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STRUCTURAL BEHAVIOUR OF CONCRETE BEAMS USING FIBER OPTIC SENSOR AND REPLACEMENT MATERIALS

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ABSTRACT

Civil structures are important to society. For durable and safe service lives, good design, quality construction as well as appropriate management during service are important goals of structural engineering management and monitoring are often essential parts of managing activities. Therefore, monitoring structures from construction to the end of the service may be useful for concrete structures, this includes monitoring during the early age. In this paper we had develop a structural health monitoring using fiber optic sensor and strength of concrete improved by E-Waste. For many point view, fiber optic sensors are the ideal transducers for civil structural monitoring. Being durable, stable from the incentive to external perturbations. They are particularly interesting for the long term health. Now a day's in India the construction is slowed down due to the increase in demand and unavailability of construction materials at feasible cost. Using alternative materials will overcome this problems an effort have been made in the construction industry to use non-bio degradable components of E-waste as a partial replacement for the coarse aggregate. And manufactured sand as a fine aggregate. It is purpose made fine aggregate produced by crushing and screening or further processing i.e. washing, grading, classifying of quarried rock, cobbles, boulders or gravels from which natural fine aggregate had been removed. An experimental study is made on the utilization of E-waste particles as coarse aggregate in concrete with a percentage replacement ranging from 0% to 30% with the strength criteria of M40 concrete. Compressive strength, tensile strength, flexural strength of concrete with and without concrete as a coarse aggregate and the stress and strain induced in the structural member by using optical fiber sensor was observed. Ultrasonic tests on strength properties were executed and the feasibility of utilizing E-plastic particles with partial replacement of coarse aggregate and fiber optic sensor for structural health monitoring has been presented.

Keywords: Coarse Aggregate, Crushed E Waste, M sand, Fiber Optic Sensor, Compressive Strength, Flexural Strength, Tensile Strength, Stress Strain Curvature.

1. INTRODUCTION

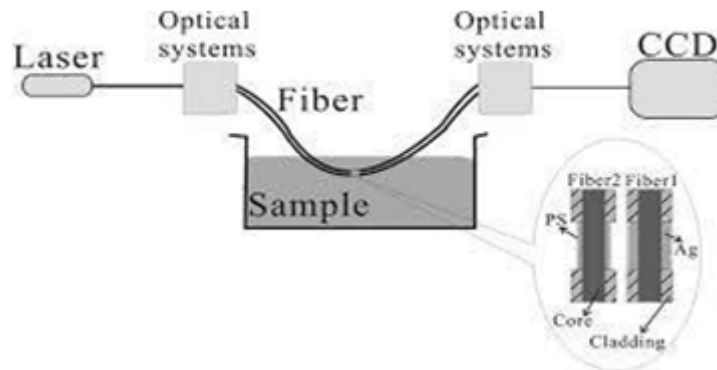
The degradation of concrete structures is a major infrastructures problems in many parts of the world. In the last years there is an increasing acknowledgement of our impact on the environment due to our life style. While the need to adopt a more sustainable approach concerning our consumption habits emerges as of particular significance. Monitoring of new and existing structures is one of the essential tools for a modern and efficient management of the infrastructure network.

This study intended to find structural behavior of fiber optic sensor by using replacement materials as e waste and m-sand. There are inherent advantages of fiber optic sensors which include their ability to be light in weight, very compact and small in size. Easy to launch light, low ISI, resistance to electromagnetic interference, high sensitivity, wide bandwidth and environmental ruggedness make them widely used in different fields [2]. All these mentioned characteristic make best use of optical fiber sensor and the networks which are made up of optical fiber are very advantages in industry for long time investment. The effective ways to reutilize the electronic waste particles (WEEE) as a coarse aggregate and manufactured sand (M-SAND) as a fine aggregate. E-waste describes loosely discarded, surplus, obsolete, broken, electrical (or) electronic devices. Rapid technology change, low initial cost has resulted in a fast growing surplus of electronic waste around the globe [1]. Several tonnes of E-waste need to be disposed per year. Traditional landfill (or) stock pile method is not an environmental friend solution and the disposal process is also very difficult to meet EPA regulations. How to reuse the non-disposable e waste becomes an important an important research topic. Amnon and Hadassa (2006) studied the effect of high levels of fine content on concrete properties. Hudson B.P. (1997) has taken a review of various tests in his article manufactured sand for concrete. Ilangovan et.al (2006) studies the strength behaviour of concrete by using crushed rock dust as a fine aggregate. They investigated the possibility of using crushed rock as a 100% replacement for sand, with varying compaction factor [3]. On this basis M-sand offers viable produced by crushing and screening (or) further processing i.e., washing, grading, classifying of quarried rock, cobbles, boulders (or) gravels from which natural fine aggregate had been removed.

2. BASIS OF LIGHT TRANSMISSION IN OPTICAL FIBER

Snell's law and the concept of total internal reflection can explain the transmission of through light optical fiber. Snell's laws relates index of refraction and incoming and outgoing angles for light passing from one material to another by equation:

$$N_1 \sin \theta_1 = N_2 \sin \theta_2.$$



When a light traverse from a fiber core that has higher refractive index into the cladding with a lower refractive index, the light wave is totally reflected back into the core. 3.

3. RESEARCH SIGNIFICANCE

3.1. E-waste

Globally about 20-50 million tons of e-waste are disposed of each year, which accounts for 5% of all municipal solid waste. When this waste ends up in landfill, it creates leaching problem which in turn contributes to the pollution of ground water resources. There are two small (WEEE) organized e-waste recycling facility in India. A report of the United Nations predicted that by 2020, e-waste from old computers would jump by 500% on 2011 levels in India additionally e-waste from discarded mobile phones would be higher about 18 times in India than 2007 levels. Such prediction highlight the urgent need to address the problem of e-waste in developing countries like India, where the collection and management of e-waste and the recycling process is yet to be properly regulated. Printed circuit board (PCB) is a very usual part of almost every electronic product. The vast annual production of PCB waste creates environmental concerns because of the leaching of toxic chemicals into landfills when it is dumped and incineration produced dioxins and furans which persist in the environment for a long period due to the task of dealing with the disposal of non cyclable parts and the expense incurred in dealing the toxic waste, recycling is non willingly done. Hence it is necessary to arrive at a cost effective and environmental friendly solution for the disposal of PCB waste. Accordingly, this paper examines the feasibility of utilizing the non-metallic portion of printed circuit board in concrete making. In particular waste strips from the culling of printed circuit board are taken for the work.

3.2. Manufactured sand

The main objective of the present work was to systematically study the Percentage replacement of manufactured sand by natural sand as 0%, 20%, 40%, 80%, and 100% on Strength properties of concrete. The study was carried out on M40 grade concrete with 0.45 water cement ratio. Manufactured sand can be used as replacement of fine aggregate, but it has to satisfy the technical requisites like workability and strength. On this aspect research on concrete with manufactured sand is scarce, so this paper also investigates the concrete produced with manufactured Sand [3].

4. EXPERIMENTAL DETAILS FOR REPLACEMENT MATERIALS

			Coarse aggregate	
	Fine aggregate			
	Natural	M	Coarse	E-
Property	sand	sand	aggregate	waste
Specific	2.44	2.37	2.67	1.74
gravity				
Finess	4.665	4.265	-	-
modulas				

Impact	-	-	8.57%	4.1%
value				
Water	6.5%	6.6%	15%	5%
absorption				

Table-1: Physical properties of materials

4.1. Concrete Mixes

The E-waste and manufactured sand contents are calculated on weight basis as coarse aggregate and fine aggregate in the conventional mix: The fineness modulus of coarse aggregate with various E-waste contents is observed as 5.236. The divided particle size is assumed between 10mm and 20mm. Then E-waste particles considered as partial replacement of coarse aggregates. The fineness modulus of manufactured sand is 4.264. so, The M-sand is considered as partial replacement of fine aggregate to substitute and remaining mix ratio as the same with conventional mix are listed below in table 2. The strength criteria of M40 grade concrete mix were analyzed.

Mix specification	Control Mix A	A1	A2	A3	A4	A5
Proportion of E- waste	0%	4%	8%	12%	16%	20%
Manufactured sand	0%	20%	40%	60%	80%	100%

Table-2: Mix specifications

4.2. Tests

Compressive strength test was conducted to evaluate the strength development of concrete containing various E-waste and M-sand contents at the age of 7, 14, 28 days respectively. Cylindrical and beam specimens were also cast for finding the split tensile strength and flexural strength of specimens on 7, 14, 28 days for each mix specification following the standard test procedures.

