian banks.

## 5. METHODOLOGY AND DATA SOURCES

The methodology is descriptive, analytical and exploratory. It is descriptive to the extent that it explains the various information security concepts, implementation frameworks, regulatory guidelines etc. It is analytical to the extent that it analyses the current state of information security practices with a view to arrive at some general features and common trends. Further, it is exploratory also to the extent that by projecting the facts arrived at, as above, it tries to identify the best course of action for the future. The sources of data are primarily secondary in nature and include the publications of various banking regulatory authorities (like, BCBS and World Bank), research reports well-known organizations, survey reports, reports of the RBI etc.

## 6. INFORMATION SECURITY: CONCEPT, RELEVANCE AND SIGNIFICANCE

The U.S. National Information Systems Security Glossary defines Information systems Security as “*the protection of information systems against unauthorized access to or modification of information, whether in, processing or transit, and against the denial of service to authorized users or the provision of service to unauthorized users, including those measures necessary to detect, document, and counter such threats*”. Prime responsibility of any Information Security (IS) management framework is to ensure confidentiality, integrity and availability of resources it strives to protect. Information systems assets are under constant threat of loss from large range of internal or external sources which may be intentional or unintentional actions. Intentional acts include fraud, theft, hacking, cracking, viruses, malicious programs, sabotage or industrial espionage by internal or external entities. Unintentional actions includes acts of God earthquakes, fires, floods, storms, accidents like water spills, fires due to electrical short circuiting etc. and accidental modifications/erasure of data by unskilled staff. Prediction and valuations of loss amounting to unintentional acts are more difficult due to its random nature. Planning mechanisms to safeguard information resources against unintentional acts are also extremely difficult. Compared to unintentional acts, management of risks arising due to intentional acts, are possible to a large extent by better planning and control of processes of information assets to be protected. The following are the processes causing loss because of intentional and unintentional acts, according to Leslie (1999) [1]: (1) *Modification* – can occur to stored data, hardware, software and transmissions via human error, acts of God, fraud, hacking and the like; (2) *Destruction* – affects hardware, software, data and transmissions and can occur through sabotage, hacking, human error, accidents, acts of God and viruses; (3) *Fabrication* – applies to data and transmissions, mainly from acts of industrial espionage, hacking and fraud; (4) *Disclosure*- occurs from leakage of data and transmissions, unauthorized access, industrial espionage and hacking; (5) *Interruption* – and Denial of Service can affect hardware, software and data via acts of hacking, industrial espionage, viruses, acts of God, accidents and human error; (6) *Theft* – of hardware, software and data can occur through acts of hacking, industrial espionage, copyright infringement and the stealing of physical property. To manage these threats effectively, management must understand the nature of the threats and the possible outcomes these pose to their information asset. Information protection is defined as “*the protection of, and recovery from, unauthorised disruption, modification, disclosure or use of information and information resources, whether accidental or deliberate*”. Although management of Information Security (IS) plays a vital part in running an organization, many executive boards have not given it the required priority. One finding of Global Information Security Survey 2004 (GISS '04)[2] conducted by Ernst & Young is “Just 20 per cent strongly agreed that their organizations perceive IS as a CEO level priority”. Other major findings are:

- (i) Respondents have named “lack of security awareness by users” as the top obstacle to effective information security, however, only 28 per cent have listed “raising employee information security training or awareness” as being a top initiative in 2004.
- (ii) “Employee misconduct involving information systems” has been cited as a distant number two concern behind “major virus, Trojan horse or Internet worms” regardless of geographic region, industry or organizational size.
- (iii) Less than half of the respondents have provided their employees with ongoing training in security and controls.

- (iv) Only 24 per cent have given their information security department the highest rating in meeting the needs of the organization.
- (v) Only 11 per cent deem government security-driven regulations as being highly effective in improving their information security posture or in reducing data protection risks

The survey have identified the significance of “human” angle in the whole ecosystem of IS management. Survey recommends IS management initiatives should be people-centric and the whole process should originate from the head of the organization. CEOs should involve themselves in the security policy formulation phase to implementation phase. Survey points out “There is no factor more influential than senior management setting the tone that information security is important and that individuals – including senior and middle management—will be held accountable for their actions. Senior management must develop an appreciation for the capabilities and limitations of IS. If senior management doesn’t believe in IS, why should anyone else follow it?”. Many earlier studies have noted that effective IS management requires fine calibration of main elements involved viz. (i) People – training and empowering people, (ii) Process – evolving a information security policy, building rules and regulations for enforcing it, (iii) Technology – ensuring maximum use of available IT resources and filling the gaps which could allow outsiders access to IS resources employed.

## 7. INFORMATION SECURITY IMPLEMENTATION FRAMEWORKS

Any information security implementation framework/model focuses on weaving a system around the three fundamental aspects - Confidentiality, Integrity, and Availability. In addition to these, three other factors are considered while building an organizational information security structure viz. Efficiency, Compliance, Reliability. Any framework/model developed addresses mechanisms to prevent breach of the above mentioned aspects. Major frameworks available for organizations to model their information security schema are given in Table I.

**Table-I: Major Information Security Frameworks**

Framework	Description
CCTA Risk Analysis and Management Method ( CRAMM V) [3]	Developed by UK Government's Central Computer and Telecommunications Agency in 1985. CRAMM Version 5.0 is launched containing CRAMM Express functionality and the updated BS 7799 Part II in 2003
Federal Information System Controls Audit Manual (FISCAM) [4]	Developed by US General Accounting Office describes the computer-related controls, including security controls, that auditors should consider when they audit integrity, reliability and availability of computerized data.
IT Baseline Protection Manual (IT BPM)[5]	Developed by Federal Office for Information Security, Germany aims to achieve a security level for IT systems that is reasonable and adequate to satisfy normal protection requirements. Discusses a comprehensive framework that includes appropriate application of organisational, personnel, infrastructural and technical standard security safeguards.
COBIT: Control Objectives for Information and Related Technologies [6]	A set of IT audit guidelines developed by Information Systems Audit and Control Association (ISACA) a professional body based in US.
Octave / Octave-S [7]	Developed by Software Engineering Institute of Carnegie Mellon University (CMU-SEI), US. OCTAVE is self-directed, meaning that people from an organization assume responsibility for setting the organization’s security strategy
Common Body of Knowledge (CBK) - International Information Systems Security Certification Consortium, (ISC)2 [8]	Compendium of information security knowledge in 10 functional domains listed below: Access Control Telecommunications and Network Security Security Management Applications Security

	Cryptography Security Architecture Operations Security Business Continuity Planning Law Investigations and Ethics Physical Security
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Source: Authors' compilation from the sources specified.

Control Objectives for Information and Related Technologies (COBIT) released by IT Governance Institute (ITGI), supported by Information Systems Audit and Control Association has become one of the most accepted frameworks for implementing information security in organizations worldwide. Being a standard developed and maintained by experts from all over the world COBIT enjoys global patronage and support. First edition of COBIT was issued in 1996 and it was updated many times after that. Latest version of COBIT was released in 2004. It is very widely recognized that COBIT is suitable as an authoritative and up-to-date set of information technology control objectives for efficient and effective IT governance in organizations. IT governance is defined as “A structure of relationships and processes to direct and control the enterprise in order to achieve the enterprise’s goals by adding value while balancing risk versus return over IT and its processes” [6]. COBIT framework tries to improve IT governance in organizations by addressing the following *Information Criteria* – Confidentiality, Integrity, Availability, Efficiency, Compliance and Reliability of the following *IT Resources* - People, Applications, Technology, Facilities and Data through the following *COBIT Processes* - Plan and Organize (PO), Acquire and Implement(AI), Deliver and Support(DS), Monitor and Evaluate (M). Details of processes to be addressed in each of the four main domains in COBIT are presented in Table II.

**Table-II: COBIT Processes [6]**

COBIT Domain	Processes
Plan and Organise (PO)	PO1 Define a Strategic Information Technology Plan PO2 Define the Information Architecture PO3 Determine Technological Direction PO4 Define the Information Technology Organisation and Relationships PO5 Manage the Information Technology Investment PO6 Communicate Management Aims and Direction PO7 Manage Human Resources PO8 Ensure Compliance with External Requirements PO9 Assess Risks PO10 Manage Projects PO11 Manage Quality
Acquire and Implement (AI)	AI1 Identify Solutions AI2 Acquire and Maintain Application Software AI3 Acquire and Maintain Technology Infrastructure AI4 Develop and Maintain Procedures AI5 Install and Accredited Systems AI6 Manage Changes
Deliver and Support (DS)	DS1 Define and Manage Service Levels DS2 Manage Third-party Services DS3 Manage Performance and Capacity DS4 Ensure Continuous Service DS5 Ensure Systems Security DS6 Identify and Allocate Costs DS7 Educate and Train Users DS8 Assist and Advise Customers DS9 Manage the Configuration DS10 Manage Problems and Incidents DS11 Manage Data DS12 Manage Facilities DS13 Manage Operations
Monitor and Evaluate (M)	M1 Monitor the Processes M2 Assess Internal Control Adequacy M3 Obtain Independent Assurance M4 Provide for Independent Audit

Source: Authors' compilation from the sources specified.

COBIT framework has been developed using the Plan-Do-Check-Act (PDCA) of the Demming Cycle. The implementation of information security strategy starts with planning of the information need and usage of the organization with measurable and constructive indicators. The information systems have to be developed and installed as a part of “do” step in the cycle. After the implementation of the information systems its effectiveness and efficiency is measured and analyzed with the indicators defined in the “plan” phase during the “check” part of the cycle. Finally, any deviation is investigated and rectified during the “act” phase of the cycle. The complete cycle is repeated to make the IS preparedness of the organization, as perfect as possible, as defined in the overall security plan.

## 8. RECENT DEVELOPMENTS AND TRENDS IN IS AND ITS MANAGEMENT IN BANKS

Like any other sector the need and importance of management of information security is taken care of seriously by financial institutions including banks. The awareness among the executive management on the ramifications of breaches of information security due to deficiencies in their people, process, and technology has increased over the years. Focus on mitigation of information security risks got attention from bankers when Basel Committee on Banking Supervision (BCBS) added “operational risk” in “The New Basel Capital Accord” (popularly known as “Basel II Framework”) – a set of comprehensive regulatory framework for commercial banks all over the world, particularly the internationally active ones; having wide acceptance in the banking industry world-wide. In the earlier framework viz. Basel I framework, BCBS had mandated only for the management of market risk and credit risk. Addition of operational risk in Basel II framework is a very significant development. This points to the recognition given by BCBS of the fast growing significance of information security risks in banks, which in turn forms one of the basic constituents of operational risks in banks. In its “Consultative Document – The New Basel Capital Accord” – BCBS committee has given the following definition of Operational risk[9]: *“Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk”*. It may be noticed that the above definition indicates the sources from which operational risk arises as (i) internal processes (ii) people and (iii) systems. But, it may also be noted that these three are the most basic factors that affect information security; as already discussed earlier in this paper. Therefore, it may be stated that banking institutions can minimize their information security breaches as they align themselves with the policies and procedures for managing operational risks, as stipulated by international banking regulators like BCBS. Although an operation risk encompasses a wide variety of risks which might occur while doing business; in this IT era, it is the information security risk that occupies the central position of all risks. Even though bankers world-wide agree that operational risks are risks that should be regulated by domestic regulators they have difference of opinion on the implementation of operational risks management. The two main schools of thought centers around quantitative measurement (loss data approaches) / qualitative measurement technique (scorecard approach) and whether operational risks treated with Pillar One (Minimum Capital Requirements) or Pillar Two (Supervisory Review Process) of Basel II.[10]. We are not going to discuss in detail of controversies or implementation of Basel II accord in this paper. In their paper titled “Risk Management Principles for Electronic Banking” BCBS has identified 14 principles to help banking institutions expand their existing risk oversight policies and processes to cover their e-banking activities. The principles are covered under three main sections as given below [11]:

- **Board and Management Oversight (Principles 1 to 3)**

1. Effective management oversight of e-banking activities.
2. Establishment of a comprehensive security control process.
3. Comprehensive due diligence and management oversight process for outsourcing relationships and other third-party dependencies.

- **Security Controls (Principles 4 to 10)**

4. Authentication of e-banking customers.
5. Non-repudiation and accountability for e-banking transactions.
6. Appropriate measures to ensure segregation of duties.
7. Proper authorisation controls within e-banking systems, databases and applications.
8. Data integrity of e-banking transactions, records, and information.
9. Establishment of clear audit trails for e-banking transactions.

10. Confidentiality of key bank information.

• **Legal and Reputational Risk Management (Principles 11 to 14)**

11. Appropriate disclosures for e-banking services.

12. Privacy of customer information.

13. Capacity, business continuity and contingency planning to ensure availability of e-banking systems and services.

14. Incident response planning.

A careful analysis of the Risk management principles proposed by BCBS committee brings out the fact that these principles essentially address the fundamental aspects of information security management viz. Confidentiality, Integrity, and Availability. Many national regulators have come up with their own country-specific directives/regulations for implementation by the respective domestic banking institutions. These are largely based on the guidelines of BCBS committee, as well as widely accepted banking practices. Table III lists some of the major regulatory steps taken by various national regulators for management of information security risks. The Table shows two such Guidelines issued by the World Bank.

**Table-III: Regulatory Guidelines by Major National Regulatory Bodies, World Bank etc**

Regulation/Regulator/Country	Salient features
OCC BULLETIN (OCC 98-3), Office of the Comptroller of the Currency, US.	Provides guidance on how national banks should identify, measure, monitor, and control risks associated with the use of technology.
OCC BULLETIN (OCC 98-38), Office of the Comptroller of the Currency, US.	Technology Risk Management: PC Banking
OCC BULLETIN (OCC 2000-14), Office of the Comptroller of the Currency, US.	Infrastructure Threats – Intrusion Risks
Management Planning Guide for Information Systems Security Auditing (2001), National State Auditors Association and U.S General Accounting Office, US.	Gives steps for establishing or enhancing an IS auditing capability. These include planning, developing a strategy, implementing the capability, and accessing results.
Risk Management Guide for Information Technology Systems SP800-30 (2001), National Institute of Standards and Technology, US.	Gives a foundation for the development of an effective risk management program, containing both the definitions and practical guidance notes necessary for assessing and mitigating risks identified within IT systems.
Guide for Developing Security Plans for Information Technology Systems SP 800-18 (1998), National Institute of Standards and Technology, US.	Details principles involved and practices that should be followed to protect IT resources.
Technology Risk Management Guidelines for Financial Institutions (2003), Monetary Authority of Singapore, Singapore.	Provides financial institutions the required awareness on the myriad dimensions of technology risks, and the actions they should take to improve the use of IT and to protect their information assets.
Internet Banking Technology Risk Management Guidelines (2002), Monetary Authority of Singapore, Singapore.	Provides detailed guidelines to be followed while implementing Internet Banking facility.
OECD Guidelines for the Security of Information Systems and Networks (2002), Organization For Economic Co-Operation And Development, France.	Raise awareness about the risk to information systems and networks; the policies, practices, measures and procedures available to address those risks; and the need for their adoption and implementation among member countries.

Electronic Security: Risk Mitigation In Financial Transactions Public Policy Issues (2002),The World Bank, US.	Provides an in-depth discussion on electronic environments used in financial institutions including electronic settlements, payment gateways and certifying agencies.
Electronic Safety and Soundness Securing Finance in a New Age WB Working Paper. 26 (2004), The World Bank, US	In-depth documentation of mechanism required for fostering a secure environment and the safety and soundness of financial systems worldwide. Intended for those formulating policies in the area of electronic security and those working with financial services providers (such as executives and management). Contains detailed discussion of information security management methods relevant for chief information and security officers and others who are responsible for securing network systems.
United Kingdom (UK), Parliament (2016) in its 'National Cyber Security Strategy 2016-2021'	This national policy of UK sets out our plan to make Britain confident, capable and resilient in a fast-moving digital world.
European Union General Data Protection Regulation (EUGDPR) (2016), approved by EU Parliament on 14 April 2016. EUGDPR will be enforced with effect from 25 May 2018.	EUGDPR includes the most important change in data protection regulations in the entire EU region over the last 20 years. (After four years of preparation and debate EUGDPR was finally approved on 14 April 2016).

Source: Authors' compilation from the sources specified.

Table IV shows the major regulatory steps taken by the Reserve Bank of India (RBI) – the central bank or regulatory authority in India.

**Table-IV: Regulatory Guidelines by Reserve Bank of India (RBI), India**

Information System Audit – A review of Policies and Practices (2004), Reserve Bank of India, India.	Details the revised Guidelines on information security audit in the light of the Reports of Working Groups and earlier Guidelines issued by the RBI
Report of the Committee on Computer Audit (2002), Reserve Bank of India, India.	Compilation of standardized checklist for auditing information system resources of banks.
Guidance note on risk-based internal audit (2002), Reserve Bank of India, India.	Details concepts and modalities of switching over to risk-based internal audit. Guidelines for implementation of IS Audit as part of the risk-based internal audit system.
Working Group for Information System Security for the Banking and Financial Sector (2001), Reserve Bank of India, India	The Working Group was constituted to discuss and finalise standards and procedures for IS Audit and IS Security Guidelines for banking and financial sector. The report serves as a basic document for adopting standards and procedures on a wide range of IS audit and IS security issues.
Report on Internet Banking (2001), Reserve Bank of India, India	Examines different aspects of Internet banking from regulatory and supervisory perspective and recommend appropriate standards for adoption in India. The report highlighted several important security policy issues in Internet Banking.
Cyber Security Framework in Banks (2016), Reserve Bank of India, India.(RBI/2015-16/418 DBS.CO/CSITE/BC.11/33.01.001/2015-16)	This RBI Circular gives guidelines on Need for a Board approved Cyber Security Policy; Cyber Security Policy to be distinct from the broader IT policy/IS security policy of a bank; Arrangement for continuous surveillance; Making IT architecture conducive to

	security; Addressing network and database security comprehensively; Protection of customer information; Cyber Crisis Management Plan; Cyber security preparedness indicators; Sharing of information on cyber security incidents with RBI; Supervisory reporting framework; Assessment of gaps in preparedness to be reported to RBI, and Organizational arrangement.
Reserve Bank of India, India (2017 Feb. 28)  An Inter-disciplinary Standing Committee on Cyber Security was set up to, inter alia, review the threats inherent in the existing/ emerging technology; study adoption of various security standards/protocols; interface with stakeholders; and suggest appropriate policy interventions to strengthen cyber security and resilience.	While (in line with the June 2016 RBI Circular, as above) banks have taken several steps to strengthen their defenses, the diverse and ingenious nature of cyber-attacks necessitated an ongoing review of the cyber security landscape and emerging threats. The need for an interdisciplinary standing committee on cyber security was felt; the 6 <sup>th</sup> Bi-monthly Monetary Policy Statement 2016-17 proposed the constitution of the same.
Reserve Bank of India (2017, Sept. 08). Cyber security and cyber resilience framework for registrars to an issue/share transfer agents (RTAs).	RTAs perform the vital function of providing services to holders of securities. RTAs should have a robust cyber security/cyber resilience framework to provide uninterrupted services.
Reserve Bank of India (2017, Oct. 12).  Insurers were advised to take immediate steps for conducting security audits of their information and computer technology (ICT) infrastructures including vulnerability assessment and penetration tests (VAPT) through CERT-In empanelled auditors, identifying the gaps and ensuring that the audit findings are rectified swiftly. Insurers are also requested to firm-up their cyber crisis management plans (CCMPs) for handling cyber incidents more effectively.	Instructions issued for setting up guidelines on information and cyber security for insurers in April 2017. On October 12, 2017 the authority again advised insurers to take immediate steps for conducting security audits, and follow other guidelines mentioned in the April circular.

Source: Authors' compilation from RBI's Official website ([www.rbi.org.in](http://www.rbi.org.in))

#### 9. ENHANCED USE OF FINANCIAL TECHNOLOGY: NEED FOR TIGHTER CYBER SECURITY MEASURES

In the recent past there has been enhanced use of Financial Technology (Fin Tech) by Indian banks and this has resulted in greater vulnerability to Information Security (IS) particularly Cyber Security (CS) risks. The frequent instances of frauds, cyber attacks, scams etc. are often arising out of the lack of proper systems for management of IS or CS. The recent instance of huge scam at Punjab National bank (PNB) in February 2018 is just such instance, which could have been avoided had there been systems and internal controls to check IS and allied risks. In the aftermath of PNB scam, the RBI has further tightened its norms. Issue of LoUs (Letter of Undertaking) has since been stopped, causing hardships to many industries, especially exporters. Now, let's analyze the benefits that accrue to a bank as it adopts a sound framework for management of information systems security.

- i) **Better management control:** Implementation of an information systems security framework would result in the formulation of policies and procedures for management of information technology in an organization. It would also result in training and re- deployment of human resources in the organization to run the information systems resources. Implementation of necessary policies and procedures would pay-off organizations when it ensures better segregation of duties, definition of roles and responsibilities, adequate management supervision and better documentation of records. Though it may not be possible to eliminate the risks altogether, management can bring them under their control, and that too as per their risk appetite and strategic plans.
- ii) **Regulatory Compliance:** Minimizing of operational risks is gaining attention of all regulators in Banking sector. As discussed in this paper when national regulators mandate compliance with Basel II recommendation, all banking entities would be required to strengthen their operational risks

management practices. Apart from that regulators are increasingly focusing on the auditing and control of information technologies employed in banks. Computerization of banking sector has given many benefits to all parties involved, but it also introduced new issues in control and supervision.

- iii) **Corporate Image:** As noted earlier in this paper banking sector reforms initiated in India in 1992 has resulted in cut-throat competition in the industry. Public sector banks and Old private banks are investing heavily in technological upgradation, in order to compete effectively with New generation banks and foreign banks. Growing customer expectations regarding the quality of service and enhanced use of technology by banks, often makes banking more and more a mechanical exercise with customers getting lesser chance to interact with the “human” element of the banking operations [12] . So to retain customers’ trust and loyalty banks need to re-assure their customers of the robustness of their information system security management. Customers would patronize banks that commit themselves more on protection of their information system resources and accordingly corporate image of such banks would improve. Similarly, any information security breaches which might happen due to poor control and supervision would definitely affect the corporate image of the bank adversely.

## PART – V: CONCLUDING REMARKS

In view of the foregoing, it may be noted that quick adoption of ICT advancements is a strategic imperative rather than an option for the banking industry worldwide, particularly in respect of developing countries like India where banking is fast undergoing a digital transformation. The ongoing Demonetisation (DeMo) drive by the Government since 08 November 2016 has given another impetus towards digital (cash less) transactions. Hence, constant and systematic management of Information System Security is of vital significance, particularly in Cyber security and allied areas. Regulatory initiatives already initiated in this regard have to be further streamlined and strengthened; keeping in view, the guidelines and directives of international agencies like BCBS, World Bank etc. The directives of the RBI are vitally significant in the Indian scenario. When banks in developing countries like India have started migrating to Basle-III norms, are growingly embracing Fin-Tech day by day, urgent attention is required to ensure that information system security is getting primary significance. This in turn forms the core of operational risk management under Basle norms.

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**A COMPARATIVE STUDY OF JUVENILE CRIMES IN INDIA VIS-À-VIS RAJASTHAN**

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**ABSTRACT**

*Internationally, the juvenile crimes are on the rise. Children are not the same as they were decades back. The adolescents of today have been getting aggressive all over the world. They want liberty with no control of the society over them. Cases of frequent gun shooting in schools reflect very alarming situation. Lessening tolerance and rising aggression has become the identity of young population in most of the developed and developing nations. India is no exception. Every part of the country, there are cases of murders, burglary, dacoity, rape, theft, robbery and other incidence which are committed by adolescents. The state of Rajasthan is also suffering from various crimes done by young age people. This study aims at finding out the situation of juvenile delinquency in the state of Rajasthan in perspective of national situation.*

*Keywords: Juvenile, Crime*

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**INTRODUCTION**

Children are supposed to be the future of a country. The education, health, love and care given to them, decides the kind of future a country want to see. This is the duty of the society to provide healthy and pleasant childhood to each and every child of the country. India's total population has almost 42% share of the youth population, out of which approximately 20% are adolescents. If quality brought up is not provided to this large population, this young asset of the nation may go in the trap of early age attractions and social mal practices. The social conditions, surrounding the children has deteriorated resulting in rising crimes done by children. Rajasthan has approx. 1.57 crores children in the age group 0-19 years as the census 2011 and the state witnesses the high number of juvenile crimes. This study aims at finding out the situation of juvenile delinquency in the state of Rajasthan in perspective of national situation.

**LITERATURE SCAN**

**Sharma BR, Dhillon S, Bano S (2009)** in their study find that Juvenile Delinquency and the problems related to it have been faced by all societies, all over the world, however, in the developing world the problems are all the more formidable. The process of development has brought in its wake a socio-cultural upheaval affecting the age-old traditional ways of life in the congenial rural milieu. **Eaton and Polk** in "Measuring Delinquency" classified the following kinds of juvenile offences: Minor violations which include minor traffic violation, Property violations, Major traffic violations which include automobile theft, Human addiction which include alcohol and drug addiction, Bodily harm which include homicide offences. **Sayashi Saha (2015)** in the study on the new Act, thinks that it is necessary for the Government to rethink and peruse child-friendly amendments in the new Juvenile Justice Act, 2015 so that injustice in Juvenile Justice Act can be curbed. **Sruti DK (2017)** observed that understanding the delinquency behavior is important. According to the author, two common theories on the issue are Psychodynamic theory and Social Learning theory. **Rupaly Middha & Shashwat Tomar (2017)** in their article observed that we have to take a serious view of the changing trends of behavior among our children which has virtually made age as too superfluous and irrelevant factor determining who actually is a Juvenile in real sense and who is not.

**OBJECTIVES OF THE STUDY**

The objectives of this work are:

- Presenting the data of juvenile crimes to know the status in the state
- Comparing the data on each juvenile crime in the state vis-à-vis national data

**FURTHER SCOPE OF THE STUDY**

- The similar studies can be carried out for different regions.
- Similar pattern can be used to carry out other comparative studies.
- Historical trends can also be found out using the same data.

**RESEARCH METHODOLOGY**

Mainly secondary data have been used by this study. NCRB reports that include yearly and state wise number of cases of juvenile delinquency are the main sources of data. Efforts have been put to combine data in such a way that makes information more useful. The collected data have been tabulated suitably.

## DISCUSSION AND ANALYSIS

The data of various juvenile crimes for 6 years period (2009-2014) have been taken to study the national situation. Further crime wise data for the state have been shown in the tables.

**Table - 1: Crime wise cases of Juvenile delinquency in India (2009-2014)**

Year	Murder	Culpable homicide not amounting to murder	Rape	Kidnapping and abduction	Dacoity	Robbery	Burglary	Theft	Riots	Criminal breach of trust	Cheating	Counter feiting	Other IPC crimes	Total Cognizable Crimes
2009	844	25	798	396	150	481	2431	5253	1422	17	108	11	11990	23926
2010	679	35	858	524	97	551	2271	4930	1081	28	134	11	11541	22740
2011	888	51	1149	760	134	639	2609	5320	1347	24	161	20	12023	25125
2012	990	48	1175	789	174	767	2625	5528	1690	22	148	33	13947	27936
2013	1007	71	1884	1121	160	904	2860	6386	1486	23	136	13	15674	31725
2014	841	52	1989	1455	182	1024	2546	6717	1092	47	349	27	17205	33526

Source: National Crime Records Bureau

(As per revised definition of Juvenile Justice Act 2000, the boys in the age group 16-18 years have also been considered as Juveniles)

In the following discussion, yearly data for each kind of juvenile crimes in Rajasthan have been compared with the national average which has been drawn by taking total number of cases divided by the number of states. The average has been taken by dividing the total number of cases in the country by the number of states.

**Table - 2: Murder**

Year	India	Average (per state)	Rajasthan
2009	844	24.11	62
2010	679	19.40	47
2011	888	25.37	71
2012	990	28.29	67
2013	1007	28.77	57
2014	841	23.36	56

Table-2 indicates that Rajasthan is much ahead of national average in murder cases committed by children.

**Table - 3: Culpable homicide not amounting to murder**

Year	India	Average (per state)	Rajasthan
2009	25	0.74	2
2010	35	1.00	1
2011	51	1.46	3
2012	48	1.37	1
2013	71	2.03	1
2014	52	1.44	0

The situation of the state in culpable homicide not amount to murder is not worrying. The total number of cases country wide is also very low.

**Table - 4: Rape**

Year	India	Average (per state)	Rajasthan
2009	798	22.80	50
2010	858	24.51	72
2011	1149	32.83	79

2012	1175	33.57	102
2013	1884	53.83	183
2014	1989	55.25	149

The above table indicates an alarming situation in terms of rape cases. The numbers are much higher than the all India average. This is to be noted that Rajasthan is in top three states in rape cases other than the juvenile ones.

**Table - 5: Kidnapping & Abduction**

Year	India	Average (per state)	Rajasthan
2009	396	11.31	50
2010	524	14.97	80
2011	760	21.71	59
2012	789	22.54	71
2013	1121	32.03	86
2014	1455	40.42	90

Kidnapping and abduction crimes committed by juvenile are much higher comparing to the national average.

**Table - 6: Dacoity**

Year	India	Average (per state)	Rajasthan
2009	150	4.12	0
2010	97	2.77	1
2011	134	3.83	1
2012	174	4.97	1
2013	160	4.57	2
2014	182	5.06	5

The data show that the position of Rajasthan is not bad in juvenile dacoity cases.

**Table - 7: Robbery**

Year	India	Average (per state)	Rajasthan
2009	481	13.74	23
2010	551	15.74	44
2011	639	18.26	46
2012	767	21.91	48
2013	904	25.83	31
2014	1024	28.44	58

As the table reflects, that robbery cases in the state are more than the national mean.

**Table - 8: Burglary**

Year	India	Average (per state)	Rajasthan
2009	2431	69.46	234
2010	2271	64.89	183
2011	2609	74.54	205
2012	2625	75.00	176
2013	2860	81.71	173
2014	2546	70.72	198

Juvenile burglary cases are almost three times the national average during the entire period of 2009-2014.

**Table - 9: Theft**

Year	India	Average (per state)	Rajasthan
2009	5253	150.09	357
2010	4930	140.46	373
2011	5320	152.00	349
2012	5528	157.94	338
2013	6386	182.46	361
2014	6717	186.58	430

Similarly, child theft cases are also on the rising side. The numbers in the state are more than double of all India average.

**Table - 10: Riots**

Year	India	Average (per state)	Rajasthan
2009	1422	40.63	28
2010	1081	30.89	39
2011	1347	38.49	18
2012	1690	48.29	19
2013	1486	42.46	17
2014	1092	30.33	31

As far as the riots cases are concerned, the situation is not bad in the state.

**Table - 11: Criminal breach of Trust**

Year	India	Average (per state)	Rajasthan
2009	17	0.49	2
2010	28	0.80	0
2011	24	0.69	1
2012	22	0.63	2
2013	23	0.66	0
2014	47	1.31	0

The cases of criminal breach of trust are very low in the country. So are in the state.

**Table - 12: Cheating**

Year	India	Average (per state)	Rajasthan
2009	108	3.09	5
2010	134	3.83	10
2011	161	4.60	21
2012	148	4.23	11
2013	136	3.89	8
2014	349	9.69	5

During the period of study, the numbers of cheating cases are more than the all India average.

**Table - 13: Counter feiting**

Year	India	Average (per state)	Rajasthan
2009	11	0.31	0
2010	11	0.31	1
2011	20	0.57	0
2012	33	0.94	1
2013	13	0.37	0
2014	27	0.75	0

Since counter feiting cases are not much in the country. Rajasthan shares a proportional data.

**Table - 14: Other IPC crimes**

Year	India	Average (per state)	Rajasthan
2009	11990	342.57	1006
2010	11541	329.74	936
2011	12023	343.51	983
2012	13947	398.49	1046
2013	15674	447.83	1185
2014	17205	452.76	1152

The state is much ahead of the national average in the cases other than the IPC crimes committed by juvenile criminal. They are almost triple the average of the country.

**Table - 15: Total Cognizable Crime**

Year	India	Average (per state)	Rajasthan
2009	23926	683.60	1819
2010	22740	659.71	1787
2011	25125	717.86	1836
2012	27936	798.17	1880
2013	31725	906.43	2104
2014	33526	931.28	2174

Total cognizable crimes are hence, much higher in the state if compared with the all India average. Table-15 is the combined presentation of all the juvenile crimes in the state and the country for the period of 2009-2014.

### OBSERVATIONS

- Rajasthan is much ahead of national average in murder cases committed by children.
- The situation of the state in culpable homicide not amount to murder is not worrying. This is because the total number of cases country wide is also very low.
- The numbers of rape case are much higher than the all India average. Rajasthan is otherwise also in top three states in rape cases.
- Kidnapping and abduction crimes committed by juvenile are much higher than the national average.
- Rajasthan's position is not bad in juvenile dacoity cases.
- The robbery cases in the state are more than the national mean.
- Juvenile burglary cases are almost three times the national average during the entire period.
- Theft cases are also on the rising side. The numbers in the state are more than double of all India average.
- As far as the riots cases are concerned, the situation is not bad in the state.
- The cases of criminal breach of trust are very low in the country. So are in the state.
- During the period of study, the numbers of cheating cases are more than the all India average.
- Since counter feiting cases are not much in the country. Rajasthan shares a proportional data.
- The state is much ahead of the national average in the cases other than the IPC crimes committed by juvenile criminal. They are almost triple the average of the country.
- Total cognizable crimes are hence, much higher in the state if compared with the all India average.

### CONCLUSION

From the above analysis, it can be noticed that the juvenile criminals are more active in the crimes like murder, rape, kidnapping, robbery, burglary and theft. Crimes such as counterfeiting, dacoity, criminal breach of trust do not appear to be much in numbers.

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## A STUDY ON CHALLENGES AND OPPORTUNITIES OF E-BANKING SERVICES IN INDIA

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### ABSTRACT

Financial sector plays an important role in the economic development of a country. Banking is the lifeline of an economy. A strong and healthy banking system is important requirement for economic growth. The implementation of internet in banking organizations has modernized the banks. Implementing the internet banking approach has benefited the both i.e. consumers as well as banks. Considering the benefits, the banks all over the globe have implemented the internet banking and banking organizations in India are no exception. The competition among the banks has led to the increasing total banking automation in the Indian banking industry. E-Banking is a generic term encompassing internet banking, telephone banking, mobile banking etc. The E-Banking services are executed only upon the customer, and these e-banking services would fully integrate with the core banking solution that is already in usage. The objective of the present paper is to examine and analyze the progress made by Internet Banking in India.

**Keywords:** Internet banking, Benefits, Challenges and Opportunities, India.

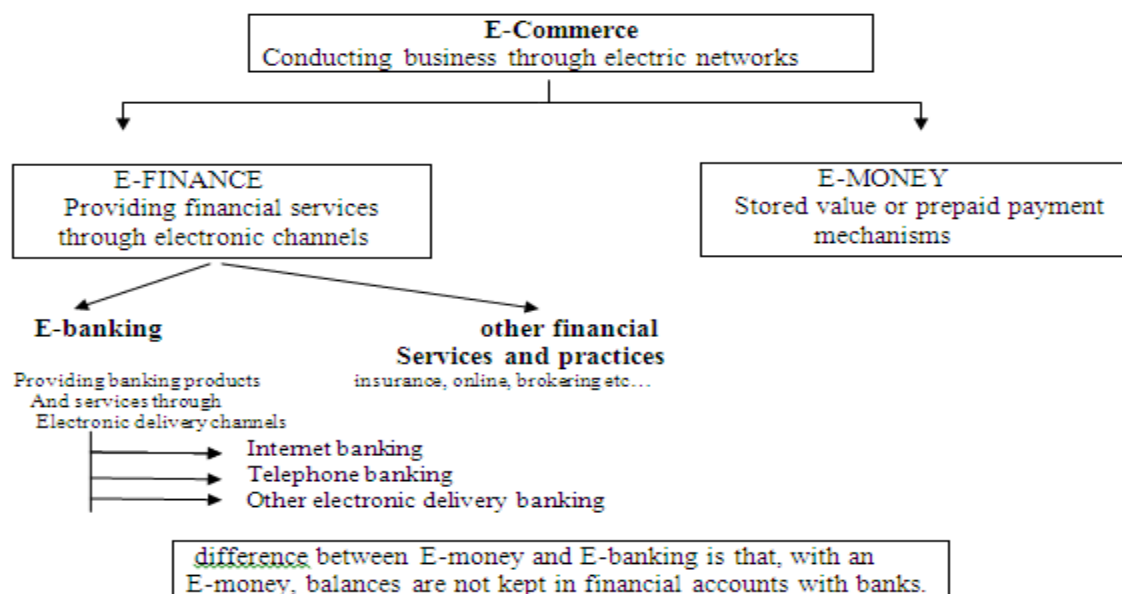
### INTRODUCTION

The banks have become an essential component of most of the economies as banking services are described as “engines for economic growth” or act as “conduits towards promoting economic growth”. In recent years the world economy has gone through a new phenomenon which is considered as one of the most important changes since the industrial revolution, i.e. The birth of “Internet-based Economy”. Considering the benefits of using internet the banks have started to invest in this newly created market. At the initial level, banks mainly focus on developing the commercial web-sites, with the purpose of promoting their products and services using the internet. Gradually, it was realized by banks that the Internet can be an effective distribution channel too. Now with the changing times the traditional approach of banking is being changed and banks are trying to match up with the recent advancement in the field of technology.

With the rapid development of technology, internet plays a significant role in changing the banking scenario. It provides an online platform for various banking transactions through which it offers various services like online payment, online fund transfer, online stock trading and online shopping etc. The use of internet as a delivery channel for banking services is increasing widely in banking sector. Internet banking facilities enable financial institution and customers to access their accounts, transactions and getting information on financial products & services. Now a day's most of the banks have launched various services through internet banking including latest service like opening, online saving accounts and demand for these services is increasing rapidly.

The concept of e-banking is fairly a new concept in India as compared to its developed counterparts. So the paper deals with defining the concept of Internet banking.

### WHAT IS E-BANKING?





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**OBJECTIVES OF THE STUDY**

- ❖ To study the current status of financial innovations in banking sector.
- ❖ To identify various e-banking services/products adopted by India.
- ❖ To study the opportunities and challenges available in E-banking.
- ❖ To recommend the government role on establishing E-Banking.
- ❖ To suggest policy implications to make E-Banking more effective.

**CURRENT STATUS OF E-BANKING IN INDIA**

Internet Banking has become an integral part of banking system in India. The few of the initiatives taken by the banks for internet banking are mentioned below:

1. The banks of India recently launched its card-less cash withdrawal service. This facility helps customers to send money to anyone using Internet banking or by using ATM, with the help of receivers mobile number.
2. The Business Transformation Program is being implemented by the Bank which will provide its customer convenience banking on a 24 X 7 basis in India and abroad with integrated delivery channels like Internet, Phone, Mobile, and others.
3. A number of banks have implemented Online Tax Accounting System (OLTAS) for collection of taxes on behalf of Central Board of Direct Taxes, Government of India.
4. The banks are making their presence on social media like Facebook and Twitter for targeting huge customer base as well as potential customers; there will be round-the-clock tweets and comments on the bank's products and services.
5. Bank has also introduced E-Locker for its customers.

**The banks offer to their customers, the following e-banking products and services are**

- Automated Teller Machines (ATMs)
- Internet Banking
- Mobile Banking
- Phone Banking
- Tele banking
- Electronic Clearing Services
- Electronic Clearing Cards
- Smart Cards
- Door Step Banking
- Electronic Fund Transfer

**CHALLENGES IN E-BANKING**

- ❖ **Security Risk:** The problem related to the security has become one of the major concerns for banks. A large group of customers refuses to opt for e-banking facilities due to uncertainty and security concerns. The internet users are not using internet banking in India because of security concerns. So it's a big challenge for marketers and makes consumers satisfied regarding their security concerns, which may further increase the online banking use.
- ❖ **The Trust Factor:** Trust is the biggest hurdle to online banking for most of the customers. Conventional banking is preferred by the customers because of lack of trust on the online security. They have a perception that online transaction is risky due to which frauds can take place.
- ❖ **Customer Awareness:** Awareness among consumers about the E-banking facilities and procedures is still at lower side in Indian scenario. Banks are not able to disseminate proper information about the use, benefits and facility of internet banking. Less awareness of new technologies and their benefits is among one of the most ranked barrier in the development of E-banking.
- ❖ **Privacy risk:** The risk of disclosing private information & fear of identity theft is one of the major factors that inhibit the consumers while opting for internet banking services. Most of the consumers believe that using online banking services make them vulnerable to identity theft..

- ❖ **Strengthening the public support:** In developing countries, in the past, most e-finance initiatives have been the result of joint efforts between the private and public sectors. The World Bank, be developed to enable public support for e-finance related initiatives.
- ❖ **Availability of Personnel services:** In present times, banks are to provide several services like social banking with financial possibilities, selective up gradation, computerization and innovative mechanization, better customer services, effective managerial culture, internal supervision and control, adequate profitability, strong organization culture etc.
- ❖ **Implementation of global technology:** There is a need to have an adequate level of infrastructure and human capacity building before the developing countries can adopt global technology for their local requirements.
- ❖ **Non- Performing Assets (NPA):** Non performing assets are another challenge to the banking sector. Vehicle loans and unsecured loans increases N.P.A. Every bank have to take care about regular repayment of loans.
- ❖ **Competition:** Competition in banking sector brings various challenges before the banks such as product positioning, innovative ideas and channels, new market trends, cross selling ad at managerial and organizational part this system needs to be manage, assets and contain risk.
- ❖ **Handling Technology:** Developing or acquiring the right technology, Early adopters of technology acquire significant competitive advances Managing technology is therefore, a key challenge for the Indian banking sector.

#### OPPORTUNITIES IN E-BANKING

- **Untapped Rural Markets:** Contributing to 70% of the total population in India is a largely untapped market for banking sector. In all urban areas banking services entered but only few big villages have the banks entered.
- **Multiple Channels:** Banks can offer so many channels to access their banking and other services such as ATM, Local branches, Telephone/mobile banking, video banking etc. to increase the banking business.
- **Competitive Advantage:** The implementation of e-banking is beneficial for bank in many ways as it reduces cost to banks, improves customer relation , increases the geographical reach of the bank , etc.
- **Internet Users & Computer Literacy:** To use internet banking it is very important or initial requirement that people should have knowledge about internet technology. so that they can easily adopt the internet banking services. The fast increasing internet users in India can be a very big opportunity and banking industry should encash this opportunity to attract more internet users to adopt internet banking services.
- **Worthy Customer Service:** Worthy customer services are the best brand ambassador for any bank for growing its business. Every engagement with customer is an opportunity to develop a customer faith in the bank. While increasing competition customer services has become the backbone for judging the performance of banks.
- **Internet Banking:** It is clear that online finance will pickup and there will be increasing convergence in terms of product offerings banking services, share trading, insurance, loans, based on the data warehousing and data mining technologies.

#### REVIEW OF LITERATURE

E-banking include: customer acceptance and satisfaction, privacy concerns, profitability, operational risks, and competition from nonbanking institutions. Between 1995 and 2003, e-banking increased eightfold. E-banking defined as the delivery of banking services through the open-access computer network directly to customers" home or private address. Simpson (2002) suggests that e-banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets reveal that in developed markets lower costs and higher revenues are more noticeable. E-banking links business to customers no matter their geographical location. It allows companies to make new business contacts from different global business alliances, test new products and services, and make market research and other enquiries all at a minimal cost both financial and otherwise (Shin, 2008).

A more recent e-banking development is wireless internet applications of banking sometimes called m-banking (mobile banking) (Choi et al., 2006; Scornavacca and Hoehle, 2007). With the combination of two most recent technological advancements – internet and mobile phone, a new service (mobile data service) is thus

enabled and K.T. Ahmed the first such wireless internet commercial transaction is performed by the banking industry (Barnes and Corbitt, 2003). E-banking also can increase competition among banks, and allows banks to penetrate new markets and thus expand their geographical reach.

### RESEARCH METHODOLOGY

The research survey was answered by a mix group of people among the customers of the Banks. The survey was conducted through questionnaires to a group of people and only 100 respondents filled in our survey that focused on gathering information about awareness, usage of and expectations about the internet banking. In this study convenience-sampling method is used, thus the respondents were randomly selected.

#### A. Research Question

This study is aimed at finding out whether the respondents are aware about internet and banking services and whether they use their knowledge of hassle free banking or they are abided by habits customs and routines.

#### B. Sample size

Sample sizes of 100 respondents were selected for this study.

#### C. Data Collection

Data will be collected from both primary and secondary sources of information.

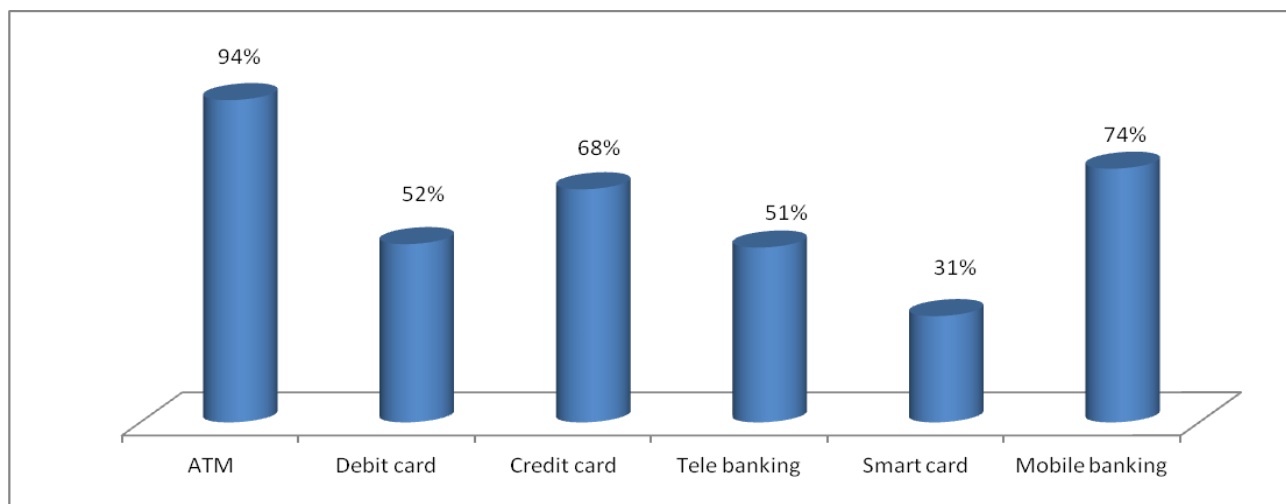
### DATA ANALYSIS AND FINDING

The Following table describes the demographic profile of the respondents which consists of gender, age, level of education. From a total of 100 questionnaires received. According to our analysis of the demographic characteristics of the respondents we can say that, 36% of the respondents are between the ages of 20 and 29 and 29% is between the age of 30 and 39. 15% of the respondents are between the ages of 40 and 49, 14% of the respondents are between the ages of 50 and 59. Then the remaining 6% is higher than the 60 years old. Within the respondents 45% are female and remaining 55% is male. If we check the education level of the respondents we can say that, 45% hold Bachelor Degree, 35% hold Master degree & 20% hold PhD, it is found that Bachelor degree respondent are using highest e-banking.

	Internet banking users	Percentage (%)
<b>GENDER</b>		
Male	55	35 %
Female	45	65 %
<b>Age</b>		
20-29	36	36 %
30-39	29	29 %
40-49	15	15 %
50-59	14	14 %
60-69	6	6 %
<b>Education</b>		
Bachelor	45	45 %
Master	35	35 %
Ph.d	20	20 %

Finding shows that there is no any significance difference between Awareness of e-banking & usage of e-banking

Services	ATM	Debit card	Credit card	Tele banking	Smart card	Mobile banking
Users who use these services	94	52	68	51	31	74



### FINDINGS SHOWS THAT ALL CONSUMERS ARE USING WWW MORE THAN A ONE YEAR

- ✓ 88% consumers are visit 1-4 times in a month & 12% consumers are never visit branch of the Bank.
- ✓ There is 76% consumer are using ATM for 1-4 times in a month.& 18% consumer are use over period of 12 months & 6% consumers are never use ATM.
- ✓ There is 34% consumers are using debit card for 1-4 times in a month & 18% consumers are using 5-8 times in a month & 48 % respondents are not using a debit card services.
- ✓ There is 32% consumers are using tele-banking for 1-4 times in a month & 19% consumers are using 5-8 times in a month & 49% respondents are not using a tele-banking services
- ✓ There is 19% consumers are using smart card for 1-4 times in a month & 12% consumers are using 5-8 times in a month & 69% respondents are not using a smart card services.
- ✓ There is 32% consumers are using credit card for 1-4 times in a month & 36% consumers are using 5-8 times in a month & 32% respondents are not using a credit card services.
- ✓ There is 46% consumers are using mobile banking for 1-4 times in a month & 28 % consumers are using 5-8 times in a month & 26% respondents are not using a mobile banking services.
- ✓ Main reason for visiting a bank branch is to make a Deposit with highest % is 40 %.

### SUGGESTIONS

The following suggestions are recommended for enhancing e-banking / internet banking services of banks to the customers

- 1) Banks should take necessary steps to create awareness among rural people about the advantages of e-banking / internet banking services available in the banks.
- 2) The e-banking / internet banking system should be enhanced to make the online enquiry and online payment much more easier to the customers.
- 3) Though e-banking / internet banking is convenient and easy to use, customers are afraid of adopting these services because they think that using these “services are difficult and complicated”. So, on-site training can be provided to the bank customers who intend to use e-banking / internet banking services.

### CONCLUSION

There's no doubt that the advent of the internet has made a positive impact in the lives of many people. And not only individuals have benefited from this technological advancement because various industries have felt its great influence as well. The banking industry is just one of the many sectors on the commercial side that has embraced the internet. The adoption of Internet banking in India will have its own advantages to both the banks and the ultimate customers. The use of information technology will not only reduce the costs of operation but also would be effective, easy to maintain, speedier and highly competitive. The challenges posed by the Internet banking are mostly of procedural nature, which can be easily counterbalanced by adopting suitable technological and security measures. There can be no doubt about the enormous potential and emancipated opportunities offered by advances in technology. However, there are prerequisites and preparations, which have to be made before the full benefits of the technology can be harvested.

## APPLICATION OF META ANALYSIS TO EVALUATE THE STUDENT'S ACADEMIC PERFORMANCE

Dr. Jaya Ahuja<sup>1</sup> and Dr. Vani Narula<sup>2</sup>Assistant Professor<sup>1</sup> and Associate Professor<sup>2</sup>, Jamia Millia Islamia University, Delhi**ABSTRACT**

Personality is an important dimension which has a major influence on the academic performance. Multiple studies have shown that there is a correlation between personality types and academic performance measured by Grade point average (GPA). The present study highlights the relationship between neuroticism and academic performance based on the identification of key personality model. In this research work, big five personality models namely Neuroticism, Extraversion, Conscientiousness, Agreeableness, and Openness to experience are considered to analyze the student's Academic Performance. The major finding of the study is negative reinforcement also helps in increasing the performance.

**Keywords:** Big Five Model, Academic Performance, Meta Analysis, Extraversion, Neuroticism

**1. INTRODUCTION**

Globalization has created a mark on the Indian economy. Corporate sector has faced many downturns; the continuous challenges include diversity management, cross cultural issues, social issues, changing nature of the environment. An organization is run by people. Students are the creative minds behind the success of the organization. The organization's success is highly determined by the knowledge, skills, and attitudes of students. Attitude is the most important parameter as compared to knowledge and skills. Knowledge and skills can be developed through learning, training but a negative attitude can make or mar. There are numerous studies on Big Five Personality traits; some authors have compared the Five Factors with the student's performance, student's motivation, employee motivation, employee performance. Personality cannot be ignored; it has an impact on every single aspect. Personality is defined as "a set of psychological traits and mechanisms within an individual that are organized and relatively enduring and that the influence on his/her interactions with, and adaptations to, the environment; Larsen and Buss (2008).

Based on the personality traits we can identify the career prospects for an individual. With the help of this there will be no role conflict, career conflict. Work performance and motivation will be high. For the development of the student who contributes towards the development of the nation quality of education is very important. If we observe there is an increase in the number of engineering and management colleges, universities but there are few which provide quality education. Quality education can be characterized by the following parameters classroom based learning, practical exposure, industry interaction, intellectual capital in the Universities, peer tutor learning, interaction with the outside world in the form of Seminars, Industrial visits, Internships, Live Projects and much more. The environment in which we live plays a very important role towards the overall development.

The Five-Factor Model (FFM) of personality is one of the incomparable models in contemporary psychology. Personality is classified into five factors, namely, Neuroticism, Extraversion, and Openness to Experience, Agreeableness, and Conscientiousness.

The Five Factor Model (FFM) is an association of personality traits acting as dimensions of individual variations in tendencies to show consistent patterns of thoughts, feelings, and actions (McCrae and Costa, 1990). Traits are further described as basic tendency that, within a cultural framework, give rise to habits, attitudes, skills, beliefs, and other characteristic adaptations (McCrae, 2001)

The objective of the study is to identify the correlation between the five higher order personality dimensions i.e. Extraversion, Conscientiousness, Openness to Experience, Agreeableness and Neuroticism called the 'Big Five' personality traits students' academic achievement measured by GPA.

**FIVE DIMENSIONS OF PERSONALITY**

**Neuroticism:** A predisposition to feel unconstructive effects such as dread, sorrow, humiliation, rage, guilt, and suspect. It is the extent to which a person is tranquil and self-confident as opposed to anxious and insecure (De Feyter, Caers, Vigna and Berings, 2012).

**Extraversion:** It is described as a general tendency toward conviviality, impudence, vigor and being informal. Hence, it is the degree to which a person is outgoing, has leadership traits and self-confident in comparison to being shy person, silent and aloof. (Clark and Schorth, 2010; Trappman et al., 2007).

**Openness to Experience:** A degree to which a person is ingenious, appreciates new ideas, creativity, innovation, out of the box thinking and curious (Costa and McCrae, 1992). It is opposite to concrete minded and narrow thinking.

**Agreeableness:** It is a construct of sympathy, cooperativeness, empathy and being antagonistic towards others. It is described as the degree to which a person is good natured, compassionate and co-operative as opposed to irritable, uncooperative, inflexible, unpleasant and disagreeable (Tripamann et al., 2007).

**Conscientiousness:** It is the extent to which an individual is methodical, dependable and structured. This trait showcases high need for achievement in an individual and self motivation. This shows that people are more responsible and complete their tasks efficiently without any delay or laziness. (Costa & McCrae, 1992; McCrae, et al, 1998; Rolland, 2002).

### 1.1 FIVE FACTOR MODEL AND ACADEMIC PERFORMANCE

Academic performance is an outcome of education — it is a degree to which a student, faculty or institution has achieved their educational goals. Academic accomplishment is calculated by examinations or continuous assessment based on theory (knowledge) and application (skills) (Ward, 1996). Abu-Bakar et al. (2010) explored academic performance and Big five personality traits in 1484 local university students from different streams like education, science, humanities, agriculture/ technical/ engineering programs. A positive significant correlation was found among student's attitude and academic achievement and the other study concluded that motivation and attitude are the best predictors of student's academic achievement (Hendricks, 1997). A similar study found positive but less significant result (Mahyuddin et al., 2009). Cognitive skill is considered to be one of the most important factors which can affect the student's achievement (Ackerman and Heggestad, 1997). A study reported that cognitive ability alone is not sufficient for academic success. Factors which are not cognitive in nature are equally important to study the academic performance. (Chamorro-Premuzic and Furnam, 2006).

The contemplation that intellect, socio economic status and persona each influence socially-valued behaviors is unswerving with the proposal that performance in both work and academic settings is unwavering by factors related to capacity to perform, opportunity to perform and willingness to perform (Blumberg & Pringle, 1982; Traag, van der Valk, van der Velden, de Vries, & Wolbers, 2005). A study conducted by Grimes, Meghan and Thomas (2004) on student evaluation of teaching and locus of control found that students with high conscientiousness were more open minded as compared to close minded. Butterfield (1964) commented that those students who are not self organized will experience frustration, anxiety and will pass the locus of control on the external forces.

Koning et al. (2012) conducted a study on student characteristics and academic achievement. He concluded that GPA has a strong positive relationship with personality trait; Conscientiousness. It is in consistence with research findings by O'Connor and Paunonen (2007) on first-year performance in higher education studied. The correlation among GPA, vocabulary, personality, and time management for all 556 students was examined by MacCann et al. (2012) and reported group differences for all variables by enrollment status (part- versus full-11 time), gender and age it was found that age is significantly correlated with time management, agreeableness and conscientiousness. One interesting finding is Conscientiousness implements more effectively in time management practices, due to which there is an assured academic success.

Lounsbury et al. (2003) examined the relationship between general intelligence, big five personality traits and a measure of work drive to course grade measured by GPA in undergraduate psychology course among 175 students. The study reported significant positive correlation between conscientiousness and Openness and GPA. This result mirrored to Paunonen and Ashton (2001). De Raad and Schouwenburg (1996) suggested that Big Five factors of Extraversion, Conscientiousness and Openness to Experience are most relevant in educational setting and each of the factors are positively correlated with academic success and contrast to Neuroticism. This was supported by Duff et al. (2004) in his study to identify the relationship between personality traits, approach to learning and academic performance measured as a composite measure, a grade point average (GPA) achieved over the course of an academic year.

### 1.2 METHOD OF ANALYSIS

#### 1.2.1 Meta Analysis

A meta-analysis is an overall analysis of various studies through which the studies are combined from mathematical view (Glass, 1976). Many papers have been reviewed, but the condition of the study is Academic Performance is measured by GPA or overall mean of the Semesters, based on the condition only 9 papers were able to meet the criteria.

**Table - I: Measures, Sample Size, and Correlation Values of Personality Traits & GPA**

Author	Measure		Sample Size n	Correlation				
	Big Five Personality Trait	Academic Performance		N	E	O	A	C
<b>Nyc, Orel and Kochergina , 2013</b>	Big Five Russian Scale	GPA	176	0.157	-.117	.099	.128	.018
Koning et al. (2012)	FFPI	GPA	1753	0.13	-0.11	-0.05	0.01	0.23
MacCann et al. (2012)	IPIP	GPA	556	0.09	-0.06	0.13	0.13	0.18
Hakimi, Hejazi, Lavasani (2011)	NEO-FFI	Self Reports (Total Means of Semesters)	285	-0.31	-0.27	0.10	0.28	0.42
Komarraju et al. (2011)	NEO-FFI	GPA	308	0.00	0.07	0.13	0.22	.29
Kappe and Flier (2010)	NEO-FFI	GPA	140	-0.06	0.05	-0.08	0.14	0.46
Chowdhury, 2006	FFM (Five Factor Modality)	GPA	130	.341	.140	.279	.245	.237
Duff et al. (2004)	16PFi	GPA	146	-0.14	0.06	0.07	0.12	0.21
Lounsbury et al. (2003)	PSI (Personal Style Inventory)	GPA	175	-0.11	0.01	0.16	-0.01	0.18

Source: Author

**1.2.2 Hunter and Schmidt (1990) "bare bones" Approach**

The meta-analysis study measures the common effect size of correlation,  $r$ . After selecting the relevant studies and eliminating the one which do not meet the condition, a combination of correlation values between Big Five personalities and GPA can be computed by using Hunter and Schmidt (1990) approach (Robbins et al. (2004); Francis et al. (1991) and Linden et al. (2010)).

Hunter and Schmidt (1990) approach is used to estimate the variability of the distribution of effect sizes (correlation). The total variance of observed study outcomes is estimated, and the variance due to artifacts such as sampling error, reliability of measurement and range restriction is subtracted to yield a residual variance. In the "bare bones" approach, only sampling error is considered as a sources of art factual variance and this estimated value is considered as the estimates sampling variance for a meta-analysis.

**1.2.3 Heterogeneity Statistic**

Heterogeneity in meta-analysis refers to the variation in outcomes between different studies. There is a variation among the studies since the sample from each study are not taken from the same population. Thus, a statistical heterogeneity would exist and the sample estimates would differ substantially. An index of heterogeneity,  $I^2$  can be defined by using Higgins and Thompson (2002) and Chi-squared heterogeneity statistic, Cochran's  $Q$ . Heterogeneity index,  $I^2$  can be described as the percentage of variation across studies that are due to heterogeneity rather than chance hence Cochran's  $Q$  test measure heterogeneity among studies. If the statistical heterogeneity is present, random effect meta-analysis is performed.

**2. RESEARCH FINDINGS****Variability Estimation**

To estimate the variability distribution of effect size by using Hunter and Schmidt (1990) "bare bones" approach, the results across studies was accumulate.

**Table - II: The Hunter and Schmidt (1990) “bare bone” variability estimation**

Author	Correlation				
	N	E	O	A	C
<b>Personality Types</b>					
<b>Nyc, Orel and Kochergina , 2013</b>	0.157	-.117	.099	.128	.018
<b>Koning et al. (2012)</b>	0.13	-0.11	-0.05	0.01	0.23
<b>MacCann et al. (2012)</b>	0.09	-0.06	0.13	0.13	0.18
<b>Hakimi, Hejazi, Lavasani (2011)</b>	-0.31	-0.27	0.10	0.28	0.42
<b>Komaraju et al. (2011)</b>	0.00	0.07	0.13	0.22	.29
<b>Kappe and Flier (2010)</b>	-0.06	0.05	-0.08	0.14	0.46
<b>Chowdhury, 2006</b>	.341	.140	.279	.245	.237
<b>Duff et al. (2004)</b>	-0.14	0.06	0.07	0.12	0.21
<b>Lounsbury et al. (2003)</b>	-0.11	0.01	0.16	-0.01	0.18
<b>Weight Mean</b>	0.011	-0.025	0.093	0.140	0.247
<b>Observed Variance</b>	0.037	0.015	0.011	0.009	0.017
<b>Estimate Variance</b>	0.030	0.012	0.009	0.007	0.014

Source: Author

Table I defines the correlation values between the Big Five personalities and students' academic achievement (GPA) of individual studies. Based on the correlation values above, each study provides a correlation estimate of the underlying relationship with the population. Neuroticism positively correlates with GPA for each study. By involving the accumulation of correlation,  $r$  of the individual studies using the weight estimate, the largest observed variance is Neuroticism (0.037) and Conscientiousness (0.02) while the smallest one is Agreeableness (0.009). There is a large unpredictability of the correlation values for Neuroticism among the studies. However, the estimate variance due to sampling error was shown that Neuroticism (0.030) is the highest one followed by Conscientiousness, Extraversion, Agreeableness and Openness to experience. Hunter and Schmidt (1990) approach further adds to the conclusion that Neuroticism and Conscientiousness are the best personality traits which highly correlate with students' academic achievement.

### HETEROGENEITY STATISTICS

Neuroticism and Conscientiousness are considered to be the best constituent of Big Five personalities with a major impact on students' academic achievement (GPA). A summary result for combination of individual studies based on the correlation between Neuroticism and GPA is presented in Table II.

Students who exhibit neurotic behaviors tend to be less satisfied with their scores which motivates them to perform better (Colquitt, J., LePine, J., & Wesson, M., 2009). People with high Neuroticism tend to experience more job dissatisfaction however, it is helpful, however, in jobs that require the formation of creative and novel ideas.

Conscientiousness predicts higher academic grade-point averages GPAs in school (Komaraju, Karau, & Schmeck, 2009; Nofle & Robins, 2007; Paunonen, 2003). This personality trait has consistently positive association with GPA beyond that explained by high school GPA (Nofle & Robins, 2007). Conscientiousness, beyond primary and secondary schooling, has emerged as a general predictor of job performance across a wide range of jobs (Barrick & Mount, 1991; Mount, Barrick, & Stewart, 1998).

Since, neuroticism was found to be the strongly correlated variable with academic performance further analysis was done using the Cochran's Q. the number of studies estimated are 9. The chi squared heterogeneity is 37.87.

Cochran's Q (37.87) found higher than 15.507, the critical value for 5 degrees of freedom with 95% level of significance found in a Chi-square distribution table. Since the calculated Cochran's Q is higher than table's value, the null hypotheses is rejected. Hence, it can be concluded that the studies were not analogous. This indicates that there is a presence of heterogeneity between the individual studies. This finding was shown that Neuroticism has high heterogeneity within studies.

**Table - III: The Correlation Meta Analysis for each study**

Study	Point Estimate
<b>Nyc, Orel and Kochergina , 2013</b>	0.157
<b>Koning et al. (2012)</b>	0.13
<b>MacCann et al. (2012)</b>	0.09
<b>Hakimi, Hejazi, Lavasani (2011)</b>	-0.31
<b>Komaraju et al. (2011)</b>	0.00



<b>Kappe and Flier (2010)</b>	-0.06
<b>Chowdhury, 2006</b>	.341
<b>Duff et al. (2004)</b>	-0.14
<b>Lounsbury et al. (2003)</b>	-0.11
<b>Effect Summary</b>	0.72

Source: Author

Table III presents the correlation values as a point estimate for each study and the effect summary or pooled estimates for all studies. There is a significant difference among various studies.

### 3. CONCLUSION & RECOMMENDATIONS

Rationale of the present study is to identify the relationship between personality traits and academic performance of students. The study is based on the Big Five Personality Traits and academic performance calculated by GPA. Data is collected through literature review and findings presented by other researchers. Among the five dimensions of big five personality, neuroticism and conscientiousness have a strong correlation with GPA. The studies were not found to be similar when heterogeneity between neuroticism and GPA was calculated. The study finds a positive relation between personality traits and academic performance.

The limitation of the study is that 9 studies are analyzed, the number can be increased and the findings can be different. The scope of the study will increase as the confidence level estimate will be higher. There are major factors that influence the findings of the study i.e. the data collected from students of different cultural backgrounds, ethnicity, educational backgrounds etc. Neuroticism is a fundamental personality trait in the study of psychology characterized by anxiety, fear, moodiness, worry, envy, frustration, jealousy, and loneliness. Hence, today's youth experiences huge competition which certainly puts them to identify various options apart from schools and self study to increase the academic performance; negative motivation i.e. might not be able to succeed if the performance is low works here. The motivational theory of Reinforcement works here, positive and negative reinforcements lead to increase in performance. To escape from negative reinforcement people tend to perform higher.

In order to increase the precision of the meta-analysis study, the number of studies should be increased. So that, the standard error of the weighted average correlation, weighted mean correlation will reduce. Hence, the confidence interval will become smaller. Therefore, to increase the number of studies, the scope of the study should become wider, not be limited to the Big Five personality traits and GPA only.

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**WOMEN ENTREPRENEURS IN INDIA: AN OVERVIEW**

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**ABSTRACT**

*Entrepreneurship seems to be ideal for women seeking participation in the country's economic development because of certain factors. Emergence of entrepreneurship can be considered to be closely linked to social, cultural, religious and psychological variables. These changes seem to be taking place because of acceptable norms in the context of women at work. Today, women are making notable headways in the entrepreneurial landscape. Women entrepreneurship enables to pool the small capital resources and skill available with women. It paves the way for fuller utilization of capital and also mobilizes the female potential. Women entrepreneurship enhances the status of women can also lead to their integration into economic development. It has been seen in many cases that in spite of many obstacles quite large number of women have somehow found the way to engage in entrepreneurial activities. Lot of debate is being generated on women taking up entrepreneurial venture. In view of this, the present paper gives an overview on women entrepreneurs in India. The paper briefly discusses about the issues and challenges faced by women entrepreneurs.*

**Keywords:** Women Entrepreneurs, Entrepreneurship, Entrepreneurial Development, Business, Economy, Challenges

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**INTRODUCTION**

An individual or group of persons who starts an enterprise is known as an entrepreneur. The concept of entrepreneur varies depending on the level of development, thoughts and perception as well as from one time period to other. Initial effort to define entrepreneurship was found in the writings of Richard Cantillon [1755] who defines entrepreneur as a person who pays a certain price for a product to resell it at an uncertain price, thereby making decisions about obtaining and using resources while consequently assuming the risk of enterprise. According to him entrepreneurs would always look for the best opportunities for using resources for their highest commercial yield leading to economic growth and development. Accordingly, if an individual can grab the opportunity, then s/he has trait of becoming an entrepreneur. Therefore, an entrepreneur is the person who explores for change and responds to it. A number of definitions have been given for an entrepreneur. However, an economist view him as a fourth factor of production along with land labor and capital. On the other hand some sociologists feel that certain communities and cultures endorse entrepreneurship say for example in India one usually says and believe that Gujaratis and Sindhis are very enterprising communities. Whereas, others feel that entrepreneurs are innovators who come up with new ideas for products, markets or techniques, method of production etc. So, we can say that, it is the entrepreneurs who shape the economy by creating new wealth and new jobs and by inventing new products and services. The act of setting up a new business or reviving an existing business so as to enjoy advantages from the new opportunities can be referred as entrepreneurship. The definition of entrepreneurship has never been differentiated on basis of gender and can be extended to women entrepreneurs without any restrictions and accordingly, women entrepreneur can be defined as a woman or group of women who start/commence, organize, and run a business enterprise. According to Schumpeter's notion of innovative entrepreneurs, women who innovate, imitate or adopt a business activity are called women entrepreneurs.

The Government of India has defined women entrepreneurs based on women participation in equity and employment of a business enterprise. Accordingly, the Government of India [GOI, 2006] has defined women entrepreneur as "an enterprise owned and controlled by a women having a minimum financial interest of 51 per cent of the capital and giving at least 51 per cent of the employment generated in the enterprise to women." However, this definition is subject to criticism mainly on the condition of employing more than 50 per cent women workers in the enterprises owned and run by the women. So, women entrepreneurs are those women who think of a business enterprise, initiate it, organize and combine the factors of production, operate the enterprise and undertake risks and handle economic uncertainty involved in running a business enterprise.

**REVIEW OF LITERATURE**

Review of literature is an important exercise in research because it tells what has been developed in the subject of the study, how it has been done and what are the conclusions arrived at. Review of literature helps the researcher to find out the research gap. In the recent years, various issues relating to women entrepreneurs have been gaining attention, especially in the context of socio-economic change and economic development. Various studies have been carried out in the area.

A review of the significant literature clearly reveals that the studies that have been carried out covering the specific areas. However, one cannot deny the fact that the subject and issues relating to women entrepreneurs, remains a potential area for researchers. And it is promising area for research.

Through review of literature, an attempt is made to provide a review of empirical researches carried out, and the existing literature relevant to the study of women entrepreneurs and entrepreneurship.

**Shah Kalpana [1985]**, in her study has made an attempt to examine some of the social aspects which inhibit women to participate in the field of science and technology. Study also revealed the general declining trend and stagnation in science and technology based industries.

**Kaushik Madhulika [1994]**, in her study has discussed about various concept of entrepreneurial competencies which work as a determinant of entrepreneurial competencies among individual. According to author's findings those women entrepreneurs who are successful are significantly different from those women entrepreneurs who are unsuccessful. And therefore, gender may not necessarily a determinant of competence levels.

**Senthil [1999]**, in the present study discusses about the management and managerial skill. The study also discusses about the barriers which comes in the way of women managers to have a successful career. These barriers are in the form of cultural, social, organizational practices and legal. It is believed that they act as a major hurdle in effective development of women as managers. Mostly the organizational matters are decided by men and are not in favour of women. Besides this, it is also noticed that there persists a wide difference in opportunities available to men and women.

**G.Malyadri [2014]** in the present study on Role of Women Entrepreneurs in the Economic Development of India indicates that women entrepreneurs are found to be working in difficult situations when compared to their male counterparts and factors like political instability, poor infrastructure, high production costs and nonconductive business environment are affecting women entrepreneurs more than men.

The report produced by **OECD [2015]** on Women's economic empowerment mentions that economic empowerment of women is the prerequisite for sustainable development and pro-poor growth especially in developing economies. This can be achieved through sound public policies, a holistic approach and long-term commitment. The report also suggests that gender specific perspectives must be integrated at the design stage of the policy formulation itself. The study suggests that women must have more equitable access to assets and services and at the same time employment opportunities should also be improved to benefit the society as a whole.

**Hina Shah and Punit Saurabh [2015]** in their study on Women entrepreneurship in developing countries have arrived at the conclusion that even though there have been some successful strategies towards the development of women entrepreneurship, there is need for taking up more initiative and efforts in this direction so that such ventures can help in poverty alleviation of South Asian region.

**Chimthanawala S.M.A, Naidu. K and Shah. N [2015]**, the present study pointed out that entrepreneurship can be a rewarding career route. But it does not come alone rather it's a combo pack because rewards and challenges go hand in hand. Today, women entrepreneurship is gaining momentum in the context of a globalized village. Many women feel the difference in the level of their confidence and are ready to take the risk of quitting the formal job and take up entrepreneurial venture and work from home. To begin with they are prepared to start business on a modest scale, making a profit and moving onwards from there. They have managed to break the proverbial glass ceiling. And their success stories have become an inspiration for others and worth studying. This study also made an attempt to study the progress of women in the corporate sector and the challenges faced by them while pursuing their goals.

In the present research **Rao [2016]**, has discussed about how women entrepreneurship is gaining importance in India in the wake of economic liberalization and globalization. The policy and institutional framework for developing entrepreneurial skills, providing vocation education and training has widened the horizon for economic empowerment of women. They are performing well. Government of India has also introduced National Skill Development Policy and National Skill Development Mission in 2009 in order to provide skill training, vocational education and entrepreneurship development to the emerging work force. However, entrepreneurship development and skill training is not the only responsibility of Government and therefore other stakeholders need to shoulder the responsibility.

The conclusion of the survey of literature shows that, more and number of women is take up entrepreneurship. The above mentioned studies have been carried out on women entrepreneurs from economic, social and other

perspective. These studies have been carried out with limited purpose of covering some selected aspects of women in business. There is a wide scope for research on women entrepreneurs and entrepreneurship in developing countries like India covering various social and economic aspects.

### **WOMEN ENTREPRENEURS AND ENTREPRENEURSHIP**

Since women are integral part of the industrialized society, it is now believed that women must work using her acquired skill to supplement income for family. Now they are expected to pick up self-employment opportunities rather than waiting for employment in the organized sector. For this, there is need to create appropriate awareness and environment to promote entrepreneurship. Entrepreneurial venture for women can be planned and developed. In India, over a period of time women entrepreneurs have broken away the beaten path and are exploring new avenues of economic participation. This further makes this task full of challenges, as they have to encounter public prejudices and criticisms. Opposition from family and social constraints has to be overcome before they establish themselves independently as entrepreneurs. The risk is greater for women entrepreneurs as compared to that of their male counterparts. There are many hurdles and limitations which women face. In the traditional Indian society, the growth of industrialization, education and domestic system are able to bring about significant changes. But still this movement and development of women entrepreneurs is in a traditional phase. Many studies have revealed that, quite a large number of women entrepreneurs have set up their own enterprise and have been managing business successfully. It has been globally recognized that women's empowerment can be a well paying strategy for overall economic and social development. This has resulted in significant changes in the approach to assist women in a continuum ranging from welfare to development. Entrepreneurship development among women is one activity that promises encouraging results. By motivating, training and assisting women towards forming and running independent business ventures, it may be possible to tackle many gender issues. "Women in business are a recent phenomenon in India. Emergence of women entrepreneurs in the economy is an indicator of women's economic independence and their improved social status. The role of women entrepreneurs help to solve the problem of unemployment and poverty [Rajeswari & Sumangala, 1999]".

Women entrepreneurship enables to pool the small capital resources and skill available with women. It paves the way for fuller utilization of capital and also mobilizes the female potential. Women entrepreneurship enhances the status of women can also lead to their integration into economic development. It has been seen in many cases that in spite of many obstacles quite large number of women have somehow found the way to engage in entrepreneurial activities. Lot of debate is being generated on women taking up entrepreneurial venture. "The underdeveloped countries have not yet reached a stage of development that can afford them either to discount or discard the notion that self-employment is confined only to man. It is intended to probe into genesis of self-employment of women by estimating interrelationship between socio-economic structure and self-employment [Asaf Ali, 1975]".

### **WOMEN ENTREPRENEURS IN INDIA - CURRENT SCENARIO**

Entrepreneurship is considered as one of the most important factors contributing to the development of society. And it is ideal for women seeking participation in the country's economic development because of certain factors. Emergence of entrepreneurship can be considered to be closely linked to social, cultural, religious and psychological variables. These changes seem to be taking place because of acceptable norms in the context of women at work.

The sixth economic census, released by ministry of statistics and programme implementation, presents a worrisome picture of the status of women entrepreneurs in the country.

- Women constitute only 13.76% of the total entrepreneurs, i.e., 8.05 million out of the 58.5 million entrepreneurs
- These establishments in total, owned by females, provide employment to 13.45 million people.
- Currently women entrepreneurs maybe less but overall women comprise about 30% of corporate senior management positions, which is notably higher than the global average [24 percent]
- The overall median proportion of female executives in successful companies is 7.1 percent, compared to 3.1 percent at unsuccessful companies.
- Another revelation is that out of these entrepreneurs, 2.76 million women [34.3% of the total entrepreneurs] work in agriculture sector whereas 5.29 million females [65.7% of the total entrepreneurs] work in non-agricultural sectors.

- In the agriculture, livestock dominates [with a share of 31.6 %] among all other farming activities.
- Among the non-agricultural activities owned by women entrepreneurs, manufacturing and retail trade are dominant ones with corresponding percentages being 29.8% and 17.8% respectively.
- Out of the total establishments under women entrepreneurs, percentage share of various social and religious groups OBC: 40.60%, SC: 12.18%, ST: 6.97% and Others [40.25%]; Hindus: 65.6%, Muslim: 12.84% and Christian: 5.2%.
- Among the states, the largest share in number of establishments under women entrepreneurship is of Tamil Nadu [13.51 percent] followed by Kerala [11.35 percent], Andhra Pradesh [10.56 percent], West Bengal [10.33%] and Maharashtra [8.25%].
- Average employment per establishment for women owned establishments is 1.67.
- India ranks 29th of 31 countries in the 2015 Global Women Entrepreneurs Leader Report by ACG Inc.

Till recently, there was no official government record exhibiting the growth of women entrepreneurs in the country. All India Report of Sixth Economic Census in March 2016 brought out the growth story of women entrepreneurs in the country based on the survey conducted during

### **REASONS FOR WOMEN BECOMING ENTREPRENEURS**

Today, women are shattering the glass ceilings and are found taking up entrepreneurship in every line of business. They are just not confined to 3P's, i.e. Pickle, Powder and Papad. There is shift from 3Ps to 3Es i.e. Energy, Electronics and Engineering with the spread of education. Skill, knowledge and adaptability in business are the main reasons for women to emerge into business ventures.

Women Entrepreneur is a person who accepts challenging role to meet her personal needs and become economically independent. A strong desire to do something positive is an inbuilt quality of entrepreneurial women, who is capable of contributing values in both family and social life. With the advent of media, women are aware of their own traits, rights and also the work situations. The challenges and opportunities provided to the women of digital era are growing rapidly that the job seekers are turning into job creators. Many women start a business due to some traumatic event, such as divorce, discrimination due to pregnancy or the corporate glass ceiling, the health of a family member, or economic reasons such as a layoff. But a new talent pool of women entrepreneurs is forming today, as more women opt to leave corporate world to chart their own destinies. They are flourishing as designers, interior decorators, exporters, publishers, garment manufacturers and still exploring new avenues of economic participation.

The following are the reasons for women to become the entrepreneur

- Lack of job opportunity
- The increasing cost of living
- Using their educational qualifications for professional mileage
- Availing the opportunities to be an entrepreneur
- Background of family business

### **PUSH FACTORS**

Push factors include situations that push women to earn a living one way or the other. These are the situations when women don't have a choice but to earn, like the death of the breadwinner of the family, a sudden fall in the income or a family income that is too low. In such circumstances, some women take jobs whether they're happy doing them or not. They'll do what it takes to care for their families. For some women, the solution is to push past barriers and build their own firms.

### **PULL FACTORS**

Pull factors attract women to the world of business. They are the influences that motivate women and make them want to compete. A woman's desire gain recognition, respect, importance, social status, and economic independence are some common pull factors. In addition to these factors, the Feminism movement is also influencing many women to prove that women can stand shoulder to shoulder with men and to bring about change in the perception of women and their roles, rights, and freedoms.

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**CHALLENGES FACED BY WOMEN ENTREPRENEURS**

Women in India constitute around half of the country's population. Hence, they are regarded as the "better half of the society". In the official proclamation, they are at par with men. But, in real life, the truth prevails otherwise. Our society is still male-dominated and women are not treated as equal partners both inside and outside four walls of the house.

**DUAL RESPONSIBILITY**

Women's family obligations also bar them from becoming successful entrepreneurs in both developed and developing nations. The domestic and household responsibilities, they are universally considered to be women's domain.

**GENDER GAPS IN EDUCATION**

While the proportion of educated women is showing a rising trend, they often lack vocational and technical skills, and work experience needed to support the development of highly productive businesses.

**LACK OF FINANCE**

"Both fixed and working capital is required to obtain materials, machinery, equipment etc and to undertake innovation. Due to a low rate of savings and deficiencies in the channelization of funds, adequate capital does not flow into productive activities. Potential entrepreneurs find it difficult to start their ventures due to lack of finance. This problem is all the more worse in the case of women entrepreneurs. Often, they are unable to raise external funds as they do not have tangible assets in their names to provide as security [Abraham, 2000]".

**LEGAL CONSTRAINTS IN FAMILY LAW**

The institutional and legal environment is critical to the growth of female-owned enterprises. Laws regulating the private sphere specifically those regarding marriage, inheritance of property and land hinder women's access to assets that can be used as collateral when securing a loan.

**ABSENCE OF FAMILY SUPPORT**

Changing economic conditions and growing pressure on the urban middle class families have brought women out of their home. Sometimes the family may make the women feel guilty of neglecting household duties in her pursuit of business obligations. Cultural traditions may hold back a woman from venturing into her own business. And therefore, it is essential that they receive support from family so that they powerfully play their new role as an entrepreneur in the changing situation.

**CONTRIBUTION OF WOMEN AS AN ENTREPRENEUR**

According to a top member of the government's think-tank NITI Aayog, women entrepreneurs in India are bringing about a lot of development in the public and private sectors. Today women as an entrepreneur are playing a significant role and their contribution in different forms cannot be ignored or overlooked.

**CONTRIBUTION IN GDP**

Economically active women in India contribute in the GDP of the country. In India, women contribute about 22 per cent of our GDP. According to Niti Aayog CEO Amitabh Kant "India needs far more contribution of women in GDP. Women contribute about 22 per cent of our GDP, the worldwide average is close to 44-45 per cent," he said at an event here. "And, therefore, if India has to grow consistently at 9-10 per cent for three decades and reap dividend of demographic advantage, the focus on women entrepreneurship has to be key aspect of growth strategy," According to a McKinsey Institute research, narrowing the gender gap in economic terms could add close to \$28 trillion to global GDP by 2025 – with almost \$3 trillion added to India's GDP alone. Achieving gender equality in India would have a larger impact solely due to the sheer number of people present in our country.

**ENHANCES GENDER EQUALITY**

The economic role of women as an entrepreneur will enhance gender equality thereby reducing gender gap. When more and more women are taking up entrepreneurship the gender gap will close fast. But at the same time one cannot deny the fact that women still have to struggle to grab equal opportunities, but the race to win is a close one, with women having slightly greater chances to win.

**BREAKING STEREOTYPES**

Society had imposed various roles and adjectives on women so there used to be a very limited number of professions for women to choose from. With the opportunity to break these stereotypes, women have redefined their roles and adjectives. They no longer stick to the professions that society expected them to stick to.



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**ROLE MODELS**

The successful women entrepreneurs will further motivate and encourage other women to take up entrepreneurship by playing an additional function as a role model. The proportion of emerging women who take on the responsibility to inspire young girls, the responsibility of a role model has increased significantly. The successful women in business like Indra Nooyi, Dr. Kiran Mazumdar Shaw, Ekta Kapoor, Indu Jain and many more who are influencing women around the India to take the wheel in their hands, and they are set to look at a world filled with success stories of women entrepreneurs. Women, who are successful as an entrepreneur and in a position of power, have a responsibility to aid in the success of other women who are looking forward up to them.

**MEASURES TO PROMOTE WOMEN ENTREPRENEURSHIP**

The Indian society today calls for a speedy change but a radical transformation both at its structural and functional levels. Right now one of the major concerns of the government is empowering women, giving women enough opportunities to show their worth. More women are joining the world of business and entrepreneurship day by day. All they need is proper inspiration, training and promotions. The Government has also taken a few steps to ensure that women are properly educated, informed and guided about entrepreneurship and the countless opportunities it has to offer. Here is what the Government is doing to help women start their own businesses. Government of India has launched some of the schemes with the intention of motivating women to take up entrepreneurship.

**TRADE RELATED ENTREPRENEURSHIP ASSISTANCE AND DEVELOPMENT [TREAD] SCHEME FOR WOMEN**

This scheme provides women with proper trade related training, information and counseling along with extension activities related to trades, products, services etc. Along with that, Government Grant also provides up to 30 percent of the total project cost as appraised by lending institutions which would finance the remaining 70 percent as loan Assistance to applicant women. It mostly helps poor & usually illiterate/semi-literate women to get started on their business.