Mix specification	Control mix	A1	A2	A3	A4	A5
Proportion of E-waste+ M Sand	0%	4%+20%	8%+40%	12%+60%	16%+80%	20%+100%
7 Days	18.5	18.6	21.0	12.0	12.2	12.3
14 Days	24.37	25.26	27.97	19.35	20.03	20.71
28 Days	39.89	37.54	39.89	38.34	38.76	39.05

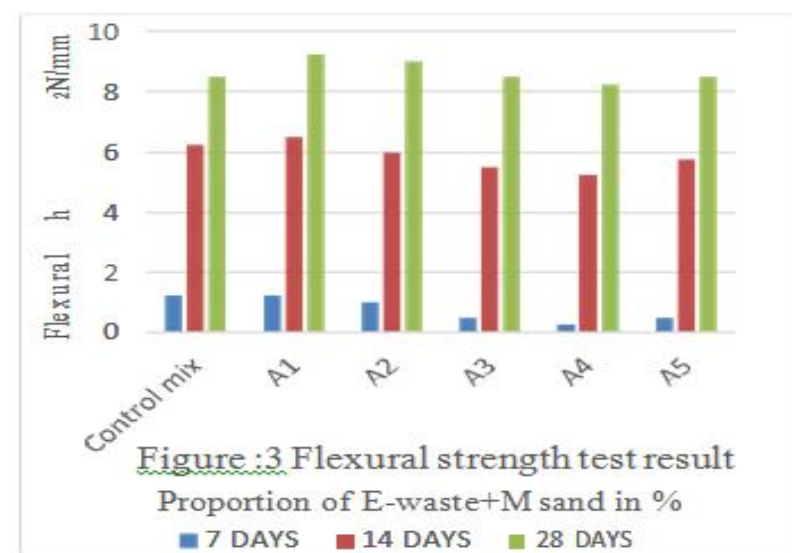
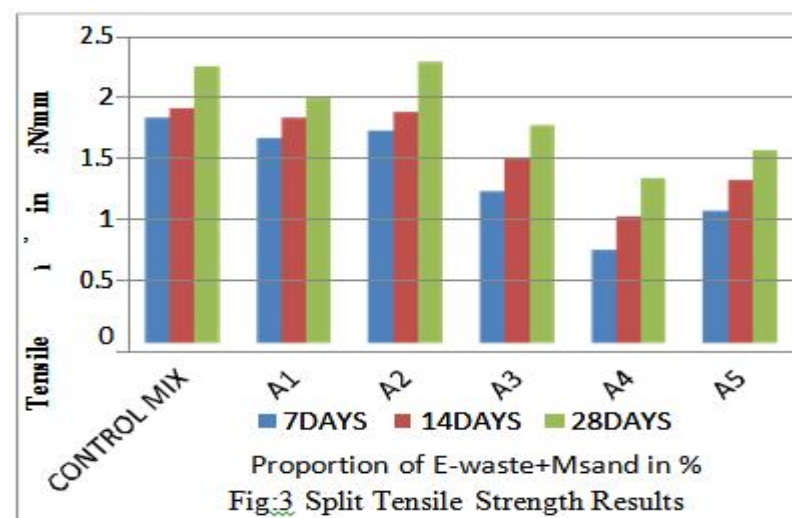
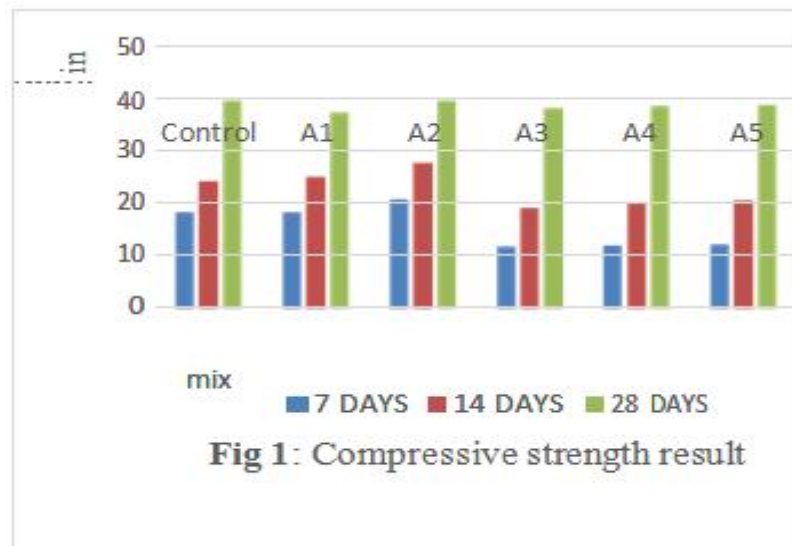
Table-3: Compressive strength test results in N/mm²

Mix specification	Control mix	A1	A2	A3	A4	A5
Proportion of E-waste + M Sand	0%	4+20%	8+40%	12+60%	16+80%	20+100%
7 Days	1.84	1.67	1.73	1.24	0.76	1.08
14 Days	1.92	1.84	1.89	1.51	1.03	1.33
28 Days	2.26	1.99	2.18	1.78	1.35	1.57

Table-4: Tensile strength test results in N/mm²

Mix specification	Control mix	A1	A2	A3	A4	A5
Proportion of E-waste + M Sand	0%	4%+20%	8%+40%	12%+60%	16%+80%	20%+100%
7 Days	1.25	1.2	1.0	0.5	0.25	0.5
14 Days	6.25	6.5	6.0	5.5	5.25	5.75
28 Days	8.5	9.2	9.0	8.5	8.25	8.5

Table-5: Flexural strength test results in N/mm²



5. EXPERIMENTAL DETAILS FOR FIBER OPTIC SENSOR A SET OF THREE REINFORCED CONCRETE BEAMS

of section 1000mm 200mm 150mm and reinforced with 4 numbers of 12mm diameter rod @ top and bottom and 8mm diameter rod @ 75mm c/c distributors were casted. Prior to pouring in concrete in to form fiber optic sensor was pasted at mid span on of the bottom reinforcing bars. Concrete control cubes were tested in replacement materials and also casted to measure the concrete strength. Beams and cubes were casted in M40 mix and the beam was reinforced with Fe415 grade steel. The w/c ratio was adopted as 0.48.

5.1 Circuits Used

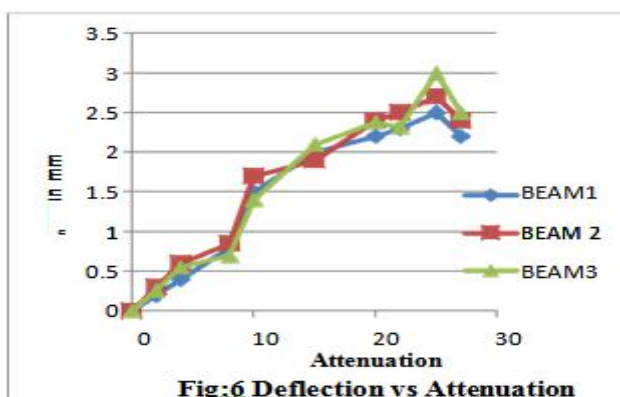
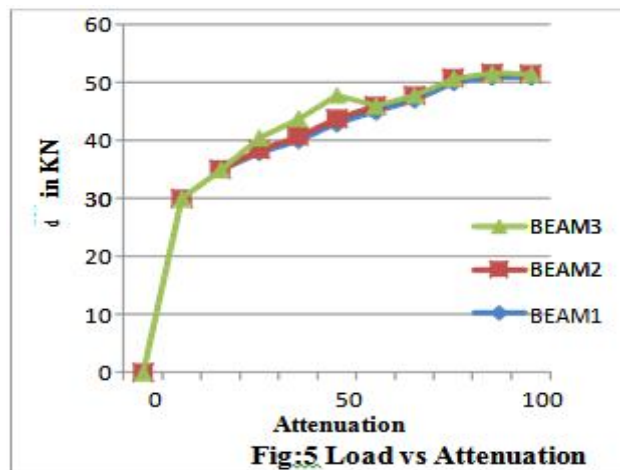
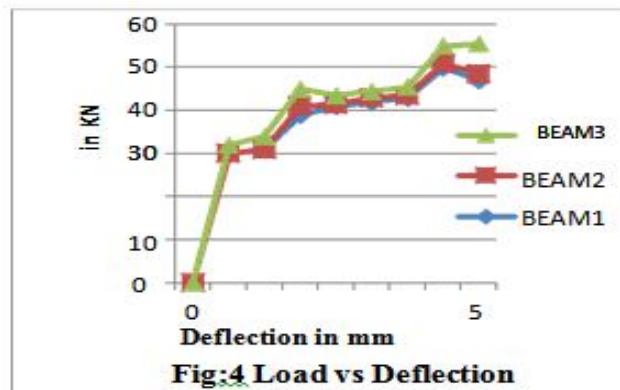
Circuit used in the study basically comprises of transmitter unit and receiving unit. The transmitter unit consists of a light emitting diode while the receiving unit consists of a photo-diode. The various disturbances, which may be present in the supply, are suppressed in this circuit. The final output voltage is monitored on an oscilloscope.

5.2 Optical Fiber Used

In the present experimental study multimode step index plastic fiber of 1mm diameter has been used. Although glass fibers are more precise than plastic fibers for receiving and transmitting light signal, but these are highly brittle and cannot be imbedded inside the concrete.

5.3 Sensing Technique Employed

The sensing technique in this study is simply to cleave the end of optical fiber and placing them into a capillary tube. A very small air-gap is provided between the two cleaved ends of the optical fiber in the capillary tube. Due to extended disturbance the air-gap in the tube is either shortened or widened resulting in corresponding gain or loss of light intensity passing through the optical fiber. The fiber optic sensing devices comprises of a light source for injecting a signal into the sensor fiber, a light detector for receiving the signal after the light has been modulated by the optical fiber sensor and an electronic system for processing the detected light into useful electrical quantity.