**MAHILA VIKAS NIDHI**

This fund has been set up by SIDBI to help women in rural area start their entrepreneurship easily. Under this scheme loan is granted to women to start their venture in the field like spinning, weaving, knitting, embroidery products, block printing, handlooms handicrafts, bamboo products etc.

**CO-OPERATIVE SCHEMES**

There are many women co-operatives schemes launched by the government to help women in agro-based industries like dairy farming, poultry, animal husbandry, horticulture etc. with full financial support from the Government.

**GOVERNMENT YOJANAS**

Swarna Jayanti Gram Swarozgar Yojana and Swarn Jayanti Sekhari Rozgar Yojana were two important schemes launched by the government to provide reservations for women and encouraging them to start their ventures.

**PRIVATE ORGANIZATIONS**

Several NGOs, voluntary organizations, Self-help groups, institutions and individual enterprises from rural and urban areas are working to helping these new women entrepreneurs in setting up their business and run it smoothly. Apart from above mentioned schemes a few training programs are also started by the Government for promoting self employment among women. They are:

- Support for Training and Employment Programme of Women [STEP].
- Development of Women and Children in Rural Areas [DWCRA].
- Small Industry Service Institutes [SISIs]
- State Financial Corporations
- National Small Industries Corporations
- District Industrial Centres [DICs]

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**POLICY RECOMMENDATIONS**

The following recommendations are put forward to enhance the growth of women entrepreneurship.

- The government of India has taken several steps to promote entrepreneurship among women. But there is need for follow ups and strategies.
- Need for introducing specific schemes for the women with low level of education.
- Arranging and organizing motivational seminars to spread awareness among women about different schemes to take up entrepreneurship.
- Identification of potential women entrepreneurs by government and help them in all aspects to set up their own business and enterprise.
- Making flexible and easy loan available for aspiring women entrepreneurs.
- Constant monitoring and follow-up of the schemes initiated by the government to boost women entrepreneurship.
- Providing support system to new women entrepreneurs so as to minimize their dependence on third party or some middle men.
- Minimizing and simplifying the paper work for the women entrepreneurs, as many of them may not be well educated.
- Other than traditional domain of women entrepreneurship more and new avenues should be identified for potential women entrepreneurs.

**CONCLUSIONS**

The evidences in the present paper shows that women are also innovative can organize and operate business. They are in no way different from their male counterparts' so far as managing business is concerned. Thus, a woman can also become a successful entrepreneur who is capable of managing her enterprise, and thereby contributing significantly to the economic health of the country.

The role of women in economic development of India is inevitable. Due to increased access to education and capital resources women enter not only in selected professions but also in professions like trade, industry and engineering. Women are also willing to take up business and contribute to the country's economic development. However, for promoting sustainable women entrepreneurship, they must be molded properly with entrepreneurial traits and skills needed to meet the changes in trends, global market challenges and also to be competent enough to sustain and strive for excellence in the entrepreneurial arena. This requires a holistic approach adopted by the regulators and the society as a whole. The ever-growing number of women entrepreneurs will continue to grow, and women in business are here to stay. The wheels have been set in motion and there's no looking back from this trend.

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**COMBINED EFFECT OF SEED FORTIFICATION WITH MO(MOLYBDENUM) AND FOLIAR APPLICATION OF ZINC (Zn) AND IRON (Fe) ON NUTRIENT UPTAKE BY SOYA BEAN (GLYCINE MAX) CROP**

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**ABSTRACT**

A field experiment was conducted during the year 2017-18 at Rotegaon taluka Vaijapur dist.Aurangabad M.S.India with aim to study the effect of seed fortification with Molybdenum (Mo) and foliar application of Zinc (Zn) and Iron (Fe) on uptake of nutrient at critical growth stages of soybean crop. The treatments comprised 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% was undertaken at 30, 50 and 70 days after sowing.

The results emerged out from this were recorded at flowering, pod formation and harvesting stages of soybean crop with application of treatment T<sub>9</sub> which received RDF along with seed fortification of Mo and foliar application Zn and Fe. the micronutrient uptake was also noticed significant and maximum i.e. 162.91, 166.91 and 177.41 g. Zn ha<sup>-1</sup>, 398.85, 401.24 and 402.39 g. Fe ha<sup>-1</sup> and 189.57, 198.18 and 203.15 g. Mo ha<sup>-1</sup> at flowering pod formation and harvesting stage of soybean plot with use of treatment T<sub>9</sub>, except the Fe content was found maximum with the use of treatment T<sub>6</sub> which comprised of RDF along with foliar application of Fe and Zn. The grain and straw yield were found to be significantly highest i.e. 2666.30Kg and 2247.60 Kg ha<sup>-1</sup> with addition of treatment T<sub>9</sub>.

**Keywords:** Soybean, seed fortification, molybdenum (Mo), foliar application, zinc (Zn) and Iron (Fe)

**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.

Foliar spraying is a new method for crop feeding in which micronutrients in the form of liquid are used into leaves (Nasiri *et al.*, 2010) <sup>[8]</sup>. Foliar application of micronutrient is more beneficial than to 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 (Kinaci and Gulmezoglu, 2007) <sup>[4]</sup>. 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.

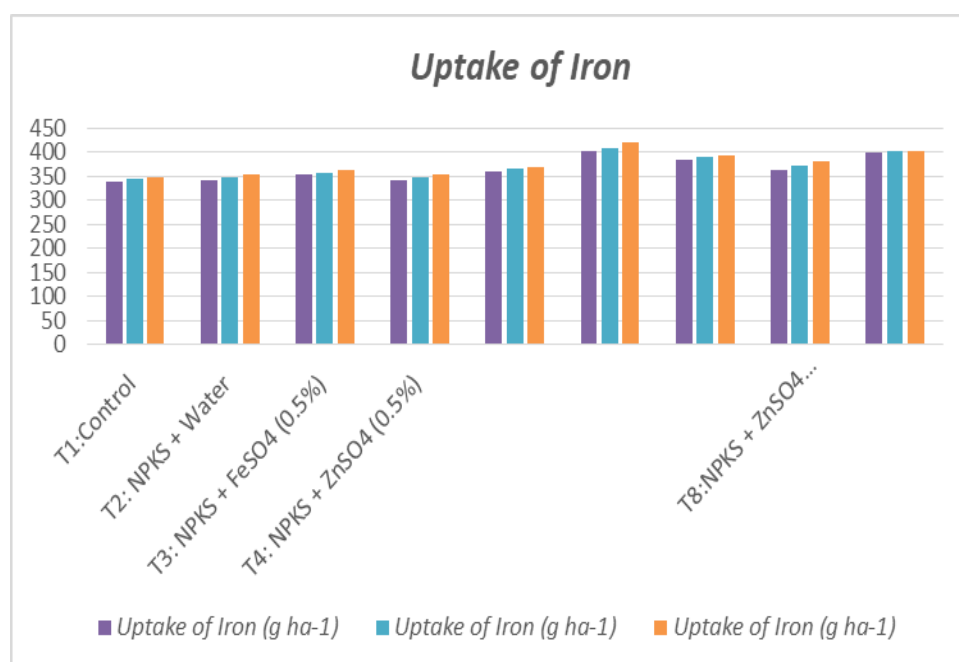
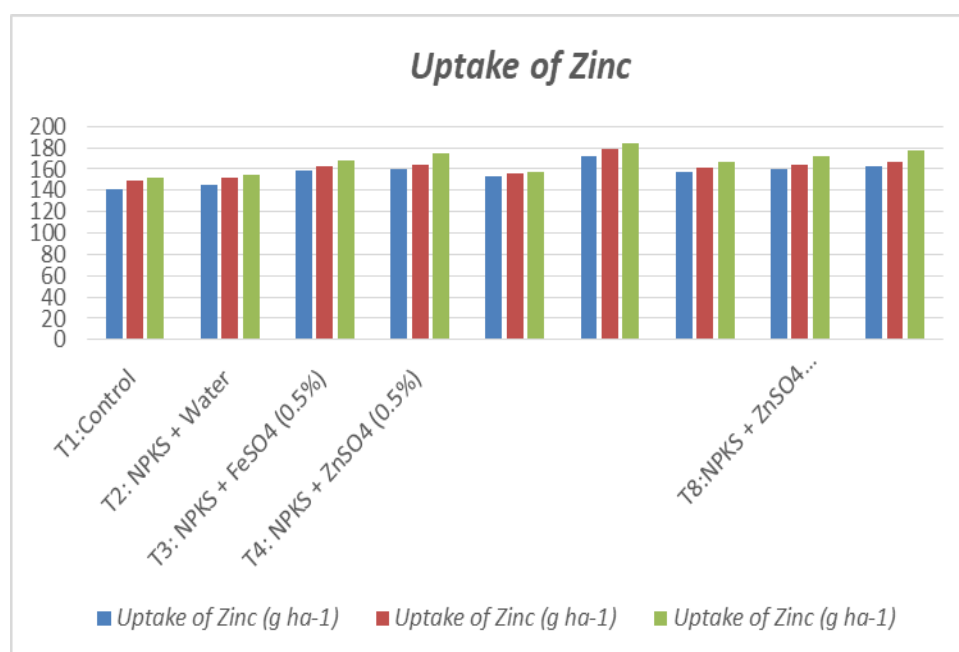
**MATERIAL AND METHODS**

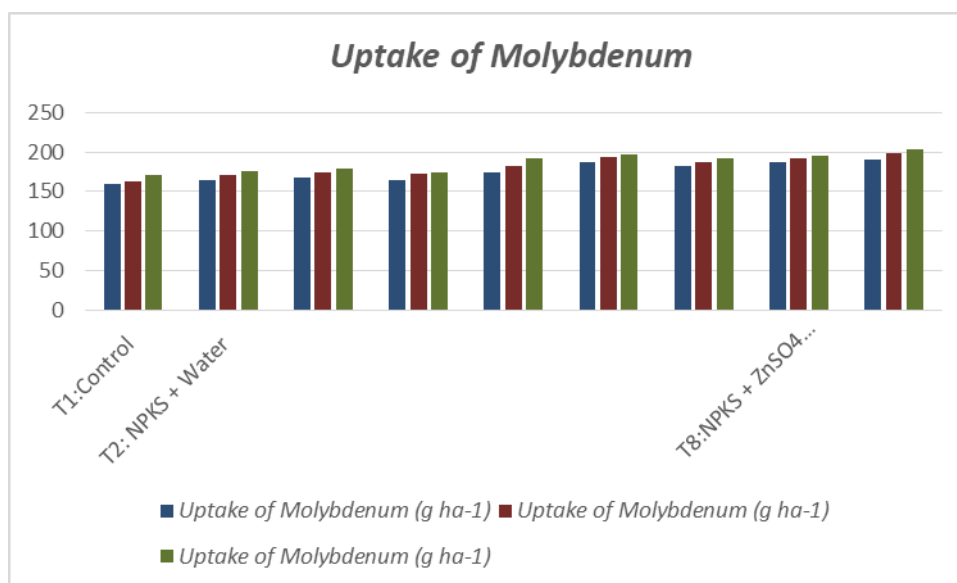
The experiment was conducted in 2017-18 at Rotegaon tal Vaijapur dist.Aurangabad. An Experiment was conducted to study the effect of foliar application of micronutrients (Zn, Fe) and seed treatment with Mo on growth, yield, uptake of nutrients and quality of Soybean. The experiment was laid out in Randomized Block design with nine treatments replicated thrice; each treatment consisted of 10 rows with row to row spacing of 45 cm. The soil has pH 8.9 and EC 0.28 dSm<sup>-1</sup> and clayey texture.

**Table-1: Uptake of micronutrients in soil as influenced by Zn And Fe foliar application of Mo with seed fortification at Flowering and Pod Formation 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 Flowering	At Pod Formation	At Harvesting	At Flowering	At Pod formation	At Harvesting
T1:Control	141.1	148.57	151.32	340.09	346.24	349.29	159.35	163.45	171.39
T2: NPKS + Water	145.03	151.3	154.42	342.17	347.29	353.51	164.45	171.51	176.03

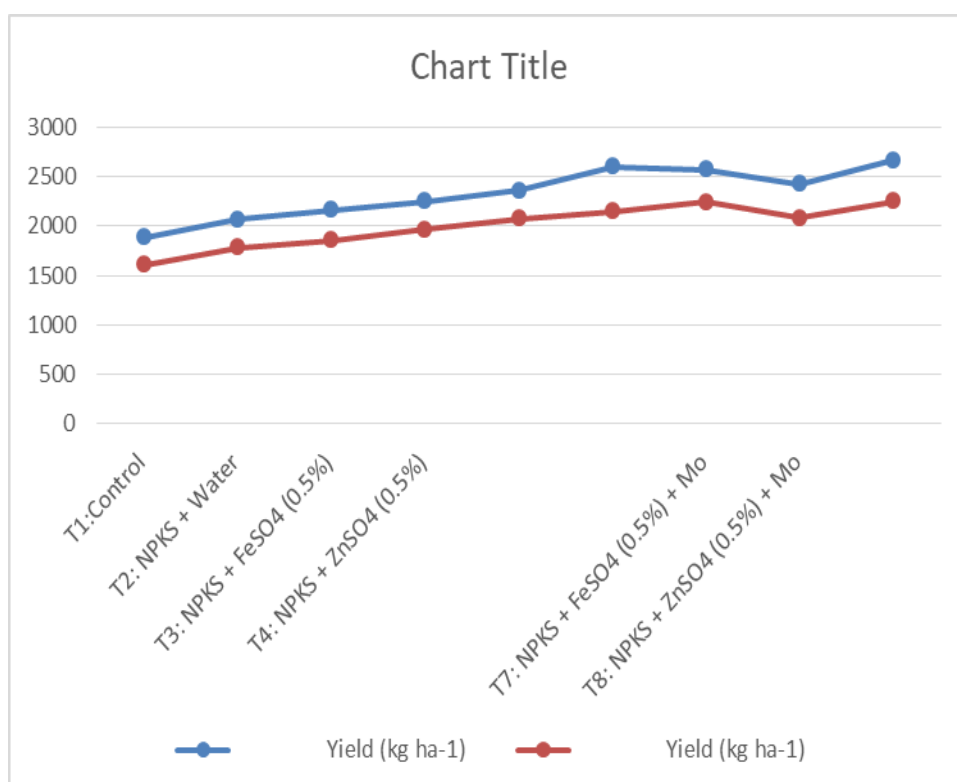
T3: NPKS + FeSO <sub>4</sub> (0.5%)	158.22	162.38	168.13	353.42	357.65	363.62	168.29	174.71	178.16
T4: NPKS + ZnSO <sub>4</sub> (0.5%)	159.92	164.50	174.70	343.04	348.06	352.74	164.79	172.63	174.51
T5: NPKS + Seed treatment with Mo	153.73	156.28	157.31	359.87	365.9	369.58	174.59	181.58	191.36
T6: NPKS + FeSO <sub>4</sub> (0.5%) + ZnSO <sub>4</sub> (0.5%)	172.51	178.59	184.01	401.3	408.31	419.66	187.22	193.56	196.53
T7: NPKS + FeSO <sub>4</sub> (0.5%) + Mo	157.31	161.51	166.28	383.29	389.82	393.34	181.54	187.59	192.14
T8: NPKS + ZnSO <sub>4</sub> (0.5%) + Mo	159.77	163.65	171.64	362.95	370.94	380.43	186.81	191.48	195.51
T9: NPKS + FeSO <sub>4</sub> (0.5%) + ZnSO <sub>4</sub> (0.5%) + Mo	162.91	166.58	177.41	398.85	401.24	402.39	189.57	198.18	203.15
S.E. $\pm$	4.98	5.032	5.17	10.75	11.2	11.43	5.58	5.68	6.58
C.D @ 5%	14.99	15.14	15.57	32.37	33.74	34.41	16.8	17.09	19.82





**Table-2: Grain and straw yield (Kg ha<sup>-1</sup>) as influenced by foliar application Fe, Zn and seed treatment of Mo in soybean.**

Treatments	Yield (kg ha <sup>-1</sup> )	
	Straw	Grain
T1:Control	1886.60	1605.00
T2: NPKS + Water	2063.30	1780.30
T3: NPKS + FeSO <sub>4</sub> (0.5%)	2160.00	1856.00
T4: NPKS + ZnSO <sub>4</sub> (0.5%)	2246.00	1966.30
T5: NPKS + Seed treatment with Mo	2360.30	2070.30
T6: NPKS + FeSO <sub>4</sub> (0.5%) + ZnSO <sub>4</sub> (0.5%)	2596.30	2147.60
T7: NPKS + FeSO <sub>4</sub> (0.5%) + Mo	2569.00	2240.00
T8: NPKS + ZnSO <sub>4</sub> (0.5%) + Mo	2427.30	2080.60
T9: NPKS + FeSO <sub>4</sub> (0.5%) + ZnSO <sub>4</sub> (0.5%) + Mo	2666.30	2247.60
S.E. ±	67.60	89.60
C.D @ 5%	203.60	269.80



### GRAIN AND STRAW YIELD

The data presented in table-2 Shows that the Treatment Significantly Influenced the Grain and Straw Yield of Soybean. There was significant and maximum grain yield 2247.60 Kg ha<sup>-1</sup> was recorded with application of treatment T<sub>9</sub> which received N, P, K, S and foliar application of iron and zinc with seed treatment of molybdenum. It was found to be at par with T<sub>7</sub>, T<sub>6</sub>, T<sub>8</sub> and T<sub>5</sub> and superior over rest of the treatments. The lowest grain yield was observed in control (1605.00 kg ha<sup>-1</sup>). The highest straw yield observed (2666.30 kg ha<sup>-1</sup>) in T<sub>9</sub> which receives N, P, K, S and foliar application of iron and zinc with seed treatment of molybdenum. It was at par with T<sub>6</sub> and T<sub>7</sub> these are superior over rest of the treatments including control (1886.60 kg ha<sup>-1</sup>) which was lowest. This result might be due to enzymatic enhancement of micronutrient effectively increased photosynthesis and translocation of assimilates to the seed. The available soil zinc and iron status (0.4 mg Zn kg<sup>-1</sup> and 1.2 mg Fe kg<sup>-1</sup>) was below the critical level, hence there was significant response in terms of grain and straw yield observed in the treatment receiving zinc and iron. Similar results were quoted by Ravi *et al.* (2008)<sup>[11]</sup>, Kobraee *et al.* (2011) in respect of zinc and iron application in soybean and Galaviet *al.* (2012)<sup>[7]</sup> in safflower.

### CONCLUSION

From this study it was concluded that application of treatment T<sub>9</sub> which received RDF along with seed fortification of Mo and foliar application Zn and Fe significantly superior in order to have maximum macronutrient (N, P, K, S), micronutrient (Zn and Mo) uptake and grain and straw yield in soybean. However, treatment T<sub>7</sub> was the next best option.

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## SCREENING OF BIODETERIORATION OF PAPER MATERIAL IN COLLEGE LIBRARY

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**ABSTRACT**

*The possible role of fungi as bio deteriorating agent in book collection has been surveyed inside the college library at Vinayakrao Patil Mahavidyalaya, Vaijapur, Dist. Aurangabad, Maharashtra, India. Air in the library was sampled twice daily with a Roto-Rod Air Sampler. The analysis of airmycospora indicated the presence of 30 fungal spore types of which 11 types are suspected to destroy the paper. These 11 types contributed 92% to the total air-mycospora of them Cladosporium, Penicillium, Aspergillus, Alternaria and Curvularia were 82% followed by Periconia, Chaetomium, Trichoderma, Torula, Rhizopus and Trichothecium.*

*Keywords: Contaminants, Roto-Rod Air sampler, Air mycospora.*

**INTRODUCTION**

For recording progress of mankind-paper has been in use for centuries and will probably continue as a medium for recording and exchanging information for quite a long time. In order to guard this precious heritage for generations to come it is essential that the written word be scientifically preserved.

It has been observed that some books, manuscripts and periodicals lost their life by more than 50% within an estimated 9-10 years period (Langwell, 1958) because apart from cellulose, now a days the paper may contain other substances like lignin, hemicellulose, pectin, waxes and tannin which act as substrate for microbial growth.

**MATERIALS AND METHODS**

Roto-rod air sampler was employed to sample air inside the library twice every day in the morning 10.00 to 10.30 am before starting the work of Library, and in the evening 4.00 to 4.30 pm before closing the work of library, for period of 8 months from 1st February 2006 to 30th September 2006. Simultaneously PDA culture plates were exposed fort-nightly spore catch from the library atmosphere. The identification of various spore types was based on comparison with the fungal collections from the affected books, visual identification and comparison with culture isolate. Collections were made with the sampler upright on the stool approximately 18 inches above the floor. Books were handled during operation of sampler.

**RESULT AND DISCUSSION**

A total of 30 fungal spore types were identified inside the library among these 11 types constituted 92% of the total intramural air-mycospora of library and are suspected to destroy the paper. The records of damaged books were more during rainy season when humidity was about 80% and temperature 24-35 °C. Inside library the bio-pollutants are generally settled on the stored books and sometimes deposited on the inner walls of library. During activities like handling, cleaning, storing and rearranging the settled bioparticles disturbed and dispersed in the library environment (Tilak and Pillai, 1988). The open doors, windows and ventilation also permit wind currents from outside and help to disperse the deposited bio-pollutants (Gregory, 1961).

The scratches of the damaged books were cultured on plates containing PDA medium. It is observed that colonies of Aspergillus, Alternaria, Curvularia, Chaetomium and Trichoderma were common on culture plates. This indicates that these were the common genera of fungi inside the library and also responsible for damage.

On scanning slides it was found that Cladosporium (30%), Penicillium (17.10%), Curvularia (7.80%), Periconia (3.55%) were predominant than Trichoderma (1.70%) and Trichothecium (0.76%).

Majority of fungi which induce biodeterioration of paper materials are members of Deuteromycotina, the biodeterioration is of two types, first type initiates the degradation process indicating representatives of Penicillium, Aspergillus, Alternaria and Curvularia. The second type consists of fungi with adaptability to definite substrate such as cellulose product. The bestknown cellulolytic fungi are Trichoderma viride and most of the members of genus Chaetomium.

The following type of fungal damage have been observed: Surface damage caused by the growth of colonies and embedded fruiting bodies in paper. Discoloration caused by pigments produced in fruiting bodies, pigments present in mycelium and pigments secreted into papers and Structural destruction of paper caused by enzymatic digestion of cellulose. Fungal growth on paper material adversely affects the longevity by enzymatic activity on paper component i.e. cellulose fibers. The process of secretion occurs

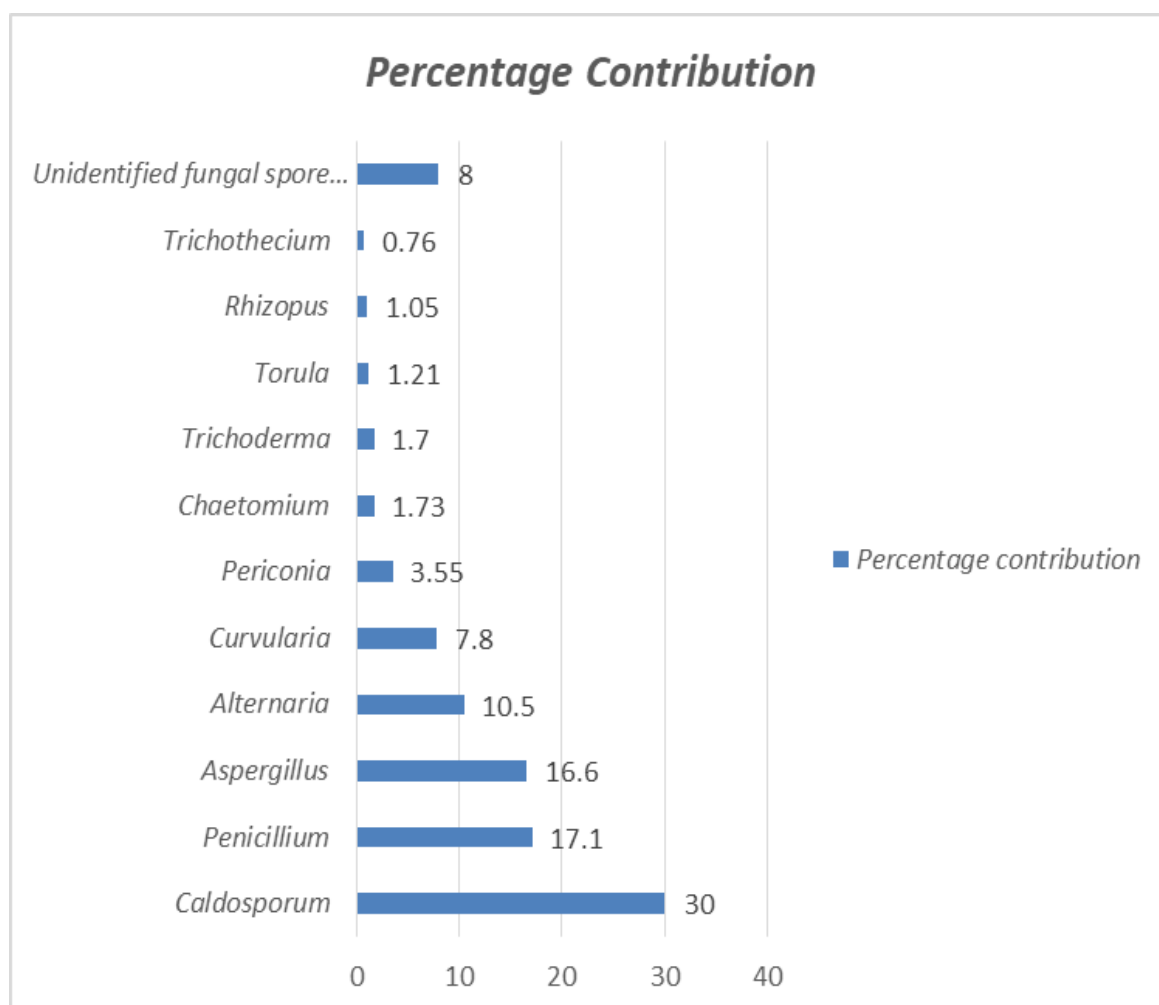


in advancement by hyphal tips and in the 1<sup>st</sup> stage of infection and it create hole on the surface of paper. These help the penetration of hold fast into the paper substrate (Pady, 1957 and Stridar, 1961).

*For the protection and preservation of the paper against bio-pollutants suitable microbio toxicant apply low toxic to human and environment should be used.* Numerous fungicides like 2, 3 trichloro-diphenyl methane (Irgasan DP-30) and 5-di chloro diphenyl methane are recommended (Kathapalia, 1960), Middleton (1977). Another important biocide which is widely used is Thymol. It is used as a fumigant (Kowalik, 1980). For immediate killing of micro-organism fumigation with ethylene oxide seems to be more suitable (Cunha, 1977).

**Table-1: Percentage contribution of major fungal spores responsible for deterioration of books**

Sr. no.	Fungal spore type	Percentage contribution
1	Caldosporum	30
2	Penicillium	17.1
3	Aspergillus	16.6
4	Alternaria	10.5
5	Curvularia	7.8
6	Periconia	3.55
7	Chaetomium	1.73
8	Trichoderma	1.7
9	Torula	1.21
10	Rhizopus	1.05
11	Trichothecium	0.76
12	Unidentified fungal spore types	8.0



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**AN EXPERIMENTAL STUDY: EFFECT OF TEACHING METHODOLOGY ON THE ACHIEVEMENT OF 6<sup>TH</sup> GRADE STUDENTS OF GOVERNMENT AND PUBLIC SCHOOLS IN SCIENCE SUBJECT**

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**ABSTRACT**

*The present study elaborates the scope of introduction a new intervention in the field teaching learning, which presumes that a new methodology which is based on the gathering and construction of knowledge from the surrounding environment and apply the same in various teaching leaning situations which raises their academic achievement, on the other side the Traditional methods of teaching which are not child centered and promote only rote memory which results low academic achievement. In the present research the investigator conducted the experimental study on 6<sup>th</sup> grade science students by introducing teaching methodoly in which the two groups were formed. 1. Control group 2.Experimental group both group were taught by using different methods of teaching and learning, Control group students were taught with Traditional teaching methods and experimental group students were taught by introducing new approach of teaching i.e. Constructivist approach of teaching and learning. Experimental method was used in the study. The questionnaire was used as the primary tool in gathering data. Quasi experimental research design was used to achieve the purpose of the present study. The study was designed on the basis of Non equivalent pretest-posttest control group design and a sample of 140 students of 6<sup>th</sup> grade (70 Govt. school & 70 Public school ) were selected from two schools randomly from 28 schools located in Nalagarh Block, Distt Solan H.P. Descriptive statistics, Independent–Samples T test: For compare the achievement scores of two groups. Analysis of results indicates that there was no significant difference between the mean achievement scores of the experimental and control group students at Pre test level. At both schools, But there was a significant difference between the mean achievement scores of the experimental and control group students at Post test level. And there was also significant difference between the mean achievement scores of the experimental and control group students at Delayed post test level of Govt. and Public school 6<sup>th</sup> grade students in science subject. Similarly a significant difference was found between the mean achievement scores of Govt. school and public school 6th grade Science students taught with the help of Constructivist and Traditional approach.*

*Keywords: Teaching Methodology and Achievement*

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**INTRODUCTION**

India is one of the world's fastest growing countries; its dominance on the various sectors has been acknowledged world over. The education sectors and specifically science education have an important role in achieving this position. The Indian education system is as old as the human civilization. Ancient Indian system was mainly concerned with vocational learning of parental crafts, manual work, physical exercise of yoga, disciplined life, truthfulness, self confidence, respecting elders, helping needy persons and love for nation etc. However Indian education system suffered a great drawback in the later period.

The quality of a school or educational system should, in real sense, be judged in terms of learner achievement, namely, how much and how well the learners have acquired the intended curriculum Input (Dove, 1991). With this framework of the concept of quality of education, it would be worth examining the effectiveness of imparting the instructions to the students and their application in their day today life situations.

In India Science education in the schools has deviated much from imparting in depth knowledge in science because it is merely bookish and theoretical. The shift in emphasis from Traditional approaches in teaching to that of reconceptualization technique of instruction and evaluation is relatively new and developing at a faster rate. It requires a number of ways to create the right environment for learning. Effective learning occurs when the students are actively involved in organizing and findings the relationships in the information they encounter rather than being the passive recipients of the teacher delivered quantum of knowledge. The young inquisitive minds may have questions about all sorts of things and these questions are being suppressed in a Traditional classroom.

Academic achievement has always been a crucial area and the main centre of educational research. Academic achievement has been considered as an important factor in life. In the rapidly changing world and with the growing advancement in science and technology, the place of education has become vital.

**TEACHING METHODOLOGY:** In the present study two methods of teaching are compared in terms of student outcome of academic achievement in science subject of 6<sup>th</sup> grade of Govt. and public school.

**CONSTRUCTIVIST APPROACH:** In a Constructivist classroom, teachers use active techniques to learning. Students learn primarily through experiments, real world problem solving, reflection and discussion. In constructivist classroom, the teacher guides the students in their learning. The teacher encourages the students to ask question and to access their learning. By asking questions, the students work through their learning and not only learn new information, but they learn how to learn. Students are encouraged to evaluate their learning and reflect on their learning progress. Hands on learning are the basis of a constructivist classroom. Students learn by doing “They become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings

**TRADITIONAL APPROACH:** The traditional methods of teaching are based on objectivist view of knowledge. In objectivist paradigm, the teacher transmits knowledge to the learners who are considered as passive receivers of knowledge. It is believed that the teacher has all the knowledge and the teacher is the source of right knowledge and correct answers. Objectivism is based on the assumption that knowledge is objective, universal and complete and it can be imported by those who have it, to those who do not have it. Constructivism on the other hand is based on the assumption that knowledge is subjective, contextual and inherently partial. Hence it focuses on the resilience of the learner’s beliefs and the social construction of reality.

### **OBJECTIVES OF THE STUDY**

1. To compare the achievement in Science subject of Government school two groups of 6<sup>th</sup> grade students:
  - i) Taught with the help of instructional material based on Constructivist approach of teaching and
  - ii) Taught with the help of instructional material based on Traditional approach of teaching.
2. To compare the achievement in Science subject of Public school two groups of 6<sup>th</sup> grade students:
  - i) Taught with the help of instructional material based on Constructivist approach of teaching and
  - ii) Taught with the help of instructional material based on Traditional approach of teaching.

### **HYPOTHESES OF THE STUDY**

1. There will be significant difference on the achievement of Govt. school two groups of 6th grade Science students :
  - i) Taught with the help of Constructivist approach.
  - ii) And Traditional approaches.
2. There will be significant difference on the achievement of Public school two groups of 6th grade Science students:
  - i) Taught with the help of Constructivist approach.
  - ii) And Traditional approaches.

### **NEED AND IMPORTANCE OF THE STUDY**

In spite of many efforts made by the various committees and commissions constituted for the betterment of education particularly science education but the quality of Science education is not satisfactory. The textbooks are activity-based inclusion of learner-centered teaching learning process and increased utilization of community resources. But still, the change is not up to the mark. Science is being taught in the schools as a body of established facts obtained by individuals using infallible methods. In the Traditional classroom, the classes are usually driven by “teacher talk” and depend heavily on textbooks for the structure of the course. Teachers serve as pipelines and seek to transfer their thoughts and meanings to the passive students.

This study will be able to put emphasis on the learner centered or activity method. The importance of the present study is to prepare students to become good adaptive learners i.e. students should be able to apply what they learn in school to the various unpredictable situations that they might encounter in the course of their work lives. Studies have proved that Constructivist approach is effective to enhance the academic performance, attitude and interest of the students by using various methods and strategies.

### **STATEMENT OF THE PROBLEM:**

**“AN EXPERIMENTAL STUDY: EFFECT OF TEACHING METHODOLOGY ON THE ACHIEVEMENT OF 6<sup>TH</sup> GRADE STUDENTS OF GOVERNMENT AND PUBLIC SCHOOLS IN SCIENCE SUBJECT.”**

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**OPERATIONAL DEFINITIONS OF THE TERMS USED**

**TEACHING METHODOLOGY:** Teaching is a controlled activity in which skilled or trained person impart the instructions to the learners by using various means of enhancing the learning outcomes to achieve the predetermined objectives. On the other hand learning is the acquisition of a skill or habit or some knowledge in any situation. The outcome of a good teaching depends upon methods used by the teacher to clarify the concept to the students.

**ACHIEVEMENT:** - Achievement is the assessment of academic performance which is largely confined to evaluation in terms of the objectives like knowledge, understanding, application and skill. An achievement test in the selected content including all the four levels of objectives was constructed by the investigator. Thus achievement in science in the present study is the total score obtained by the students in the achievement test constructed by the investigator.

**REVIEW OF THE RELATED LITERATURE**

**Kant (1983)**, the first major precursor said that scientific knowledge is actively constructed from our observational experience. For Kant, the metaphor of construction is pointedly appropriate.

**Saunders (1992)** explained that constructivism could be defined as that philosophical position, which holds that any reality is in the most immediate and concrete sense; the mental construction of those who believe they have discovered and investigated it.

**Boyer, Barbara A.; Semrau, Penelope(1995)** This study emphasizes that Educational Technology seems ideally suited for reinforcing Constructivist teaching and learning. Defines Constructivism and asserts that it moves away from the traditional objectivist approach to learning.

**Mordechai Ben-Ari (1998)** The findings of the study indicated that the Constructivism is a theory of learning which claims that student construct knowledge rather than merely receive and store knowledge transmitted by the teacher. Constructivism has been extremely influencing in science and mathematics education, but not in computer science education.

**E.W.Jenkins (2000)** suggested that the recent dominant emphasis upon constructivism in science education has narrowed both the professional and the research agenda relating to the school science teaching. The paper argues for greater clarity and precision when referring to Constructivist ideas in science education and for a better understanding of the role that learning theories should play in influencing the ways in which science is taught in schools.

**McAvoy, Rogers & Paparozzi, Christina (2003)** this paper presented the epistemological assumptions of Constructivism in contrast to those of a more objectivist position. Within this framework is defined the concepts of learning, instruction and evaluation. It presents examples and draws implications for the application in the design of learning settings.

**Kim, Jong Suk (2005)** The results of the study suggested that Constructivist teaching is more effective than Traditional teaching in terms of academic achievement, Constructivist teaching is not effective in relation to self -concept a learning strategy, but had some effect upon motivation, anxiety towards learning and self monitoring, it was found that a Constructivist environment was preferred to a Traditional classroom.

**K.V. Sridevi (2007)** The results of the study concluded that constructivist approach was found effective than the Traditional methods of teaching in improving the achievement in science, perception of nature of science, science process skills, scientific attitude and attitude towards science among eighth standards students.

**Demirci, Cavide (2009)** the aim of this research was to see if there is significant difference between the means of achievement and retention learning. The constructivist approach and Traditional approach were applied to the both groups and it was found that the group taught with constructivist approach has high mean score of achievement and retention than that of the Traditional group taught with the Traditional methodology.

**Pradnya B.Patil (2010)** In this study she asserts that the group taught through Jigsaw classroom showed a substantial progress than the traditional classroom. And 94% teachers respond that jigsaw classroom technique is easy to learn and 76% students actively participate in jigsaw classroom

**Amit Gautam, A.K. Kulshrestha (2011)** stated that Constructivist teaching is an effective way to teach as it encourages active and meaningful learning and promotes responsibility and autonomy besides achieving desirable educational goals of teaching and learning.

**Renu Bala (2011)** In this study an attempt was made to study the attitude of the science teachers' towards science and its effect on the student achievement in science, It was found that majority of students have favorable attitude toward science which effect the achievement in science.

## METHODOLOGY

### POPULATION

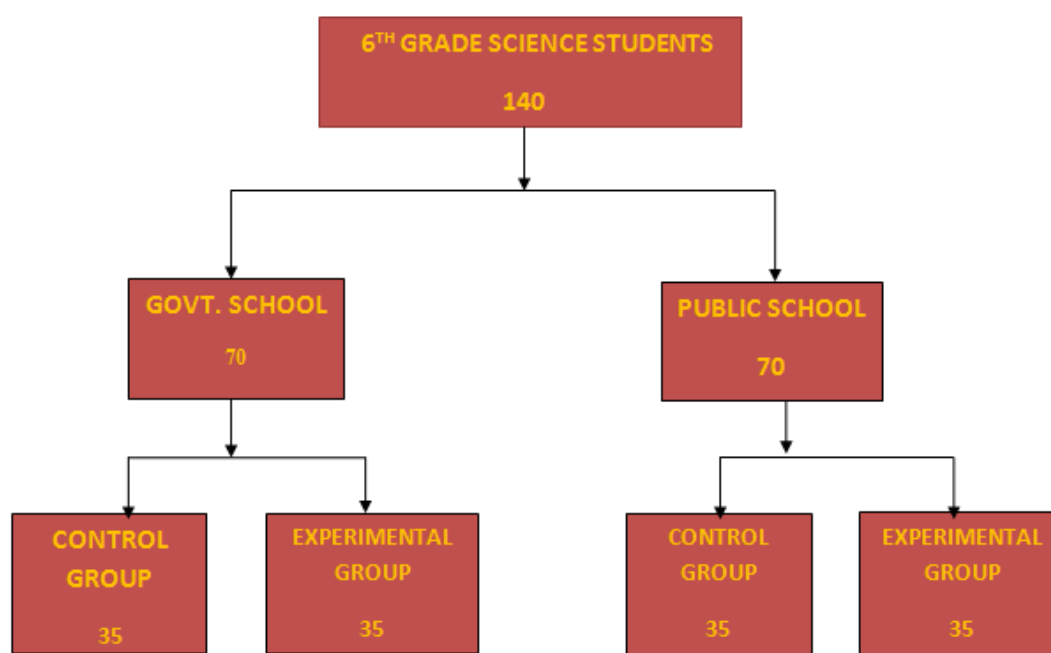
In the present study all the students of 6<sup>th</sup> grade studying in the Govt. and Public schools in Himachal Pradesh constituted the population of the study.

### SAMPLING PROCEDURE

Out of 12 districts of the State of Himachal Pradesh, District Solan was selected on the basis of random sampling. Further out of Five educational blocks in the District Solan, the Investigator has selected one Educational Block i.e. Nalagarh Educational Block on the basis of random sampling. After that in Nalagarh Educational Block, the Investigator had selected two schools out of 28 Schools.

**SAMPLE:** The sample of the study consist of total 140 students, out of which 70 students were selected from Govt. school and 70 students were selected from the Public school after that groups were formed in which the control group constituted 35 students and experimental group constituted 35 students in both school . Distribution of sample is shown in figure-I.

**SAMPLING FRAME  
FIGURE-1**



### DATA ANALYSIS

Data collected will put for tabulation and statistical calculation. Various statistical techniques like calculation of Mean, Median, SD and 't' test.

**DESIGN OF THE STUDY:** The present study was experimental in nature. Quasi experimental research (Non –Equivalent Pretest-Posttest Control group) design was used to achieve the purpose of the present study. The study was designed on the basis of Non equivalent pretest-posttest control group design.

### TOOL USED AND DEVELOPED IN THE STUDY

- Verbal Intelligence test by R.K. Ojha and K.Ray Choudhury:** To measure the mental ability of students to form the groups.
- Science Achievement test:** To measure Academic achievement of the students in Science at different levels of testing i.e. pretest, posttest and delayed posttest.
- Lesson Plans based on Constructivist Paradigm:** To achieve the objectives of Constructivist teaching based on Constructivist principles of teaching and learning

The study was carried out three main phases:

#### PROCEDURAL DETAILS OF THE STUDY

**Phase-I Developmental Phase**

**Phase-II Try out of lessons**

**Phase-III Implementation phase**

#### STATISTICAL TECHNIQUES USED

Descriptive statistics, Independent–Samples T test: For compare the achievement scores of two groups.

#### ANALYSIS AND INTERPRETATION OF DATA

The data was analyzed and interpreted in the light of objectives of the study as below:

#### GOVT. SCHOOL STUDENTS FINDINGS ON ACHIEVEMENT SCORES OF EXPERIMENTAL AND CONTROL GROUP AT DIFFERENT LEVELS OF TESTING IN SCIENCE

The achievement scores at different levels of testing i.e. Pretest, Posttest and Delayed posttest in Science subject w.r.t. two methods of teaching as given below in the table 1.

**TABLE-1**

**Mean, Standard Deviations of the Samples Pre-test, Post-test and Delayed post-test scores of the Govt. School students.**

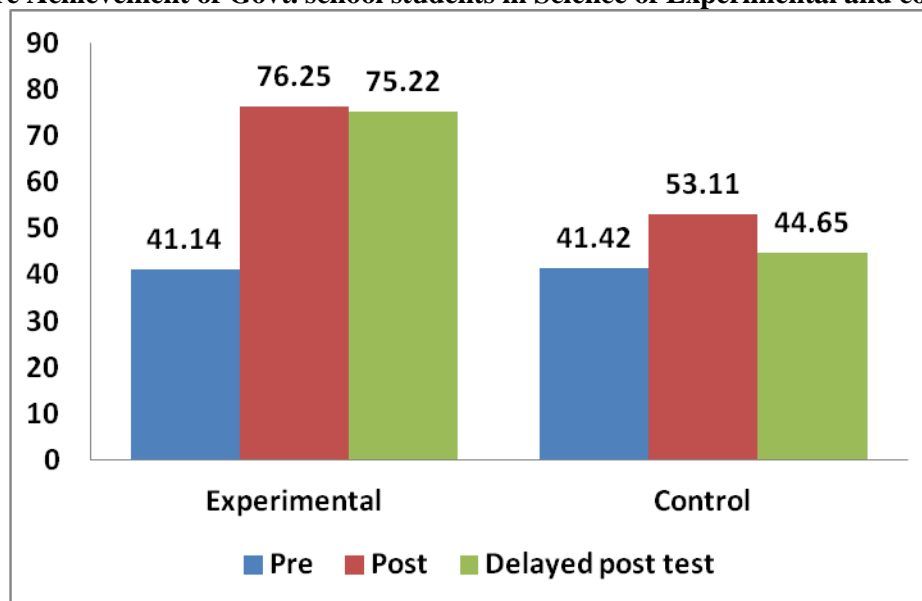
Test	Group	Method	N	Mean	SD	SEM
Pre test	Experimental	Constructivist Approach	35	41.14	12.64	2.13
	Control	Traditional Approach	35	41.42	10.80	1.82
Post test	Experimental	Constructivist Approach	35	76.25	14.45	2.44
	Control	Traditional Approach	35	53.11	10.22	1.72
Delayed post test	Experimental	Constructivist Approach	35	75.22	14.73	2.49
	Control	Traditional Approach	35	44.65	10.68	1.80

**N=Number, SD=Standard Deviation, SEM-Std. Error of mean**

Table-1 reveals that at pre - test level there was no statistical significant differences in the mean scores and Standard deviation of the Govt. school students in experimental group i.e. Constructivist group (41.14,SD=12.64) and Control group i.e. Traditional group (41.42,SD=10.80) ,which suggests that Govt. school students had same entry level before the treatment. At the Post test level there was statistical significant difference in the mean and Standard deviation of Govt. school students in experimental group i.e. Constructivist group (76.25, SD=14.45) and Control group i.e. Traditional group (53.11,SD=10.22) suggests that Govt. School students in constructivist group gained significantly after treatment in comparison to their colleagues in Traditional group, whose mean scores were slightly different from their mean scores at pre-test level (41.42,SD=10.80). At the delayed post test level there was significant difference in the mean scores and Standard Deviation of the Govt. school students in experimental group i.e. Constructivist group (75.22, SD=14.73) and Control group i.e. Traditional group (44.65, SD=10.68) implying that Govt. School students in Constructivist group retained the facts and information on selected Science Units taught more than their colleagues in Traditional group. Figure 1.1 depicts the mean differences of Experimental and Control groups at Pretest, Posttest and Delayed posttest level.

Figure – 1.1

Mean Score Achievement of Govt. school students in Science of Experimental and control group



#### GOVT. SCHOOL STUDENTS COMPARISON ON ACHIEVEMENT SCORES OF EXPERIMENTAL AND CONTROL GROUPS INDEPENDENT SAMPLES IN SCIENCE

The Experimental and control groups Govt. schools students were compared at the independent sample t test for equality of means at three levels of testing i.e. Pretest, Posttest and delayed posttest w. r. t two methods of teaching as shown below in the table 2.

Table-2

Summary Table for the Independent Samples on Pretest, Post test and Delayed post test scores of Govt. school students.

t-test for equality of means			
Tests	t	df	Sig.(2-tailed)
Pretest	-.102	68	.919
Posttest	7.73	68	.000
Delayed Posttest	9.93	68	.000

Table-2 indicates that the t-test values for the pretest, posttest and delayed posttest with respect to the two methods of teaching i.e. Constructivist Approach and traditional Approach. At the pretest level, the exact probability level is .919 which is greater than p value ( $p > .05$ ). This implies that there was no significant difference in the mean scores of students in Constructivist group (41.14, SD=12.64) and students in Traditional group (41.42, SD=10.80). At the posttest level, the p value is .000 which is less than p value ( $p < .05$ ). This implies that there was a significant difference in mean scores of the students exposed to Constructivist Approach (76.25, SD=14.45) and students in Traditional Approach (53.11, SD=10.22). At the Delayed posttest level p value is also .000 which is less than the p value ( $p < .05$ ). Hence there was significant difference in the mean scores between the Constructivist group (75.22, SD=14.73) and Traditional group (44.65, SD=10.68).

Hence, the Hypotheses-1, There will be a significant difference on the achievement of Govt. school 6th grade Science students taught with the help of Constructivist and Traditional approach” is accepted.

#### PUBLIC SCHOOL STUDENTS FINDINGS ON ACHIEVEMENT SCORES OF EXPERIMENTAL AND CONTROL GROUP AT DIFFERENT LEVELS OF TESTING IN SCIENCE.

The achievement scores of experimental and control groups Public school students were compared at different levels of testing i.e. Pretest, Posttest and Delayed posttest in Science subject w.r.t. two methods of teaching as given below in the table 3.



TABLE-3

Mean, Standard Deviations of the Samples Pre-test, Post-test and Delayed post-test scores of the Public school students.

Test	Group	Method	N	Mean	SD	SEM
Pre test	Experimental	Constructivist Approach	35	50.65	6.85	1.15
	Control	Traditional Approach	35	50.97	12.39	2.09
Post test	Experimental	Constructivist Approach	35	83.31	8.69	1.47
	Control	Traditional Approach	35	59.94	12.82	2.16
Delayed post test	Experimental	Constructivist Approach	35	82.42	8.94	1.51
	Control	Traditional Approach	35	53.25	12.50	2.11

N=Number, SD=Standard Deviation, SEM-Std. Error of mean

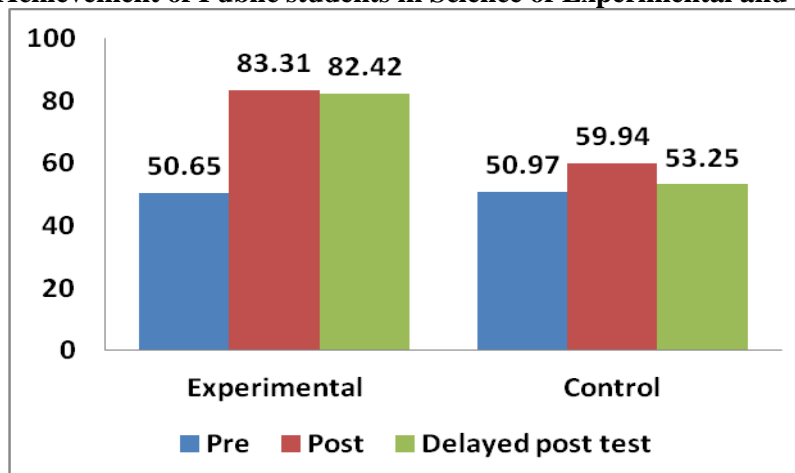
Table-3 shows that at pre - test level there was no statistical significant differences in the mean scores and Standard deviation of the Public school students in experimental group i.e. Constructivist group (50.65,SD=6.85)and Control group i.e. Traditional group (50.97,SD=12.39),which suggests that Public school students had same entry level before the treatment. At the Post test level there was statistical significant difference in the mean and Standard deviation of Public school students in experimental group i.e. Constructivist group (83.31, SD=8.69) and Control group i.e. Traditional group (59.94,SD=12.82) suggests that Public school students in constructivist group gained significantly after treatment comparison to their colleagues in Traditional group, whose mean scores were slightly different from their means score at pre-test level (50.97,SD=12.39).

At the delayed post test level there was significant difference in the mean scores and Standard Deviation of the Public school students in experimental group i.e. Constructivist group (82.42, SD=8.94) and Control group i.e. Traditional group (53.25, SD=12.50) implying that Public school students in Constructivist group retained the facts and information on selected Science Units taught more than their colleagues in Traditional group.

Figure 3.1 depicts the mean differences of Experimental and Control groups at Pretest, Posttest and Delayed posttest level.

Figure – 3.1

Mean Score Achievement of Public students in Science of Experimental and Control group



#### PUBLIC SCHOOL STUDENTS COMPARISON ON ACHIEVEMENT SCORES OF EXPERIMENTAL AND CONTROL GROUPS INDEPENDENT SAMPLES IN SCIENCE

The Experimental and control groups Public school students were compared at the independent sample t-test for equality of means at three levels of testing i.e. Pretest, Posttest and Delayed Posttest w. r. t two methods of teaching as shown in the table 4.

Table-4

**Summary Table for the Independent Samples on Pretest, Post test and Delayed post test scores of Public school students.**

t-test for equality of means			
Tests	t	df	Sig.(2-tailed)
Pretest	-.131	68	.896
Posttest	8.92	68	.000
Delayed Posttest	11.22	68	.000

The t-test values for the pretest, posttest and delayed posttest are evident from the Table-4 with respect to the two methods of teaching i.e. Constructivist Approach and traditional Approach. At the pretest level, the exact probability level is .896 which is greater than p value ( $p > .05$ ). This implies that there was no significant difference in the mean scores of students in Constructivist group (50.65,  $SD=6.85$ ) and students in Traditional group (50.97,  $SD=12.39$ ). At the posttest level, the p value is .000 which is less than p value ( $p < .05$ ). This implies that there was a significant difference in mean scores of the students exposed to Constructivist Approach (83.31,  $SD=8.69$ ) and students in Traditional Approach (59.94,  $SD=12.82$ ). At the Delayed posttest level p value is also .000 which is less than the p value ( $p < .05$ ). Hence, there was significant difference in the mean scores between the Constructivist Approach (82.42,  $SD=8.94$ ) and Traditional Approach (53.25,  $SD=12.50$ ).

Hence, the Hypotheses Stated-2, "There will be a significant difference on the achievement of Public school 6th grade Science students taught with the help of Constructivist and Traditional approach" is retained.

### CONCLUSIONS AND RESULTS

The study shows that there was improvement in the achievement scores among the students of Govt. and public schools at different levels of testing after teaching with new methodology as compared to the Traditional methods of teaching. It was found that there was no significant difference between the mean achievement scores of the experimental and control group students at Pre test level. But there was a significant difference between the mean achievement scores of the experimental and control group students at Post test level. And there was also significant difference between the mean achievement scores of the experimental and control group students at Delayed post test level.

Similarly a significant difference was found between the mean achievement scores of Govt. school and public school 6th grade Science students taught with the help of Constructivist and Traditional approach.

### EDUCATIONAL IMPLICATIONS

On the basis of the findings, the present study has following educational implications.

- The findings of the present study highlight the shift from teacher centered to learner centered classroom wherein the students are given full freedom to explore and discover the things on their own.
- The results of the present study are indicative of the fact that instructional treatment has an impact on the learning outcomes of the student's. The Students who were taught science by using constructivist approach attained better scores than the students who were taught with Traditional approach.
- This study also revealed that the students have really enjoyed the classroom experiences and also felt that constructivist approach was not stressful. This study led to healthy relationship among the teacher and taught

### SUGGESTIONS FOR FURTHER RESEARCH

In the light of the results and findings of the study following suggestions are brought forth:

- As the results of the Constructivist approach are more encouraging when compared with Traditional teaching methods, Constructivist Approach and its different techniques should be included in the curriculum at all the level of education.
- Constructivist Approach should be used in Science teaching and learning at the level of Elementary school, High school and College level.
- The present study was conducted only a ten units of science syllabus prescribed by HPBSE. More studies may be conducted on larger portions of the total curriculum, in order to cross-validate the present findings.

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**EXPORTS OF HANDLOOM PRODUCTS FROM INDIA: PROSPECTS, CHALLENGES AND REMEDIAL STRATEGIES**

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**Abstract**

*India's handloom sector is the second largest employment generator in the country after agriculture. It creates employment to the tune of 43 lakh and supports the livelihood for so many weavers and allied workers. Being one of the most popular traditional industries in India, this vital sector can contribute heavily towards balanced and equitable development of the nation. It accounts for about 15 percent of the total cloth production in India, and also contributes substantially to the exports earnings of the country. In fact, as high as 95 percent of the total hand-woven fabric is produced in India. In this context, this paper looks into the prospects and challenge of the handloom industry in India and offers strategies for the its sustained growth.*

*Keywords: Handloom sector, Employment, Rural Development, Export earnings.*

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**1. Introduction**

Equitable and balanced economic development of a developing nation like India is possible only through development of its traditional industries. This is because of the fact that majority of the Indian population still lives in villages and only through meaningful rural development (RD), the dream of balanced and equitable economic development can be materialised. Apart from the above vital developmental role at the bottom of the pyramid, many rural industries have also become instrumental in propelling the export-driven growth of the country. The case of handloom industry in India is one within the above category, it being a significant contributor to the export earnings of the country while at the same time providing livelihood for the masses in the Indian villages. As a major foreign exchange earner to the country, it accounts for as high as 95 percent of the total hand-woven fabric produced in India. In the above context, this paper looks into the strategic significance of India's handloom sector with a focus on its export performance over the years.

**2. Relevance and Significance of the Study**

In any nation, economic development that is equitable and balanced alone can be said to be holistic and hence sustainable in the long run. Hence, handloom sector which is one of the most common traditional industries in India has got a vital role to play so as to bring about a balanced and equitable development of the economy. Besides, this sector is very promising in terms of its huge export potential. There is enough scope for further expansion of the exports of handlooms from India and hence improving the foreign exchange earnings of the nation. In this context, a critical study of the export potential of India's handloom sector assumes high analytical significance, given the huge untapped market for India's handloom products.

**3. Objectives of the Study**

- (i) To make an overall study of the features of handloom sector in India, its performance over the years, major strengths and challenges;
- (ii) To make a detailed and critical study of the export performance of the handloom sector in India; and
- (iii) To make suggestions for the sustained growth of handloom products from India, based on the findings of this study.

**4. Methodology of the Study**

The study is descriptive-analytical in nature. It is based primarily on secondary data that are available from authentic sources, like, the publications of the Government of India (Ministry of Textiles), publications of NABARD, RBI, etc.

**5. Previous Studies and Research Gap**

Asha Krishnakumar (2003) [5] has pointed out the fast declining performance of Indian handloom industry particularly in the reforms era initiated in the early 1990s. The utmost need for developing market, both domestic and international, for the handloom industry in India has been highlighted in her paper. The national textile policy (2000) has proposed a major policy shift for the textile industry comprising of the handlooms, power looms and mills. The significance of the handloom sector in the Indian economy is that it is the major employer next only to agriculture and it experienced severe crisis during the last decade and half. The report of the Satyam committee is crucial to the formulation of the Textile Policy, 2000. One of its principal objectives is coping with the competition in the international market. It stated that handloom weavers need market. It

suggested the government to support the weavers by devising special schemes. The committee also recommend the scrapping of the Reservation Act and Hank Yarn Obligation which despite their ineffective implementation. These legal measures were meant to protect the interests of the handloom weavers. (K. Srinivasulu, 2010) [6]. The handloom weavers are classified on the basis of organization of production into cooperative, master-weaver and independent weaver segments. It is a well accepted method to analyze the internal differentiation in the handloom sector and to appreciate the problems of the weavers therein. Deviating from this, the report differentiates the weavers into three tiers on the basis of the 'quality' of cloth produced. In the first tier are group of weavers producing unique, exclusive, high value added items. In the second tier producers of medium priced fabrics and made up articles from not-so-fine counts of yarn and in the third tier those producing plains and low cost textile items. The committee did not make any attempt to estimate the proportion of weavers in each tier either in terms of production of fabric or the volume of employment. For this the committee acknowledges that there is a poor and inadequate database on handlooms and it has not deterred it from making far-reaching recommendations. One of the committee's major assumptions is that the weavers in the third tier are unskilled and also ones who produce cloth that has no market demand. So, the committee recommended shifting the weavers of the third tier to other tiers of handlooms, power looms and other occupations. Government should take steps in this direction and provide the weavers with semi-automatic looms and training. (K. Srinivasulu, 2010) [2].

Dr. Manoj P. K. and Rajesh S (2013)[10] have studied the quality of work life (QWL) and such other variables relating to industrial relations scenario in textile units in Kannur district of North Kerala. Suggestions for improving the QWL are made based on the findings of the study. In another study by the same authors Dr. Manoj P. K. and Rajesh S (2015) [11] the case of unorganized sector workers in the textile industry in northern Kerala has been studied in detail with a focus on the challenges to industrial relations. The need for putting in place more stringent legislations for ensuring the welfare of the informal (unorganized) sector employees in textile and other sectors for bringing in cordial industrial relations has been highlighted in this paper. In yet another study by the above authors Dr. Manoj P. K. and Rajesh S (2015) [12] the work life in respect of women employees and their job satisfaction have been studied, with reference to textile units in Malabar region (Northern part) of Kerala. Accordingly 300 workers in various units in the unorganized sector were studied. Kannur district of North Kerala. Issues relating to social security, legal protection etc. of women workers of textile units were covered in this study. Suggestions for improving the QWL are made based on the findings of the study.

In spite of many studies on the handloom sector, studies that focus on the export potential of handloom products from India, export performance over the years etc. with a view to formulate suitable remedial strategies are very scarce. Hence, this study seeks to bridge the above research gap by making a critical study of the export performance of handloom products from India, with a view to suggest suitable remedial strategies.

## 6. Handloom Sector In India: An Overview

The handloom sector in India is one of the largest unorganized economic activities after agriculture. It constitutes an integral part of the rural and semi rural livelihood in the country. Handloom weaving represents one of the richest and most vibrant aspects of the Indian cultural heritage. The strengths of this sector are as follows: (i) it is low capital intensive, (ii) It uses minimal use of power, (iii) it is eco-friendly, (iv) it has flexibility for small production, and (v) it has openness to innovations and adaptability to the market needs. It is a natural productive asset and tradition at cottage level, which has sustained and grown by transfer of skill from one generation to other. Handloom weaving is largely decentralized and the weavers are mainly from the vulnerable and weaker sections of the society, who weave for their household needs and also contribute to the production in the textile sector. The weavers of this industry are keeping alive the traditional craft of different States. The level of artistry and intricacy achieved in the handloom fabrics is unparalleled and certain weaves/designs are still beyond the scope of modern machines. Handloom sector can meet every need ranging from the exquisite fabrics, which takes months to weave, to popular items of mass production for daily use. According to the 3<sup>rd</sup> Handlooms Census (2009-'10), more than 43 lakh people are engaged in weaving and allied activities which was 65.5 lakh as per the 2<sup>nd</sup> handloom census conducted during 1995-96. The state-wise details of the handloom weavers and allied workers and number of handlooms are given in Table I.

Table I: Handloom Sector in India – Some Basic Particulars

1.	No. of looms	23.77 lakh
		20.66 lakh looms (rural)
		3.11 lakh looms (urban)

2.	No. of looms in NER (North Eastern Region)	15.5 lakh (65% of total)
3.	No. of persons engaged in weaving and allied activities	43.31 lakh
		36.33 lakh workers (rural)
		6.98 lakh workers (urban)
4.	No. of adult weavers and allied workers	38.47 lakh
5.	Man days worked per weaver per annum	234 days

Source: Govt. of India (2015), Ministry of Textiles, *Note on Handloom Sector*, p.2. [21]

Out of the 38.47 lakh adult weavers and allied workers in the country, 77 percent are women and 23 percent male weavers, 10 percent of the weavers are from scheduled castes (SCs), 18 percent of the weavers are from scheduled tribes (STs), 45 percent are from other backward classes (OBCs) and 27 percent are from other castes. It is noted that there has been a general trend of gradual and steady increase in the production as well as export of handloom products in India over the years.

The salient features of the handloom sector in India are enumerated hereunder: (i) there is gradual value addition taking place to the handloom products, (ii) there is gradual improvement in the quality of the handloom products that are produced in India, (iii) over the years more number of weavers are taking up weaving as full time profession, (iv) Many SHGs and SPVs (special purpose vehicles) in the handlooms sector are exporting products directly, and (v) many high-end retailers are selling handloom products. [Adapted from, Govt. of India (2015), Ministry of Textiles, *Note on Handloom Sector*, p.3.] [21]

The major strengths of the handloom sector in India include mainly the following: (i) The sector is capable of producing of intricate woven fabric with high levels of versatility and in wide varieties, (ii) Availability of diverse designs, and also the capacity to quickly shift or switchover from one design to another, (iii) Availability of highly skilled manpower who are capable of producing wide range of products in diverse designs, (iv) Peculiar type of traditionally evolved modes of production that employ low-end technology, and avoid the use of electric power too, (v) The production technology/production process is of eco-friendly nature, (vi) Prevalence of informal school for skill generation as well as technology transfer, and (vii) Even today, many weaves or processes are beyond the scope of power looms and they continue to be produced using handlooms. [Adapted from, Govt. of India (2015), Ministry of Textiles, *Note on Handloom Sector*, p.3.] [21].

The main challenges that India's handloom sector is facing at present are briefly discussed hereunder: (i) Though the number of weavers who adopt full-time weaving profession is increasing, the fact remains that the number of handloom weavers is constantly and steadily falling; (ii) The productivity of India's handloom sector is quite low in comparison with power loom and mill sectors; (iii) There is only limited scope for technological upgradation and for improvement in the weaving activity; (iv) Switching over of skilled manpower from handloom sector to other sectors; (v) It is noted that younger generation of weavers is not taking up weaving profession owing to lower earnings, tougher conditions of work etc.; (vi) There are serious constraints relating to availability of credit facilities for the units in the handloom sector in India. [Adapted from, Govt. of India (2015), Ministry of Textiles, *Note on Handloom Sector*, p.3.] [21]

## 7. Exports of Handloom Products from India: Trend and Pattern

But, the growth rate in production is very low, and in respect of exports some declining figures also in the last two years viz. FY 2014 and FY 2015. This points to the need for more attention on production with a special focus on raising the exports. The export figures for the last 2 years deserve a critical review so as to reverse the disturbing figures that reflect fall in exports. Reasons for the fall need to be studied meticulously and remedial measures taken. (Table II).

Table II: Trend in Production and Exports of Handloom Products in India.

Year	Handloom cloth production (million sq.mt)	Handloom exports (Rs. in Crore)
2007-08	6947	N.A
2008-09	6677	N.A.
2009-10	6806	1252
2010-11	6907	1575
2011-12	6901	2624
2012-13	6952	2812

2013-14	7104	2233
2014-15	7203	2246

Source: Textiles Commissioner Office and HEPC

The Handloom Export Promotion Council (HEPC) is a statutory body constituted under the Ministry of Textiles, Government of India, to promote the export of all handlooms products such as fabrics, home furnishings, carpets and floor coverings. HEPC was constituted in 1965 with 96 members, and its present membership is about 2,000 spread all over the country. HEPC has its head office at Chennai and regional office at New Delhi.

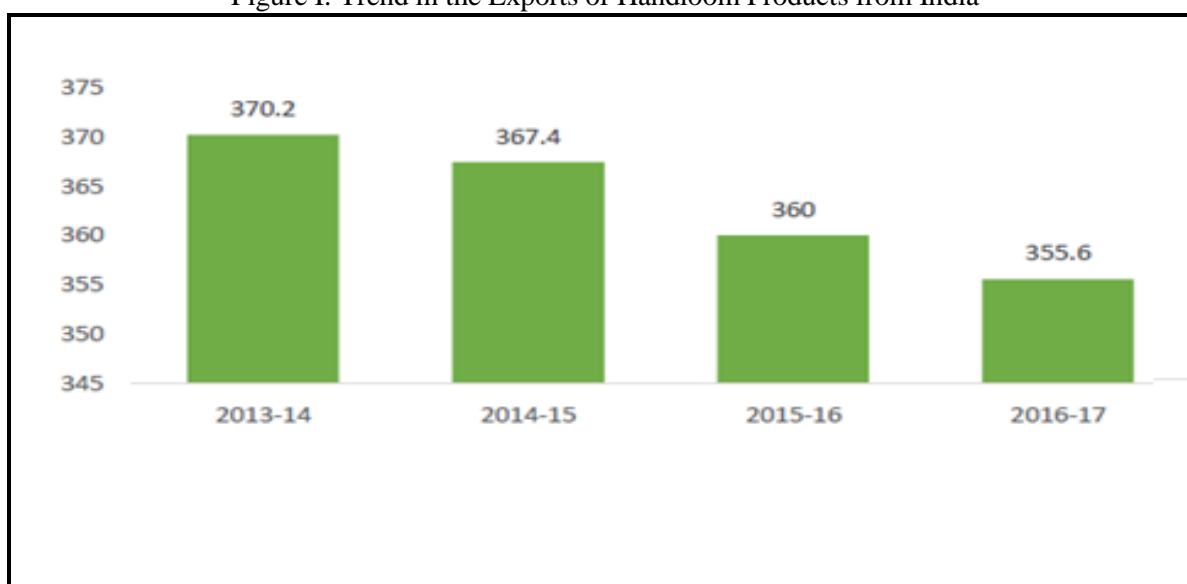
The primary objective of HEPC is to provide all support and guidance to Indian handloom exporters and international buyers for trade promotion and international marketing. In the financial year 2014-15, various handloom agencies participated in 15 international exhibitions and in the current financial year 2015-16, 14 International events have been approved for participation by HEPC.

The export of handloom products during the financial year 2014-2015 was Rs. 2246.48 crore and for the year 2015-16, Govt. of India has fixed a target of USDollars (USD) 421 million for handloom exports. The export of handloom products from India was valued at USD 355.91 million in FY2017-18. Nearly 15 per cent of cloth production in India is from Handloom sector. Cloth production from April to November 2017 stood at 5,134 million square meters. Production of hand woven fabric from India constitutes 95 per cent of global production.

Along with the artistry of weavers, the Indian handloom industry demonstrates the richness and diversity of Indian culture. With over 4.3 million people directly and indirectly involved in the production, the handloom industry is the second-largest employment provider for the rural population in India after agriculture. Indian handloom products are known for their unique designs and finesse. The trend is to mix old designs with new techniques and create original products. As of 2018, the handloom industry in India has got a strong infrastructure, with about 2.4 million looms of varied designs and construction, indicating significant production capacity.

Over the years there has been a declining trend in the exports of handloom products from India. This consistently falling trend, needless to mention, is highly discouraging and hence needs to be reversed by way of suitable remedial strategies. (Figure I).

Figure I: Trend in the Exports of Handloom Products from India



Source: Based on Data available with Govt. of India, DGCIS / EXIM Bank.

Regarding the percentage share of the production of handloom production vis-à-vis the total production of cloth items (which comprises of cloth produced in handlooms, power loom, and mills) there has been gradual but slow fall in the percentage share of handloom products. This indicates the fact that the relative prominence of handloom products in the total cloth production in the country. Needless to mention, this discouraging trend needs to be reversed by way of focused attention on handloom production, (Table III, and Figure II).

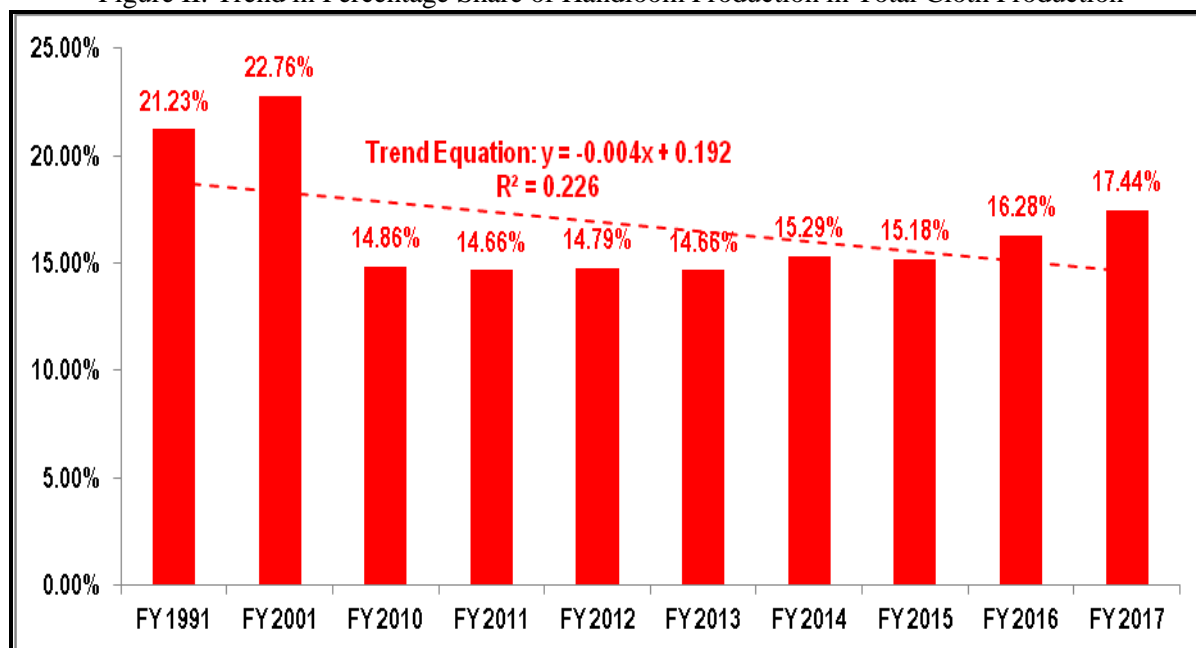
Table III: Percentage Share of Handloom Production in Total Cloth Production

Year	Mill		Handloom		Power loom		Total cloth*
	Values	% of the share	Values	% of the share	Values	% of the share	
1990-91	2.59	12.80	4.29	21.23	13.35	65.97	20.23
2000-01	1.67	5.06	7.51	22.76	23.80	72.18	32.98
2009-10	2.02	4.41	6.81	14.86	37.00	80.75	45.82
2010-11	2.21	4.69	6.91	14.66	38.02	80.67	47.13
2011-12	2.31	4.95	6.9	14.79	37.45	80.26	46.66
2012-13	2.42	5.10	6.95	14.66	38.04	80.24	47.41
2013-14	2.53	5.45	7.1	15.29	36.79	79.24	46.43
2014-15	2.49	5.25	7.2	15.18	37.75	79.57	47.44
2015-16	2.32	4.94	7.64	16.28	36.98	78.78	46.94
2016-17	2.26	4.92	8.01	17.44	35.67	77.64	45.94

Source: Govt. of India, Commissioner of Textiles.

Over the years, the percentage share of handloom production in the total cloth production in India has been gradually falling, as is evident from Trend Equation wherein the small but definite negative slope (viz.-0.004) is indicative of this constant decline. (Figure III).

Figure II: Trend in Percentage Share of Handloom Production in Total Cloth Production



Regarding the category-wise exports of various handloom products also, it has been noted that except for the category of Fabrics, the yearly increase is either marginal or negative. It appears that all categories except Fabrics need to perform better so as to reverse the negative trend or just marginal increase (Table III, and Figure III).

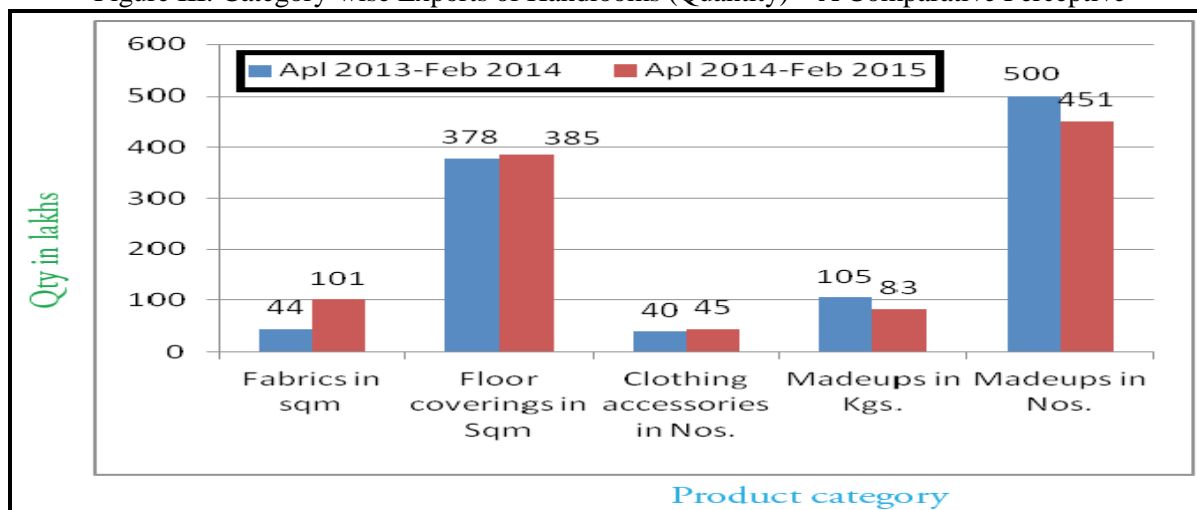
Table III: Category-wise Exports of Handlooms (Quantity) – A Comparative Perceptive

Category of Exports	Period: April 2013-Feb. 2014	Period: April 2014-Feb. 2015
Fabrics (Sq. M.)	44	101
Floor Coverings (Sq. M)	378	385
Clothing Accessories (Nos)	40	45
Madeups (Kgs)	105	83
Madeups (Nos)	500	451

Source: Govt. of India, Commissioner of Textiles.



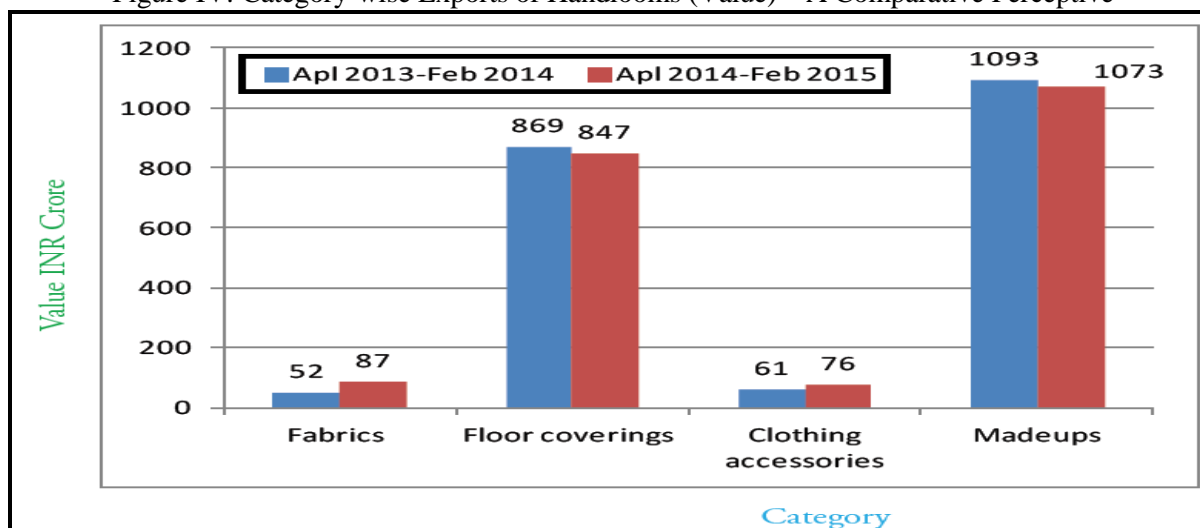
Figure III: Category-wise Exports of Handlooms (Quantity) – A Comparative Perceptive



Source: Govt. of India, Commissioner of Textiles.

Regarding the category-wise exports of handlooms from India (in terms of value) too, it has been noted that only in respect of one item (viz. Fabrics), there is a notable increase in exports. In respect of all other items of exports, there is either a negative growth (decline) or only a marginal positive growth. (Figure IV).

Figure IV: Category-wise Exports of Handlooms (Value) – A Comparative Perceptive



Source: Govt. of India, Commissioner of Textiles.

## 8. Strategies for Sustained Growth of Handloom Exports from India

In view of the foregoing analysis, considering the rather 'not-so-encouraging' or even 'discouraging' scene in respect of the relative production and also exports of handlooms from India, the following are the strategies for the sustained production and exports of handlooms:

- To increase the demand for the handloom products, the Government should actively promote such products among the public at large, including the Government servants, school students etc. by providing incentives for its use. For promotion of exports of handloom products, special events like exhibitions, tradeshow etc. need to be organised abroad, particularly in countries wherein there is consistent demand for such products at present, like, USA, UK, Germany, France, Italy, Australia, Japan etc.
- Further, the Government owned organisations like The Handloom Export Promotion Council (HPEC) should take the initiative of setting up handloom showrooms in various promising destination in India and abroad, including tourism hotspots.
- Technology integration by adoption of Information and Communication Technology (ICT) or otherwise through automation of processes would help to enhance the service quality and reduce the operational costs. It would help to attract more new generation customers to handloom products and also to enhance the competitiveness of products.

- (iv) Strategic tie-ups with reputed E-Commerce companies (like, Amazon, Flip cart etc.) are highly advisable for enabling the online purchase of handloom products; because modern customers prefer such online mode purchases only.
- (v) Special incentives be extend to clusters consisting of handloom industrial units with a view to expand their activities, and also to attract more people into this vital sector. Accordingly, handloom products could be produced as well as exported with greater levels of competitiveness.

### **9. Concluding Remarks**

To conclude, it may be pointed out that given the vast resources of India and an impeccable track record in handloom production for many centuries, the high reputation for the unique handloom products from India, leveraging on these peculiar resources appears to be very meaningful for expanding the exports of handlooms from the country. Providing necessary incentives to the exporters, by encouraging clusters in this field should be a priority for the Government. Accordingly, the handloom exports from India can be scaled up from the present 'not so encouraging' status in this regard.

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**RELEVANCE OF SMALL AND MEDIUM SCALE INDUSTRIES IN INDIA: REVIVAL STRATEGIES FOR THE BALANCED ECONOMIC DEVELOPMENT OF THE NATION**

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**ABSTRACT**

*Small and Medium Scale Enterprises (SMEs) are supposed to be the backbone of Indian economy – one of the fastest growing emerging economies of the world. In the ongoing era of economic deregulation and globalization, SMEs have to play a more important role, particularly when the industrial sector in general and the manufacturing segment within it in particular are showing a general stagnancy in growth over the two decades. It is largely recognized that manufacturing sector particularly the SME component within it, if properly revamped, can act as the growth engine for Indian economy. This is because, though majority of the population in India has to depend on agriculture for livelihood, the share of agriculture to the national GDP is fast declining and so does the employment offered by this sector. Because of the continued stagnancy in the industrial sector, particularly the manufacturing sub-sector, and also the constantly declining performance of the agricultural sector, there exists a very disappointing trend in the relative growth rates of the three major sectors viz. services, industries, and agriculture. In fact, the contribution of the industry sector to GDP has been stagnant at about 27 percent between 1991 and 2006. Of this 27 percent, the share of the manufacturing has been static at about 17 percent which is quite low as per the international standards. For Indian economy to exhibit a balanced, stable and sustainable growth it is highly imperative that Indian manufacturing, most importantly the SME segment, has to grow phenomenally primarily through improving its competitiveness in terms of costs and quality. Accordingly, in a TRIPS-compliant and globalized regime the need for enhancement of productivity and competitiveness of SMEs assumes tremendous significance. In this context, this paper looks into the macro level strategies that can help fast revival of the Indian SME sector by improving its competitiveness, thus facilitating balanced economic development, given the surge in the services sector.*

*Keyterms: SMEs, Competitiveness, NMCC, Innovation, TRIPS, IPR, Industrial Clusters.*

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**1. INTRODUCTION**

In the ongoing era of economic deregulation initiated in India in the early nineties, there has been quite a large number of favourable developments. The economic growth rate of India economy has been one of the highest among all emerging economies and also such factors as external debt, foreign exchange reserves, resilience of the financial and banking sector etc. Given the current pace of economic growth and also the generally favourable macro economic environment, it is widely belied that India will join the league of developed nations in the near future. In spite of all of these, there are certain adverse aspects also. These include, most importantly, a general stagnancy in the industrial sector (which in turn primarily comprises of the manufacturing sector) leading to growing imbalance in the economy, with the services sector growing fast while the agricultural sector is fast declining. Because, the share of industrial sector to the overall GDP of the nation has been hovering at about 27 percent for the last two decades or so. So also, manufacturing sub-sector – the most prominent constituent of the industrial sector has been stagnant at about 17 percent over these years. Despite clear indications of revival of Indian industry (particularly manufacturing) since 2006, it is noted that urgent and focused attention is required in the case of manufacturing sector to maintain and improve the current pace of growth by reducing the growing imbalance among the different sectors. In this context, the Small and Medium Scale Enterprises (SMEs) sector has got a major role to play.

**2. OBJECTIVES OF THE PAPER**

- (i) To study the present scenario of Indian economy, the sectoral contribution of various sectors to the total GDP of the country, and also growth imbalances between sectors;
- (ii) To study in detail the manufacturing sector in India with a focus on SME sector and the need for greater performance of SMEs for the balanced development of India; and
- (iii) To suggest macro level strategies for the revival of the SME sector in India by improving its competitiveness, thus facilitating balanced economic development of the nation.

### 3. METHODOLOGY OF THE STUDY

The study is descriptive-analytical in nature. It is based primarily on secondary data that are available from authentic sources, like, the publications of the Govt. of India and various governmental bodies like NMCC, and also those of RBI, World Bank etc.

### 4. RELEVANCE AND SIGNIFICANCE OF THE STUDY

The imbalance between the different sectors of Indian economy in respect of their relative share to the national GDP has been an issue of utmost significance for the last so many years. The situation is worsening year after year; with the share of industries remaining rather stagnant over the years, while that of agriculture declining significantly every year and that of services growing fast. Though, of late, there are indications of a revival in the industrial sector there is no scope for complacency since its share is still very poor in the overall GDP. This in turn has resulted in growing imbalance between the major sectors calling for urgent policies to correct it. (Table I)

**Table-I: Pattern of Sectoral Composition of GDP (at Factor Cost) in India. (Percentage)**

Financial Year	Agriculture	Industry	Services	Total GDP
FY 1950-51	59.60	14.50	25.90	100
FY 1960-61	55.10	17.30	27.60	100
FY 1970-71	48.50	20.70	30.80	100
FY 1980-81	41.50	21.60	36.90	100
FY 1989-90	33.90	27.00	39.10	100
FY 1991-92	<b>26.70</b>	<b>31.30</b>	<b>42.00</b>	100
FY 2002-03	21.90	25.90	52.20	100
FY 2003-04	22.20	25.80	52.00	100
FY 2004-05	20.80	26.00	53.20	100
FY 2005-06 <sup>QE</sup>	19.90	26.10	54.00	100
FY 2006-07 <sup>RE</sup>	18.50	26.40	55.10	100

Source: (1) Govt. of India, Ministry of Finance, *Economic Survey* (Issue till 2006-'07), New Delhi

(2) CSO, Govt. of India [Note: QE: Quick Estimates, RE: Revised Estimates]

It may be noted that the share of industries sector to the national GDP has been hovering at about 27 percent over the last two decades or more. Of this, the share of manufacturing sub-sector has been roughly about 17 percent throughout. However, going by international standards, this share of manufacturing sector may be observed to be quite low, as is evident from the comparative figures relating to some of the East Asian economies. (Table II).