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7. RESULTS AND DISCUSSIONS

Concrete mixes revealed an increase of up to 39.89 N/mm² in compressive strength, 2.30 N/mm² in split tensile strength and 9.25 N/mm² in flexural strength as a result of replacement of E-waste and manufactured sand up to 8 % and 40 % as seen in Table 1,2,3 and Fig. 1,2,3 respectively. Load versus deflection curves for test beam 1, beam 2 and beam 3 respectively (Fig 4). Load versus attenuation (change in intensity of light) curves for test beam 1, beam 2 and beam 3 respectively (Fig 5). Deflection versus attenuation curves for test beam 1, beam 2 and beam 3 respectively (Fig 6). The attenuations were measured on optical fiber sensors provided in the test beams at the level of steel at mid span while the deflection was measured by dial gauge at mid span. As seen in Fig 4, load vs. deflection relation is always linear up to a load of 30 KN and the rate of change of deflection is small whereas beyond this value of the load, the deflection increases post cracking range. The same pattern is observed in the load vs. attenuation curve (Fig 5). Initially the variation is almost linear up to a load of 30 KN after which intensity losses are higher for the same increment of load. During the experiment found that at a load of about 35 KN cracks appear on the beam surface but formation (invisible) in the beam. The characteristics of optical fiber sensor can be used as a crack detection tool before that there is a considerable loss in the intensity of light, which may be due to crack.

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A COMPARATIVE ANALYSIS OF CSR PRACTICES OF HPCL AND IOCL

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ABSTRACT

Corporate Social Responsibility (CSR) is a company's commitment to operate in an economically, socially and environmentally sustainable manner that is transparent and ethical, while at the same time addressing the expectations of all stakeholders. Across the globe, the concept of Corporate Social Responsibility has been accepted as an element for success and survival of business along with fulfilling social objectives. CSR, which has largely been voluntary contribution by Indian Corporates, has now been made mandatory under the Companies Act, 2013. Applicability of mandatory CSR, activities which may be considered as eligible CSR spend, mode of conducting CSR activities and the format of CSR reporting is specified in the Act. New CSR provisions, which are made effective from 1st April 2014, put formal and greater responsibility on companies to set out clear framework and process to ensure strict compliance. The present study is an attempt to analyse CSR spending and reporting practices of two leading public sector oil companies in India - Hindustan Petroleum Corporation Limited (HPCL) and Indian Oil Corporation Limited (IOCL). The study aims to examine sector wise CSR initiatives taken by HPCL and IOCL during last three years i.e. 2014-15, 2015-16 and 2016-17.

Keywords: Companies Act, 2013, Corporate Social Responsibility, HPCL, IOCL, Ministry of Corporate Affairs

1. INTRODUCTION

Stakeholders today are redefining the role of corporates taking into account the corporates' broader responsibility towards society and environment, beyond economic performance, and are evaluating whether they are conducting their role in an ethical and socially responsible manner. Corporate Social Responsibility (CSR) is a company's commitment to operate in an economically, socially and environmentally sustainable manner that is transparent and ethical, while at the same time addressing the expectations of all stakeholders. It is recognized world over that integrating social, environmental and ethical responsibilities into the governance of businesses ensures long term success, competitiveness and sustainability.

The Concept of CSR in India is not new, the term may be. In India companies are practicing the Corporate Social Responsibility (CSR) for decades. CSR in India has evolved through different phases like community engagement, socially responsible production and socially responsible employee relations. An insight into the history of CSR reveals that till 1990s it was solely dominated by the idea of philanthropy. However, over the last few years, the concept of CSR has been changing. CSR, which has largely been voluntary contribution by Indian Corporates, has now been made mandatory under the Companies Act, 2013. As per Section 135 of the Companies Act, 2013 every company having Net Worth of Rs.500 crore or more, or Turnover of Rs.1000 crore or more, or Net profit of Rs.5 crore or more during any financial year will have to spent 2% of average net profit of past three years for specified CSR activities. Activities which may be considered as eligible CSR spend, mode of conducting CSR Activities and the format of CSR reporting is specified in the Act.

2. OBJECTIVES OF STUDY

- To analyse CSR spending and reporting practices of two leading public sector oil companies in India - Hindustan Petroleum Corporation Limited (HPCL) and Indian Oil Corporation Limited (IOCL).
- To examine sector wise CSR initiatives taken by HPCL and IOCL during the period of study.
- To make comparative analysis of sector-wise CSR spending of HPCL and IOCL during the period of study.

3. RESEARCH METHODOLOGY

3.1 Sources of Data

The present study is based on secondary data. Data is collected mainly from the published Annual Reports of HPCL and IOCL and from the website of Ministry of Corporate Affairs.

3.2 Period of Study

Mandatory CSR provisions as per the Companies Act, 2013 has been made effective from financial year 2014-15. Considering this the present study is carried out to examine the CSR spending and reporting practices of HPCL and IOCL for last three Financial Years i.e. from 2014-15 to 2016-17.

4. DATA ANALYSIS AND INTERPRETATION

4.1 Hindustan Petroleum Corporation Limited (HPCL)

Table-1: CSR Expenditure of HPCL

Year	Mandatory CSR		Actual CSR Expenditure		Unspent Amt. brought forward from previous year	Unspent Amt. carry forward to next year
	Amount Rs. (In Crores)	% of PAT*	Amount Rs. (In Crores)	% of PAT*		
2014-15	34.03	2%	34.07	2%	0	0
2015-16	53.92	2%	71.76	2.66%	0	0
2016-17	82.9	2%	108.11	2.61%	0	0

Source: Annual Reports of HPCL, www.hpcl.com

* As a % of Average Net Profit of last three years.

Table-2: Sector-wise CSR Expenditure of HPCL (Rs. in Crores)

Sectors\ Years	2014-15	2015-16	2016-17
Environmental Sustainability	0	17.87	16.58
Skill Development	2.80	5.18	11.48
Education	19.69	16	27.24
Health Care	9	11.64	11.76
Sports	0.85	0.68	0.99
Sanitation (Swachh Bharat Abhiyaan)	0	15.82	10.15
Empowerment of Socially & Economically Backward Groups	1.44	4.37	4.91
Others	0.29	0.2	25
Total	34.07	71.76	108.11

Source: Annual Reports of HPCL, www.hpcl.com



Graph-1: Sector-wise CSR Expenditure as a % of Total CSR Expenditure of HPCL for the year 2014-15



Graph-2: Sector-wise CSR Expenditure as a % of Total CSR Expenditure of HPCL the year 2015-16



Graph-3: Sector-wise CSR Expenditure as a % of Total CSR Expenditure of HPCL for the year 2016-17

Interpretation: During all 3 years of study i.e. 2014-15, 2015-16 and 2016-17, HPCL has spent more than the prescribed mandatory amount of CSR i.e. more than 2% of average net profit of last three years. During 2015-16 and 2016-17, actual CSR spent is around 130% of mandatory CSR. Thus, HPCL stays committed to its CSR and intends to continuously increase the impact of its CSR initiatives. In 2014-15, the company spent major of its CSR funds in the field of education (58%). The company did not spend any funds towards environmental sustainability and sanitation or cleanliness programs. In 2015-16, the company started focusing on CSR activities relating to environmental sustainability and spent highest CSR funds (25%) for this, followed by education (22%) and sanitation (22%). In 2016-17, promotion of education (25%) and environmental sustainability (15%) continued to remain as the major thrust areas for CSR. However, the actual CSR spent for environmental sustainability has declined as compare to year 2015-16.

4.2 Indian Oil Corporation Limited (IOCL)

Table-3: CSR Expenditure of IOCL (Rs. in Crores)

Year	Mandatory CSR		Actual CSR Expenditure		Unspent Amt. brought forward from previous year	Unspent Amt. carry forward to next year
	Amount Rs. (In Crores)	% of PAT*	Amount Rs. (In Crores)	% of PAT*		
2014-15	112.95	2%	113.79	2.01%	20.45	19.61
2015-16	141.50	2%	156.68	2.20%	19.61	4.43
2016-17	212.67	2%	213.99	2.01%	4.43	3.11

Source: Annual Reports of IOCL, www.iocl.com

* As a % of Average Net Profit of last three years.

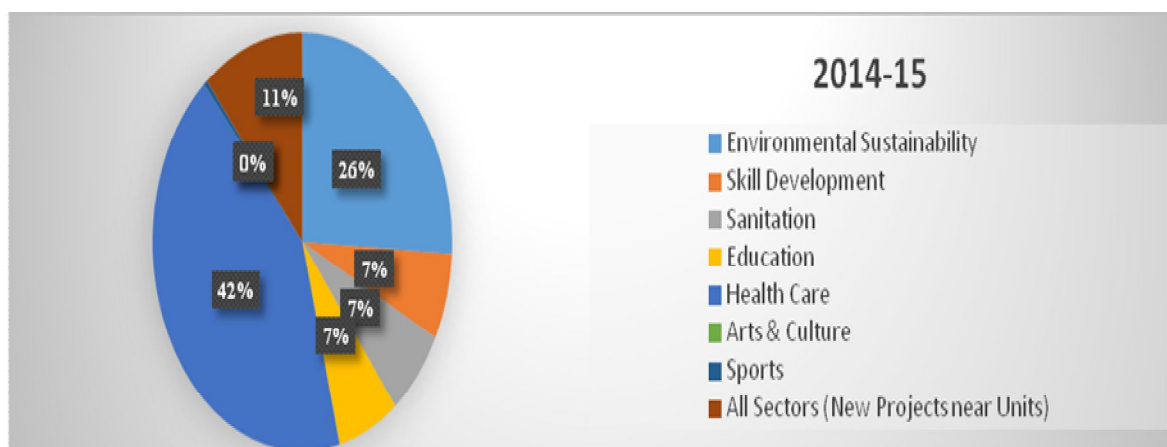
Table-4: Sector-wise CSR Expenditure of IOCL (Rs. in Crores)

Sectors \ Years	2014-15	2015-16	2016-17
Environmental Sustainability	29.48	40.57	45.34
Skill Development	7.59*	7.33	8.37
Education	7.59*	15.09	79.36
Health Care	48.43	12.81	12.21
Sports	0.49	0.56	1.39
Sanitation	7.67	44.87	2.15
Arts & Culture	0	0	22.92
All Sectors (New Projects near Units across India for various activities in all sectors combined)**	12.54	35.45	42.25
Total	113.79	156.68	213.99

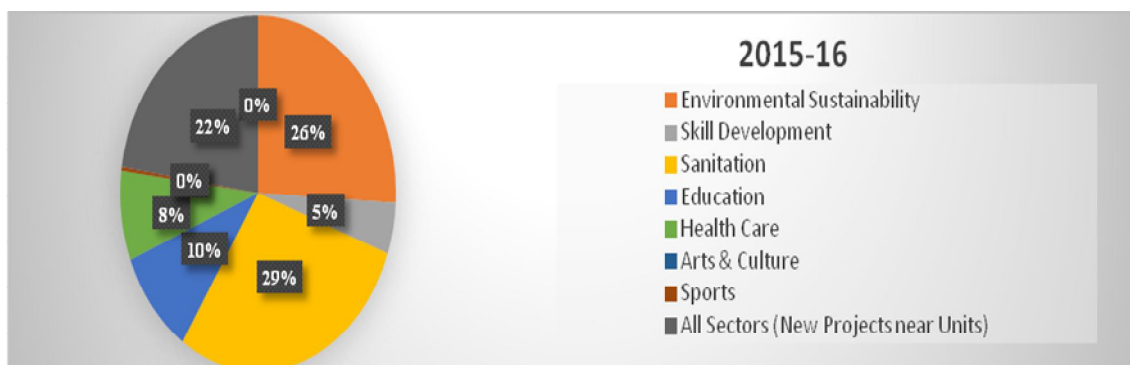
Source: Annual Reports of IOCL, www.iocl.com

* As per Annual Report, total Expense for Education/Sanitation is 15.18, so average is taken as 7.59.

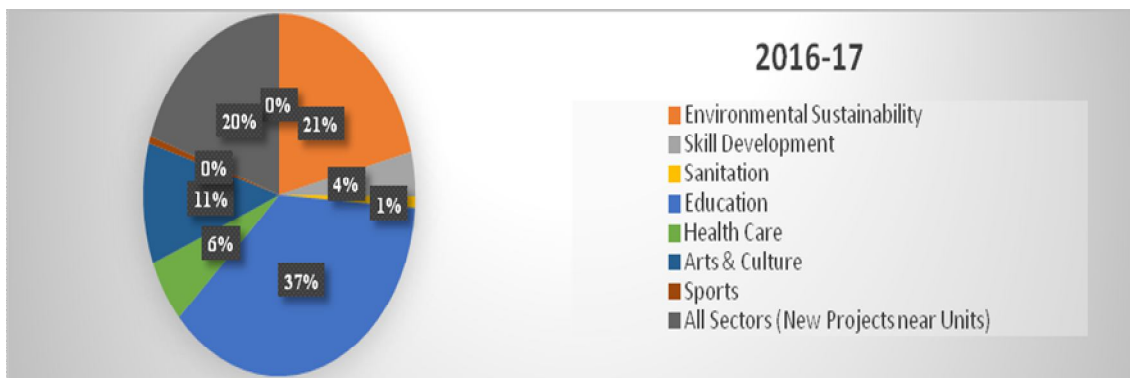
** In Annual Report it is given in total, sector-wise CSR amount is not specified.



Graph-4: Sector-wise CSR Expenditure as a % of Total CSR Expenditure of IOCL for the year 2014-15



Graph-5: Sector-wise CSR Expenditure as a % of Total CSR Expenditure of IOCL for the year 2015-16



Graph-6: Sector-wise CSR Expenditure as a % of Total CSR Expenditure of IOCL for the year 2016-17

Interpretation: During all 3 years of study i.e. 2014-15, 2015-16 and 2016-17, IOCL has complied with the CSR provisions of Companies Act, 2013 and has spent more than the prescribed mandatory amount of CSR i.e. more than 2% of average net profit of last three years. On 1st April 2014 the brought forward unspent CSR amount was Rs.20.45 crore, which company has spent over the years, however Rs.3.11 crore remained unspent on 31st March 2017. In 2014-15, out of total CSR funds 42% was spent for activities relating to Health care and 26% was spent for environmental sustainability. In 2015-16, the key CSR spending areas were sanitation (29%), environmental sustainability (26%) and education (22%). In 2016-17, promotion of education (37%) and environmental sustainability (21%) continued to remain as the major thrust areas for CSR.

4.3 Comparison of CSR Practices of HPCL and IOCL

Table-5: Actual CSR Expenditure of last 3 Years (2014-15 to 2016-17)

Year	HPCL		IOCL	
	Rs. (in Crores)	% of PAT*	Rs. (in Crores)	% of PAT*
2014-15	34.07	2%	113.79	2.01%
2015-16	71.76	2.66%	156.68	2.20%
2016-17	108.11	2.61%	213.99	2.01%

* As a % of Average Net Profit of last three years.

Table-6: Sector-wise Total CSR Expenditure of last 3 Years (2014-15 to 2016-17)
(Rs. in Crores)

Sectors	Total CSR Expenditure of last 3 Years	
	HPCL	IOCL
Environmental Sustainability	34.45	115.39
Skill Development	19.46	23.29
Education	62.93	102.04
Health Care	32.4	73.45
Sports	2.52	2.44
Sanitation (Swachh Bharat Abhiyaan)	25.97	54.69
Empowerment of Socially & Economically Backward Groups	10.72	0
Art & Culture	0	22.92
Others	25.49	90.24
Total	213.94	484.46



Graph-7: Sector-wise Total CSR Expenditure of last 3 Years (in %) of HPCL



Graph-8: Sector-wise Total CSR Expenditure of last 3 Years (in %) of IOCL

FINDINGS AND CONCLUSION

The actual CSR spent of both HPCL and IOCL during all 3 years of study was more than the prescribed mandatory amount of CSR. During 2015-16 and 2016-17, actual CSR spent of HPCL is around 130% of mandatory CSR. Thus, HPCL stays committed to its CSR and intends to continuously increase the impact of its CSR initiatives. To ensure compliance with mandatory CSR generally every year IOCL spends 100% of mandatory CSR but not more than that, only in 2015-16 IOCL spent more i.e. around 110% of mandatory CSR.

Promotion of education and environmental sustainability are the key CSR areas for both HPCL and IOCL. Every year HPCL spends around 25% of its total CSR funds towards promoting education through various projects like "Unnati" - for computer awareness, "Nanhi Kali" - for girl child, "ADAPT" - for children with special needs and "Akshaya Patra" - for providing mid-day meals in Government schools. The major CSR activities and projects of IOCL includes Swachh Bharat Abhiyaan, Swachh Vidyalaya Abhiyaan, Sarve Santu Niramaya, Indian Oil Multi-Skill Development Institute, Indian Oil Academic as well as sports Scholarship Scheme.

In 2015-16, both HPCL and IOCL have spent the significant amount for sanitation as a response to the Swachh Bharat Abhiyaan launched by Prime Minister Shri Narendra Modi. In recent years, due to increased global warming and environment degradation, environment protection has assumed utmost priority at the national as well as international level. As a concern to environment protection, both HPCL and IOCL are spending major of its CSR funds towards environmental sustainability activities and projects. However, CSR spent for environmental sustainability is showing declining trend in HPCL, while it is showing increasing trend in IOCL. The detail analysis of CSR Reports reveals that HPCL majorly do CSR through the implementing agencies who on its behalf perform the tasks, while IOCL has its own projects like Indian Oil Muskaan, Indian Oil Multi-Skill Development Institute, Indian Oil Academic as well as Sports Scholarship etc. IOCL also do CSR via implementing agencies for some of the activities. During the period of study both the HPCL and IOCL have not contributed anything in the field of sustainable livelihood generation, empowerment of women & backward classes along with rural transformation. Hence, companies should focus on contributing to these sectors also. Companies should determine a strong and innovative CSR strategy which can deliver high performance in ethical, environmental and social areas and meet all the stakeholders' objectives.

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A SECURED DATA SHARING BETWEEN TWO VIRTUAL MACHINES USING TEMPORAL CHAINING TRIPLE DES ALGORITHM

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ABSTRACT

In cloud computing must provide the security guarantees for the sharing data files because they are outsourced. In cloud provide privacy-preserving is the challenging issue for the frequent change of the membership in the cloud, especially for an untrusted cloud due to the collusion attack. In the proposed scheme, firstly distribute a key without any communication channel and distribute the keys securely, the users can securely obtain their private keys from group manager. Secondly, achieve fine-grained access control, the specified or registered user can only use the source of the cloud and revoked user cannot access any files in the cloud. Thirdly, protect the data sharing from collusion attack, the revoked users cannot get the original data file. Finally, the proposed scheme can achieve fine efficiency, which means previous users need not to update their private keys for the situation either a new user joins in the group or a user is revoked from the group.

Keywords: Cloud Computing, DES, Data Storage, Virtual machines

1. INTRODUCTION

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the common use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing consists of hardware and software resources made available on the internet as managed third-party services. These services typically provide access to advanced software applications and high-end networks of server computers.

The goal of cloud computing is to apply traditional supercomputing, or high-performance computing power, normally used by military and research facilities, to perform tens of trillions of computations per second, in consumer-oriented applications such as financial portfolios, to deliver personalized information, to provide data storage or to power large, immersive computer games.

The cloud computing uses networks of large groups of servers typically running low-cost consumer PC technology with specialized connections to spread data-processing chores across them. This shared IT infrastructure contains large pools of systems that are linked together. Often, virtualization techniques are used to maximize the power of cloud computing.