**Table-II: Share of Manufacturing in GDP of select East Asian Economies.**

Malaysia (2002)	Thailand (2002)	China (2002)	Mexico (2002)	India (2003)
31	34	35	19	17

Source: World Development Indicators 2004

For a sustained and balanced growth of the economy at the targeted level of 8 to 10 percent, a careful balance has to be maintained between the three major segments of the economy viz. agriculture, industry and services; or, in other words, there has to be a balancing between "farm, factory and services". The manufacturing sector in India grew only at an average of 6.3 percent during 1991 to 2003 as against 12 percent in China. In India, manufacturing sector (which currently provides employment to just about 12 percent of the population) has to carry the major burden of increasing employment opportunities in the coming decades directly or indirectly; particularly to meet the huge unemployment that is likely to arise in rural and agricultural sectors. For instance, by 2025 the total proportion of workforce involved in agriculture is likely to decline from 56 percent (as of 2005) to 40 percent; and this in turn would call for substantial non-farm employment opportunities. Further, from the 1990s the employment intensity of the growth process in India is on the decline and accordingly the employment elasticity has been falling constantly from 0.59 (between 1983 to 1987) to 0.38 (between 1983 to 1993) and further to 0.33 (between 1993 to 1999); showing a rising pattern of capital intensity and labour productivity. Government of India has set up the National Manufacturing Competitiveness Council (NMCC) in 2004 as one of the instruments to help achieve this balanced and accelerated growth of the economy. To attain the targeted GDP growth rate of 8 to 10 percent as mentioned above, NMCC estimates that the share of manufacturing should be raised to the level of 30 to 35 percent by 2020. NMCC suggests that the decade 2006-2015 be treated as the Decade of Manufacturing for India and India should target a growth rate of 12 to 14 percent during the period, so as to improve its contribution to GDP to the level as mentioned above. Thus,

manufacturing sector has got a very vital role to play in the Indian economy in the days to come. Fast revival of manufacturing is essential for correcting the above imbalance in the allocation of manpower and hence achieving enhanced productivity and rapid economic development. In short, robust growth in manufacturing is an imperative for creation of better employment possibilities as well as overall economic growth and development. Because of the favourable macro economic environment and conducive policy decisions of the Government, there has been clear indications of a revival of the Indian industrial sector, particularly the manufacturing sub-sector. (Table III)

**Table-III: Industrial and Manufacturing Outputs–Gradual Rise (Percent) (Year on Year)**

Particulars	FY 2003-'04	FY 2004-'05	FY 2005-'06	FY 2006-'07
Overall Industrial Output	7.0	8.4	8.2	11.3
Manufacturing Output	7.4	9.2	9.1	12.3

Source: Estimates of Central Statistical Organization (CSO)(2007) and NMCC (2007).

## 5. SIGNIFICANCE OF SMALL AND MEDIUM SCALE ENTERPRISES IN INDIA

Small and Medium Scale Enterprises (SMEs) have got a strategic role to play in the economic and social development of the developing countries like India. They have been considered as a powerful instrument for realizing the twin objectives of (i) “industrialization of a country”, and (ii) “creating employment opportunities” in rural and backward areas. In fact, they contribute significantly to the national economies the world over and are often considered to be the “engine of growth” in most of the developed and industrialized countries. That is why E.F. Schumacher has commented, “small is beautiful”. The ongoing process of economic deregulation in India since 1991 has created many opportunities for the growth of SME sector. At the same time, there have been a number of challenges as well. Further, in the recent phase of globalization particularly since introduction of Special Economic Zones in India (through SEZs Act 2005) each and every sector of the Indian economy is in the process of being integrated in with the world market. The SME sector has also been exposed to the challenges of globalization increasingly day by day. This sector could achieve enhanced and sustained growth by increasing technological capabilities as well as creating and maintaining sustained competitive advantages in the environment of increased competition and rapid technological changes. In many Asian countries industrialization has not succeeded in achieving the intended objectives of absorbing surplus labour, alleviating poverty and bringing about a regional balanced growth, primarily because of the inadequate attention paid to sectors like SMEs, rural and agriculture.

The definition of small industries differs from country to country depending upon their historical conditions and economic growth. Generally, all these definitions are based upon certain determining factors such as size of enterprise, number of persons employed, investment pattern, energy, input, location, production, technology, and market orientation. Earlier, the government of India had grouped small scale industries (SSIs) (from the year 2006, however, “MSMEs” is the term used i.e. micro, small and medium enterprises) into two categories viz. (i) those using power but employing less than 50 persons, and (ii) those not using power and employing less than 100 persons. However, in most of the cases, investment pattern is taken as the basis of distinction between large and small-scale industries. The definition of small scale units in India has undergone so many changes over the years, investment being the primary consideration behind such definitions. Way back in 1966, small scale enterprises were defined as undertakings with a fixed capital investment of less than Rs.7.5 lakhs and ancillaries with a fixed capital investment of Rs.10 lakhs. Subsequently, in the years 1975, 1980, 1985, 1990, 1997, 2000 and finally in 2006 the definition has been changed based on the investment ceilings. (Definitions till 1990 have been omitted here). In 1997, based on the recommendations of Abid Hussain Committee, the Government has raised the investment limit on plant and machinery respect of small and ancillary units to Rs. 3 crore (from Rs.60 lakhs and Rs.75 lakhs respectively as was applicable till then), and to Rs.25 lakhs (from Rs.5 lakhs) in respect of tiny units. In 2000, the Government has reduced the investment limit to Rs. 1 crore (from Rs. 3 crore as above) while the limit of Rs. 25 lakhs for tiny units were retained as such. The latest definition is as per the Micro, Small and Medium Enterprises Development Act, 2006. (MSMED 2006). (Box I).

### Box I: Definition of SMEs as per the MSME Development Act, 2006 (MSMED 2006)

#### I. Manufacturing / Production of Goods: (based on investment in plant and machinery)

- (1) Micro Enterprises: Investment up to 25 lakh,
- (2) Small Enterprises: Investment above 25 lakhs and up to Rs 5 crore.
- (3) Medium Enterprises: Investment above Rs. 5 crore and up to Rs. 10 crore.

## II. Services: (based on investment in plant and machinery)

- (1) Micro Enterprises- Investment up to 10 lakh
- (2) Small Enterprises – Investment above 10 lakh and up to Rs. 2 crore
- (3) Medium Enterprises – Investment above Rs. 2 crore and up to Rs. 5 crore.

Source: MSMED, 2006

## 6. DIMINISHING GOVERNMENTAL PROTECTION: APPREHENSION ON SUSTAINABILITY OF SMES

The Government continued to provide protection to the small-scale sector, inter-alia through the policy of reserving items for exclusive manufacture in the small-scale sector during the pre-reforms era. Government of India had been encouraging and supporting these units through deliberate policies such as protection from large-scale industries, capital subsidies, different tax treatment, reservation etc. For instance, the policy for reservation was introduced in 1967, which received a proper statutory backing in 1984. While only 47 items were reserved for the SSI units in the year 1967, the same increased to as high as 873 in 1984. But, during the post reforms regime, the policy of the Government has been one of de-reservation. As per the Abid Hussain Committee's report submitted in 1997 the Government has reduced the number of reserved items. As of January 2007, there are only 239 items in the list of reserved items. Of late, the logic of reserving items for domestic production exclusively in the small-scale sector in the deregulated regime has been questioned based on the plea that such products can be freely imported from abroad or produced in SEZs. Further, it is also argued that such a policy would prevent the small units from growing big and hence benefiting from the economies of scale. All these developments underline the utmost significance of enhancing the competitiveness of SMEs in order to survive and grow.

## 7. CHALLENGES FACED BY SMES IN INDIA AND GROWING INSTANCES OF SICKNESS

Based on the findings of studies, the major challenges faced by SMEs in India are as follows:

- ❑ Inadequate access to finance due to lack of information and non-formal business practices, particularly the problem of working capital.
- ❑ Competition from both domestic and multinational companies.
- ❑ Lack of access to private equity capital and venture capital.
- ❑ Lack of demand and also the problem of marketing, particularly lack of access to inter-state and international Markets.
- ❑ Limited access to secondary market institution instruments and delays in the settlement of dues/payments of bills by the large-scale buyers.
- ❑ The problem of power shortage.
- ❑ Non availability / inadequate availability of raw materials
- ❑ Equipment problem – availability of quality equipments at affordable prices.
- ❑ Problem of obsolete technology, inability for technological up-gradation, modernization.
- ❑ Labour problem – availability of skilled labour at reasonable costs.
- ❑ Management problem (lack of organizational, financial and management skills)
- ❑ Problem of suitable diversion / expansion before stabilization
- ❑ Challenges posed by the Special Economic Zone (SEZs) is an emerging problem.

In the LPG (Liberalization, Privatization and Globalization) era, SEZs are the order of the day. Market forces will determine the system and manner of production. SMEs have been left out from a regime of protective environment to a competitive environment, greatly affecting their growth and development. The survival and growth of SMEs depend on their competitiveness which in turn highlights the need for constant innovation.

Lack of demand and shortage of working capital have been pointed out to be the main reasons for sickness/incipient sickness of SMEs in India. Almost all available studies point to the fact that the performance of SME sectors is adversely affected by the absence of timely low cost credit, improved technology, good infrastructure, quality consciousness, modern marketing, proper organization and a synergy with the large

organized industries. Regarding the reasons for sickness of the small-scale units, the financial problems has been stated to be the main reason for closure of 35 per cent of the units. This has been more or less the case in every industry. In case of 14.4 per cent of units, marketing problems has been stated as the reason for closure. Here also, between industries, there was not much of a change in pattern; "Raw material non-availability" has been stated as the reason for closure by 5.6 per cent of units. 2.2 per cent units have been stated to be closed down due to labor problems, while 19 per cent have been reported to be closed because of other reasons. (Table IV).

**Table-IV: Reasons for Closure of Small Sector units at All India Level**

Sl. No.	Reasons for Sickness	Percentage of Incidence
01.	Financial problems	34.70
02.	Marketing problems	14.40
03.	Raw Material problems	05.60
04.	Disputes among owners	03.70
05.	Natural calamity	03.40
06.	Labour problems	02.20
07.	More than one reasons (combined)	16.50
08.	Other reasons	19.40
	Total	100.00

Source: Dutt and Sundaram. (2007), *Indian Economy*, S Chand & Company Ltd.

## 8. REVIVAL STRATEGIES OF SMES FOR THE BALANCED ECONOMIC DEVELOPMENT OF INDIA

Based on the foregoing discussions, some strategies for the faster and sustained development of SMEs in India have been suggested hereunder:

- ❑ Facilities for easier and hassle-free availability of credit to SMEs be ensured by the Government through suitable policy measures. Considering their special significance in the national economy, focused attention on their credit be paid by the banks as well.
- ❑ Financial assistances for meeting the working capital needs as well as fixed capital for the purpose of expansion, diversification etc. need to be facilitated by the Government to the SMEs, in liaison with formal sector financial institutions like banks.
- ❑ Suitable training be extended for the entrepreneurs of SMEs for the scientific marketing of the products of SMEs.
- ❑ Training on the scientific management of SMEs by following modern techniques of business management be arranged by the Government through organizations like MSME Institute (formerly SIS) and such other institutes.
- ❑ Facilitating the creation of clusters comprising of SMEs in identical industries is advisable. Besides, the Government should extend suitable incentives and concessions to such industrial clusters for their enhanced competitiveness.
- ❑ Facilities for uninterrupted supply of raw materials to SMEs be ensured, including availability of working capital for the procurement of raw materials to them need to be provided. Encouraging industrial clusters is one option in this regard.
- ❑ Encouraging the SMEs to invest more in Research and Development (R&D) with a view to enhance their competitiveness is another strategy for the sustained development of SMEs because competitiveness is an imperative for the survival and growth of SMEs in the ongoing LPG era.

## 9. CONCLUDING REMARKS

Besides the basic issues of SMEs like the credit availability, marketing of products etc. all of which need suitable remedies, in the ongoing LPG era, SMEs need to improve their competitiveness for their survival and growth. This in turn calls for innovations of all sorts on an ongoing basis and also added thrust on R&D. At the macroeconomic level, the focus must be on creation and management of knowledge as strategic asset rather than accumulation of minimum knowledge levels of innovative capability. In India, adoption of the clustering and networking model with modern manufacturing strategies like lean manufacturing appears to be advisable for the SMEs. In all these issues, the Government should play the role of a facilitator.



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**A STUDY ON ASSESSMENT THE INCOMES AND INVESTMENT BEHAVIOR OF MUSLIM SALARIED PEOPLE IN MUMBAI CITY**

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**ABSTRACT**

*Islamic investment is based on principle of profit and loss sharing. The profit and loss sharing principle allows the financial institutions to earn a return on invested funds, provided that the financial institutions share the risk of investment and incurs the loss if the investment fails. It is the duty of every Muslims to find a Shariah based investment that adheres to rules and regulations described in the Quran. The main benefit of Shariah based investment is that it encourages people to invest in a socially responsible manner. They are advised to avoid investing in industries that promote alcohol, smoking, pornography and so forth. It is also against the Shariah law, to invest in companies that derive their profit mainly from interest, casinos and gambling, pork, hedging in silver and gold, ordinary insurance and financial services that generate their income from interest. Islamic financial market is the principle of prohibition of interest. It is considered as unlawful. In the Islamic terminology; interest means "effortless profit or profit that increases the principal amount without putting any effort". Any predetermined payment over and above the actual amount of principal is prohibited. Interest is strictly banned in Islam. Muslim investors needed an interest free financial market and as an effect of this need Islamic financial market emerged as an academic discipline adopting Shariah based financial strategies for application in the Islamic financial market. The purpose of this paper is to assess the incomes and investment behaviour of Muslim salaried people in Mumbai city. A survey questionnaire is distributed to 400 Muslim respondents using convenient sampling technique as the preliminary investigation. The study findings justify further refinement and show that the survey instrument is appropriate in a wider study of a representative sample of the Islamic investment behaviour of Muslim salaried people.*

*Keywords: Islamic investment, behaviour, Islamic Banking, Islamic financial planning, Islamic financial market.*

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**INTRODUCTION**

Islamic finance has grown rapidly over the past decade, and its banking segment has become systemically important in number of countries in a wide range of regions. Islamic finance is projected to continue to expand in response to economic growth in countries with large and relatively unbanked Muslim populations. It is also fueled by the large savings accumulated by many Islamic countries that are seeking to invest in Shariah-compliant financial products. The growing reach of Islamic finance it is often argued that Islamic finance is inherently less prone to crisis because its risk-sharing feature reduces leverage and encourages better risk management on the part of both financial institutions and their customers. It is also argued that Islamic finance is more stable than conventional finance, because: (i) Islamic finance involves prohibitions against speculation; (ii) financing is asset-based and thus fully collateralized; and (iii) It is founded on strong ethical precepts. Moreover, Islamic financial institutions (IFIs) are considered to be a good platform for increasing access to financial inclusion, including access to finance for SMEs, thereby supporting growth and economic development. Islamic finance faces a number of challenges, despite the efforts of Islamic finance standard setters, in many countries the industry is governed by a regulatory and supervisory framework developed for conventional finance. Therefore, it does not fully take account of the special nature of Islamic finance. The industry is still largely a nascent one, lacking economies of scale, and operating in an environment where legal and tax rules, financial infrastructure, and access to financial safety needs and central bank liquidity are either absent or, if available, do not appropriately take into account the special characteristics of Islamic finance.

Islam prohibits the charging and payment of interest on financial transactions and advocates social justice and equality through distribution of wealth within the society. Following these principles, the Islamic banking and finance sector has experienced rapid global acceptance since the establishment of the first commercial Islamic bank in 1975. With annual growth rates of between 15 per cent and 20 per cent, the assets of the Islamic finance sector are expected to reach the US \$ 2 trillion mark by the year 2015. The strong performance of the Islamic financial institutions during the global financial crisis has further enhanced the reputation of the sector as a legitimate alternative to the conventional financing system. However, the sector faces many challenges as it continues to expand globally. These challenges include the regulatory environment in some countries that limit

the ability of Islamic financial institutions to offer certain financing products, and a lack of consumer knowledge about the system.

### **LITERATURE REVIEW AND HYPOTHESIS FORMULATION**

A review of literature is a text of scholarly papers, articles which includes the status of knowledge of the research area including substantive findings as well as theoretical and methodological contributions in the study. This review of literature deals with past studies conducted on the subject, to generate understanding in the area, extensive review of literature was carried out by the researcher. All the sections of the study have undergone gradual change and evolved at present level. The study is conducted in the field of Islamic Income and Investment Behaviour of Muslim Salaried People in Mumbai City and relevant literature is reviewed to find the gap in the literature and accordingly frames the problems, hypothesis and objectives for the research study.

**Abdus Samad (2004)** has stated that in Islam investment in production and consumption is guided by strict ethical codes. Muslims are not permitted to invest in production, distribution and consumption enterprises involved in alcohol, pork, gambling, illegal drugs, etc., even though these enterprises may be profitable. Providing financing for such activities is illegal in Islam. Hence, it is forbidden for an Islamic bank to finance activities or items that are not permitted by the Shariah. The limitation of investment and financing is extended to cover any activity or business which may be harmful to the individual or the society. Thus, financing investment for the production or consumption of tobacco, alcohol or pornography is also prohibited. This restriction provides limitation on the profitability of the Islamic banks. On the other hand, conventional banks do not face any such constraint in their financing investments.

**Abu Hanifa (2013)** has pointed out that Islamic Shariah does not support interest based banking investment whereas conventional banks are in favor of interest and conventional rules & regulation. In a highly competitive financial market bank performance provides signal to depositor investors whether to invest or withdraw funds from the bank. The special features of the investment policy of the bank are to invest on the basis of profit loss sharing system in accordance with the principles of Islamic Shariah. Earning profit is not the only motive and objective of the bank's investment policy rather emphasis is given in attaining social good and in creating employment opportunities. Some conventional banks operating under the Islamic Shariah with named as Islamic banking branch or Islamic banking window. The level of competition has been intensified in the banking industry of Bangladesh with the incorporation of Islamic banking by conventional banks. Islamic banks no longer simply receive deposits and make loans. Instead, they are operating in a rapidly innovative industry with a lot of profit pressure that urges them to create more and more value-added services to offer to and better satisfy the customers. Risks are much more complex now since one single activity can involve several risks. Risks are inside risks. Risks overlap risks. Risks contain risks.

**Kramer (2003) and Rogers (1962)** discuss awareness and related aspects. According to them awareness is elementary but it is essentially the first step to more critical considerations. Awareness leads to knowledge. An individual is exposed to innovation but lacks complete information about it as observed by Rogers.

**Metawa and Almossawi (1998)** has pointed out that a wide gap between awareness and usage of Islamic banking products, especially financing products. The level of awareness and extent of knowledge of customers on Islamic financial system in UK was investigated by and found out that majority non-Muslim customer's knowledge and perception towards Islamic banking were extremely minimal.

**Mallin, Saadouni, and Briston (1995)** assessed the performance of ethical funds and conventional funds in UK, based on traditional risk approach. Study showed that ethical funds in general are riskier than non-ethical funds and ethical funds reported higher returns than non-ethical funds.

**Gerrard and Cunningham (1997)** observed five significant differences after investigating the degree of awareness of the Islamic banking system in Singapore. Study also revealed that there was a general lack of awareness of the culture of Islamic banking in both, Muslim and non-Muslim customers.

**Naser and Moutinho (1997)** studied and assessed the perception of the Islamic banks towards marketing effectiveness. They concluded that the Islamic banks should put more coherent efforts to improve their long term investment position and the system should do more to activate its marketing effectiveness.

**Karthikeyan (2001)** while studying small investors' perception on post-office saving schemes in India observed that the level of awareness among investors in the old age group was higher than that of young age group.

**Orlitzky, Schmidt and Rynes (2003)** have stated that also falls in socially responsible investing category. They did 52 studies between 1972 and 1997 on the relationship between corporate social performance and corporate financial performance. They found a positive relationship between socially responsible investing and financial performance of companies in respect of enhanced productivity of the workforce, greater customer loyalty, fewer litigation cases, less environmental remediation costs, improved brand reputation, and better risk management.

**Madhumathi (2005)** carried out a study to examine the risk perception of individual investors and its impact on their investment decision based on 450 samples selected on a random basis from major metropolitan cities in India. The investors were divided into three groups as risk seekers, risk bearers and risk avoiders. The results of the study revealed that, a large number of investors (76 percent) were risk bearers. The risk bearers had the tendency to use company performance as a basic factor to take investment decisions and they used to depend on the advice of share brokers and investment consultants. The risk seekers on the other hand took their decision mainly on the basis of market condition, industrial position and social changes. Their source of information consisted of impersonal sources such as newspapers and reports. In fact they were advice givers rather than advice takers. Risk avoiders did not have a specific trait in terms of information perception processing capacity or situational constraint. They were very objective and looked for facts and certainty in their investment decision situations. Their decisions were mainly based on the advice of the friends and relatives. Market performance of the share company's operating level capital, performance and the expectation of the investors were found to influence the risk perception of the investors.

**Rajarajan (2006)** had undertaken a study on investor's life styles and investment characteristics. The association between the investor's lifestyles and the investment related characteristics was studied by using cluster analysis, correspondence analysis and KruskalWallies test. The study revealed that the level of expenses, earnings and investment were associated with size of households. The active investors group was dominated by officers, individual group by clerical and passive investors group by professionals. Islamic Banking Act 1983 (IBA) was introduced to allow the establishment of IBS alongside the conventional banking system (CBS). The IBS offer products and services in accordance to the Shariah law as well as principles and subject to Bank Negara Malaysia regulation (Central Bank of Malaysia, 2006).

**Tapan and Tripathy (2008)** investigated that an empirical study of investor's perception with an aim to identify the investor's awareness and attitude towards public issues. The study area was Bhubaneswar and sample size was 125 investors from the salaried and business class. It was found that majority of the investors (83.9 percent) used newspaper as the sources of information followed by financial journals and business magazines. Majority of the investors (63.3 percent) stated that they were not in a position to get the required timely information from the company and equity shares were preferred by the investors because of the higher rate of return.

**Tahir and Brimble (2011)** has stated that the extent to which Muslim investors comply with the requirements laid out in Islamic investment principles is assessed by They also sought to identify the factors that influence the asset allocation decision in an investment experiment. They found that level of religiosity is the major factor that influences investment decision. The level of awareness, understanding and perceptions of Islamic banking products and services among non- Muslims in Malaysia, based on 280 respondents was analyzed and assessed using ANOVA along with Pearson Correlation Coefficient.

**Ling, Pey and Hui (2012)** they found out that the level of awareness towards Islamic banking was high, level of understanding of the products and services was average and they did not understand most of the Arabic terms. The perceptions towards Islamic banks varied among the respondents. The study showed that some of the demographic variables had significant relationship with awareness, understanding and perceptions. Educational level had the most significant relationship with all the variables.

## **OBJECTIVES OF THE STUDY**

To study and assess the incomes and investment behavior of Muslim salaried people.

## **PROBLEMS OF THE STUDY**

Lack of awareness, inflation, large family size and traditional belief of Muslim salaried people is the biggest obstacles in the path of the investment.

## **HYPOTHESIS OF THE STUDY**

1. Null Hypothesis ( $H_0$ ): There is not a significant relationship between incomes and investment behavior of Muslim salaried people.

Alternative Hypothesis ( $H_1$ ): There is a significant relationship between incomes and investment behavior of Muslim salaried people.

2. Null Hypothesis ( $H_0$ ): Inflation and large family size have not significantly influenced the investment decision of Muslim salaried people.

Alternate Hypothesis ( $H_1$ ): Inflation and large family size have significantly influenced the investment decision of Muslim salaried people.

Therefore, the researcher has justified the linkages between the title, objective, problem and hypothesis. The efforts taken on review of literature are worthwhile.

## RESEARCH METHODOLOGY

“Research design is the conceptual structure within which research is conducted. Research design indicates the blue print for the collection, measurement and analysis of data. The design includes an outline of what the researcher plans and frames the research work. It explains how samples are selected, sample size determined, how data is collected and which statistical methods are used for data analysis”.

Quantitative research approach is being used for the study as a quantitative research enables the researcher to examine association and differences among the variables. To carry out research effectively, Data is collected from primary sources and secondary sources.

**Universe of the study:** The study covers all the 52 railway station areas of Mumbai city dealing with Western line, Central line and Harbour line.

**Sample of the study:** To assess the quality of the study, the universe mentioned above is not possible for an individual to reach all areas of Mumbai city. Therefore, within Mumbai city there are 52 railway station areas, the researcher has purposely selected 40% of Western line, Central line and Harbour line viz. 20 areas for the research study. The researcher collects the filled questionnaire from 400 respondents including female/ male Muslim Financial planner in order to know the behavior of Muslims in Islamic financial planning and management. This research design fulfills the sample size determination suggested by R.V. Krejcie and D.W. Morgan.

## DATA COLLECTION

Primary data collection involved Mumbai city, there are 52 railway station areas, the researcher has purposely selected 40% of Western line, Central line and Harbour line viz. 20 areas for the conducting the study. The researcher collects the filled questionnaire from female/ male Muslim salaried people from selected railway station, colleges, schools and companies. The researcher also visits to all Muslim minority institutions. The survey enumerators facilitated 20 respondents from each of the 20 areas selected of the Mumbai city in completing the questionnaire.

**Table-1: Demographic Description of the Respondents**

Demographic Variable	Demographic Categories	Number	(%)
<b>Area</b>	Western line	200	50
	Central line	140	35
	Harbour line	60	15
<b>Gender</b>	Female	152	38
	Male	248	62
<b>Age</b>	Less than 20years	4	1.0
	20-30years	112	28
	31-40years	174	43.5
	41-60years	110	27.5
<b>Education</b>	Graduation	208	52.0
	Post-graduation	129	32.3
	Professional	63	15.8
<b>Occupation</b>	Private	82	20.5
	Public	68	17
	Profession	250	62.5
<b>Annual Income (in INR)</b>	Less than 2 lakh	12	3.0
	2-3.5 lakh	88	22.0
	3.5 -5 lakh	285	71.3

	5 lakh and above	15	3.8
<b>Annual Savings (in INR)</b>	Less than 10,000	78	19.5
	10, 000-20,000	82	20.5
	20, 000-40,000	209	52.3
	40,000 and above	31	7.8
<b>Savings Objective</b>	Children's education	129	32.3
	Retirement	19	4.8
	Home purchase	180	45
	Children's Marriage	17	4.3
	Health care	52	13
	Others	3	.8

## ANALYSIS AND RESULTS

In the present study researcher used this analysis for hypothesis testing. For testing the hypothesis or test of significance, following tests are performed.

i) 'z' test for two independent samples at 95% confidence level.

ii) **Kolmogorov-Smirnov** test for two independent samples at 95% confidence level.

For analysis researcher used statistical package SPSS version 21. In addition to this, excel add-in Mega Stat is also used. Depending upon the type of data statistical methods are chosen. Statistical analysis is categorized as descriptive analysis and inferential analysis, which is often known as statistical analysis.

The value of the test-statistic is

$$X^2 = \sum_{i=1}^n \frac{(O_i - E_i)^2}{E_i}$$

Where

$\chi^2$  = Pearson's cumulative test statistic,

$O_i$  = an observed frequency;

$E_i$  = an expected (theoretical) frequency, asserted by the null hypothesis;

$n$  = the number of cells in the table

## TESTS OF NORMALITY

Before selecting statistical test we test normality of data as follows:

We use **Kolmogorov-Smirnov** test for testing normality and results of which are tabulated below:

**Table-2: Tests of Normality- Kolmogorov-Smirnov**

	Kolmogorov-Smirnov <sup>a</sup>		
	Statistic	df	Sig.
Influence of Inflation and large family size on the investment decision of Muslim salaried people.	0.258	400	0.000

## OBSERVATIONS AND INTERPRETATIONS

From the above table it is observed that significant p value 0.000 for k-s tests is less than 0.05 clearly indicates that data for different characteristics related to influence of Inflation and large family size on the investment decision of Muslim salaried people is not normal. Hence we use non parametric **one sample sign test** for testing significance of different characteristics related to influence of Inflation and large family size on the investment decision of Muslim salaried people.

## ONE SAMPLE SIGN TEST

To test above null hypothesis we use **one sample sign test** with hypothesized mean value 3

The details of which are tabulated as follows.

**Table-3: One sample nonparametric sign test of median vs hypothesized score 3 for influence of Inflation and large family size on the investment decision of Muslim salaried people**

	Median score	Sample size	Calculated 'z' value (one tailed, upper )	Significant P value
Hypothesized scores different characteristics related to influence of inflation and large family size on the investment decision of Muslim salaried people.	$\mu_0 = 3.0$	n= 378	z = 15.28	p =0.000
Observed Mean rating scores for different characteristics related to influence of Inflation and large family size on the investment decision of Muslim salaried people.	M= 2.2			
<b>Critical z values:</b> 1. At 5% level of significance the corresponding z value is 1.645 2. At 1% level of significance the corresponding z value is 2.326				

**OBSERVATION**

From the above table it is observed that 'z' value for null hypothesis is 6.61 which is greater than +1.645 (also greater than +2.326). Also p value is 0.0000 which is less than 0.01. **Hence we reject null hypothesis at 5% & 1% level of significance.**

**INTERPRETATION**

On the basis of above data it can be inferred that Median rating scores for different characteristics related to influence of Inflation and large family size on the investment decision of Muslim salaried people is greater than or equal to 3.

**FINDINGS**

Inflation and large family size has significantly influenced the investment decision of Muslim salaried people.

**DISCUSSION AND FINDINGS**

1. Out of total 400 respondents, 12(3%) of respondents has annual income of less than Rs. 2 lakh, 88(22%) of respondents has annual income between 2 lakh and 3.5 lakh, 285(71.25%) of respondents has annual income between 3.5 lakh and 5 lakh and 15(3.75%) of respondents has annual income of above Rs. 5 lakh. Majority of the graduate male respondents with age category of 31-40 years have their annual income between 3.5 lakh and 5 lakh.
2. Out of total 400 respondents, 78(19.5%) of respondents has annual saving of less than Rs. 10,000, 82(20.5%) of respondents has annual saving between Rs.10,000 and 20,000, 209(52.25%) of respondents has annual saving between Rs. 20,000 and Rs. 40,000 and 31(7.75%) of respondents has annual saving of Rs. 40,000 and above. Majority of the graduate male respondents with age category of 31-40 years has an annual savings between Rs. 20,000 and Rs. 40,000.
3. Out of total 400 respondents, 178(44.5%) of respondents save their annual salary between 0% to 15%, 190(47.5%) of respondents save their annual salary between 15% to 30%, 30(7.5%) of respondents save their annual salary between 30% to 50% and 2(0.5%) of respondents save their annual salary more than 50%. Majority of the graduate male respondents with age category of 31-40 years save their annual salary between 15% to 30%.
4. Out of total 400 respondents, 29(7.25%) of respondents resulting newspaper as a source of investment advice, 118(29.5%) of respondents resulting news channel as a source of investment advice, 112(28%) of respondents resulting family or friends as a source of investment advice, 10(2.5%) of respondents resulting books as a source of investment advice, 3(0.75%) of respondents resulting internet as a source of investment advice, 54(13.5%) of respondents resulting magazines as a source of investment advice, 49(12.25%) of respondents resulting advisors as a source of investment advice, 25(6.25%) of respondents resulting financial planner as a source of investment advice. Majority of the graduate male respondents with age category of 31-40 years resulting news media as a source of investment advice.

Hence from the above findings it is revealed that **“Muslim salaried people saves and invest 15% to 30% of their annual salary”**.

### **CONCLUSION**

The financial crisis has been a blessing in disguise for banking institutions offering Shariah-compliant solutions, providing numerous business opportunities to them. Islamic banking institutions can now target a fresh High Net Worth (HNW) client base. Reversion to more ethical investments by non-Muslims can offer Islamic institutions significant opportunities for expansion. The institutions which can take advantage of this shift in customer preferences during the current great recession should be in a position to become leaders in the future. Islamic law prohibits investing in businesses that are considered haram in Islamic ethical code. Islamic ethical investment structures avoid businesses that deal in gambling, alcoholic liquor, nightclubs, pornography, pork and such. Islamic investments rely on tangible asset-backed transactions and avoid sub-prime securities and financial leverage from hybrid products, derivatives and associated creative accounting practices. Investors in Islamic investments have an implicit right of information on the use of their funds and the nature and performance of underlying assets. The comfort level of investors through this transparent guarantee on the proper utilization of their funds is a clear advantage in Islamic banking. Non-Muslim scholars at the Anderson Graduate School of Management, University of California, have pointed out that, "Islamic finance will be less prone to inflation and less vulnerable to gambling-like speculation, both of which are fuelled by the presence of huge quantities of debt instruments and derivatives." Islamic banking, if comprehensively implemented in its original form, can be an ethical solution for preventing future financial crises. Many western social investments and green funds are based on promotion of environmentally friendly businesses. Islamic finance does not allow financing anti-social and unethical businesses dealing in gambling, alcoholic liquor, and nightclubs. In this respect, it is clearly ahead of the recent surge in ethical finance and socially responsible finance.

Islamic financial institutions, because of their knowledge of the nature of their clients' businesses, are in a better position to detect and prevent the channeling of depositors' money for financing highly risky anti-social activities. The financing it provides is mostly asset-based, whereby the Islamic bank knows the actual utilization of funds due to the very nature of its transparently structured modes of finance. The global market for Islamic banking services continues to expand and the sector has perhaps the best potential for growth of any sector in international finance today. Products that are compliant with Shariah law are gaining wider understanding and acceptance and are making their way into the international mainstream of financial products. The Islamic finance industry, with the help of leading bankers, product development managers, lawyers, regulators and investors, are contributing to new product innovations and expanding the market in breadth and depth.

### **SCOPE FOR FURTHER STUDIES**

Researcher has tried to evaluate the impact of Islamic financial planning on the investment behavior of Muslims such as investment in Shariah product, Awareness of Shariah rules and Quran principles, Shariah investment advice, Investment pattern and Savings pattern of Muslims, Investment objective and Financial literacy knowledge of Muslims. Further study can be conducted with reference to its impact on stock market performance, banking sector, growth rate, wealth creation and such other parameters.

### **LIMITATIONS OF THE STUDY**

The geographical limitation of the primary data collection is confined to Mumbai city only. Respondents' opinion can be biased.

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**NURSES MIGRATING FROM KERALA TO U.K: A STUDY OF THE PATTERN OF THEIR INWARD REMITTANCES AND SPENDING**

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**ABSTRACT**

*There has been a constantly increasing trend in the migration of nurses from India to United Kingdom (UK) and such other advanced nations. Among the nurses migrating abroad, majority are from Kerala state in India. This paper makes a study of the pattern of the inward remittances by migrant nurses working in UK and also that of their spending in Kerala, implications of their remittances and spending behavior, and suggests steps for making their spending beneficial for the economy of Kerala.*

*Keywords: Migration, Non-Resident Keralites, Remittances, Spending pattern.*

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**1. INTRODUCTION**

Over the years, there has been steady rise in the immigration to the United Kingdom (UK) since 1945. This trend has been very clear in the post-2000 period. Other immigrants have come as asylum seekers, seeking protection as refugees under the United Nations 1951 Refugee Convention, or from member states of the European Union, exercising one of the European Union's Four Freedoms. In fact, about 70 percent of the population increase between 2001 and 2011 censuses was due to foreign-born immigration. In fact, as high as 7.5 million people (11.9 percent of the population) were born abroad. This paper studies in detail the remittances and spending pattern of nurses migrating from Kerala and its implications.

**2. RELEVANCE AND SIGNIFICANCE OF THE STUDY ON MIGRATION TO UK FROM INDIA**

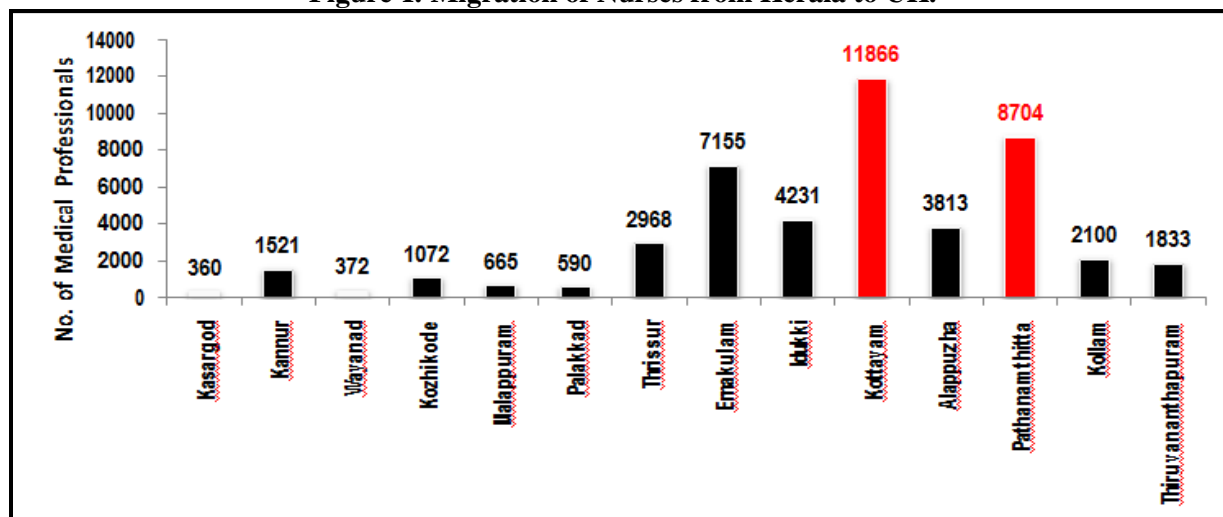
During the past decade, the size and characteristics of immigration to the United Kingdom (UK) have changed significantly. Immigrants are more numerous, more mobile and more diverse than ever before. The experience of immigration is different; immigrants are coming from a broader array of countries, staying for shorter period of time, enjoying significant engagements with communities outside of the United Kingdom and are no longer settling solely in cities. In parallel, UK immigration policy has undergone radical changes. Public opinion and other forces have prompted policy makers to focus their efforts on combating illegality and on flows of asylum seekers. At the same time, economic pressures have dictated the need to have selection systems so the country can attract desirable economic immigrants. Despite the current recession, immigration to the UK is expected to remain at approximately 150,000 net migrants per year. Globally, more than 232 million people are international migrants – a number that continues to rise. Advances in transportation and communication have increased the capacity and desire to move. Migration today is more widely distributed across more countries. The data-rich research offered here, based on credible sources, sketches migration flows, the sending of remittances, admission levels, enforcement actions and more for countries around the world. Net UK migration increased to 212,000 in the year to September 2013, pushing it further away from the conservatives' target of below 100,000 according to official estimates. Though there are many studies on inter-state migration in India and its impact, like, the study by Dr. Manoj P K and Neeraja James (2014) [9] on migration of housing construction workers to Kerala from other states, studies involving migration from India to other countries are very scarce. So, this study focuses on migration of nurses from Kerala state to UK, and pattern of their remittances and spending.

**3. OBJECTIVES OF THE PAPER**

- (i) To make a cursory review of the trend of nurses migrating from Kerala to U.K;
- (ii) To study the pattern of inward remittances and that of spending by migrant nurses;
- (iii) To suggest policies which make remittances and spending beneficial for the state.

**4. METHODOLOGY OF THE STUDY**

As part of this research study, a field study was conducted among the households of international health workers (nurses) in Kerala. The methodology adopted has been a multi-stage sampling. In the first stage, two districts in Kerala with the highest concentration of nurses viz. Kottayam (11866 nurses) and Pathanamthitta (8704 nurses) were selected using Purposive (Deliberate) sampling, based on the statistics on the number of nurses published by Dept. of Economics and Statistics, Govt. of Kerala. (Figure I).

**Figure-I: Migration of Nurses from Kerala to UK.**

Dept. of Economics and Statistics, Govt. of Kerala. (2013)

In the second stage, from these two selected districts (viz. Kottayam and Pathanamthitta) a total number of 600 nurses were selected on a pro-rata basis, based on the relative concentration of the nurses in these districts. Accordingly, 350 nurses and 250 nurses respectively were selected from Kottayam and Pathanamthitta districts. In the third stage, 350 households corresponding to the 350 nurses in Kottayam district and another 250 households corresponding to the rest 250 nurses in Pathanamthitta district were selected. Suitable number of households from various Panchayats and Municipalities in the respective districts were selected on a pro-rata basis, using the Govt. statistics relating to the distribution of migrant nurses. For this Random sampling (Lottery) method was used.

##### **5. NURSING PROFESSIONALS IN KERALA: NATURE OF THEIR MIGRATION TO UK**

As per 2011 Census, the total population in Kottayam is 1.97 million. The male population is 0.97 million and the female population is 1.01 million. The total working population in the district is 0.74 million. The literacy rate of the Kottayam is 97.21. The total population in Pathanamthitta is 1.20 million in 2011. The male and female population is 0.56 and 0.64 million respectively. The total working population is 0.39 million, and the literacy rate of the district is 96.55. As already noted, the two districts of Kottayam and Pathanamthitta were selected deliberately because the chunk of nursing professionals in Kerala is migrated from these two districts. As per the statistics available of the Dept. of Economics and Statistics, Govt. of Kerala as of 2013, as high as 25 percent of the nursing professionals working abroad are from Kottayam district, and the Pathanamthitta district records the second position with 18 per cent share of nurses.

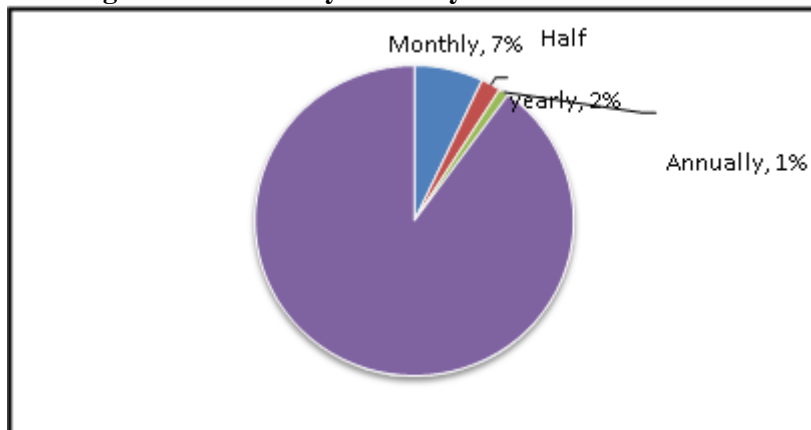
Kottayam and Pathanamthitta districts together account for 43 per cent of the total migrant nurses from Kerala. Besides, the statistics indicate that 16 percent of the total international migrants from Kottayam district are from the medical field and that for Pathanamthitta district it is 8 per cent. A sample of 350 households were chosen randomly from Kottayam district using lottery method and another 250 were chosen from Pathanamthitta district. Totally, 600 households with international migrant nurses were surveyed. Representation of rural, semi urban and urban areas of both Kottayam and Pathanamthitta districts was ensured by adopting a pro-rata approach for sample selection. For this study, a sample of 350 nurses from Kottayam district representing 5 Taluks and 21 City or Panchayat areas have been selected. Also, a sample of 250 nurses from Pathanamthitta district representing 45 households from 3 Taluks and 15 City or Panchayat areas have been selected. The field survey was conducted during vacation time of migrants. Face to face discussion with the sample nurses was done in 54 percent of the cases.

##### **6. REMITTANCES OF MIGRANTS AND THE SPENDING PATTERN**

An analysis of the total remittances to migrant families in Kerala is attempted here. To estimate the total amount of remittances to migrant families, different modes of remittances which commonly practices among international migrant workers is studied. In general, when asked about total remittance-flows to families in terms of cash, often there is the issue of under-reporting the actual amounts. To avoid such likelihood errors, the researcher has estimated the total remittance amount from different modes like money received through money transfer agencies like UAE Exchange, Federal Express, Western Union, etc.; banks; friends; on visits by emigrant; in the form of gifts and goods like gold ornaments, electronic items,

computers and smart phones, etc.; money to build house and purchase lands; to buy automobiles like car and scooter; to invest in share and secondary markets; to start business; to dowry expenses; to education expenses; medical expenses; repayments of debts etc. The data from the field survey reveal that migrants do not have any practices in remitting their money to families in a fixed or regular interval. In fact, 90 percent of families report that they do not receive money in a fixed pattern.(Figure II).

**Figure II: Periodicity of Money Received from Abroad**



Source: Field Survey

As per the estimation based on the field study among 600 migrant households in two districts of Kerala, during the last 12 months of the study period (viz. 01.01.2015 to 31.12.2015) the average remittances by migrants is Rs.5.59 lakhs. The housing condition wise estimates show that the average remittances of migrant families who reside in 'luxurious' house is Rs.6.20 lakhs. Migrant families who belong to 'very good' houses is Rs.5.83 lakhs, and families reside in 'good' and 'poor' houses is Rs.3.41 lakhs and Rs.0.50 lakhs respectively.

During the reference period, the total remittance to sample health migrant households is Rs.559 lakhs in the State. Out of this total remittances, Rs.304 lakhs (54 percent) is generated by migrant families who reside in 'luxurious' houses, and Rs.210 lakhs (38 percent) is made by migrant families who live in 'very good' houses. It shows the direct relationship between the amount of remittances and the housing condition of migrant families. As the remittance amount increases the housing condition of migrant families also increases, which is actually an indicator to understand how remittances improve the living standards of people in Kerala (Table I).

**Table-I: Housing structure-wise Remittances**

Type of house	Average Remittances (in Lakhs)	Total Remittances (in Lakhs)	Percentage of Total Remittances
Luxurious	6.20	303.77	54.33%
Very Good	5.83	209.94	37.55%
Good	3.41	44.36	7.93%
Poor	0.50	1.00	0.18%
All	5.59	559.07	100.00%

Source: Field Survey

Religion wise estimates show that the average remittance of migrant families who belong to Hindu religion is Rs.1.59 lakhs. But, its share to total remittances is Rs.3.69 percent only. On the other hand, the average remittance of Christian families is Rs.6.19 lakhs; its share to total remittances being as high as Rs.96.31 percent. It is seen that migrant workers of Christian religion is the vital remittance contributing force in Kerala. (Table II).

**Table-II: Religion-wise Flow of Remittances**

Religion	Average Remittances (Lakhs)	Total Remittances (Lakhs)	Percentage (%)
Hindu	1.59	20.62	3.69%
Christian	6.19	538.45	96.31%
All	5.59	559.07	100.00%

Source: Field Survey

The caste wise pattern of remittances by Christians show some interesting results, while there is no such fact about Hindu sub-groups. Of the Christian families, Roman Catholics contribute maximum remittances and their total share is Rs.401.27 lakhs.(Table III)

**Table-III: Caste-wise Remittances (Christians)**

Christian Caste	Average Remittances (in Lakhs)	Total Remittances (in Lakhs)	% to Total Remittances
Malankara Syrian Catholic	0.99	2.98	0.55%
Roman Catholic	7.87	401.27	74.52%
Jacobite Syrian	10.95	65.70	12.20%
Orthodox Syrian	1.03	9.29	1.73%
Marthoma Syrian	1.24	2.48	0.46%
SC (Dalit)	7.00	14.00	2.60%
Pentecost	2.33	4.65	0.86%
Others	3.17	38.08	7.07%
All	6.19	538.45	100.00%

Source: Field Survey

It comes around Rs.74.52 percent of total remittances of migrant workers from Christian religion. Their average family remittance is Rs.7.87 lakhs. The second major remittance producing community is Jacobite Syrian. Their share of total remittances is Rs.12.20 percent among Christians. However, their average remittance per family is Rs.10.95 lakhs per annum, which is the highest among other Christian communities. Interestingly, the Dalit Christian migrants also record relatively good figures. Their share to total remittance is Rs.2.60 percent, and the average remittance per family is 7 lakhs. (Table III).

Now, let us consider as to how the migrant families in Kerala are utilising the money that they receive from abroad during the reference period. The estimates show that 30.20 percent of total remittances is utilised to meet day-to-day-expenses of migrant families. The average spending for day-to-day expenses is Rs.0.96 lakhs per migrant family. The second position goes to health and medical expenses. It comes around 23.21 percent. The average medical expense per household is Rs.0.71 lakhs. The average remittance utilisation among migrant families is relatively high for purchase of land (Rs.2 lakhs), dowry payment (Rs.2 lakhs), gold (Rs.2 lakhs), bank deposits (Rs.1 lakh) pays back debt (Rs.0.96 lakhs), renewal of house (Rs.0.78 lakh), and education of children (Rs.0.77 lakh). (Table IV).

**Table-IV: Remittances Spending Pattern\***

Items	Average Spending (Lakhs)	Total Spending (Lakhs)	Percentage to Total Spending
For day-to-day household expenses	0.96	23.15	30.20%
Education of children/relatives	0.77	5.40	7.04%
To pay back debt	0.96	3.85	5.02%
Purchase/build houses/apartments	0.75	1.50	1.96%
Major repair/renewal of existing house	0.78	6.27	8.18%
Purchase/improve land	2.00	2.00	2.61%
Dowry payment	2.00	2.00	2.61%
Start new business/expand or enlarge existing business	0.00	0.00	0.00%
Deposit in bank/stock market, equity etc.	1.00	1.00	1.30%
Donation to temple/church/mosque, other religious/Charitable organizations	0.22	1.99	2.60%
Purchase of scooter/car/other vehicles	0.00	0.00	0.00%
Medical expenses of family members	0.71	17.79	23.21%
Purchase of gold	2.00	4.00	5.22%
Cash in hand	0.83	4.15	5.41%
Others	0.51	3.56	4.64%
Total	2.07	76.66	100.00%

Source: Field Survey

\* Estimates related to 'household' average is calculated based on reported households.

The housing type wise analysis indicates that the average remittance utilisation per migrant families who reside in 'luxurious' houses is high in purchase of land (Rs.2 lakhs), dowry payment (Rs.2 lakhs), gold purchase (Rs.2 lakhs), renewal of house (Rs.1.50 lakhs), household expenses (Rs.1.30 lakhs), education of children (Rs.1.15 lakhs), bank deposits (Rs.1 lakh), pay back debt (Rs.0.96 lakhs), and medical expenses (Rs.0.59 lakhs). The other type of houses also report almost similar pattern. (Table V).

**Table-V: Remittances Spending Pattern (Housing type-wise)**

Housing Type	Items	Average Spending (Lakhs)	Total Spending (Lakhs)	Percentage to Total Spending
Luxurious	For day-to-day household expenses	1.3	18.2	36.47%
	Education of children / relatives	1.15	2.3	4.61%
	To pay back debt	0.96	3.85	7.71%
	Purchase / build houses / apartments	0.5	0.5	1.00%
	Major repair/renewal of existing house	1.5	3	6.01%
	Purchase / improve land	2	2	4.01%
	Dowry payment	2	2	4.01%
	Start new business / expand or enlarge existing business	0	0	0.00%
	Deposit in bank / stock market, equity, etc.	1	1	2.00%
	Donation to temple / church / mosque, other religious / Charitable organizations	0.22	0.86	1.72%
	Purchase of scooter / car / other vehicles	0	0	0.00%
	Medical / Hospital expenses of family members	0.59	6.45	12.92%
	Purchase of gold	2	4	8.01%
	Cash in hand	0.81	3.25	6.51%
	Others	0.83	2.5	5.01%
	Total	2.77	49.91	100.00%
Very good	For day-to-day household expenses	0.46	3.2	25.91%
	Education of children / relatives	0.23	0.7	5.67%
	Major repair / renewal of existing house	0.32	1.27	10.28%
	Donation to temple / church / mosque, other religious / Charitable organizations	0.18	0.53	4.29%
	Medical / Hospital expenses of family members	0.62	4.94	40.00%
	Cash in hand	0.9	0.9	7.29%
	Others	0.27	0.81	6.56%
	Total	0.95	12.35	100.00%
Good	For day-to-day household expenses	0.58	1.75	12.15%
	Education of children / relatives	1.2	2.4	16.67%
	Purchase / build houses / apartments	1	1	6.94%
	Major repair / renewal of existing house	1	2	13.89%
	Donation to temple/church/mosque, other religious / Charitable organizations	0.3	0.6	4.17%
	Medical / Hospital expenses of family members	1.07	6.4	44.44%
	Others	0.25	0.25	1.74%
	Total	2.4	14.4	100.00%

Source: Field Survey

## **8. IMPLICATIONS OF THE TYPICAL PATTERN OF REMITTANCES AND SPENDING BY MIGRANTS**

Summing up the above discussions, the overall picture regarding the economic impact of remittances and spending by the international migrant nurses is given hereunder. As high as 49 percent of migrant families live in a 'luxurious' houses and 36 percent in 'very good' houses. The average landholding size of migrant families is 50 cents. Hindu migrant families own 29 cents per family and Christian migrant families own 53 cents per family. The average remittance per migrant household is 5.59 lakhs per annum.

The empirical data clearly show a significant association between household structure and remittances. The migrant families who reside in 'luxurious' houses receive the remittance amount of 6.20 lakhs, and the 'very good' houses receive 5.38 lakhs. Those with 'good' and 'poor' households receive 3.41 and 0.50 lakhs respectively. The average remittances of Hindu migrant families is 1.59 lakhs while that of Christian families is 6.19 lakhs. The estimates show that 30.20 percent of total remittances are utilised for day-to-day expenses of families and 23.21 percent is used for medical expenses. The average savings of migrant family is 4.86 lakhs. The average savings of Hindu migrant families is 6.23 lakhs and Christian families is 4.66 lakhs. The data reveal that 78 percent of migrant families have some kind of investments. The major investment areas of migrant families are land, building and gold. 63 percent of migrant families invested in gold, 44 percent of migrant families invested in land and 25 percent migrant families invested in buildings. The average investment of migrant families is 49.58 lakhs. The average investment in land is 38.17 lakhs and in buildings is 8.95 lakhs. The average investment in gold is 2.28 lakhs. The average investment among Hindu migrant family is 39.95 lakhs and among the Christian family is 51.01 lakhs. Christian migrant families invest more in land and building. However, Hindu migrant families invest more in gold. The average monthly consumption expenditure of migrant families is Rs.18650. The major chunk of consumption expenditure is made for food, medical and education purpose. The average monthly expenditure for food is Rs.8325. The average expenditure for medical and education is Rs.5358 and Rs.1286 respectively. Migrant families spend Rs.285 for alcohol and Rs.120 for tobacco products per month. The consumption expenditure of Hindu migrant families is Rs.21323. They spend Rs.11577 for food, Rs.4846 for medical expenses, Rs.463 for education and Rs.308 for alcohol. The average consumption expenditure of Christian migrant families is Rs.18250. It is lower than Hindu migrant families. Christian migrant families spend Rs.7839 for food, 5435 for medical expenses, Rs.1409 for education and Rs.282 for alcohols. Their average expenditure on medical and education is higher than the Hindu migrant families. In short, health migrant workers from Kerala contribute a huge amount as remittances, and its welfare impact on migrant families is well evident in Kerala. It is seen that there is a significant relationship between the remittances of nurses and their investments in the home state. Higher remittances would promote more investments and hence more economic development. This is in line with the Neo-Classical Micro theory of migration. In short, migration of nurses leads to local economic development.

## **9. SOME POLICY SUGGESTIONS**

- (i) Given the higher costs of securing health education in India as per international standards, and higher costs to get job visa from of international recruiting agencies, the Government should take steps to make it inclusive by providing cost effective and/or Government-supported health education and training to the poor among all social groups. Further, the Government should take suitable policy measures to regulate the intermediary recruiting agencies so as to prevent them from exploiting the trained health professionals; the Government may network directly with international health institutions to recruit professionals from Kerala.
- (ii) Even if international health migrant workers from Kerala lead a satisfactory life abroad, many of the migrant workers feel that they are underpaid, and they face certain racial discrimination from foreign nationals. So, the Government should take steps to protect the interests of migrant nurses from Kerala in ensuring parity in salary, protection from social discrimination. The Government should take up the matter with UN organisations (like, ILO and WTO) to resolve issues like social discrimination, disparity in salary etc.
- (iii) As the study has revealed that the majority of migrant workers looks for a permanent residency status in foreign countries and most of them are not willing to return to India. This situation may restrict the future flow of remittances to Kerala. It is revealed that international migrants are not keen to invest their earnings in a productive manner in Kerala, and that chunk of their savings goes to unproductive investments like land and gold. As this would adversely affect the economic interests of Kerala, the Government should take steps to divert the remittances to more productive sectors of the economy.

Further, there should be focus on utilizing the knowledge of the trained and skilled migrants to improve the state's health sector. This may encourage many of them to return to Kerala also.

- (iv) The Government should frame policies to attract the international health tourists by utilising the connection and experience of international health migrant workers from Kerala, and the state should take initiatives to build various health infrastructures at par with global standards. This would expand the capabilities of Kerala state to optimize its comparative advantage in terms of internationally trained human resources in the healthcare sector.
- (v) Finally, as international migrant health workers generate a huge amount of remittances to the State, the government should adopt certain policy measures to protect the aged family members of migrant workers and their domestic wealth. In this regard, the Government should introduce a separate social security scheme for the family members of international health migrant workers.

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**A STUDY ON CONSUMER'S PERSONALITY TRAITS AND PURCHASE INTENTION TOWARDS ECO-FRIENDLY PRODUCTS IN COIMBATORE CITY**

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**ABSTRACT**

*The environment apprehension has become the most important matter for mankind in the present world. The businesses are no exemption for this issue and they are responding through eco-friendly products. One of the important factors that play significant role in determining purchase intention is consumer's personality. The Coimbatore city has been selected for the present study. The data have been collected from 300 consumers of eco-friendly products through structured questionnaire by using random sampling technique. To examine the socio-economic characteristics of consumers, the frequency and percentage analysis have been carried out. The mean and standard deviation have been worked out for personality traits and purchase intention of consumers. To examine the influence of personality traits on purchase intention of consumers, the multiple linear regression has been used. The regression analysis shows that agreeableness, openness, extraversion and conscientiousness are positively and significantly influencing the purchase intention of consumers towards eco-friendly products. It is suggested that the consumer should understand their personalities properly and change their personalities if needed to enhance their purchase intention towards eco-friendly products. Besides, marketers of eco-friendly products must target and segment their consumers on the basis of their personality traits in order to improve their sales volume and profitability.*

*Keywords: Consumer, Eco-Friendly Products, Personality Traits, Purchase Intention*

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**1. INTRODUCTION**

The environment apprehension has become the most important matter for mankind in the present world. The businesses are no exemption for this issue and they are responding through eco-friendly products. The depletion of oil resources, raw materials and pollution are making business organizations to consider about their products. The eco-friendly products are being introduced by business organizations to protect the environment (Kumar and Anand, 2013). Businesses also start realizing to incorporate newly emerging concerns of environmental aspects into their strategies to remain competitive and even survive (D'Souza et al, 2006).

Over the past decades, theory and research in the trait view of personality have slowly converged and a consensus has been reached that the Five-Factor Model often termed as "Big Five" can be used to describe the most salient aspects of personality (Goldberg, 1990). The Big Five is composed of neuroticism, extraversion, openness, agreeableness, and conscientiousness, which are enjoying increasing acceptance and popularity among personality psychologists.

Psychographic factors play an important role in determining purchase intention of consumers. One of the important factors that play significant role in determining purchase intention is consumer's personality. Personality assists to identify who a consumer is and what motivates him or her. Being aware of consumer's personality and motivation might enable him or her to overcome emotions and mistakes when confronted with a choice of eco-friendly products. So, the present research is made to study consumer's personality traits and purchase intention towards eco-friendly products.

**2. METHODOLOGY**

The Coimbatore city has been selected for the present study. The data have been collected from 300 consumers of eco-friendly products through structured questionnaire by using random sampling technique. To examine the socio-economic characteristics of consumers, the frequency and percentage analysis have been carried out. The mean and standard deviation have been worked out for personality traits and purchase intention of consumers. To examine the influence of personality traits on purchase intention of consumers, the multiple linear regression has been used.

**3. RESULTS AND DISCUSSION****3.1. SOCIO-ECONOMIC CHARACTERISTICS OF CONSUMERS OF ECO-FRIENDLY PRODUCTS**

The socio-economic characteristics of consumers of eco-friendly products were analyzed and the results are presented in Table-1. The results reveal that about 65.67 per cent of consumers are males and the remaining of 34.33 per cent of consumers are females. It is clear that about 45.33 per cent of consumers are in the age group of 26 – 35 years followed by 36 – 45 years (17.00 per cent), 46 – 55 years (13.67 per cent), 21 – 25 years (13.00 per cent) and above 55 years (11.00 per cent).

The results indicate that about 41.33 per cent of consumers are having educational qualification of graduation followed by post graduation (24.00 per cent), higher secondary education (15.67 per cent), secondary education (11.33 per cent) and diploma (7.67 per cent). It is observed that about 45.00 per cent of consumers are working in private sector followed by Government service (34.00 per cent), business (12.00 per cent) and retired (9.00 per cent). The results reveal that about 47.00 per cent of consumers are in the annual income group of Rs.2,01,000 – Rs.4,00,000 followed by Less than Rs.2,00,000 (30.00 per cent), Rs.4,01,000 – Rs.6,00,000 (16.33 per cent) and more than Rs.6,00,000 (6.67 per cent).

**Table-1: Socio-Economic Characteristics of Consumers**

Socio-Economic Characteristics	Frequency	Percentage
<b>Gender</b>		
Male	197	65.67
Female	103	34.33
<b>Age Group</b>		
21 – 25 years	39	13.00
26 – 35 years	136	45.33
36 – 45 years	51	17.00
46 – 55 years	41	13.67
Above 55 years	33	11.00
<b>Educational Qualification</b>		
Secondary	34	11.33
Higher Secondary	47	15.67
Diploma	23	7.67
Graduation	124	41.33
Post Graduation	72	24.00
<b>Occupation</b>		
Business	36	12.00
Government Service	102	34.00
Private Sector	135	45.00
Retired	27	9.00
<b>Annual Income</b>		
Less than Rs.2,00,000	90	30.00
Rs.2,01,000 – Rs.4,00,000	141	47.00
Rs.4,01,000 – Rs.6,00,000	49	16.33
More than Rs.6,00,000	20	6.67

### 3.2. PERSONALITY TRAITS OF CONSUMERS

The personality traits of consumers were analyzed and the results are hereunder presented.

#### 3.2.1. EXTRAVERSION TRAIT

The personality trait of extraversion of consumers was analyzed and the results are presented in Table-2.

**Table-2: Extraversion Trait of Consumers**

Sl. No.	Extraversion	Mean	Standard Deviation
1.	Comes up with new ideas	4.72	0.11
2.	Tends to find fault with others	3.16	1.04
3.	Sometimes shy and inhibited	4.68	0.21
4.	Considerate and kind to almost everyone	4.70	0.13
5.	Relaxed and handles stress well	3.21	1.05
6.	Worries a lot	<b>4.23</b>	<b>0.27</b>
7.	Can be tense	4.67	0.21
8.	Makes plans and follows through with them	4.62	0.10

The results show that the consumers are strongly agreed with comes up with new ideas, sometimes shy and inhibited, considerate and kind to almost everyone, can be tense and makes plans and follows through with them, while, they are agreed with worries a lot and they are neutral with tends to find fault with others and relaxed and handles stress well.

**3.2.2. OPENNESS TRAIT**

The personality trait of openness of consumers was analyzed and the results are presented in Table-3.

**Table-3: Openness Trait of Consumers**

Sl. No.	Openness	Mean	Standard Deviation
1.	Reserved	3.31	0.75
2.	Does a thorough job	4.63	0.24
3.	Ingenious and a deep thinker	4.75	0.17
4.	Assertive personality	3.78	1.10
5.	Tends to be disorganized	3.29	1.14
6.	Tends to be lazy	3.26	1.15
7.	Generates a lot of enthusiasm	4.69	0.12
8.	Gets nervous easily	3.80	0.85
9.	Inventive	3.27	1.03
10.	Likes to reflect, play with ideas	4.66	0.11

The results indicate that the consumers are strongly agreed with does a thorough job, ingenious and a deep thinker, generates a lot of enthusiasm and likes to reflect, play with ideas, while, they are agreed with assertive personality and gets nervous easily and they are neutral with reserved, tends to be disorganized, tends to be lazy and inventive.

**3.2.3. AGREEABLENESS TRAIT**

The personality trait of agreeableness of consumers was analyzed and the results are presented in Table-4.

**Table-4: Agreeableness Trait of Consumers**

Sl. No.	Agreeableness	Mean	Standard Deviation
1.	Reliable	4.67	0.13
2.	Curious about many different things	4.16	0.47
3.	Remains calm in tense situations	3.33	0.61
4.	Trustable	4.73	0.10
5.	Likes to cooperate with others	4.02	0.74
6.	Aesthetic experiences	4.24	0.36
7.	Artistic interests	4.13	0.41
8.	Easily distracted	3.19	0.83

The results reveal that the consumers are strongly agreed with reliable and trustable, while, they are agreed with curious about many different things, likes to cooperate with others, aesthetic experiences and artistic interests and they are neutral with remains calm in tense situations and easily distracted.

**3.2.4. NEUROTICISM TRAIT**

The personality trait of neuroticism of consumers was analyzed and the results are presented in Table-5.

**Table-5. Neuroticism Trait of Consumers**

Sl. No.	Neuroticism	Mean	Standard Deviation
1.	Full of energy	4.65	0.18
2.	Perseveres until the task is finished	4.44	0.21
3.	Can be somewhat careless	3.97	0.56
4.	Starts quarrels with others	3.21	0.79
5.	Outgoing and sociable	4.69	0.11
6.	Does things efficiently	4.67	0.12
7.	Tends to be quiet	3.37	0.68
8.	Sophisticated in art, music, or literature	3.39	0.74

The results show that the consumers are strongly agreed with full of energy, outgoing and sociable and does things efficiently, while, they are agreed with perseveres until the task is finished and can be somewhat careless and they are neutral with starts quarrels with others, tends to be quiet and sophisticated in art, music, or literature.

**3.2.5. CONSCIENTIOUSNESS TRAIT**

The personality trait of conscientiousness of consumers was analyzed and the results are presented in Table-6.

**Table-6: Conscientiousness Trait of Consumers**

Sl. No.	Conscientiousness	Mean	Standard Deviation
1.	Talkative	4.70	0.13
2.	Can be cold and aloof	3.83	0.44
3.	Depressed	3.36	0.69
4.	Helpful and unselfish with others	3.76	0.85
5.	Has an active imagination	3.98	0.70
6.	Sometimes rude to others	4.66	0.12
7.	Tends to be quiet	3.40	0.77
8.	Has a forgiving nature	4.05	0.53
9.	Emotionally stable and not easily upset	3.73	0.69

The results indicate that the consumers are strongly agreed with talkative and sometimes rude to others, while, they are agreed with can be cold and aloof, helpful and unselfish with others, has an active imagination, has a forgiving nature and emotionally stable and not easily upset and they are neutral with depressed and tends to be quiet.

### 3.3. PURCHASE INTENTION OF CONSUMERS TOWARDS ECO-FRIENDLY PRODUCTS

The purchase intention of consumers towards eco-friendly products was analyzed and the results are presented in Table-7.

**Table-7: Purchase Intention of Consumers towards Eco-Friendly Products**

Sl. No.	Purchase Intention	Mean	Standard Deviation
1.	I intend to purchase eco-friendly products because they are more concerned about safety	4.70	0.11
2.	I intend to purchase eco-friendly products because I am more concerned with environmental problems	4.75	0.13
3.	I intend to purchase eco-friendly products because I am more health conscious	4.72	0.10
4.	I intend to purchase eco-friendly products because they are having superior quality	4.20	0.32
5.	I intend to purchase eco-friendly products because they are easily available	3.96	0.53

The results reveal that the consumers are strongly agreed with they intend to purchase eco-friendly products because they are more concerned about safety, they intend to purchase eco-friendly products because they are more concerned with environmental problems and they intend to purchase eco-friendly products because they are more health conscious, while, they are agreed with they intend to purchase eco-friendly products because they are having superior quality and they intend to purchase eco-friendly products because they are easily available.

### 3.4. INFLUENCE OF PERSONALITY TRAITS ON PURCHASE INTENTION OF CONSUMERS TOWARDS ECO-FRIENDLY PRODUCTS

To examine the influence of personality traits on purchase intention of consumers towards eco-friendly products, the multiple linear regression has been used and the results are presented in Table-8.

**Table-8: Influence of Personality Traits on Purchase Intention of Consumers towards Eco-Friendly Products**

Personality Traits	Regression Co-efficients	t-Value	Sig.
Intercept	1.345**	7.192	.000
Extraversion (X <sub>1</sub> )	.106**	3.764	.000
Neuroticism (X <sub>2</sub> )	.113	.679	.659
Openness (X <sub>3</sub> )	.127**	4.170	.000
Agreeableness (X <sub>4</sub> )	.198**	4.945	.000
Conscientiousness (X <sub>5</sub> )	.084**	2.954	.004
R <sup>2</sup>	0.59	-	-
Adjusted R <sup>2</sup>	0.58	-	-
F	32.175	-	.000

\*\* Significant at one per cent level

The coefficient of multiple determination ( $R^2$ ) is 0.59 and adjusted  $R^2$  is 0.58 indicating the regression model is good fit. It is inferred that about 58.00 per cent of the variation in purchase intention is explained by the personality traits. The F-value of 32.175 is statistically significant at one per cent level indicating that the model is significant.

The results show that agreeableness, openness, extraversion and conscientiousness are positively and significantly influencing the purchase intention of consumers towards eco-friendly products at one per cent level. Thus, the null hypothesis that there is no significant influence of personality traits on purchase intention of consumers towards eco-friendly products is rejected.

#### **4. CONCLUSION**

Among the features of extraversion trait, the consumers are strongly agreed with comes up with new ideas, sometimes shy and inhibited, considerate and kind to almost everyone, can be tense and makes plans and follows through with them and among features of openness trait, the consumers are strongly agreed with does a thorough job, ingenious and a deep thinker, generates a lot of enthusiasm and likes to reflect, play with ideas. Among the features of agreeableness trait, the consumers are strongly agreed with reliable and trustable and among the features of neuroticism trait, the consumers are strongly agreed with full of energy, outgoing and sociable and does things efficiently. Among the features of conscientiousness trait, the consumers are strongly agreed with talkative and sometimes rude to others.

The consumers are strongly agreed with they intend to purchase eco-friendly products because they are more concerned about safety, they intend to purchase eco-friendly products because they are more concerned with environmental problems and they intend to purchase eco-friendly products because they are more health conscious. The regression analysis shows that agreeableness, openness, extraversion and conscientiousness are positively and significantly influencing the purchase intention of consumers towards eco-friendly products.

It is suggested that the consumer should understand their personalities properly and change their personalities if needed to enhance their purchase intention towards eco-friendly products. In addition, marketers of eco-friendly products must target and segment their consumers on the basis of their personality traits in order to improve their sales volume and profitability.

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**CHALLENGES AND STRATEGIES OF SERVICE MARKETING**

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**ABSTRACT**

*Services have become a vital part of the world economy. Over the past decade the role of services marketing has become a prevailing feature in the service industry. Services are activities which are intangible in nature; therefore, standardization is one of the major issues in services. The marvelous growth and economic contributions of the service sector have pinched increasing attention to the issues and problems of service sector industries.*

*Keywords: Service marketing, challenges and strategies*

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**INTRODUCTION**

Services marketing typically refer to both business to consumer (B2C) and business to business (B2B) services, and include marketing of services like telecommunications services, financial services, all types of hospitality services, car rental services, air travel, health care services and professional services. The range of approaches and expressions of a marketing idea developed with the hope that it be effective in conveying the ideas to the diverse population of people who receive it. During the earlier days of trade, we were apparently presuming goods and services to be a part of the same basket. For e.g.; restaurants were a mean of providing just “food” and the ambience and hospitality wasn’t given its due importance. However, researchers in the field of marketing began to differentiate between goods and services and were able to demonstrate it with substantial evidence.

However, while researchers were finding differences between services marketing and goods marketing, the results were often inconclusive and conflicting. Implementation of the marketing strategies required a clear distinction of whether a service was a pure service or a constituent of service and good together. Thus, a “service-good continuum” was developed with pure service on one terminal point and pure commodity good on the other terminal point.

**LITERATURE REVIEW**

The rationale for a separate treatment of services marketing centers on the existence of a number of characteristics of services which are consistently cited in the literature: intangibility, inseparability of production and consumption, heterogeneity, and perishability. Figure 1 presents a summary of the references documenting these differences. The fundamental difference universally cited by authors (e.g., Bateson 1977; Berry 1980; Lovelock 1981; Rathmell 1966, 1974; Shostack 1977a) is intangibility. Because services are performances, rather than objects, they cannot be seen, felt, tasted, or touched in the same manner in which goods can be sensed. Intangibility, according to Bateson (1979) is the critical goods-services distinction from which all other differences emerge. Inseparability of production and consumption involves the simultaneous production and consumption which characterizes most services. Whereas goods are first produced, then sold and then consumed, services are first sold, then produced and consumed simultaneously (Regan 1963). Since the customer must be present during the production of many services (haircuts, airplane trips), inseparability “forces the buyer into intimate contact with the production process” (Carmen and Langeard 1980, p. 8). Inseparability also means that the producer and the seller are the same entity, making only direct distribution possible in most cases (Upah 1980) and causing marketing and production to be highly interactive (Gronroos 1978).

**Table 1.1 Differences between physical goods and services**

Physical Goods	Services
A thing	An activity or process
Tangible	Intangible
Homogeneous	Heterogeneous
Production and distribution are separated from consumption.	Production, distribution and consumption are simultaneous process.
Core value produced in factory	Core value produced in buyer-seller interactions.
Customers do not participate in the production process	Customer may participate in the production
Can be kept in stock.	Cannot be kept in stock.
Transfer of ownership.	No transfer of ownership.
Source: Christian Gronross, Service management and Marketing, Massachusetts : Lexington Books, 1990, p. 28.	

## THE CHALLENGES OF SERVICE MARKETING MANAGEMENT

### 1. Intangibility

Consumers can see and touch goods they're a physical product. They know exactly what they're buying when they're spending their money. They may even be able to carry the item away with them although they have to drive off the lot when they buy a car.

This portability is not the case with services. The effects of services may not be apparent immediately, and what's done is not always obvious. The client of a management consultant, for example, may have to wait for months (or years) before they can see the results.

**Lack of Emotion:** Physical products can trigger an emotional impulse compelling the customer to buy. Color, shape, and style are important for physical products especially those aimed at the general public.

No such built-in emotional appeal exists in the intangible world of services. The consumer might have a hard time even imagining all the details involved in what is done for them by a service business.

No product or service can be completely tangible or intangible, of course. For example, a law firm selling legal services needs business cards, computers, and other tangible objects to practice law but the firm's clients aren't paying for them. Similarly, a hardware store will need salespeople, guarantees, and operating manuals and lessons to sell drill machines or table saws.

Even so, it's easy to tell the difference between a service business and a tangible goods business.

### 2. Lack Of Ownership

You can buy a product, take it home, own it for years, and perhaps even resell it. But you can't do the same with a service. You can avail it only for a specific period of time and then it's over--unless you pay again. The lack of physical ownership makes it harder to sell services.

Even companies don't own and control services the way they can control tangible products. It's because service delivery depends on human interactions between the service provider's employees and customers.

### 3. Perishability

Another defining quality of services is that they are perishable. I don't mean that they will spoil, but they are time-bound. You can't build an inventory or store services like you can with physical products. Services are usually performed at specific times and on stated dates.

A dentist cannot start a procedure until the patient is in the chair. An airline cannot sell a seat on a flight that has already left the gate.



**4. Heterogeneity**

Services are heterogeneous. Service businesses operate through several diverse elements and interactions. A bank may offer customer service through a helpline or website and cash withdrawals through ATMs and counters.

In most industries, the service delivery process involves a lot of human interaction. As human behavior is subjective and unpredictable, no two sets of services can be identical in their details and results.

**5. Interactivity**

Service delivery depends on a chain of interactions between customer and service provider, as well as between the people working inside the service provider. The customer is central to the whole process and all activities must aim at their satisfaction.

The degree of this cooperation will vary among different types of services. But it must be present to make service delivery possible. No such cooperation is required for delivering physical products.

**SERVICES MARKETING STRATEGIES**

We consider strategy an integrated and coordinated set of commitments and actions designed to exploit our potentials and gain competitive advantage. The success of the services marketing depends upon the make use of the services marketing mix in a right blend.

**Product**

Services are intangible, therefore is often difficult to understand the quality and quantity in advance. An effective way to generate confidence is to highlight the tangible aspects. Banks are issuing credit cards as tangible element of their credit facilities.

**Price**

It draws the attention of service users and service providers it may not be same by all service provides. There are number of factors influencing the pricing strategy. Airline services pay more attention in fixing the price to attract more customers because it is perishable in nature.

**Promotion**

Promotion is the life blood of services marketing then other businesses, because it is having intangible nature products the effective promotional tools can take the services to the prospective consumers, aggressive advertising campaign “INCREIBLE INDIA “By Tourism” Ministry has played a major role in changing the image of India from that of the land of snake charmers to a hot and happening place and has sparked renewed interest among foreign travelers.

**Place/Distribution**

High contact services have to be distributed directly because consumer and supplier have to meet. Economics of scale can be achieved by using indirectly distribution with computer- based technology such as travel agents and ATM'S.

**People**

All people involved either directly or indirectly of the consumption of a service is important. People can add a significant value to a service offering. People sell the service and either make or break the marketing of the service you offer. It's time to take a look at the “face” of your service and evaluate.

**Physical Evidence**

The way that service is delivered needs to be communicated and followed through. You are creating an intangible experience so communication and documentation is the only physical evidence you have to share with your consumer. Make sure you are doing enough of it.

**Process**

Procedure and flow of activities of how services are consumed is an essential strategy in marketing services. Everything must run smoothly to keep the trust of the consumer.

**CONCLUSION**

Services have five unique characteristics that are not found in goods, i.e. intangibility, inseparability, variability, perishability and ownership. The intangibility characteristic of services seems to be the leading one in the definition of services. These unique characteristics create frequent challenges for service marketers to draw new customers and hold current customers. Success lies in understanding your customers and defining a service concept that matches their expectations. Design a service delivery process that works like a charm and

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staff it with engaged and motivated employees. Track your performance and continuously improve the quality of your services. And that's what service marketing management is all about.

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**STARTUP CHALLENGES AND ISSUES IN INDIA**

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**ABSTRACT**

*Startups have been the flavor of the season over the last few years for the Indian markets. This has resulted into the emergence of a number of home grown unicorns across the country. Indian government has announced an action plan that addresses all aspects of the Start-up ecosystem. The government launched its Start-up India hub for all stakeholders of the entrepreneurial ecosystem in India to discover, connect and engage with each other. Start-up India was launched to provide a very promising future to the entrepreneurs of the country. The initiatives introduced were in great favor to make start-ups successful.*

*Keywords: Startups India, Indian Government*

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**INTRODUCTION**

Indian government is serious in promoting entrepreneurship at the startup level and has taken a number of initiatives to ensure appropriate support. In this aspect it is relevant to mention 'Make in India' campaign introduced in September'14 to attract foreign investments and encourage domestic companies to participate in the manufacturing sector. The government increased the foreign direct investment (FDI) limits for most of the sectors and strengthened intellectual property rights (IPRs) protection to instill confidence in the startups. In order to make the country as number one destination for startups, Government of India (GOI) has introduced new campaign called 'Standup India' in 2015 aimed at promoting entrepreneurship among women and to help startups with bank funding. Another commendable and far reaching initiative is 'Digital India' introduced in 2015 to ensure government services are made available to every citizen through online platform that aims to connect rural areas by developing their digital infrastructure which translates into a huge business opportunity for startups.

Startups have been the flavor of the season over the last few years for the Indian markets. This has resulted into the emergence of a number of home grown unicorns across the country. One of the major contributors leading to this development has been the mega funding that has been ploughed into most of these unicorns between the period 2007 and 2017. This has been in line with the global trend dominating the space. Even the aspiring unicorns have had a decent run during this period, where managing to find investors is usually considered a tough task. The trends of investments suggest that investors want to enter as an early investor, even before the start of the firm. From an overall viewing, India comes across as a thriving under-penetrated consumer driven market with a scope for exponential growth. Internet penetration and its increasing importance will drive most of the businesses. On account of the consumer demographics, with China being out of bounds, India offers the largest pie of investment opportunity that the world is eyeing. This is despite the multitude of operational, regulatory and taxation issues that surround the business running environment in India.

The larger problems plaguing the businesses, such as the unorganized and fragmented Indian market, lack of clear and transparent policy initiatives, lack of infrastructure, lack of knowledge and exposure, complications in doing business, etc. are at least now being identified as issues that need to be addressed. The framework and course of regulations need to be updated and adopted as per the times.

**LITERATURE REVIEW**

Sunanda (2017) has done a case study approach on how to start and manage startup companies in India, entrepreneurial venture is a new business in the form of company or partnership business or temporary designed and search of a repeatable and scalable business model, and explained how the entrepreneurial are innovate to create job opportunities in the market.

Andaleeb & Singh, (2016) did research on financing sources for start-up companies in India; in this research paper identified the sources of financing with exclusively on financial ventures in India, explored views on stages for development of start-ups. The major goal of this paper was to know whether the country has made proper arrangements to fund the entrepreneurial ideas.

(Sharifi & Hossein, n.d.(2016) did research on understanding the financial challenges faced by startups in India, explained the major problem in the country is creation of employment opportunities. The researchers identified

how the startups face the challenges over the pooling of money from different sources and what are the difficulties faced by them during that acquisition of funds.

(Calopa, 2014) conducted research on Analysis of Financing sources for start-ups companies. They explored views on the development of start-up companies, their sources of financing with special emphasis on financing venture. This research paper emphasized on better understanding of the financing strategy of entrepreneurial ventures.

(Journal, n.d.) According to Mr. Anurag Garg Indian markets are getting flooded by the startups and highlighted the major sources available for acquiring capital from the outsiders like seed capital, Banks and venture capital without moving to the capital market. This research paper explained the major problems faced by the startups in India especially hiring the talent, absence of mentor and in the conclusion explained the role of entrepreneurs for industrial and market development.

### START-UP INDIA

In order to meet the objectives of the initiative, Indian government has announced an action plan that addresses all aspects of the Start-up ecosystem. With this Action Plan the Government hoped to accelerate spreading of the Start-up movement:

- From digital/ technology sector to various other sectors including agriculture, manufacturing, social sector, healthcare, education, etc.; and
- From existing tier 1 city to tier 2 and tier 3 cities including semi-urban and rural areas. The Action Plan was divided across the following areas:
- Simplification and Handholding
- Funding Support and Incentives
- Industry-Academia Partnership and Incubation (TCGTBI, IEST and Government of India, 2016).

**Table no 1.1 Break-up of Indian Startup Businesses**

Technology Based	Non-Technology Based
<b>E-Commerce - 33%</b>	Engineering- 17%
<b>B2B - 24%</b>	Construction-13%
<b>Internet - 12%</b>	Agri- products- 11%
<b>Mobile apps - 10%</b>	Textile - 8%
<b>SaaS - 8%</b>	Printing & packaging - 8%
<b>Other - 13%</b>	Transport & logistics- 6%
	Outsourcing & support -5%
	Others-32%

Source: Startups India- An Overview, Grant Thornton, 2015

### START-UP INDIA: OPPORTUNITIES

The government launched its Start-up India hub for all stakeholders of the entrepreneurial ecosystem in India to discover, connect and engage with each other. It was a step taken to assist startups in succeeding. The opportunities that could be drawn from the policy were largely the ones that were the major bottlenecks for any entity's success. Under the initiative, Start-ups were exempted from paying income tax on their income for the first 3 years. Around 80% rebate was provided on filing a patent application. The system for patent filing was made fast track. There was an exemption of tax on the capital gains. A mobile app was launched to enable start-ups to get registered within a day. The app also provided a simple application form for the registration. A web portal was also launched for issues regarding clearances, approvals and registrations. Another major advantage was that the compliance regime was based on self-certification. There would also not be any inspection for the first 3 years of start-up businesses in respect of manpower. The norms under the policy for exit strategies are much easier. Furthermore, there are relaxed norms of public procurement for start-ups which included no requirement of turnover or experience. Government has setup a fund with an initial corpus of Rs. 2,500 crores and total corpus of Rs. 10, 000 crores to be used over a period of 4 years.