CLOUD computing is recognized as an alternative to traditional information technology due to its intrinsic resource-sharing and low-maintenance characteristics. In cloud computing, the cloud service providers (CSPs), such as Amazon, are able to deliver various services to cloud users with the help of powerful datacenters. By migrating the local data management systems into cloud servers, users can enjoy high-quality services and save significant investments on their local infrastructures. One of the most fundamental services offered by cloud providers is data storage. Let us consider a practical data application. A company allows its staffs in the same group or department to store and share files in the cloud. By utilizing the cloud, the staffs can be completely released from the troublesome local data storage and maintenance. However, it also poses a significant risk to the confidentiality of those stored files. Specifically, the cloud servers managed by cloud providers are not fully trusted by users while the data files stored in the cloud may be sensitive and confidential, such as business plans. To preserve data privacy, a basic solution is to encrypt data files, and then upload the encrypted data into the cloud. Unfortunately, designing an efficient and secure data sharing scheme for groups in the cloud is not an easy task due to the following challenging issues.

First, identity privacy is one of the most significant obstacles for the wide deployment of cloud computing. Without the guarantee of identity privacy, users may be unwilling to join in cloud computing systems because their real identities could be easily disclosed to cloud providers and attackers. On the other hand, unconditional identity privacy may incur the abuse of privacy. For example, a misbehaved staff can deceive others in the company by sharing false files without being traceable. Therefore, traceability, which enables the group manager (e.g., a company manager) to reveal the real identity of a user, is also highly desirable. Second, it is highly recommended that any member in a group should be able to fully enjoy the data storing and sharing services provided by the cloud, which is defined as the multiple-owner manner. Compared with the single-owner manner, where only the group manager can store and modify data in the cloud, the multiple-owner manner is more flexible in practical applications. More concretely, each user in the group is able to not only

read data, but also modify his/her part of data in the entire data file shared by the company. Last but not least, groups are normally dynamic in practice, e.g., new staff participation and current employee revocation in a company. The changes of membership make secure data sharing extremely difficult. On one hand, the anonymous system challenges new granted users to learn the content of data files stored before their participation, because it is impossible for new granted users to contact with anonymous data owners, and obtain the corresponding decryption keys. On the other hand, an efficient membership revocation mechanism without updating the secret keys of the remaining users is also desired to minimize the complexity of key management.

2. LITERATURE SURVEY

Zhongma Zhu and Rui Jiang (2016) proposed a cryptographic storage system that enables secure data sharing on untrustworthy servers based on the techniques that dividing files into file groups and encrypting each file group with a file-block key. Yu et al (2010) exploited and combined techniques of key policy attribute-based encryption, proxy re-encryption and lazy re-encryption to achieve fine-grained data access control without disclosing data contents

B. Wang, with B. Li, and H. Li (2012) proposed cloud data services, it is common place for data to be not only stored in the cloud, but also shared across multiple users. Unfortunately, the integrity of cloud data is subject to skepticism due to the existence of hardware/software failures and human errors. Several mechanisms have been designed to allow both data owners and public verifiers to efficiently audit cloud data integrity without receiving the entire data from the cloud server.

K. Ren, C. Wang, and Q. Wang (2010) first discuss a number of pressing security challenges in cloud computing, including data service outsourcing security and secure computation outsourcing. Then they focused on data storage security in cloud computing. As one of the primitive services, cloud storage allows data owners to outsource to cloud for its appealing benefits. However, the fact that owners no longer have physical possession of the outsourced data raises big security concerns on the storage correctness. Hence, enabling secure storage auditing in the cloud environment with new approaches becomes imperative and challenging.

Shucheng Yu, Cong Wang, Kui Ren, and Wenjing Lou (2010) proposed a scheme to achieve this goal by exploiting KPABE and uniquely combining it with techniques of proxy re-encryption and lazy re-encryption. Moreover, the proposed scheme can enable the data owner to delegate most of computation overhead to powerful cloud servers. Confidentiality of user access privilege and user secret key accountability can be achieved.

Zhongma Zhu, Zemin Jiang, Rui Jiang (2007) proposed a secure multi owner data sharing scheme, named Mona, for dynamic in the cloud. By leveraging group signature and dynamic broadcast encryption techniques, any cloud user can anonymously share data with others. Meanwhile, the storage overhead and encryption computation cost of the scheme are independent with the number of revoked users.

M. Kallahalla (2003) proposed a plutus is a cryptographic storage system that enables secure file sharing without placing much trust on the file servers. In particular, it makes novel use of cryptographic primitives to protect and share files. Plutus features highly scalable key management while allowing individual users to retain direct control over who gets access to their files.

G. Ateniese and K. Fu (2005) proposed an application called *atomic proxy re-encryption*, in which a semi trusted proxy converts a ciphertext for Alice into a ciphertext for Bob *without* seeing the underlying plaintext. They predicted that fast and secure re-encryption will become increasingly popular as a method for managing encrypted file systems. Although efficiently computable, the wide-spread adoption of BBS re-encryption has been hindered by considerable security risks. Following recent work of Dodis and Ivan, They presented new re-encryption schemes that realize a stronger notion of security and demonstrate the usefulness of proxy re-encryption as a method of adding access control to a secure file system. Performance measurements of our experimental file system demonstrate that proxy re-encryption can work effectively in practice.

R. Lu, X. Lin, X. Liang, and X. Shen (2010) proposed a secure provenance that records ownership and process history of data objects is vital to the success of data forensics in cloud computing, yet it is still a challenging issue today. The essential bread and butter of data forensics and post investigation in cloud computing, the proposed scheme is characterized by providing the information confidentiality on sensitive documents stored in cloud, anonymous authentication on user access, and provenance tracking on disputed documents. With the provable security techniques, we formally demonstrate the proposed scheme is secure in the standard model.

B. Waters (2008) proposed a new methodology for realizing Ciphertext-Policy Attribute Encryption (CP-ABE) under concrete and noninteractive cryptographic assumptions in the standard model. Produced solutions allow any encryptor to specify access control in terms of any access formula over the attributes in the system. The efficient system, ciphertext size, encryption, and decryption time scales linearly with the complexity of the access formula. The only previous work to achieve these parameters was limited to a proof in the generic group model.

3. SYSTEM ARCHITECTURE

The architecture of the system proposed in this paper is shown in Figure 1. It consists of six components namely Cloud Module, Group Manager Module, Group Member Module, File Security Module, Group Signature Module and User Revocation Module. In this system, various intelligent agents have been used to validate the access privileges of users and to perform effective decision making.

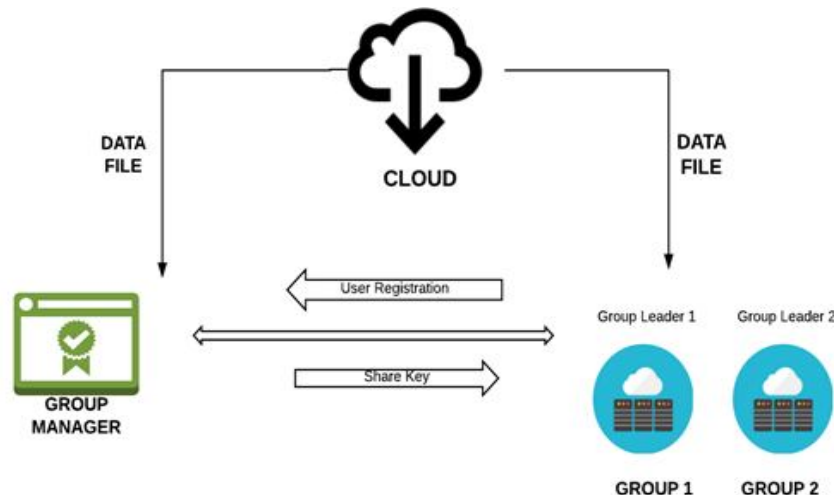


Figure-1: System Architecture

In Cloud Module, We create a local Cloud and provide price abundant storage services. The users can upload their data in the Cloud and the cloud storage can be made secure. Group Manager Module consists of three components namely System Parameters module, User Registration and User Revocation.

Group Member Module consists of two components namely Store the private data into cloud server and Share them with others in the group. File Security Module consists of two components namely Encrypting the data file and File stored in the cloud can be deleted by either group manager or data owner. Group Signature Module used to group signature scheme allows any member of the group to sign messages while keeping the identity secret from verifiers. Besides, the designated group manager can reveal the identity of the signature's originator when a dispute occurs, which is denoted as traceability. User Revocation Module is User revocation is performed by the group manager via a public available revocation list(RL), based on which group members can encrypt their data files and ensure the confidentiality against the revoked users.

4. PROPOSE TEMPORAL CHAINING TRIPLE DES ALGORITHM

In this work, a new algorithm called Temporal Chaining Triple DES Algorithm (TCTDESA) has been proposed for improving the performance. This algorithm has been implemented to assign and manipulate roles periodically by considering temporal constraints in order to enhance the security. The proposed Temporal Chaining Triple DES Algorithm consists of three phases namely Temporal Chaining Triple DES Constraint Checking with Aggregate phase, Temporal Chaining Triple DES Constraints Checking without Aggregate phase and Intelligent Leader Polling Algorithm phase which performs access control based on temporal constraints.

Triple standard encryption standard algorithm are repeats basic DES three times using either 2 or 3 unique Keys, 168 bit key length and uses 64 bit block size.