**START-UP INDIA: CURRENT SCENARIO**

Out of the total applications received, 1333 have been recognized as Start-ups by the Department of Industrial Policy and Promotion. The hub has mentored more than 400 Start-ups for incubation, funding support, on business plans, pitching support, etc. A Start-up India Online Hub is also being developed which will serve as an online platform where all the stakeholders of the Start-up ecosystem can work together and synergize their efforts (Ministry of Commerce and Industry, Government of India, 2017). Under the scheme for Start-ups Intellectual Property Protection, 200 Patent applications have received the benefit of up to 80% rebate in patent fees and free legal assistance. Overall, more than 350 Startups have benefitted from the scheme. 35 Start-ups have availed benefit of fees rebate in expedited examination filing fees (Form 18(A)). Trademark Rules, 2017 has been recently amended to provide 50% rebate in Trademarks filing fee to Start-ups. In the Union Budget 2017-18, the Government has increased this period of profit-linked deductions available to the eligible start-ups to 7 years (Ministry of Commerce and Industry, Government of India, 2017).

INR 600 crore has been released to SIDBI. Total commitments stand at INR 623.5 crore to 17 Alternative Investment Funds. 65 Start-ups have received funding from various AIFs. Start-up India has launched an interactive online learning and development module to educate Start-ups and aspiring entrepreneurs, through different stages of their entrepreneurial journey. Over 1,40,000 applicants have signed up for the course, out of which around 4,800 applicants have completed 100% of the course successfully (Ministry of Commerce and Industry, Government of India, 2017). NITI Aayog (Planning Commission of India) has received applications for setting up Atal Incubation Centers (AICs) in public and private sector as well as scaling up of Established Incubation Centers (EICs).

**Table no 1.2 List of Current Startups and Area of Operations**

Area of Operation	Startup Firm Name
Online food delivery	FRESHMENU, SWIGGY
Online fish, meat delivery	FRESHTOHOME
Big data analytics for trade	PEELWORKS
Online pharmacy	MYRA
Platform to get local businesses online	NOWFLOATS
Logistics management software	FAREYE
Lifestyle tracking platform	HEALTHIFYME
Payments solutions for credit/debit cards	PINELABS
AI-driven solutions for retailers-	STAQU
Packaged ready-to-cook idli/dosa batter	IDFOODS
Peer-to-peer lending	FAIRCENT

Source: 17 Startups to Watch, TOI, 2017

**INITIATIVES TAKEN BY THE GOVERNMENT**

The govt plays an important role for establishing the new enterprises. The initiatives taken by the govt of India for startup are as follows.

- 1. Self certification:** The main objective of the govt is to reduce the load on the startups hence allowing them to concentrate fully on their business and keeping the low cost of adherence. It will include labor laws and environment related laws.
- 2. Start-up India hub:** A single contact point will be created for the start-ups in India, which will enable them to exchange knowledge and access to funds.
- 3. Register through app:** An online portal, will be available in the form of a mobile application, which will help entrepreneurs to interact with the govt and other regulatory officials.

**4. Patent protection:** A monitoring system for patent inspection at reduced costs is being created by the central government. It will enhance perception and acquisition of the Intellectual Property Rights (IPRs) by the entrepreneurs

**5. Rs 10,000 crore fund:** The government will develop a pool with a starting aggregation of Rs 2,500 crore and a total aggregation of Rs 10,000 crore over four years, to help new entrepreneurs. The important role will be played by the Life Insurance Corporation of India in blossoming this collection. The fund will be managed by a group of professionals selected from the start-up industry.

**6. National Credit Guarantee Trust Company:** A National Credit Guarantee Trust Company (NCGTC) will be created with a budget of Rs 500 crore per year for the next four years to help the drift of funds to entrepreneurs

**7. No Capital Gains Tax:** Investments through venture capital funds are exempted from the Capital Gains Tax. The same policy will be executed on start-ups.

**8. No Income Tax for three years:** Start-ups would not pay Income Tax for the first three years.

**9. Tax exemption for investments of higher value:** In case of ventures of higher amount than the market price, they will be exempted from paying tax.

**10. Building entrepreneurs:** Creative study plans for students will be implemented in over 5 lakh schools. Apart from this, there will also be an annual businessman grand provocation to develop high class businessmen.

## CONCLUSION

India is becoming super power in the world, in that process the government should take responsibility to make ease of getting approval of loans from banks. Start-up India was launched to provide a very promising future to the entrepreneurs of the country. The initiatives introduced were in great favor to make start-ups successful. Some of these initiatives like easier and faster registration, self-certification, zero inspection for first few years were a great aid to the people who wanted to pursue a business through this medium. Over the last year there was lot of out of the box thinking and a sense of direction was seen in the upcoming entrepreneurs of India.

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## USEFULNESS OF GIVEN COMBINATION DRUGS IN MANAGEMENT OF CHRONIC SINUSITIS

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**ABSTRACT**

The primary objective was to ascertain the therapeutic use of given Unani medicines in the management of chronic sinusitis. This is an interim analysis of the open clinical observational study was undertaken by the Department of Moalijat, Ajmal Khan Tibbiya College and Hospital, AMU, from March 2005 to July 2007. Symptoms were ascertained during the follow-up period. Six predefined Unani medicines were shortlisted in decoction form and for inhalation. Only those patients were included in this study in whom the diagnosis was confirmed on the basis of clinical symptoms and sign with haziness/ opacity in X-Ray PNS, A total of 98 patients suffering from chronic sinusitis were enrolled in the study. Only 30 patients completed the treatment and followed up regularly. There was a statically significant reduction after 45 days of treatment. Radiological appearance also improved. For statistical analysis t-test and chi-square tests were applied. No adverse effects were observed during treatment.

**Keywords:** - Sinusitis, Headache, Pain, Decoction, Inflammation.

**1. INTRODUCTION**

Sinusitis is the inflammation of the mucous membrane of paranasal sinuses [4], [15], [16], [21], [41], [44], [53].

Classification of sinusitis.

1. On the basis of Onset
  - a. Acute sinusitis (*Haad Waram –e- Tajawif-e- Anaf*)
  - b. Chronic sinusitis (*Muzmin Waram -e- Tajawif –e Anaf*).
2. On the basis of Anatomical position
  - a. Frontal sinusitis
  - b. Maxillary sinusitis
  - c. Ethmoidal sinusitis
  - d. Sphenoidal Sinusitis
3. On the bases of opening
  - a. Open
  - b. Closed
4. On the basis of secretion
  - a. Suppurative (*Sadeedi*)
  - b. Non Suppurative (*Mukhati*) [6], [11], [21], [27]

**HISTORICAL BACKGROUND**

Paranasal sinuses are not described in old books of anatomy. So, the term sinusitis is not found in ancient books of medicine, but in the context of *Nazla* and *Zukam*, it is found that signs, symptoms, and complications are very close. Almost all Unani physicians expressed a common opinion about *Nazla* and *Zukam*. “If the secretion of brain fell towards the Throat and chest, it is called *Nazla*, and if secretes through nose, it is called *Zukam*”. [8], [9], [28], [29], [33], [34], [35], [39], [51]. According to Hippocrates “A person having a painful spot in the head, with intense headache, pus or fluid running from the nose, removes the disease [13]. Ismail Jurjani in *Zakheera Khwarezm shahi* and Ibn-e-Sina in *Al Qanoon* described briefly about *Nazla* and *Zukam* which is very similar to chronic sinusitis. Hakeem Kabeeruddin quoted Hippocrates in *Tarjuma-e-Kabeer* “Actually *Zukam* is *Nazla* of mucous membrane of the nose and *Nazla* is that *Waram* of the mucous membrane, along with secretion is found” [53]. It shows that ancient eminent physicians were well known to this disease in the form of *Nazla* and *Zukam*, There is some difference in the pathogenesis of *Nazla* and *Zukam*, but the complication is approximately the same [27]. According to write (1952), Ballenger Del Capi was the

first who indicate the presence of paranasal sinuses. [10], [13]. Zarneek and Scyladan explained that till the end of the 19<sup>th</sup> century, Otorhynologists discovered chronic inflammation of paranasal sinuses and its pathogenesis, etiology, and symptoms [48]. Lucas and Douglas (1934) explained about transport mechanism of mucous membranes of paranasal sinuses [10], [13] Heller and Bidden wrote the theory of humidification which is the main function of paranasal sinuses [43]. Recheart (1902) introduced Antroscopy first which is very useful in the diagnosis of sinusitis. [13].

**Anatomy of Paranasal Sinuses:** Paranasal sinuses are the combination of air spaces which are located around the nasal space. [13], [21], [47]. There are four pairs of paranasal sinuses located each side of the nose.

- a. Right and left frontal sinuses.
- b. Right and left maxillary sinuses.
- c. Right and left, anterior & posterior ethmoidal sin-uses.
- d. Right and left, sphenoidal sinuses [14].

Paranasal sinuses are layered by a mucous membrane [11], [47], [50].

#### Physiological Functions of Paranasal Sinuses

- a. Humidification [12]
- b. Pressure damping
- c. Regulation of resonance [38]
- d. Thermoregulation
- e. Air conditioning [12], [13], [38]
- f. Lightens the weight of the skull [12], [40].

#### Pathological Changes During Inflammation of Para-Nasal Sinuses

- a. Acute congested – *Haad Ahtqani*
- b. Acute purulent – *Haad Sadeedi*
- c. Chronic purulent – *Muzmin sadeedi*
- d. Chronic hyperplastic – *Muzmin Mufrit Naseeji Namu*

#### Etiology

1. Acute Rhinitis [6], [12], [13], [17], [21], [38], [44], [54].
2. Pharyngeal infection [6], [11], [13], [21].
3. Dental infection
  - a. Acute periapical abscess
  - b. Periodontal abscess
  - c. Tooth Extraction
  - d. Foreign body in the sinuses by dental prosthetic material. [6], [13], [21], [44]
4. Swimming and Diving [6], [13], [14], [21]
5. Trauma
  - a. Compound fracture of the bone
  - b. Contusion of the sinuses
  - c. Foreign body [13], [44]
6. Barotrauma [6], [13], [21]
7. Primary ciliary Dyskinesia [6], [13], [21]
8. Bacterial infection - Gonococci
  - a. Streptococci



- b. Staphylococci
- c. Haemophilus influenza
- d. E. coli
- e. Micrococcus catarrhalis 13, 20, 21, 53, 54
- 9. Viral Infection Rhinovirus
  - a. Para Influenza I and II
  - b. Coxsackie A21 [6], [13], [21], [54]
- 10. Fungal infection: - Aspergillus Fumigatus
  - a. Apiospermum
  - b. Curvularia
  - c. Chyopermum (6, 13, 21, 54)

**Symptoms**

- 1. Flat-voice
- 2. Anosmia
- 3. Cacosmia
- 4. Postnasal Drip
- 5. Maxillary antral Pain
- 6. Ethmoidal Pain
- 7. Frontal Pain
- 8. Sphenoidal Pain
- 9. Nasal Obstruction
- 10. Nasal Discharge
- 11. Headache [6], [10], [11], [13], [14], [20], [21], [3].

**Signs**

- 1. Swelling
- 2. Tenderness
- 3. Anterior Rhinoscopy shows an inflamed mucous membrane.
- 4. Posterior Rhinoscopy shows the presence of mucous at the upper surface of palate due to inflammation in any paranasal sinuses. [6],[13], [14], [20], [21]

**Trans Illumination Test:** Examination of the pharynx Pus in lateral pharyngeal gutter means inflammation of the anterior group of sinuses. Trans Illumination Test [6], [11], [13], [21], [44]

**Usool-e-Ilaj** According to pathology and signs and symptoms drug were chosen

- a. *Muhallil-e-Awram*
- b. *Musakkin*
- c. *Mulattif*
- d. *Dafe – Hassasiyat*
- e. *Muqwwi-e-Dimagh*

**Radiological Examination:** X-Ray Paranasal sinuses elicit

- a. Opaque sinuses
- b. Thickened mucosal lining

c. Fluid level

### Composition of Drugs

1. Ustukhuddus – Lavedulla staechodos – 6gm
  - a. *Muhallil*, - [2], [3], [18], [19], [22], [26], [38], [46], [52]
  - b. *Musakkin*, - [5], [18], [26]
  - c. *Muqawi Dimagh*- [2], [3], [18], [19], [42], [45], [46], [52]
2. Asarun – Welleriana wellich – 4gm
  - a. *Muhallil* [3], [7], [18], [22], [24], [25], [30], [32], [35], [37], [46], [52]
  - b. *Mulattif* [1], [3], [7], [18], [24], [25], [32], [35], [37], [52]
  - c. *Musakkin* [37]
3. Gul -e- Babuna –Matricaria commomila – 4gm
  - a. *Muqawwi-e-Dimagh* [18], [22], [24], [25], [37], [42], [52]
  - b. *Muhallil -e- Awram* [2], [7], [18], [23], [24], [25], [37], [42], [52]
  - c. *Mulattif* [7],[23],[25],[26]
  - d. *Musakkin* [7],[18],[24],[36],[49]
4. *Aslus-Soos Muqashshar* - Lavendulla staechodos - 6gm
  - a. *Muhallil*
  - b. *Musakkin*
  - c. *Muqavvi e-Dimagh*
  - d. *Mulattif* [18], [19], [25], [30], [36], [45], [46]
5. *Fil-Fil Siah*-Piper nigrum - 3grains
  - a. *Muhallil-e-Awram* [7], [17], [24], [25], [35], [37], [45], [46], [49]
  - b. *Muqavvi -e- Dimagh* [32], [45], [46], [49]
  - c. *Musakkin*
  - d. *Muqawwi -e- Dimagh* [2], [3], [5], [18], [19], [24], [25], [30], [31], [32], [35]
6. *Gul -e- Nilofer-Nymphae alba* – 4gm
  - a. *Mulattif*
  - b. *Muhallil -e- Awram*
  - c. *Musakkin*
  - d. *Muqawwi -e- Dimagh*. [2], [3], [5], [18], [19], [24], [25], [30], [31], [32], [35]

**2.1 The Objective of the Study:** Objective of the study is to evaluate the therapeutic efficiency and safety of giving combination in the patients of chronic sinusitis using the improvement in the symptoms and sign on the basis of trans-illumination test and X-Ray findings of paranasal sinuses.

**2.2 Material and Method:** The study was designed to evaluate the therapeutic effectiveness of a given combination of 6 Unani drugs in the form of decoction and for steam inhalation, undertaken by the Department of Moalijat, Ajmal Khan Tibbiya College and Hospital, AMU from March 2005 to July 2007, Symptoms and signs were ascertained during the follow-up period. Only those patients were included in this study in whom the diagnosis was confirmed on the basis of clinical symptoms and signs with haziness/Opacity in X-Ray PNS. A total of 98 patients suffering from chronic sinusitis were enrolled in this study but only 30 patients completed the treatment and followed up regularly.

**2.3 Exclusion Criteria:** The patient suffering from chronic sinusitis with other diseases like tuberculosis, gonorrhea, syphilis, DNS, Nasal polyposis, Benign and malignant tumors, adhesions, choanal atresia, collapse, foreign body and patient with psychological disorders were excluded in the study.

**2.4 Administration of Drug:** The given combination was supposed one *addad* for decoction, ½ dose is given in the morning and a half in the evening for 45 days. Follow up period was 0-15, 16-30, and 31-45 days. The steam of combination was also given.

**3. Statistical Analysis:** For statistical analysis t-test and chi-square tests were applied.

**4. Observation, Discussion and Results:** 98 patients with chronic sinusitis were subjected to study but only 30 patient has completed the treatment and were regular for follow up. So the observation and results based on 30 subjects. Chronic sinusitis was more found in 18-26 of the age groups. Male were more affected than females. The number of students were more than other. According to temperament 17(56.7%) of total subjects were phlegmatic (*Balghami*). 23(76.6%) were found from the middle class. 16(53.7%) of patients were affected by pollution. 3(3.33%) were swimmers/ divers. On the basis of anatomical position, patients of frontal sinusitis were 80% and 20% of maxillary sinusitis. There was no patient of ethmoidal and sphenoidal sinusitis. 13 Patients (43.3%) were suffering from continuous headache, after treatment of 45days 8 (61.5%) patients were relieved but 5 (38.5%) patients were not relieved by headache. The paired t-test was significant. 17(56.7%) Patients with periodic headache. After 45 days of treatment 10 (58.8%) were not relieved. Only 7(41.2%) patients were overcome. The t-test was insignificant. On the basis of the presence of facial pain, patients were divided into two groups, in the first group 20(66.7%) patients were suffering from pain at the site of frontal sinusitis. After 45 days, 14(70%) patients were recovered from pain, 6 (30%) patients were not get relieved by treatment. In second group 5 (16.7%) the patient was of pain at the site of the maxillary sinus. After 45 days, only 2(40%) patients get relieved ( $X^2=13.3$ ,  $P < .001$ ). The patient of nasal obstruction were 6(20%), after 45 days of treatment, 5 (83.3%) people get relieved by symptoms. 19(63.3%) patients were suffered from rhinorrhea. 14(73.7%) get relieved. After apply chi-square test, result was highly significant ( $X^2=13.6$ ,  $P < .001$ ). Tenderness at the site of frontal sinus was positive in 12(40%) patients after treatment 50% result was found. Tenderness at the site of the maxillary sinus was positive 4(13.3%) patients, after 45 days of treatment, 75% result found. There was nasal congestion in 5(16.7%) patient on rhinoscopy. Improvement rate was (80%). On Trans illumination test, 22(73.3%) patients showed translucency at the site of the frontal sinus, in which 3 (60%) were returned to normal. ( $X^2=11.3$ ,  $P<.001$ ), 5(16.7%) patient showed translucency at the site of the maxillary sinus. 3(60%) were returned to normal. On applying the chi-square test, result was significant. ( $X^2=18.7$ ,  $P<.001$ ). In X-Ray PNS 9 (30%) patients showed fluid in sinuses, after treatment 5(66.7%) patient get relieved. Partial opacity was found in 15(50%) patients, after 45 Days, X-Ray of only 6(40%) become normal. On applying chi-square test result was insignificant ( $X_2=4.3$ ,  $P<.05$ ). Total Opacity was positive in 6(29%) patients, 4 (66.7%) patient were negative. After 45 days chi-square test was insignificant ( $X_2=2.3$ ). There was no effect of the drug on vital signs and blood cell count.

**5. Conclusion:** The given formulation was very effective in reducing the symptoms and signs of chronic sinusitis without causing any adverse effect. Hence it may highly be recommended for patients suffering from chronic sinusitis as well as acute sinusitis instead of anti-allergic drugs.

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**“INNOVATION AND RURAL ENTREPRENEURSHIP IN TODAY’S SCENARIO – UNLEASHING RURAL CONSUMER’S BRAND AWARENESS”**

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**ABSTRACT**

*All around the globe India has the greatest ability for serving the rural market. Such markets are price perceptive and are related to the level of local income. An effort is carried out to encourage the promotion of brand image in the rural markets. They are recognizing the unit in which rural populations are in an improved situation with a higher per capita income level. This is possibly achieved by using the different rural traditional media for tapping the untapped potential for reaching out to rural areas by using local languages. To efficiently knock the rural market a trader must link it to the activities undertaken by rural the population. Also, it can be used in huge numbers to enable association of the brand with the innumerable ceremonies, merriments, commemorations, fairs to attract rural get-togethers. Rural India institutes in the foundation of our country and contributes towards producing higher than almost half of the national income. In the marketing development implementation, rural markets are increasingly gaining a lot of status of important in the marketing planning exercise by the consumer and social dealers. Rural marketing includes rigorous personal selling determinations in comparison to metropolitan marketing.*

*Keywords: Rural market, Brand, Rural Branding, rigorous personal selling, Rural Consumer.*

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**INTRODUCTION**

The rural market inhabits a greater fragment of the Indian economy. Rural marketplaces of India obtained substantial importance, due to the comprehensive development of the Indian economy which gave rise to a considerable upsurge in the buying power of the purchasers even living in rural areas and rural markets gaining importance for the motives of development in rural regions of India. Items for sale in rural marketplaces need to be more naive, accessible, recognizable, reasonable, presented in a stimulating panache, and existing at purchaser approach. The rural consumer demonstrates distinguishing appearances that promote rural products to be bought by rural buyers. A brand is a tag, span, symbol, mark, sketch, or an amalgamation of these attributes to recognize the items of the trader and distinguish it from the remaining entrants.

The brand means conventional excitements or perceptiveness perceived by purchasers for thinking regarding the items. Barely limited products are capable of creating a market for their selves. It is greatly significant for each unit to generate consciousness regarding products to the purchasers to recognize their merchandise as they desire to distinguish it called branding. It is utilized to generate distinct recognition in the highly cutthroat driven market. The object is to appeal purchasers and upsurge the sales by attracting rural purchasers. Nowadays's the marketplace is engulfed with a great number of analogous products.

**There are features of Rural Market, for each marketer to be aware of -**

- Lower-income, affected by seasonal fluxes.
- Lower literacy rates.
- Opposition to revolution Price sensitivity
- Bigger brand allegiance Guided by conventional acceptance
- Quality awareness
- Short risk handling capability
- Absence of Structural skills
- Purchasing choice
- Small and deferred Hard to forecast demand Messages unruly
- Snags linked to dispersal and channel organization
- Varied socio-economic underdevelopment
- The purchasing power of rural purchasers is on the upsurge.

**Research Objectives: The research paper consists of the following objectives:**

1. To describe the features of rural marketing.
2. To explain the distinguishing importance of rural marketing.
3. To recognize the magnitude of rural branding
4. To study the promotion approach for brands in rural markets.
5. To determine a growing trend regarding brand awareness.
6. To evaluate the factors that create brand awareness.

**Rural Branding**

Rural branding demands for a bigger factor of regional media and lesser of corpus media. As rural markets have focused mediums such as temples, commemorations, fairs, movie halls, which can be used for the promotion of brands. Direct Marketing, also activities such as street displays, movie shows, fairs, and road plays help in promoting brands. The infiltration in rural areas is remarkably for brands with household electrical gadgets. These are highly efficacious due to advertisement campaigns and dispersal web in the rural parts.

In India, major variations among rural and metropolitan traders. Also, the cultural settings change but the facets that affect buying pronouncements vary. Charge and worth for currency are elevated for urban marketers. There is a transformation in media spread and the level of literacy in rural society and the kind of products that are used. There is a huge variation in the standard of living of the inhabitants subsisting in rural sectors. The nature of the range of brand which urban purchaser relishes are diverse from the ranges existing with the rural purchaser.

In the rural areas, Branding necessitates expertise management of marketplaces. The rural purchasers switched using branded in place of basic items. Traders willing to expedite in rural areas confront numerous challenges. Traders need to beat complications of accessibility, economical, appropriateness, and responsiveness. The first object is to confirm the accessibility of the product Traders needs to make the cost of distribution manageable. Traders have evolved a sturdy distribution system to promote its brands reaching even in the cores of rural areas.

To deal with interior parts, traders resort to the usage of traditional means of transport like auto-rickshaws, ships, and bullock-carts.,The second object is to warrant the economy of purchases of items available in rural areas earning mostly on daily wages. The third object is to gain satisfactoriness for the products to be promoted in rural areas. There is a necessity to propose items that ensemble the rural marketplaces. The fourth object for creating awareness is to spread information through vans and roadshows T.V., cinema, etc to reach rural consumers.

**AWARENESS REGARDING BRAND:**

Brand Awareness implies customers know the presence of a brand. Cognizance of the brand shows every bit of brand information is related. Creating awareness encompasses the creation of the brand clearly and loudly to the purchasers in rural areas by different promotional means like promotions, patronages, proceedings, advertising, promotions, etc. Brand awareness relates to an avenue adopted to which users get conversant and accustomed to a brand and identify the brand.

Brand awareness comprises of a brand recognizing and brand reminding. Brand recognizing is the capability of the purchaser to identify the brand put up questions regarding the brand or the ability to identify the explicit brand, which means the ability to differentiate the brand from other brands. To recall the brand is the probable ability of the purchaser to get well with a brand. Brand awareness amended to the level of brand names carefully chosen which are easy to speak recognized and communicative; and inimitable as and dissimilar. There are two kinds of brand awareness:

Aided Knowledge – It implies that on stating the item class, purchasers can identify the brand on their own with some hints.

Unassisted Cognizance-It implies that on stating the item class, the purchaser can identify without hints.

Aaker recommended some important points for achieving awareness among consumers which include

being diverse and remarkable, using a punchline or slogan, exposing brand sign, media hype brand, promotion of events, an extension of the brand, using hints of product category, brand, or both, repeating regularly. It is significant to generate brand awareness regarding products and aids tp recognize the awareness about the

product by the purchasers. Higher the rate of brand awareness increased is the sales volume as well as the profitability and share of the market. To generate brand awareness, its vital to generate a dependable brand image, jingles, and punchlines.

### **Brand Erecting**

There are numerous steps to be followed which can aid in creating such a brand much simpler. These comprise of, perceptive with the onlookers, edifying brand, upshot of logo and calligraphy of the same, pointing the suitable spectators, and engaging advertising. By doing so more sales can be expected than before. The brand must have existed in the market for some time ago. However, brand building is a tedious task in rural areas. As it is a lengthy, wearisome, and systematic effort concerning subdivision, marketing mix, and packing methodological and monetary efforts. The below-stated instruments have been used to effectively shape brand in rural markets:

### **Tools Employed To Effectually Shape Brand In Rural Markets**

#### **Customization**

Rural consumer needs to customize the usages of diverse items as per their requirements. As per the requirements of the purchaser, customization aids in brand building by generating or changing an item to make it pertinent to the requirements of rural consumers.

#### **Implication**

There should be credentials of the products to their name, color, package, quality, etc. The brand name to be important or the punch line is in a language understandable and is in harmony with the culture prevailing and the societal environs of the market. It should be simple for the user to remember about the product.

#### **Mass media**

Vehicles with audiovisual instruments determine the prevailing impediments of rural consumers to influence. Haats to be effectual means for rural advertising. Rural consumers are in purchasing disposition at the Haats and fairs. The mass media was selected by the traders to generate responsiveness. The brand-building be done by Fairs, street plays of the rural areas. The television and radio are significant procedures of media.

#### **Communication**

The communication regarding the products and the company to be vibrant. The local language is used to influence rural purchasers. The company to bequeath the communication appropriately in a manner it creates excitement in the concentrations of the user.

#### **Word of Mouth**

The rural consumers desire trustworthy information and the narrations they hear are additionally credible in the form of hints and aids.

#### **Image**

Images present should also be consistent to increase brand awareness. It is important that consistent in the use of images so that maximization in recognition and positive impressions can be achieved. Wegman's logo, for example, can be found on its storefront, on the products it produces itself, on the receipt consumers receive after purchase, on the bags customers carry out of the store, and in many of its distributed informational material.

### **Brand Effects On Rural India :**

The concept of branding entered in Indian rural markets. A brand is recognized in the rural market with the help of colors, visual effect, or any other identification rather than name which facilitates easy brand recall. The following are the tools which show how a brand could reach rural India:

#### **Exploiting Technology**

Technologies fill the gap in rural India's supply chain and get big brands even to the smallest of the villages. Technologies must be promoted in rural areas.

#### **Marketing Strategies**

The majority of Rural Indians are illiterate. Rural folk should be educated about the merits of the product before launching the product. So that the product shall be made easily available. Effective Pricing and Packaging contribute a lot. Mass media ads can persuade people to try affordable products. For that product need to be packed as per their convenience and pocket.

#### **Sales on Wheels**

A scheduled display and sale items on Wheels can also enhance the Sales. Moreover, they can organize the Demonstration cum Sales Exhibition at frequent Intervals.



**Brands Accessibility**

The potential buyer usually uses all brands according to their capacity. But if a rural area not holding the potential buyers then "To promote the brand is useless".

**Brand Customer**

The brand reaches needs to know the customer base for particular brands in rural areas. Leveraging brand reach to rural areas may not be that much difficult in case it is properly well planned to tap the source of customers. All visual Media like TV channels are very popular in rural areas. The ad campaign will help to promote. Then it is necessary to appoint dealers/retails to keep stocks to distribute. The advantages, applications, and other service back-up have to explain by the marketers. Moreover, the rural masses with their hard-earned money have been more price-sensitive, and hence the price benefits to them play a vital role.

**RURAL RETAILING IN INDIA**

The difference in purchase behavior between the rural and urban population is mainly decided by the money power, literacy standard, mental maturity, and lifestyle. The marketers should give what the customer base in rural areas want intending to penetrate this segment. Then only the repeated purchase can be assured.

- Create consumer awareness and quality management: To generate consciousness of items and their eminence. To dominate the quality administration is indispensable.
- CSR marketing and retail For stepping into rural market effort are to differentiate the features of rural markets and successfully match rural opinions.
- CSR marketing is an important method for the brand to enter the rural marketplace.
- By relating products and satisfying rural needs affordably. By displaying the appropriate connection between product, faith, and usability in the rural marketplace
- Outlet The higher income group in rural India is growing at a phenomenal rate, and the concept of brands and quality is very much prevalent. These current consumption trends provide compelling opportunities for marketers to capitalize on the increasing mass market in India for almost all product categories.
- Ps - Product, Price, Place & Promotion for stepping into the rural market, dealers require to modify its Ps - Product, Price, Place & Promotion in a manner so that marketing strategy is advantageous to locate and create the brand in directed rural markets. The Product to be considered matching the requirements of the rural marketplace. Promotion to comprehend communication in a manner employing media. A good blend of all Ps is essential to create a brand in the rural marketplace.
- Sampling methods efficacious rural marketing representations have established a strong encounter with the regional inhabitants to ensure items bought belong to a brand with which they were familiar.
- Promotional distribution and follow through with the facility can only endure in market rural or urban.
- Identification of the need brands can always provide a good product over the traditional but they need to know what is the need and requirement.
- Reasonably cheap price of the product and dealer network makes a brand to reach rural people. Rural Indians only see the cost of the product but not the quality or value. Hence a brand can reach only by cutting its sale price reasonably.
- Roadshows /local theatre There is a need to identify the brand with widespread arrangements of entertaining rural greeneries. These supporting and sponsoring sports, street plays, or leading roadshows to lead the brand to homes.
- Comprehend personality Render products pf good quality than misrepresenting them.
- Education and Judgment Education and judgment, enable purchasers to buy the exact product and others begin copying which helps in bulk production.
- Localized population Guidance of local source by demo, helps to promote.
- Transfer business partnership For rural masses. a business partnership is important.

**CONCLUSION**

Rural marketing necessities scrutiny because variations are occurring in the rural marketplaces. Vendors need to secure a deep acquaintance of purchaser needs. The rising influence of the rural purchaser is a chance for

businesses to congregate to the rural marketplaces. Some exclusive distinctive topographies which demand distinct marketing plans to be characteristically established to ensemble the rural and urban marketplace.

Marketers usage of determinants like outlooks, inclinations, disposition, and régime to slice marketplaces.

The purpose to generate a good picture regarding the brand compels to penetrate rural marketplaces. Establishments need to discover the exclusive features of its items and message to potential purchasers. The current products, businesses need to retain an authorization on brand image and need to apprise with the aid of consumer's responses to preserve its brand appearance and generate brand awareness. For the initiation of new items, it is significant for traders to communicate about products at the accurate time. This aids to generate improved outlook of the brand in the minds of purchasers to generate brand awareness.

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**MORPHOLOGICAL APPERANACE OF RHIZOME IN DRYOPTERIDACEAE****Shabnam Begum**

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**ABSTRACT**

A survey was conducted to explore morphological nature of Rhizome in different species of Dryopteridaceae family. It was observed that different species of Dryopteridaceae family showed slightly variation in this morphological appearance. In most of the species thickened Rhizome was observed and slightly drifter in size. When colour of rhizome was considered then brown colour was appeared in most of the species of Dryopteridaceae family.

**Keywords:** Rhizome, Size, Colour, Dryopteridaceae family.

**INTRODUCTION**

Mostly species of Dryopteris are distributed in north western Himalayan and Eastern Himalayan Region of India Mehra (1961) has drawn attention to the existence of species complex and their bearing on taxonomy of taxa and stated that study of some of these taxa brings to light how they have successfully exploited all the methods of evolutionary advance prevalent in the Angiosperms. Kachroo (1987) writes " Divergent evolution in the basic pattern for biological change. The evolutionary change have affected nearly all characteristics of a fern taxon. By studying such diversities in characters one can frame an idea about the patterns in evolutions. However one way remember that evolution tends in general to go in different direction "



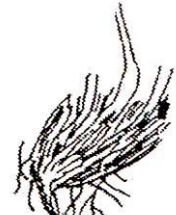
**MATERIALS & METHODS**

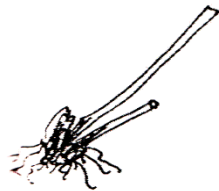
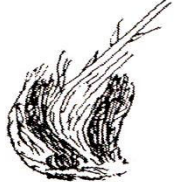
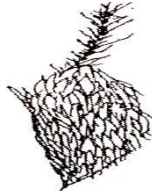
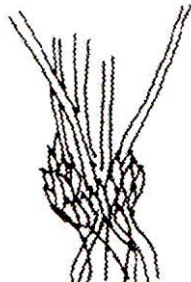
A frequent visit was organized at hilly places to explore, morphological behavior of Rhizome with different species of Dryopteris. During visit ecological conditions of the places were also noted. Specimen were collected by uprooting the plants. Herbarium of such plants were also prepared. Morphological characters of Rhizome of various species of Dryopteris were noted. In present paper the morphological characteristic of Rhizome has been worked out

**RESULTS & DISSCUSSION**

Rhizomes of different species of Dryopteris were observed, which are showing by following table. This table is explaining to the size, Position and Colour of several species Dryopteris.

Morphological characteristics of rhizome of Dryopteris species.

Sl.No	Name of Species	Morphology of Rhizome			
		Size	Position	Colour	Hand Sketch
01	D. Barbigea	3.5 to 4 cm thick	Erect	Densy Brown	
02	D. Marginata	4cm thick	Erect	Light brown	
03	D. Pand	4.5cm thick	stout erector suberct	Brown	

04	D.Pulvinulifera	0.3cm thick	Semierect	Golden Brown	
05	D.Serrato-dentata	up to 12cm thick	Suberect	Dark brown	
06	D.spara	5cm thick	Suberect	Pale Brown	
07	D.stenolepis	5 to 10cm thick	Short erect with spreading roots	Dark Brown	

Species of *Dryopteris* are mostly partially evergreen but no more useful plant than the male form. *D. filix-mass* for almost any position in the garden, in sun or shade, day or moist and dry shade is one of the most difficult of condition to cope with but it loops lateral and dull by vivid winter.

In modern days phylogenetic relationship is examined on the basis of evidence received from cytology, Palynology, Stomatal types, Developmental physiology and Reproductive Biology, Anatomy, photochemistry (Biochemical Taxonomy and Systematic), Gametophytes, Comparative morphology, Numerical Taxonomy and Ground plan method of ecology and Geography.

Mehra (1961) System is fully based on synthesis of idea evolved earlier on the basic of morphology with the information provided by basic chromosome numbers.

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**USAGE OF AGRICULTURE AND HORTICULTURE PRODUCTS BASED RECYCLING ORGANIC MANURES ALONG WITH ASSIST OF SOLAR ENERGY ARE USED AS NEMATODE MANAGEMENT IN TOMATO NURSERY FIELD**

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**ABSTRACT**

*A field experiment was conducted at farmer's field during May 2011 in Salem district to study the effect of soil solarization with organic amendments as a method of root-knot nematode and weed management in tomato nursery bed. Solarization of nursery beds using 300 gauge transparent polyethylene sheets was carried out with various amendments to study the performance of tomato seedlings. The experiment was laid out in randomized block design with 11 treatments replicated thrice. The treatments included, solarization for four weeks with four different amendments viz., vermicompost, poultry manure, Farm Yard Manure (FYM), neem cake and castor cake along with non-solarized control and solarization without amendment. In four treatments, Azospirillum was inoculated two days after the polythene sheet removal. The study was carried out during May, 2018. The results of the experiment revealed that solarization treatment with vermicompost followed by solarization with poultry manure and neem cake were found to be effective in increasing the soil temperature in all depths and on all days of observation. Similarly, the least values for root knot nematode population and soil borne pathogens were recorded in the solarization treatment with neem cake.*

*Keywords: Solarization, Root-knot nematode, Tomato seedlings, Soil Borne Pathogens, Vermi Compost and Neem Cake.*

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**INTRODUCTION**

Indiscriminate use of chemical fertilizers, pesticides and herbicides has led to the deterioration of soil health, ground water quality, soil microbial population, atmospheric constituents, quality of the agricultural produce and thereby the health of animals and humans. Soil organic matter is a vital component of the soil that controls the physical, chemical and biological properties to a large extent. Hence now the emphasis is given for the use of organic resources and non-chemical management practices to maintain the soil quality and environmental health in order to produce high quality produce. The global scenario also currently directs the scientists to produce residue free farm produce and hence there is an emerging awareness among public on the use of high quality food materials which are free from chemical toxicants. This has paved the way for organic farming. Organic farming aims at harmony with nature and achieving production without harming the environment. It is a management system that enhances biodiversity, biological cycles and soil biological activity to produce healthy plants and animals and foster human and environmental health. Organic agriculture dramatically reduces external inputs obtained by reframing chemo-synthetic fertilizer and pesticides. With an increasing demand for organic products especially in Europe, USA and Japan, many countries are making an onset in the development of organic farming as a potential avenue to make a mark in the international market. Organic food contains less of bad stuff, such as pesticides, heavy metals etc., and more of good stuff, such as vitamins and minerals. Several studies have shown that organically grown crops contain higher level of nutrients such as vitamin-C and iron, besides, secondary metabolites (e.g., phenolic metabolites) that are believed to have anticancer properties (Azadi et al., 2011). Hence, now-a-days, the produce through organic cultivation are fetching higher price, which ultimately increase the income of farmers. Organic farming can be taken up for high value crops like chillies, bengal gram and baby corn. On-farm generation of organic source and possibility of getting high premium price for organically grown crops will commensurate the net return in addition to maintenance of soil ecological equilibrium. (Siddeswaran and Shanmugam, 2013).

**MATERIAL AND METHODS**

The nursery trial was conducted during May 2016 to study the effect of solarization with amendments on the performance of tomato seedlings. The soil was well ploughed to break the clods and plant debris which might interfere with uniform conduction of heat and biogases that may protect some pathogenic organisms to escape. The amendments chosen were among available materials in Salem district. The dosage of amendment used was 1 kg m<sup>-2</sup>. The organic amendments were incorporated thoroughly into the soil according to the respective treatments. After incorporation of the organic amendments, raised nursery beds of size 3m x 1m were formed. Then the beds were irrigated to field capacity to encourage exothermic fermentation process. After irrigation, the beds were covered with the high density poly ethylene sheet of 300 gauge thickness and the sides were

tucked into the soil. These beds thus done were solarized for a period of four weeks and monitored carefully. After the solarization period was over, the polyethylene sheets were removed. Azospirillum was applied in the respective treatments both to seeds and as band application for respective treatments after 2 days of sheet removal. The seeds of tomato cv.Kashi Sarath were sown in the nursery beds. Mulching was done with paddy straw and the beds were watered using rose can. Germination and growth of the seedlings were monitored until transplantation. The experiment was laid out in Randomized Block Design with 11 treatments replicated thrice. The treatments include combination of solarization for four weeks with four different amendments viz., Vermicompost, Poultry Manure, Castor Cake and neem cake along with non-solarized control and solarization without amendment. At the end of treatment period, inoculation with Azospirillum was done for specific treatments.

### Treatment Details

T <sub>1</sub>	-	Non solarized control
T <sub>2</sub>	-	Solarization without amendments
T <sub>3</sub>	-	Solarization with Castor cake
T <sub>4</sub>	-	Solarization with Neem cake
T <sub>5</sub>	-	Solarization with vermicompost
T <sub>6</sub>	-	Solarization with poultry manure
T <sub>7</sub>	-	Solarization with Castor cake + Azospirillum
T <sub>8</sub>	-	Solarization with Neem cake + Azospirillum
T <sub>9</sub>	-	Solarization with vermicompost + Azospirillum
T <sub>10</sub>	-	Solarization with poultry manure + Azospirillum
T <sub>11</sub>	-	Solarization without amendments + Azospirillum

Simultaneously main field solarization was carried out with same set of treatments during April-May 2016.

### NEMATODE POPULATION

In experiment I soil samples were collected from non-solarized and solarized plots treated for 20, 30 and 40 days. Analysis for nematode population in 100g of soil was carried out following the method suggested by Cook and Baker (1983).

### RESULTS

#### Soil Nematode Population

As per the data presented in Table 1 the microbial and nematode population differed significantly due to solarization with various amendments. The least number of larvae of nematodes (13.11) were recorded in the treatments which received solarization with neem cake (T<sub>4</sub>). This was on par with the treatment T<sub>5</sub> which recorded the same value for number of nematode population (14.14) whereas highest population of nematodes (20.37) was recorded in T<sub>1</sub> (control). The treatment, T<sub>2</sub> recorded a nematodes population of 19.32 for nematodes. This was lower than control and higher than solarization with amendments. The percentage reduction over control for nematodes under treatment T<sub>4</sub> varied from 46.10 per cent for Xiphinema sp. and 38.33 per cent for Hoplolaimus sp. This was comparable with T<sub>4</sub> as shown in Table 1.

### DISCUSSION

Soil solarization is a hydrothermal disinfestation method based on covering the water saturated soil with transparent polyethylene sheet and thus, increasing the soil temperature by the solar energy. The recent string in solarization is combining it with organic amendments like animal waste and plant residues that are capable of producing toxic volatiles. During the process of solarization with amendments, bio toxic volatile compounds are released when organic matter is heated (Stapleton, 1997). This process has been shown to improve the efficacy of solarization with the improved control of soil borne plant pathogen, nematodes and weeds. Such a treatment was reported to result in certain physical, chemical and biological changes that favour plant health and growth while producing deleterious effect on weeds, pathogens and pests. Soil borne diseases such as damping off, plant parasitic nematodes and weeds are often inoculated in transplants and nursery stocks (Umamaheswari, 2009). Healthy transplants will be produced from healthy nursery soil. Therefore investigations were undertaken to study the effect of soil solarization on seedling growth of tomato.

### SUMMARY

Implementing solarization along with organic amendments significantly changed the microbiota of the soil. The analysis revealed that there was a reduction in nematode population. The least values for was

recorded in the solarization treatments with neem cake and vermicompost. Both the treatments increased the germination percentage, root and shoot length uniformly.