ENCRYPTION

Step 1: Encrypt the plain text blocks using single DES with key k1

Step 2: Now decrypt the output of step 1 using single DES with key k2

Step 3: Finally encrypt the output of step 2 using single DES with key k3

Step 4: The output is the cipher text

DECRYPTION

Step 1: Decrypt the cipher text using single DES with key k3

Step 2: Encrypt the output of step 1 using single DES with key k2

Step 3: Decrypt the output of step 2 using single DES with key k1

Step 4: The output is the plain text

LEADER POLLING ALGORITHM

The **Leader polling Algorithm** is a method for dynamically electing a group owner by using the unique member ID number is selected as the group leader. When a group member G determines that the current owner is down because of message timeouts or failure of the coordinator it performs the following sequence of action.

Steps

1. G sends an election message (inquiry) to all other members with higher member Ids, expecting an "I am alive" response from them if they are alive.
2. If G doesn't receive any reply from the member with the higher member ID than it, It wins the election and broadcasts victory.
3. If G receives a message from the member with a higher ID, G waits a certain amount of time for any process with a higher ID to broadcast itself as the leader. If it does not receive this message in time .It re-broadcasts the election message.
4. If G gets an election message (inquiry) from another process with a lower ID it sends an "I am alive" message back and starts new elections.

5. PERFORMANCE ANALYSIS

This work has been implemented in a private cloud called Eucalyptus cloud. For this purpose, web based the RSA-based instantiations as well as the protocols have been implemented in Java and Linux. The experiments were conducted using an Intel I5 processor running at 2.4 GHz, 4 GB RAM, and a 7200 RPM Western Digital 350 GB Serial ATA drive with an 8 MB buffer. In this work, data auditing process was carried out in order to evaluate the performance of the system. For analysing the CPU, main memory and disk usage at user and cloud service provider sides, the simulation software "Eucalyptus" has been installed in Linux operating system. Moreover, two cluster-level components are deployed at the head-node of one cluster. Finally, every node with a Hypervisor was used with a Node Controller (NC) for controlling the Hypervisor.

The results obtained from the experiments are explained using tables in this paper. Table 1 shows the comparison on the number of requests denied by Temporal Chaining Triple DES Algorithm (TCTDESA) with Constraints with five experiments and with different number of request. The requests included genuine and malicious user request with a proportion of 13:2.

Table-1: Number of user requests denied access by Temporal Chaining Triple DES Algorithm

Ex. No	No. of User Request Tried	No. of requests denied by Temporal Chaining Triple DES Algorithm (TCTDESA) with Constraints	No. of requests denied by Temporal Chaining Triple DES Algorithm (TCTDESA) without Constraints
Ex1	1500	28	48
Ex2	2500	57	77
Ex3	3500	135	168
Ex4	4500	145	182
Ex5	5500	193	252

From Table 1, it can be observed that the proposed Temporal Chaining Triple DES Algorithm (TCTDESA) with constraints model performs better when compared without constraints model in restricting the users and provides more than 95% detection and prevention accuracy. This is due to the use of intelligent agents and effective key sharing techniques that is proposed and used in this model.

Figure 2 shows the number of authorized users who were permitted by the Temporal Chaining Triple DES Algorithm (TCTDESA) model. From this figure, it is observed that the access permission of Temporal Chaining Triple DES Algorithm (TCTDESA) with constraint is lower than Temporal Chaining Triple DES Algorithm (TCTDESA) without constraints. Moreover, 5% of less users were denied access in comparison with the existing system and hence the security is enhanced. This is due to the fact that temporal constraints are used effectively to check the abnormal users.

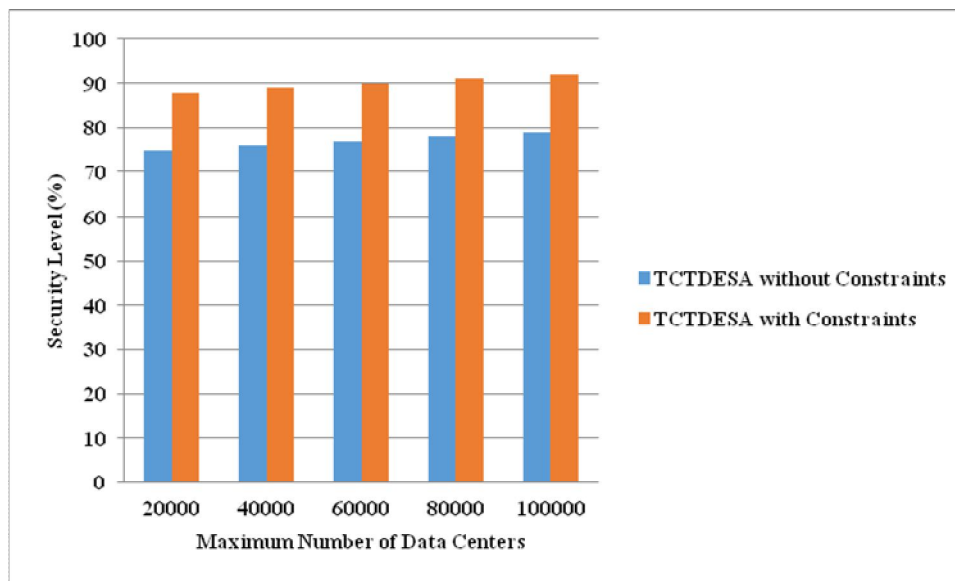


Figure-2: The number of data centers security level.

Table 2 shows the number of user requests and requests for access denied by the Temporal Chaining Triple DES Algorithm (TCTDESA) model after checking the identity and temporal power constraints.

Table-2: The number of user request access by Temporal Chaining Triple DES Algorithm (TCTDESA)

Ex. No	No. of User Request Tried	No. of requests denied by DES Algorithm	No. of requests denied by Temporal Chaining Triple DES Algorithm (TCTDESA)
Ex1	1500	82	105
Ex2	2500	105	142
Ex3	3500	178	242
Ex4	4500	185	305
Ex5	5500	315	410

Table 3 shows the comparison on the number of user upload data by Temporal Chaining Triple DES Algorithm (TCTDESA) with constraints and Temporal Chaining Triple DES Algorithm (TCTDESA) without constraint with five experiments and with different number of request.

Table-3: Data upload by Temporal Chaining Triple DES Algorithm (TCTDESA)

Ex. No	No. of User Tried	No. of data upload by Temporal Chaining Triple DES Algorithm (TCTDESA) without Constraints	No. of data upload by Temporal Chaining Triple DES Algorithm (TCTDESA) with Constraints
Ex1	3500	2015	2565
Ex2	5500	4125	4563
Ex3	7500	6582	6985
Ex4	9500	8526	8956
Ex5	11500	10125	10985

From Table 3, it can be observed that the proposed Temporal Chaining Triple DES Algorithm (TCTDESA) with constraints model performs better when compared with Temporal Chaining Triple DES Algorithm (TCTDESA) without constraints model in upload data to the server and provides more than 95% detection and prevention accuracy. This is due to the use of intelligent agents and effective key sharing techniques that is proposed and used in this model.

Figure 3 shows the number of user requests permitted by traditional Temporal Chaining Triple DES Algorithm (TCTDESA) with constraints Model and intelligent agent based Temporal Chaining Triple DES Algorithm (TCTDESA) without constraints Model when the request is sent during time interval (t_1 , t_2). From the implementation carried out in this model, it is observed that there is a difference of 8.5% users who were denied access in comparison with the Temporal Chaining Triple DES Algorithm (TCTDESA) model.

The experiments conducted in this work show that it takes 1079 ms to create 15 roles, 945 ms to include 8 edges and 812 ms to grant 15 permissions for each of the 15 roles, and 4538 ms to assign 70 users to each role. The time taken for each of the simple operations is between 75 to 150 ms.

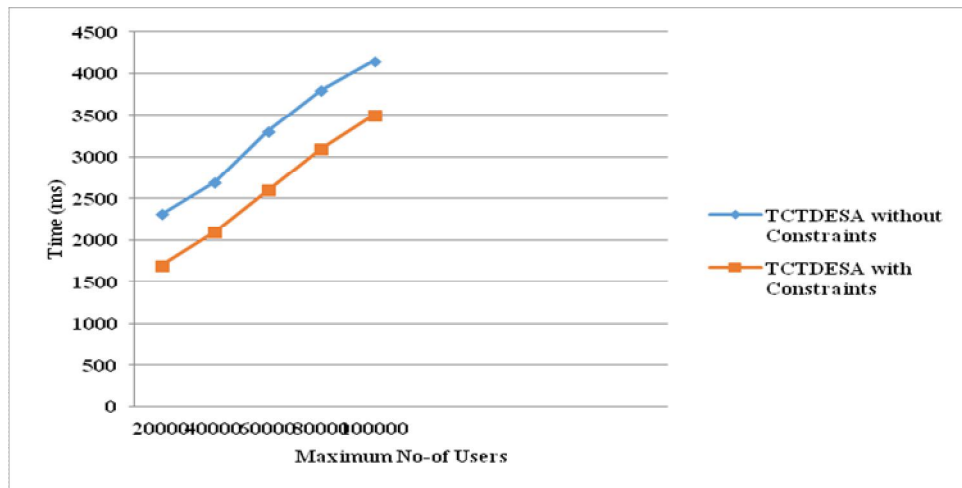


Figure-3: The number of users permitted during time interval (t_1 , t_2).

Figure 4 shows the time taken to assign 75 users with 25 roles. From the graph, it can be observed that the time taken to process the Temporal Chaining Triple DES Algorithm (TCTDESA) with role based access control and Temporal Chaining Triple DES Algorithm (TCTDESA) without access control are both proportional to the size of the database. However, the time taken to process the constraints in Temporal Chaining Triple DES Algorithm (TCTDESA) with access control is less when it is compared with Temporal Chaining Triple DES Algorithm (TCTDESA) without access control.