**Table 1.**Effect of nursery solarization with amendments on soil microbial population as observed on 28<sup>th</sup> day after solarisation

Treatments	Nematodes (No of larval per 10 ml of suspension)
T <sub>1</sub> - non solarized control	20.37
T <sub>2</sub> - solarization with no amendments	19.32
T <sub>3</sub> - solarization with Caster cake	18.20
T <sub>4</sub> - solarization with Neem cake	13.11
T <sub>5</sub> - solarization with Vermicompost	14.14
T <sub>6</sub> - solarization with poultry manure	14.61
SED	0.51
CD (P=0.05)	1.03

**Table 2.** Effect of nursery solarization with amendments on soil nematode population

Nematodes	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	T <sub>6</sub>
Hoplolaimus sp.	4.80	3.67 (23.54)	3.53 (26.45)	2.96 (38.33)	3.05 (36.45)	3.30 (31.25)
Tylenchulus sp.	7.42	6.10 (17.78)	5.74 (22.64)	4.64 (37.46)	4.81 (35.17)	5.37 (27.62)
Heterodera sp.	6.23	5.11 (17.97)	4.98 (20.06)	3.79 (39.16)	4.25 (31.78)	4.53 (27.28)
Xiphinema sp.	4.49	3.40 (24.27)	3.31 (26.28)	2.42 (46.10)	2.86 (36.30)	3.09 (31.18)
Rotylenchus sp.	5.33	4.20 (21.20)	4.07 (23.63)	3.30 (38.08)	3.64 (31.70)	3.82 (28.33)

Values in parenthesis indicate percentage reduction in population over control.

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**ENHANCEMENT OF ROOT NOUDLES AND DOLICHOS BEAN YIELD THROUGH APPLICATION OF ORGANIC AMENDMENTS**

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**ABSTRACT**

*The experiment was conducted to standardize the quantity of bulky and concentrated organic manures for Dolichos Bean to substitute the inorganic fertilizers. The experiment was laid out in a randomized block design with 14 treatments in 3 replications. The treatment schedule included various levels of bulky (25 and 75 % N) and concentrated organic manures (25 and 75 % N), inorganic fertilizers along with an absolute control. The bulky organic manures used were FYM and vermicompost and the concentrated manures used were neem cake and groundnut cake. The nutrient content of bulky and concentrated organic manures used in the study were FYM (0.80, 0.41 and 0.74 % NPK), vermicompost (1.60, 2.20 and 0.67 % NPK), poultry manure (3.47, 1.33 and 3.1 NPK), neem cake (5.2, 1.0 and 1.4 % NPK) and castor cake (4.1, 1.9 and 1.4 % NPK). Quantity of organic manures required was computed on the basis of nitrogen equivalent to substitute the recommended dose of chemical fertilizer (32.72 kg NP ha<sup>-1</sup>) in garden bean. Among the organic manures and concentrated oil cakes applied, 75 per cent N supplied through vermicompost @ 2.41 t ha<sup>-1</sup> along with 25 per cent N supplied through neem cake @ 0.22 t ha<sup>-1</sup> followed by 75 percent N supplied through poultry manure @ 0.61 t ha<sup>-1</sup> along with neem cake @ 0.22 t ha<sup>-1</sup> were identified. which recorded the maximum level of soil physico-chemical properties, number of, nutrient uptake, post harvest nutrient status of soil and yield of Garden bean.*

*Keywords: Dolichos Bean, bulk and concentrated organic manures, root nodules and yield.*

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**INTRODUCTION**

For improving the soil health, bulky organic manures should be necessarily applied. FYM, vermicompost, poultry manure and pressmud are some of the commonly available organic manures which are widely used by the farmers. Organic manures which are tried in the present investigation are FYM, poultry manure, oilcakes and vermicompost. Among the varied organic inputs, Farm yard manure is considered as a repository of plant nutrients. The role of FYM is multidimensional, varying from building up of organic matter, good soil aggregation, permeability of soil and related physical properties to long lasting supply of several macro and micronutrients, besides, improving cation exchanging capacity of soil (Gupta et al., 1983). Biological nitrogen fixation (BNF) is the biological process by which the atmospheric nitrogen (N<sub>2</sub>) is converted to ammonia by an enzyme called nitrogenase. It is the major source of the biosphere nitrogen and as such has an important ecological and agronomical role, accounting for 65 % of the nitrogen used in agriculture worldwide. The most important source of fixed nitrogen is the symbiotic association between rhizobia and legumes. The nitrogen fixation is achieved by bacteria inside the cells of de novo formed organs, the nodules, which usually develop on roots, and more occasionally on stems. This mutualistic relationship is beneficial for both partners, the plant supplying dicarboxylic acids as a carbon source to bacteria and receiving, in return, ammonium. Legume symbioses have an important role in environment-friendly agriculture. They allow plants to grow on nitrogen poor soils and reduce the need for nitrogen inputs for leguminous crops, and thus soil pollution. Nitrogen-fixing legumes also contribute to nitrogen enrichment of the soil and have been used from Antiquity as crop-rotation species to improve soil fertility. They produce high protein-containing leaves and seeds, and legumes such as soybeans, groundnuts, peas, beans, lentils, alfalfa and clover are a major source of protein for human and animal consumption. Vermicompost produced using earthworm is another rich and recognized source of macro and micro-nutrients and contributes much towards improving the fertility of soil. Vermicompost contains major and minor nutrients in available form along with enzymes, antibiotics, vitamins, beneficial microorganisms and other plant hormones and have definite advantage over other organic manures in respect of quality and shelf life of produce (Meerabai and Raj, 2001). Kale et al., (1992) found that the application of vermicompost to fields improved the physico-chemical and biological properties of soil.

**MATERIAL AND METHODS**

The seeds of Dolichos bean cv. Konkan Bushan were dibbled singly at a spacing of 30 x 60 cm apart. The first irrigation was given immediately after sowing followed by life saving irrigation and subsequent irrigations were given once in a week. Incidence of sucking pests was managed by spraying with Neem seed kernal extract at 5%. Weeding was done where and when found necessary. Quantity of organic manures required was computed on the nitrogen equivalent basis. Recommended dose of N (36 kg ha<sup>-1</sup>) was supplied in two different

combinations like supply of 25% and 75% N through Bulky and 25% and 75%N through concentrated organic manures. The bulky organic manures used were FYM, Poultry Manure and vermicompost (VC) and the concentrated manures used were neem cake (NC) and castor cake (GC). 25 and 75 per cent N was calculated as 0.84 and 2.25 t ha<sup>-1</sup> of FYM; 0.8 and 2.41 t ha<sup>-1</sup> of VC; 0.25 and 0.61 t ha<sup>-1</sup> of poultry manure; 0.22, and 0.78 t ha<sup>-1</sup> of NC; 0.20 and 0.65 t ha<sup>-1</sup> of CC to substitute the recommended dose of N (36 kg ha<sup>-1</sup>). Bulky organic manures were applied as basal and concentrated cakes were top dressed in 2 split doses. First application was done at 20 days after sowing. The second was applied on 45<sup>th</sup> day of sowing. Recommended dose of inorganic fertilizers were applied only in the conventional farming treatment.

### Experimental Design and Treatment Details

The experiment was laid out in a Randomized Block Design with three replication and fourteen treatments, viz.,

T <sub>1</sub>	-	Control
T <sub>2</sub>	-	Inorganic fertilizers (36:72 kg NP ha <sup>-1</sup> )
T <sub>3</sub>	-	25 % N as Farm Yard Manure (0.84 t ha <sup>-1</sup> ) +75 % N as Neem cake (0.78 t ha <sup>-1</sup> )
T <sub>4</sub>	-	75 % N as Farm Yard Manure FYM (2.52 t ha <sup>-1</sup> )+ 25 % N as Neem cake(0.22 t ha <sup>-1</sup> )
T <sub>5</sub>	-	25 % N as Farm Yard Manure (0.84 t ha <sup>-1</sup> ) + 75 % N as Castor cake (0.65 t ha <sup>-1</sup> )
T <sub>6</sub>	-	75 % N as Farm Yard Manure (2.52 t ha <sup>-1</sup> ) +25 % N as Castor cake (0.20 t ha <sup>-1</sup> )
T <sub>7</sub>	-	25 % N as Vermicompost (0.80 t ha <sup>-1</sup> )+75 %N as Neem cake (0.78 t ha <sup>-1</sup> )
T <sub>8</sub>	-	75 % N as Vermicompost (2.41 t ha <sup>-1</sup> )+25 % N as Neem cake (0.22 t ha <sup>-1</sup> )
T <sub>9</sub>	-	25 % N as Vermicompost (0.80 t ha <sup>-1</sup> ) +75 % N as Castor cake (0.65 t ha <sup>-1</sup> )
T <sub>10</sub>	-	75 % N as Vermicompost (2.41 t ha <sup>-1</sup> )+25 % N as Castor cake (0.20 t ha <sup>-1</sup> )
T <sub>11</sub>	-	25 % N as Poultry manure (0.25 t ha <sup>-1</sup> ) +75 % N as Neem cake(0.78 t ha <sup>-1</sup> )
T <sub>12</sub>	-	75 % N as Poultry manure (0.61 t ha <sup>-1</sup> ) +25 % N as Neem cake (0.22 t ha <sup>-1</sup> )
T <sub>13</sub>	-	25 % N as Poultry manure (0.25 t ha <sup>-1</sup> ) +75 % N as Castor cake (0.78 t ha <sup>-1</sup> )
T <sub>14</sub>	-	75 % N as Poultry manure (0.61 t ha <sup>-1</sup> ) + 25 % N as Castor cake(0.22 t ha <sup>-1</sup> )

## RESULTS

### Number of Root Nodules Plant<sup>-1</sup> at Harvest

There were significant differences seen among all the treatments against control as for as this trait is concerned. The highest number of root nodules per plant was recorded in T<sub>2</sub> (25.46) closely followed by T<sub>8</sub> (24.50). The next best value was observed in T<sub>12</sub> (24.35) and T<sub>7</sub> (24.26). The treatment T<sub>1</sub> (control) recorded a value of 21.01, which was lowest when compared to all other treatments as presented in the table.1

### Weight of Root Nodule Plant<sup>-1</sup> at Harvest

The nodule weight per plant varied significantly among all the treatments when compared to control. The highest (190.01mg) value for this trait was recorded in the treatment T<sub>2</sub>. This was followed by the treatments T<sub>8</sub> (187.30 mg), then by T<sub>12</sub> (184.20 mg) and by T<sub>7</sub> (181.74 mg) in order. There existed significant differences between the treatments T<sub>4</sub> and T<sub>3</sub> too. The least nodule weight plant<sup>-1</sup> was recorded in the treatment T<sub>1</sub> (146.15 mg) which was kept as control as shown in the table 1

**Table.1.** Effect of bulky and concentrated organic manures on nodule number and nodule weight per plant in garden bean

Treatments	Nodule number per plant <sup>-1</sup>	Nodule weight (mg plant <sup>-1</sup> )
T <sub>1</sub> - Control	21.01	146.15
T <sub>2</sub> - Inorganic fertilizers (36:72 NP kg ha <sup>-1</sup> )	25.46	190.01
T <sub>3</sub> - FYM @ 10 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	22.88	179.15
T <sub>4</sub> - FYM @ 15 t ha <sup>-1</sup> + NC @ 1.50 t ha <sup>-1</sup>	22.98	155.08
T <sub>5</sub> - FYM @ 10 t ha <sup>-1</sup> + CC @ 2.0 t ha <sup>-1</sup>	22.56	151.12
T <sub>6</sub> - FYM @ 15 t ha <sup>-1</sup> + CC @ 1.50 t ha <sup>-1</sup>	22.75	153.10
T <sub>7</sub> - VC @ 5 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	24.26	181.74
T <sub>8</sub> - VC @ 7.5 t ha <sup>-1</sup> + NC @ 1.50 t ha <sup>-1</sup>	24.50	187.30
T <sub>9</sub> - VC @ 5 t ha <sup>-1</sup> + NC @ 2.0 t ha <sup>-1</sup>	23.43	173.00
T <sub>10</sub> - VC @ 7.5 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	24.08	176.61

T <sub>11</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	24.10	178.03
T <sub>12</sub> - PM @ 10 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	24.35	184.20
T <sub>13</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC @ 2.0 t ha <sup>-1</sup>	23.13	167.91
T <sub>14</sub> - PM @ 10 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	23.29	162.58
<b>S.ED</b>	<b>0.02</b>	<b>0.93</b>
<b>CD (P=0.05)</b>	<b>0.04</b>	<b>1.91</b>

### Pod Yield per Hectare

The pod yield per hectare has shown significant difference among all the treatment when compared with control (Table 3). The pod yield was highest (6.46 t ha<sup>-1</sup>) in T<sub>2</sub> which was followed by T<sub>8</sub> (5.50 t ha<sup>-1</sup>) and T<sub>12</sub> (5.35 t ha<sup>-1</sup>). The treatment T<sub>3</sub> and T<sub>4</sub> were however, on par with each other. The treatment, T<sub>1</sub> recorded the lowest pod yield of 2.72 tonnes per hectare.

**Table.2.**Effect of bulky and concentrated organic manures on yield per plot and hectare in garden bean

Treatments	Pod yield per hectare in tonnes
T <sub>1</sub> - Control	2.72
T <sub>2</sub> - Inorganic fertilizers (36:72 NP kg ha <sup>-1</sup> )	6.46
T <sub>3</sub> - FYM @ 10 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	3.63
T <sub>4</sub> - FYM @ 15 t ha <sup>-1</sup> + NC @ 1.50 t ha <sup>-1</sup>	3.64
T <sub>5</sub> - FYM @ 10 t ha <sup>-1</sup> + CC @ 2.0 t ha <sup>-1</sup>	3.01
T <sub>6</sub> - FYM @ 15 t ha <sup>-1</sup> + CC @ 1.50 t ha <sup>-1</sup>	3.21
T <sub>7</sub> - VC @ 5 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	5.26
T <sub>8</sub> - VC @ 7.5 t ha <sup>-1</sup> + NC @ 1.50 t ha <sup>-1</sup>	5.50
T <sub>9</sub> - VC @ 5 t ha <sup>-1</sup> + NC @ 2.0 t ha <sup>-1</sup>	4.43
T <sub>10</sub> - VC @ 7.5 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	5.08
T <sub>11</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	5.10
T <sub>12</sub> - PM @ 10 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	5.35
T <sub>13</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC @ 2.0 t ha <sup>-1</sup>	4.32
T <sub>14</sub> - PM @ 10 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	4.13
<b>S.ED</b>	<b>0.02</b>
<b>CD (P=0.05)</b>	<b>0.05</b>

### DISCUSSION

Regarding the physico chemical properties, numerically higher values for EC, organic carbon, water holding capacity and lower values for pH and Bulk density were registered under 75 per cent N supplied through oil cakes. But the values among all the treatments were statistically not significant since it was tried for one season. If the practice is continued for few more years there must be a change in the physico chemical properties. Application of manures, irrespective of sources and rates recorded significantly higher organic carbon and this might be due to increased yield of roots and plant residues and external application of organic manures as reported by Yadav et al., (2000). The differences in the organic carbon content with the application of different sources of nutrients might be due to the result of differential rate of oxidation of organic matter by microbes (Trehan, 1997). The decrease in soil pH after organic matter addition might be because of the production of CO<sub>2</sub> and organic acids during decomposition of organic materials. Consequently, if there is decrease in soil pH directly it is related with increase in EC. This is in accordance with Shelke et al. (2001) and Mali et al. (2004). The decreased bulk density might be due to incorporation of organic manures with lower bulk density (Umamaheswari., 2009).

The data on nutrient uptake pattern revealed that the application of inorganic fertilizers resulted in the highest nutrient uptake. This is in accordance with Sharma et al., (1995). Among the various organic manures and concentrated oil cakes tried, application of 75 per cent N through vermicompost along with 25 per cent N through neem cake recorded the highest nutrient uptake. This could be attributed to the supplementation of higher nitrogen, phosphorus and potassium supplied by means of vermicompost and neem cake. Moreover, Vermicompost contains nutrients in forms that are readily taken up by plants such as nitrates, exchangeable phosphorus and soluble potassium as reported by Edwards and Burrows (1988). Similarly, the nutrients in neem cake are also in readily available form. This is in accordance with the reports of Chinnaswamy (1976), Sridhar (2003);Bharathi(2004) and Sundhararaman (2009). The next recognizable treatment for nutrient uptake pattern

was the application of poultry manure @  $2.16 \text{ t ha}^{-1}$  along with neem cake @  $0.73 \text{ t ha}^{-1}$ . The increased nutrient uptake by the crop due to neem cake can be ascribed to the presence of alkaloids like nimbin and nimbidin, which have nitrification inhibiting properties and releases N slowly. Thus apart from the nutrient content in the neem cake, the retention capacity of nutrients to a prolonged period and its balanced availability might have resulted in better uptake of nutrients as reported by Deshpande et al. (2007).

Significant variation was observed among the treatments for the trait, post harvest nutrient status of soil. The maximum availability of nitrogen, phosphorus and potassium were obtained with application of vermicompost @  $10.03 \text{ t ha}^{-1}$  along with neem cake @  $0.73 \text{ t ha}^{-1}$ . This might be due to the fact that vermicompost was found to enhance the number of nitrogen fixing bacteria and symbiotic microbial association thereby contributing to increase in nitrogen, phosphorus and potassium in soil. This is in line with the work of Kale et al. (1987). Another reason may be the higher amount of total and mineral nitrogen level as ammonia in the vermicompost that could be rapidly converted to nitrate thus minimizing the loss of N from soil reported by Kale et al. (1992). Application of vermicompost increased the proportion of mineral nitrogen available for plants at any given time, although nitrogen was immobilized in the initial stage as reported by Mahesh (1995), an increased availability of nitrogen in soil by the application of vermicompost compared to poultry manure and FYM is due to mineralization of native 'N' by higher bacterial population. Rao et al., (1996) stated that, higher levels of available potassium were recorded with vermicompost application due to earth worm activity. Further, presence of more organic matter in vermicompost amended soil might have enhanced the nutrient retention in post harvest soil as earlier reported by Arancon et al. (2006). Since the nutrient content in neem cake is greater, the availability of soil nutrients was also higher. The influence of neem cake in increasing the rhizosphere micro flora was also discussed earlier by Subramanian and Rao (1974). The microbiological properties of soil could influence in decomposition of organic matter and enzymatic activities in soil (Nannipieri et al., 1990). This also might be the reason for increasing the availability of nutrients. The lower loss of nutrients due to the slow release in the manure amended plots may be responsible for an increase in available nutrients in soil when compared to inorganic manures as reported by Upperi et al. (2011)

## CONCLUSION

Among the treatments comprising organic manures and concentrated oil cakes, 75 per cent N supplied through vermicompost  $2.41 \text{ t ha}^{-1}$  along with 25 per cent N supplied through neem cake @  $0.22 \text{ t ha}^{-1}$  followed by incorporation of poultry manure @  $0.61 \text{ t ha}^{-1}$  25 per cent N supplied through neem cake @  $0.22 \text{ t ha}^{-1}$  recorded the maximum number of root nodules and maximum values for growth and yield attributes. oil cakes. Within the treatments, insignificant variation was observed for these traits. . The maximum values for uptake and availability of nitrogen, phosphorus and potassium, pod yield were obtained with application of vermicompost @  $10.03 \text{ t ha}^{-1}$  along with neem cake @  $0.73 \text{ t ha}^{-1}$  followed by poultry manure @  $2.16 \text{ t ha}^{-1}$  and with neem cake @  $0.75 \text{ t ha}^{-1}$ .

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**EFFECT OF BULK AND CONCENTRATED (OIL CAKES) ORGANIC MANURES AND INORGANIC FERTILIZER ON NUTRIENT UPTAKE, POST-HARVEST SOIL NUTRIENT STATUS AND PHYSICO-CHEMICAL PROPERTIES OF SOIL OF BABY CORN**

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**ABSTRACT**

Baby corn is a finger like corn which is harvested before pollination or two to three days after silk emergence. Comparison of the effect of bulk and concentrated (oil cakes) organic manures and inorganic fertilizer information is limited in baby corn and needs field investigation. Hence, the field experiment were conducted at farmers field of sendarappatti village in Salem district. during Feb – March, 2010. The experiment was laid out in a randomized block design with 14 treatments in 3 replications. The treatment schedule included various levels of bulk (25 and 75 % N) and concentrated organic manures (25 and 75 % N), inorganic fertilizers along with an absolute control. The bulky organic manures used were FYM and vermicompost and the concentrated manures used were neem cake and castor cake. The nutrient content of bulky and concentrated organic manures used in the study were FYM (0.80, 0.41 and 0.74 % NPK), vermicompost (1.60, 2.20 and 0.67 % NPK), poultry manure (3.47, 1.33 and 3.1 NPK), neem cake (5.2, 1.0 and 1.4 % NPK) and castor cake (4.1, 1.9 and 1.4 % NPK). Quantity of organic manures required was computed on the basis of nitrogen equivalent to substitute the recommended dose of chemical fertilizer (150:75:40 kg NPK ha<sup>-1</sup>) in baby corn. Among the various levels and sources of organic manures and inorganic fertilizers tried, inorganic fertilizers recorded the maximum growth characters and highest nutrient uptake. Among the organic manures and concentrated oil cakes applied, 75 per cent N supplied through vermicompost @ 10.03 t ha<sup>-1</sup> along with 25 per cent N supplied through neem cake @ 0.73 t ha<sup>-1</sup> followed by poultry manure @ 2.16 t ha<sup>-1</sup> neem cake @ 0.73 t ha<sup>-1</sup> was identified as the best treatment in baby corn. The maximum availability of nitrogen, phosphorus and potassium in post harvest soil was recorded in plots incorporated with the application of 75 per cent N supplied through vermicompost @ along with 25 per cent N supplied through neem cake followed by the application of 75 per cent N supplied through poultry manure along with 25 per cent N supplied through neem cake in baby corn.

**Keywords:** Baby corn, FYM, Vermicompost, Poultry Manure, Neem cake, Castor cake and Physico-Chemical Properties

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**INTRODUCTION**

Baby corn (*Zea Mays* L) refers to the young, fresh corn ear just before or within two to three days after silking but prior to pollination and fertilization, which open dehusking is used as vegetables. Baby corn ears light yellow in colour with regular row arrangement 10-12cm are prefer in the market. It is high nutritive crop. Among the various technologies to boost the productivity and quality of the crops, nutrient management assumes greater significance. Organic manures have a number of agronomic and environmental advantages over chemical fertilizers (Chandrasekaran et al., 2010). Organic manures consist of 30-40 elements in high concentration whereas the chemical fertilizers contain only 5-6 elements in high concentration. Besides, organic manures contain micro-nutrients too. Further, an improvement in soil physical and chemical properties involving soil structure, water holding capacity, and drainage and check over soil erosion are achieved through application of organic manures. Also, application of the organic manures helps the soil microorganism to produce polysaccharides, leading to better soil structure. N fixation and P solubilisation occurs due to improved microbial activity in the organically amended soil (Ismail, 1997). Organic manures act as a binder between soil particles and hence improve soil water retention. Organic manures have long-term positive effect on soil fertility which is the real basis of a productive soil. Since it has more residual effect, the manure lasts for successive crops. They increase the availability of nutrients to the plants due to the presence of high humus content. This humus content supports the growth and multiplication of beneficial soil microorganisms like nitrogen fixers, phosphate solubilises and phosphate mobilizes. Thus organically grown plants become naturally healthy and hence disease resistant so that the application of pesticides could be avoided (Atiyeh et al., 2002).

**MATERIALS AND METHODS**

The experimental field was carried out in such a manner to leave minimal disturbance to the land. The seeds of baby corn cv.CoBc1 were dibbled singly at a spacing of 45 x 30 cm apart. The first irrigation was given immediately after sowing followed by life saving irrigation and subsequent irrigations were given once in a week. Incidence of sucking pests were managed by spraying with Neem seed kernel extract at 5%. Weeding

was done where and when found necessary. Quantity of organic manures required was computed on the nitrogen equivalent basis. Recommended dose of N ( $150 \text{ kg ha}^{-1}$ ) was supplied in two different combinations like supply of 25% and 75% N through Bulky and 25% and 75% N through concentrated organic manures. The bulky organic manures used were FYM, Poultry Manure and vermicompost (VC) and the concentrated manures used were neem cake (NC) and castor cake (GC). 25 and 75 per cent N was calculated as  $3.5$  and  $10.5 \text{ t ha}^{-1}$  of FYM;  $3.34$  and  $10.03 \text{ t ha}^{-1}$  of VC;  $0.72$  and  $2.16 \text{ t ha}^{-1}$  of poultry manure;  $2.18$ , and  $0.73 \text{ t ha}^{-1}$  of NC;  $2.0$  and  $0.65 \text{ t ha}^{-1}$  of CC to substitute the recommended dose of N ( $150 \text{ kg ha}^{-1}$ ). Bulky organic manures were applied as basal and concentrated cakes were top dressed in 2 split doses. First application was done at 20 days after sowing. The second was applied on 45<sup>th</sup> day of sowing. Recommended dose of inorganic fertilizers were applied only in the conventional farming treatment.

### Experimental Design and Treatments

The experiment was laid out in a randomized block design with three replications and thirteen treatments, viz.,

T <sub>1</sub>	-	Control
T <sub>2</sub>	-	Inorganic fertilizers ( $150:75:40 \text{ kg NPK ha}^{-1}$ )
T <sub>3</sub>	-	25 % N as Farm Yard Manure ( $3.50 \text{ t ha}^{-1}$ ) + 75 % N as Neem cake ( $2.18 \text{ t ha}^{-1}$ )
T <sub>4</sub>	-	75 % N as Farm Yard Manure FYM ( $10.50 \text{ t ha}^{-1}$ ) + 25 % N as Neem cake ( $0.73 \text{ t ha}^{-1}$ )
T <sub>5</sub>	-	25 % N as Farm Yard Manure ( $3.50 \text{ t ha}^{-1}$ ) + 75 % N as Castor cake ( $2.00 \text{ t ha}^{-1}$ )
T <sub>6</sub>	-	75 % N as Farm Yard Manure ( $10.50 \text{ t ha}^{-1}$ ) + 25 % N as Castor cake ( $0.65 \text{ t ha}^{-1}$ )
T <sub>7</sub>	-	25 % N as Vermicompost ( $3.34 \text{ t ha}^{-1}$ ) + 75 % N as Neem cake ( $2.18 \text{ t ha}^{-1}$ )
T <sub>8</sub>	-	75 % N as Vermicompost ( $10.03 \text{ t ha}^{-1}$ ) + 25 % N as Neem cake ( $0.73 \text{ t ha}^{-1}$ )
T <sub>9</sub>	-	25 % N as Vermicompost ( $3.34 \text{ t ha}^{-1}$ ) + 75 % N as Castor cake ( $2.00 \text{ t ha}^{-1}$ )
T <sub>10</sub>	-	75 % N as Vermicompost ( $10.03 \text{ t ha}^{-1}$ ) + 25 % N as Castor cake ( $0.65 \text{ t ha}^{-1}$ )
T <sub>11</sub>	-	25 % N as Poultry manure ( $0.72 \text{ t ha}^{-1}$ ) + 75 % N as Neem cake ( $2.18 \text{ t ha}^{-1}$ )
T <sub>12</sub>	-	75 % N as Poultry manure ( $2.16 \text{ t ha}^{-1}$ ) + 25 % N as Neem cake ( $0.73 \text{ t ha}^{-1}$ )
T <sub>13</sub>	-	25 % N as Poultry manure ( $0.72 \text{ t ha}^{-1}$ ) + 75 % N as Castor cake ( $2.00 \text{ t ha}^{-1}$ )
T <sub>14</sub>	-	75 % N as Poultry manure ( $2.16 \text{ t ha}^{-1}$ ) + 25 % N as Castor cake ( $0.65 \text{ t ha}^{-1}$ )

### Nutrient uptake

#### Nitrogen Uptake

The data with regard to nitrogen uptake is shown in table.1. For this trait significant variation was noticed in all the treatments when compared with control. Among the various treatments T<sub>2</sub> recorded the highest uptake of nitrogen of  $145.35 \text{ kg ha}^{-1}$ . The next best treatment was T<sub>8</sub> which registered a value of  $140.68 \text{ kg ha}^{-1}$ . The least uptake of nitrogen was registered in the control (T<sub>1</sub>)  $80.65 \text{ kg ha}^{-1}$ .

#### Phosphorus Uptake

Significant positive variation was exhibited by all the treatments for phosphorus uptake when compared to control, which recorded the lowest value of  $15.98 \text{ kg ha}^{-1}$  (Table 38). The highest uptake of phosphorus was recorded in the treatment T<sub>2</sub>  $31.53 \text{ kg ha}^{-1}$  followed by T<sub>8</sub>  $30.97 \text{ kg ha}^{-1}$ . (Table 1)

#### Potassium Uptake

For this trait, significant variation was noticed in all the treatments. Among the various treatments T<sub>2</sub> recorded highest uptake of potassium ( $121.87 \text{ kg ha}^{-1}$ ) followed by T<sub>8</sub> ( $118.38 \text{ kg ha}^{-1}$ ) and T<sub>12</sub> ( $115.18 \text{ kg ha}^{-1}$ ). The least uptake of potassium  $70.58 \text{ kg ha}^{-1}$  was recorded in the treatment T<sub>1</sub> as shown in the table 1.

**Table.1.** Effect of bulky and concentrated organic manures on nutrient uptake in baby corn

Treatments	Nutrient uptake ( $\text{kg ha}^{-1}$ )		
	Nitrogen	Phosphorus	Potassium
T <sub>1</sub> - Control	80.65	15.98	70.58
T <sub>2</sub> - Inorganic fertilizers ( $150:100:50 \text{ NPK kg ha}^{-1}$ )	145.35	31.53	121.87
T <sub>3</sub> - FYM @ $10 \text{ t ha}^{-1}$ + NC @ $2.25 \text{ t ha}^{-1}$	105.58	21.56	87.52
T <sub>4</sub> - FYM @ $15 \text{ t ha}^{-1}$ + NC @ $1.50 \text{ t ha}^{-1}$	110.63	22.61	90.87
T <sub>5</sub> - FYM @ $10 \text{ t ha}^{-1}$ + CC @ $2.0 \text{ t ha}^{-1}$	95.32	19.18	81.10
T <sub>6</sub> - FYM @ $15 \text{ t ha}^{-1}$ + CC @ $1.50 \text{ t ha}^{-1}$	100.47	20.45	84.74
T <sub>7</sub> - VC @ $5 \text{ t ha}^{-1}$ + NC @ $2.25 \text{ t ha}^{-1}$	134.16	27.15	109.23
T <sub>8</sub> - VC @ $7.5 \text{ t ha}^{-1}$ + NC @ $1.50 \text{ t ha}^{-1}$	140.68	30.97	118.38
T <sub>9</sub> - VC @ $5 \text{ t ha}^{-1}$ + NC @ $2.0 \text{ t ha}^{-1}$	123.87	25.25	99.30
T <sub>10</sub> - VC @ $7.5 \text{ t ha}^{-1}$ + NC @ $1.5 \text{ t ha}^{-1}$	125.68	26.17	102.55

T <sub>11</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC 2.25 t ha <sup>-1</sup>	130.53	26.87	106.97
T <sub>12</sub> - PM @ 10 t ha <sup>-1</sup> + NC 1.5 t ha <sup>-1</sup>	137.31	28.36	115.18
T <sub>13</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC 2.0 t ha <sup>-1</sup>	114.64	23.63	93.95
T <sub>14</sub> - PM @ 10 t ha <sup>-1</sup> + NC 1.5 t ha <sup>-1</sup>	119.07	24.90	96.67
<b>S.ED</b>	<b>1.95</b>	<b>0.40</b>	<b>1.57</b>
<b>CD (P=0.05)</b>	<b>4.01</b>	<b>0.84</b>	<b>3.23</b>

### Post harvest soil nutrient status

#### Available Nitrogen in Soil

All the treatments were found to differ significantly against control. The treatment T<sub>8</sub> recorded the highest available nitrogen in soil (168.77 kg ha<sup>-1</sup>). The next best value was recorded in the treatment T<sub>2</sub> (164.98 kg ha<sup>-1</sup>) followed by T<sub>12</sub> (160.65 kg ha<sup>-1</sup>). The lowest available nitrogen in soil was recorded in T<sub>1</sub> (105.30 kg ha<sup>-1</sup>) as shown in table 3 .

#### Available Phosphorus in Soil

The residual phosphorus content of soil was highest in the treatment T<sub>8</sub> (31.99 kg ha<sup>-1</sup>) which was followed by T<sub>2</sub> (30.32 kg ha<sup>-1</sup>). The least value for this trail was recorded in control (6.45 kg ha<sup>-1</sup>) as presented in the table .3.

#### Available Potassium in Soil

Significant differences existed among the treatment, against control for this trait. The value for this trait was highest in T<sub>8</sub> (250.63 kg ha<sup>-1</sup>) and was followed by T<sub>2</sub> (243.61 kg ha<sup>-1</sup>). The value for this trait was the least in T<sub>1</sub> (203.65 kg ha<sup>-1</sup>) as shown in the table (3).

**Table.3.**Effect of bulky and concentrated organic manures on post harvest nutrient status of soil in baby corn

Treatments	Available soil nutrient (kg ha <sup>-1</sup> )		
	Nitrogen	Phosphorus	Potassium
T <sub>1</sub> - Control	105.30	6.45	203.64
T <sub>2</sub> - Inorganic fertilizers (150:100:50 NPK kg ha <sup>-1</sup> )	164.98	30.32	243.61
T <sub>3</sub> - FYM @ 10 t ha <sup>-1</sup> +NC @ 2.25 t ha <sup>-1</sup>	123.45	10.90	215.38
T <sub>4</sub> -- FYM @ 15 t ha <sup>-1</sup> + NC @ 1.50 t ha <sup>-1</sup>	127.18	12.70	217.51
T <sub>5</sub> - FYM @ 10 t ha <sup>-1</sup> + CC @ 2.0 t ha <sup>-1</sup>	112.10	7.95	210.80
T <sub>6</sub> - FYM @ 15 t ha <sup>-1</sup> + CC @ 1.50 t ha <sup>-1</sup>	118.37	9.20	213.10
T <sub>7</sub> - VC @ 5 t ha <sup>-1</sup> + NC @2.25 t ha <sup>-1</sup>	149.42	23.84	229.34
T <sub>8</sub> - VC @ 7.5 t ha <sup>-1</sup> + NC @1.50 t ha <sup>-1</sup>	168.77	31.99	250.63
T <sub>9</sub> - VC @ 5 t ha <sup>-1</sup> + NC @2.0 t ha <sup>-1</sup>	140.15	18.50	223.62
T <sub>10</sub> - VC @7.5 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	143.28	21.42	225.54
T <sub>11</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC 2.25 t ha <sup>-1</sup>	146.99	23.60	227.40
T <sub>12</sub> - PM @ 10 t ha <sup>-1</sup> + NC 1.5 t ha <sup>-1</sup>	160.65	29.82	231.93
T <sub>13</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC 2.0 t ha <sup>-1</sup>	131.46	14.54	219.18
T <sub>14</sub> - PM @ 10 t ha <sup>-1</sup> + NC 1.5 t ha <sup>-1</sup>	136.27	16.48	221.37
<b>S.ED</b>	<b>1.90</b>	<b>0.55</b>	<b>3.28</b>
<b>CD (P=0.05)</b>	<b>3.92</b>	<b>1.14</b>	<b>6.76</b>

### Physico- Chemical Properties of Soil

The data on soil physico chemical properties revealed that numerically higher values for organic carbon (0.47 per cent), EC (0.42 dSm<sup>-1</sup>), water holding capacity (24.6 per cent) and lower value for pH (7.05) and Bulk density (1.53 mg m<sup>-3</sup>) were recorded best performs in the maximum number of organic manures in association with biofertilizer and foliar applied plots than control plot. But no significant variation was observed among the treatments (Table 4 ).

**Table.4.** Effect of bulky and concentrated organic manures on physico chemical properties of soil

Treatments	Soil organic carbon (%)	EC (dSm <sup>-1</sup> )	pH	Bulk density (mg m <sup>-3</sup> )	Water holding capacity (%)
T <sub>1</sub> - Control	0.41	0.41	7.11	1.56	24.1



T <sub>2</sub> - Inorganic fertilizers (150:100:50 NPK kg ha <sup>-1</sup> )	0.42	0.42	7.10	1.55	24.2
T <sub>3</sub> - FYM @ 10 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	0.43	0.42	7.05	1.53	24.6
T <sub>4</sub> - FYM @ 15 t ha <sup>-1</sup> + NC @ 1.50 t ha <sup>-1</sup>	0.43	0.42	7.05	1.53	24.6
T <sub>5</sub> - FYM @ 10 t ha <sup>-1</sup> + CC @ 2.0 t ha <sup>-1</sup>	0.47	0.43	7.04	1.53	24.6
T <sub>6</sub> - FYM @ 15 t ha <sup>-1</sup> + CC @ 1.50 t ha <sup>-1</sup>	0.47	0.45	7.05	1.53	24.6
T <sub>7</sub> - VC @ 5 t ha <sup>-1</sup> + NC @ 2.25 t ha <sup>-1</sup>	0.47	0.42	7.05	1.53	24.6
T <sub>8</sub> - VC @ 7.5 t ha <sup>-1</sup> + NC @ 1.50 t ha <sup>-1</sup>	0.47	0.42	7.05	1.53	24.6
T <sub>9</sub> - VC @ 5 t ha <sup>-1</sup> + NC @ 2.0 t ha <sup>-1</sup>	0.43	0.42	7.05	1.53	24.5
T <sub>10</sub> - VC @ 7.5 t ha <sup>-1</sup> + NC @ 1.5 t ha <sup>-1</sup>	0.47	0.43	7.05	1.52	24.5
T <sub>11</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC 2.25 t ha <sup>-1</sup>	0.47	0.42	7.03	1.53	24.7
T <sub>12</sub> - PM @ 10 t ha <sup>-1</sup> + NC 1.5 t ha <sup>-1</sup>	0.47	0.46	7.03	1.50	24.7
T <sub>13</sub> - PM @ 7.5 t ha <sup>-1</sup> + NC 2.0 t ha <sup>-1</sup>	0.43	0.43	7.02	1.52	24.5
T <sub>14</sub> - PM @ 10 t ha <sup>-1</sup> + NC 1.5 t ha <sup>-1</sup>	0.47	0.46	7.03	1.50	24.5
<b>S.E.D</b>	-	-	-	-	-
<b>CD (P=0.05)</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>

## DISCUSSION

FYM is considered as a repository of plant nutrients. It is the best source for maintenance of soil organic matter. Application of FYM had resulted in increased organic carbon content apart from N, P and K build up (Gupta, 2005). Vermicompost a stabilized organic material produced by interaction between earthworms and microorganisms, through a non-thermophilic process, have been reported to enhance plant germination, growth and yield in many crops (Narkhede et al., 2011). Vermicompost contains major and minor nutrients in available forms along with enzymes, antibiotics, vitamins, growth hormones and beneficial microorganisms and have definite advantage over the other organic manures in respect to quality and shelf life of produce (Taleshi et al., 2011). Neem cake is a rich source of nitrogen, phosphorus, potassium and micronutrients. It has the unique property as fertilizer and pest repellent. It starts decomposing immediately after its incorporation and liberates nutrients for the use of crop plants, readily and gradually. In India, castor cake is used as organic manure for vegetable crops as it is considered as the richest source of nutrients among the available oil cakes (Chandrasekaran et al., 2010). Though the uses of such source by farmers exist in practice, a scientific documentation on use of exact quantity for specific crop sequence of the region is established in the present study.

Growth parameters such as the plant height and number of branches at flowering and harvest were the highest with the application of inorganic fertilizers in tomato, garden bean and baby corn. This might be due to appropriate supply of N, P and K at the right proportion and at the right time. This corroborates the findings of Siddeswaran and Shanmugam (2013) in baby corn. Among the various bulky and concentrated organic manures tried, the treatment involving 75 per cent of N supplied through vermicompost @ 10.73 t ha<sup>-1</sup> and 25 per cent N supplied through neem cake @ 0.5 t ha<sup>-1</sup> increased the plant height and number of branches at flowering and harvest phenomenally when compared to control. Increased plant height might be due to increased uptake of nitrogen which is the constituent of protein and protoplasm and vigorously induced the vegetative development of the plants as reported by Flores et al. (2005). The increased plant height may also be due to the supplementation of organic nitrogen, phosphorus and potassium along with micro nutrients besides the growth promotory effect of vermicompost. Mackay (1982) confirmed the effects of vermicompost in increasing the availability of phosphorus and IAA in the plant system and thereby would have increased the plant growth. Similar findings were made by Sree devi et al., (2012) in tomato. Application of vermicompost increases the activities of N fixing bacteria and the rate of humification. Humic acid in vermicompost enhances the availability of both native and added micronutrients in the soil as reported by Teleshi et al. (2000). Besides, application of organic manures would have helped in the plant metabolism through the supply of important micronutrients such as Zinc, iron, copper, manganese etc., in an optimum level, in the early growth phase which might have encouraged the vigorous growth. This is in accordance with Barani and Anburani (2004). The favourable response in plant height obtained in the present study could be attributed to the catalytic action of vermicompost in the soil which might have improved the soil physical conditions facilitating better aeration leading to deeper penetration of roots and higher nutrient extraction. Renuka and Ravi Shankar et al. (1998) in tomato reported similar favourable effect on plant height due to the application of vermicompost. According to Sadanandam and Hamza (2002), available soil nutrients were found to be higher due to application of neem cake when compared to other oil cakes such as ground nut cake and sesame oil cake and cotton cake and the nutrients in neem cake are readily available to the crop thereby resulted in increased plant height. Regarding the

highest number of branches in the same treatment, more availability and uptake of nutrients, particularly N, P, K, micronutrients, water and production of growth promoting substances through the integration of vermicompost and the ready availability of nutrients from the neem cake might have contributed for the highest number of branches. These findings are in consonance with Srinivasan et al.(2014) in baby corn.

## CONCLUSION

The data on nutrient uptake pattern revealed that the application of inorganic fertilizers resulted in highest nutrient uptake. Among the various organic manures and oil cakes tried, application of vermicompost @ 10.03 t ha<sup>-1</sup> and neem cake @ 0.73 t ha<sup>-1</sup> followed by poultry manure @ 2.16 t ha<sup>-1</sup> and neem cake @ 0.73 t ha<sup>-1</sup> recorded the highest nutrient uptake. The maximum availability of nitrogen, phosphorus and potassium were obtained with application of poultry manure @ 2.16 t ha<sup>-1</sup> and with neem cake @ 0.73 t ha<sup>-1</sup> followed by vermicompost @ 10.03 t ha<sup>-1</sup> along with neem cake @ 0.73 t ha<sup>-1</sup>. Numerically higher values for organic carbon, EC, water holding capacity and lower value for pH and bulk density were observed in the treatment combination, 75 per cent N through bulky organic manures along. With 25 per cent N through oil cakes. Within the treatments, insignificant variation was observed for these traits.

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