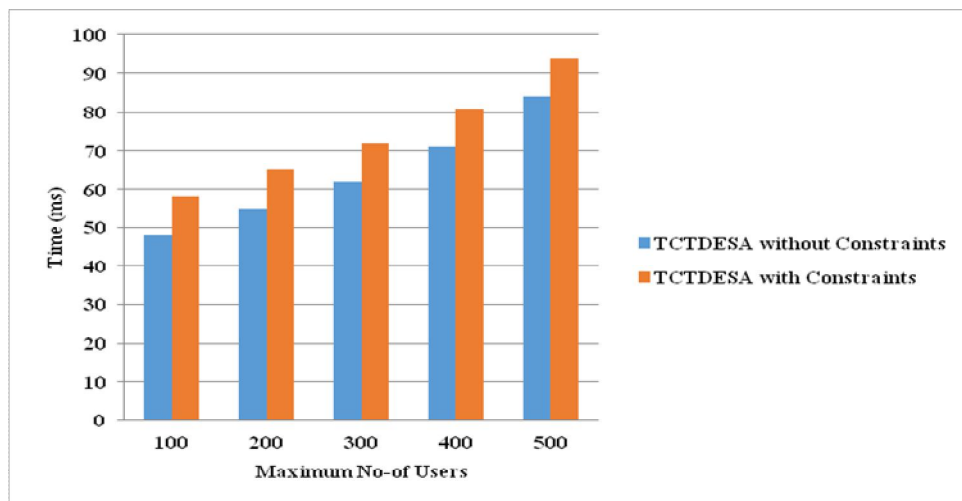


Figure-4: User role assignment

Figure 5 shows the memory analysis by the Temporal Chaining Triple DES Algorithm (TCTDESA) model.

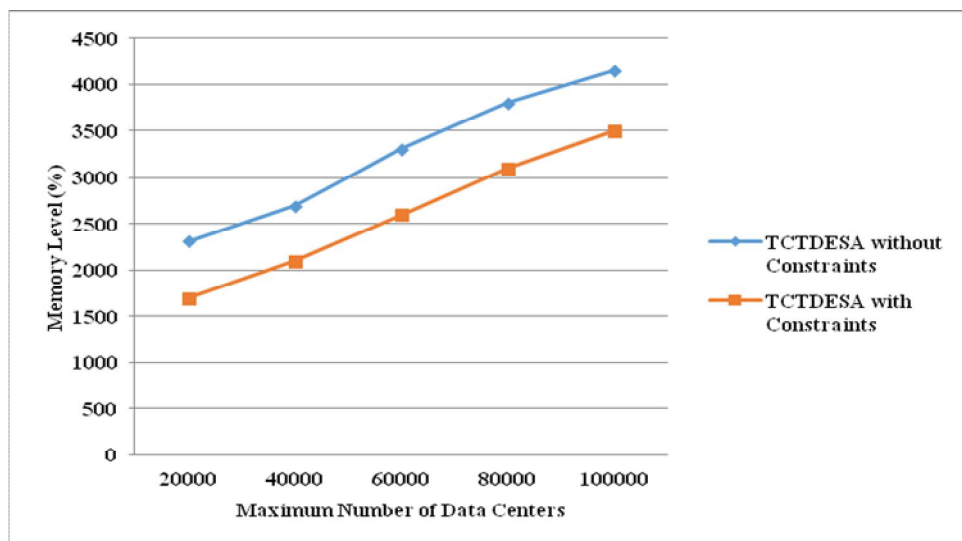


Figure-5: Memory Analysis

Figure 5 shows the memory taken they are requested by the user. From the graph, it can be seen that the memory required for processing revoke is proportional to the number of user sessions and number of users who requested for rollback at a time. Therefore Temporal Chaining Triple DES Algorithm (TCTDESA) consumes less memory when compared to Temporal Chaining Triple DES Algorithm (TCTDESA) model.

Figure 6 shows the data upload and download performance by the Temporal Chaining Triple DES Algorithm (TCTDESA) model.

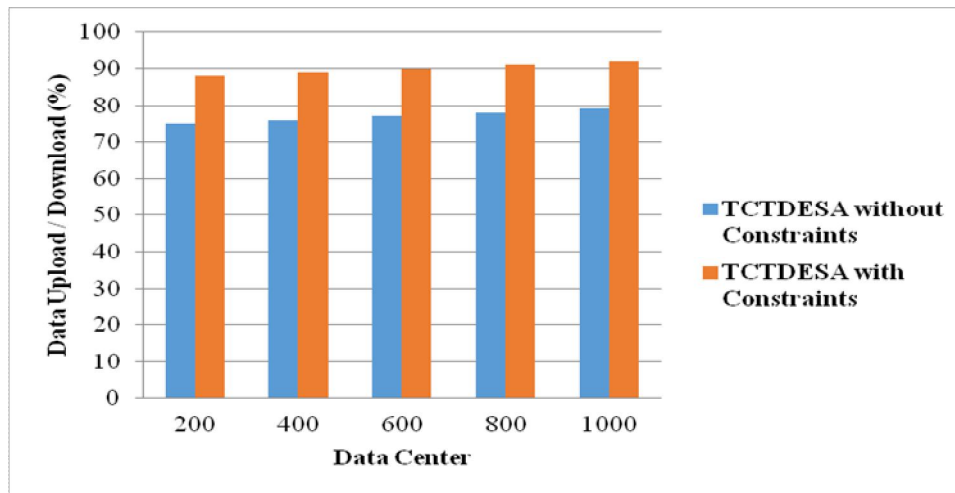


Figure-6: Data Upload / Download Performance

Figure 6 shows the data upload and download performance when they are requested by the user. From the graph, it can be seen that the data required for processing revoke is proportional to the number of user sessions and number of users who requested for rollback at a time. Even though the revoking data increases with the number of users, it decreases after a certain time limit due to the application logic and presence of intelligent agent who learn the behavior. Therefore Temporal Chaining Triple DES Algorithm (TCTDESA) with constraints consumes better than compared to Temporal Chaining Triple DES Algorithm (TCTDESA) without constraints model.

6. CONCLUSION

In the proposed scheme the hypervisor was created to create a different operating system or virtual machine (instance) using VMware. In VMware hypervisor, created shared folder will act as a cloud and the virtual machines (instances) will act as the users. The Triple DES algorithm was used to securely transfer files between the users or between the virtual machines. In the proposed secured data sharing scheme, a user is able to share data with others in the group without revealing identity privacy to the cloud. Additionally, it supports efficient user revocation and new user joining. More specially, efficient user revocation can be achieved through a public revocation list without updating the private keys of the remaining users, and new users can directly decrypt files stored in the cloud before their participation. Moreover, the storage overhead and the encryption computation cost are constant.

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A STUDY ON THE EFFECT OF SERVICE GUARANTEE ON PERCEIVED SERVICE QUALITY AND CUSTOMER SATISFACTION

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ABSTRACT

Service guarantees are an important feature of many service offerings because consumers recognize greater risk associated with the purchase of services than with the purchase of goods. Superior service Quality is a key determinant of a firm success. Service guarantee has been advocated by many experts as an important tool for improving quality which in turn has a positive impact on customer satisfaction. Despite wide spread use of service Guarantee, there is a void in understanding how service Guarantee affects the perceived service quality, which in turn has an impact on customer satisfaction. This paper tries to examine the moderating effect of service guarantee on service quality (SQ) and customer satisfaction. Based on the available literature this paper tries to develop a conceptual model to determine the effect of a well designed service guarantee on service quality and customer satisfaction. In addition the paper tries to explain how implementing guarantees enables firms to positively influence service quality and improves customer satisfaction.

Keywords: Customer satisfaction, Service firms, Service Guarantee, Service offerings, Service Quality.

INTRODUCTION

Superior service Quality is a key determinant of a firm's success. Service guarantees have been advocated by many experts as a powerful tool for improving service quality of the firm. Service guarantees are often seen as an effective tool to start quality improvements, to maintain superior quality levels, and to signal high quality (Wirt, 1998). Customer perception of superior service quality has been found to increase customer satisfaction (Anderson & Sullivan, 1990; Cronin & Taylor, 1992; Oh & Parks, 1997). A popular tool for marketing and achieving higher service quality is the service guarantee (Ettorre, 1994; Hart, 1988; Harvey, 1998).

Service guarantee can be defined as a promise made by the service organization on its service quality to reduce customers perceived risk. And in order to improve the reliability, assurance and empathy of their commitments, organization also provides additional compensation commitments in the basic of service guarantees, which means that organizations are willing to compensate when their service quality can't reach the standard they had promised, thus leading to customer satisfaction. First, a service guarantee clarifies the standards of performance a customer can expect from the organization, and thereby reduces the uncertainty faced. Second, it promises high quality performance in those service elements considered as important by the consumer. Finally, it reduces negative consequences should the service fail by promising a substantial payout and/ or rework (Berry, 1995).

To cope with the maturing markets, increasing customer satisfaction expectation, tough competition, many service firms are forced to be proactive and offer superior service quality. Service quality now recognized as a key ingredient to achieve competitive advantage. (Hart, Schlesinger, & Maher, 1992; Zeithaml, Parasuraman, & Berry, 1990).

A service guarantee can force firms to focus on customers need and forces them to re-engineer their processes to support the guarantee (Ettorre, 1994). Organizations are being punished for service below the expected quality level, a service guarantee forces the firm to identify the roots of service delivery problems and improve service quality (Maher, 1991). A well-conceived service guarantee can have positive impact on operations and culture of the organization (Berry, 1995).). Service guarantees serve as extrinsic cues to signal service quality (Ostrom and Iacobucci 1998), enhance customer satisfaction (McCollough and Gremler 1999). However, despite such support from the literature and interest from practitioners, to date, no conceptual model has been developed on the impact of service guarantees on service quality and customer satisfaction. This paper draws on the available literature on service guarantees and service quality to develop a number of propositions which are then integrated into a single conceptual model. The model shows the proposed impact of a well-designed guarantee on service quality and customer satisfaction. The paper studies only three variables of Quality (reliability, assurance and empathy).

The first section of the paper introduces the requirements for a well-designed guarantee. This is important as only well-designed guarantees will give the firm the desired impacts. In the second section a number of propositions are developed on the impact of a well-designed guarantee on service quality and customer satisfaction. Perceived risk and uniqueness of the guarantee are introduced as potential amplifiers of the impact

of guarantees on consumer behaviour. A summary of all propositions is presented and discussed in form of a model in section three. Avenues for further research are outlined in the last section.

DESIGNING OF SUCCESSFUL SERVICE GUARANTEE

A service guarantee is a firm's promise that it will perform at a certain level (Hays and Hill, 2001; Hogreve and Gremler, 2009). A service guarantee is an explicit statement explaining what the customers can expect (the promise) and what the service firm will do if it fails to deliver (the pay-out) [Hart, Schlesinger and Maher 1992]. Such a statement can be a powerful tool for achieving and marketing service quality. However, the mere presence of a guarantee does not automatically confer these advantages to the firm. Experts generally agree that seven key characteristics are required for a service guarantee to be successful (Hart 1988; Hart, Schlesinger and Maher 1992; Heskett, Sasser and Hart 1990). In particular, service guarantees should be (1) unconditional, (2) easy to understand and to communicate, (3) meaningful concerning the aspects of the service guaranteed and the financial pay out or compensation at service failure, (4) easy to invoke, (5) easy to collect on, (6) credible, and (7) a declaration of trust in customers. Service guarantees typically contain two elements: (a) A promise that expresses the firm's willingness to engage in behaviors considered desirable by its customers; (b) Some form of compensation in the event of service failure. Service guarantee can be defined as a marketing tool service firms have increasingly been using to reduce consumer risk perceptions, signal quality, differentiate a service offering, and to institutionalize and professionalize their internal management of customer complaint and service recovery. Service quality and customer satisfaction, the key differentiators, are now emerged as the important element of the business strategy of service companies. Service quality plays an important role in the customization process of service delivery, improvement of the productivity and profitability of the organizations as well as in the satisfaction process of the customers of the organizations. Service guarantee contributes to firm's *customer relationship* marketing strategies by reducing customers' pre purchase risk (Boshoff, 2002; Fruchter and Gerstner, 1999; Hart, 1988; Kandampully and Butler, 2001; Rust and Chung, 2006). All propositions developed in the next section refer to the impact of well-designed guarantees on service quality and customer satisfaction.

Service guarantees facilitate attribution by defining the locus of causality, increasing perceptions of firm control over the service delivery process, and by (de)stabilizing the cause of service (failure) success (Weiner 1986). Service guarantees help customers assign and evaluate attributions for success or failure (Callan and Moore 1998).

Previous research indicates that when customers believe that failure is less likely to occur again in the future (i.e. an unstable cause), they are more likely to be satisfied and repurchase firm services (Smith and Bolton 1998). Service guarantees allow firms to declare to their customers that the cause of service (failure) success is (not) stable or permanent.

A thorough search of the literature found most experts in agreement with Christopher Hart who stated that a "good" or strong service guarantee should be unconditional, easy to understand and communicate, meaningful, and easy and quick to invoke (Hart, 1988; Hill, 1995). From the opposite perspective, this implies that a "bad" or weak service guarantee is conditional, hard to understand and communicate, irrelevant, and difficult or time-consuming to invoke. Many authors argue that an explicit service guarantee is beneficial because it makes both the first and the second promises very clear. Explicit service guarantees are found in many firms across a wide variety of industries (Anon., 2002, 2003a, b; Howard and Crompton, 2004; Lawrence and McCollough, 2004; McCaskey and Symes, 2004; Paterik, 2002; Sarel, 2001; Taylor, 2004; Wolff, 2004). However, the mere existence of an explicit service guarantee does not insure that a firm has excellent service or that its customers are delighted with that service (Downs, 2003; Sharpsteen, 2000); similarly, the lack of an explicit guarantee does not necessarily mean that the service organization is not serious about keeping its promises to its customers. It is possible that a firm has a strong implicit "service contract" with its customers, maintains high internal standards, and provides its customers with a strong "service guarantee," without ever having an explicit written service guarantee. It has been argued that rather than evaluating a service guarantee as a "zero-one variable" indicating the presence or absence of a service guarantee, a service guarantee should be evaluated as a continuous variable ranging from weak to strong. (Julie M. Hays, Arthur V. Hill).

DEVELOPMENT OF PROPOSITIONS ON THE IMPACT OF GUARANTEES

Service guarantees have become an important and effective means to signal quality (Ostrom and Iacobucci 1998), attract and retain customers (Evans, Clark, and Knutson 1996), and gain market share through differentiation (Hill, Hays, and Naveh 2000; Johnson and Watson 1998). In addition, firms use service guarantees to learn about customer needs (Hart 1993) and fine-tune internal processes to respond to service failure (Callan and Moore 1998; Rushmore 1998).

Customers have difficulty evaluating service quality prior to consumption since most services are high in experience or credence attributes. Even when search attributes can be used to distinguish between firms, customers may not have access to full information about the quality of competing services. Hence, service guarantees serve as useful signals of service quality (Note: signaling theory assumes a rational consumer, who is both, motivated and capable of decoding firm signals, see Kirmani and Rao 2000).

A review of the literature on service guarantees focuses on a few key benefits of guarantees. These benefits can be grouped into two main categories: (1) impact on service quality, and (2) impact on customer satisfaction. Both categories are discussed in the next two subsections.

1. Impact on Service Quality

Service guarantees are often seen as an effective tool to jump-start quality improvements, to maintain superior quality levels, and to credibly signal high quality (Wirtz, 1998). It can therefore be concluded that a well designed service guarantee can lead to increased service quality expectations, lower perceived risk, and increased purchase intent. Service guarantees have become an important and effective means to signal quality (Ostrom and Iacobucci 1998), attract and retain customers (Evans, Clark, and Knutson 1996), and gain market share through differentiation (Hill, Hays, and Naveh 2000; Johnson and Watson 1998).

P1: A well designed service guarantee clarifies the standards of performance a customer can expect from the organization, thus providing Assurance about the quality being provided by them

Assurance is defined as the knowledge and good manners or courtesy of employees (Van Iwaarden et al., 2003). Further, it is also defined as the ability of employees with the help of the knowledge possessed to inspire trust and confidence will strongly strike the level of customer satisfaction (Parasuraman et al., 1988).

The guarantee have been claimed to have a number of influences on how services are managed as the guarantee clearly states the level at which the service should be delivered, and indicates the costs of failing to do so. Some of these influences include learning from service failures, setting standards for service delivery for both employees and customers.

P2: A well-designed guarantee forces the firm to ensure that the basic service delivery system, support functions and procedures are geared towards meeting guaranteed standards.

Such a guarantee tells employees what the company stands for and forces the company to define each employee's role and responsibilities in delivering the service" (Hart 1988). Furthermore, management is encouraged to set internal standards for all parts of the operation to ensure that the level of guaranteed service quality is met (Marvin 1992). Constant employee performances at /above or below these standards become internally highly visible due to no or high payout costs, respectively.

P3: A well-designed guarantee forces management to provide reliable service and eliminate and/or reduce potential fail points in the service operation.

Reliability is defined as the ability to perform the required service to customers dependably and accurately as promised to deliver (Zeithaml et al., 1990). Dealing whatever the problems in services encountered by customers, performing the required services right from the first time, services being rendered at the promised time and maintaining error-free record are the paradigm of reliability in terms of service quality which will strongly influence the level of customer satisfaction (Parasuraman et al., 1988).

P4: The improvement in the service quality forces a firm to show empathy toward its customers.

Empathy is defined as the ability to take care of customer's attention individually in providing service to customers (Iwaarden et al., 2003). Further, it is researched that understanding customer expectations better than competitors in providing the required customer service at any time without any inconvenience will strongly influence the level of customer satisfaction (Parasuraman et al., 1988). A well designed guarantee forces a constant focus on customer needs and expectations (Rose 1990). A service performance that did not keep up with changing customer needs over time would lead to dissatisfaction and increased guarantee pay-outs. A focus on customer needs becomes a driving force that naturally keeps performance at the standards expected by consumers (Marvin 1992).

2. Impact on customer satisfaction

Customer perceptions of superior quality have been found to relate to increased customer satisfaction that, in turn, leads to increased customer retention and positive economic outcomes for the organization (Cronin & Taylor, 1992, 1994; Fornell et al., 1996; Ittner & Larcker, 1996; Oliver & DeSarbo, 1988; Parasuraman, Zeithaml, & Berry, 1985, 1988).

P5: A well designed service guarantee, increases customer retention rates.

Hart (1993) claimed that the service guarantee is a legally binding contract. According to Kennett (1995), the service guarantee allows customers to know what type of service recoveries and compensations they can receive from service operators in the case of any service failures, or when customers are not satisfied with the service received thus increases rate of retention.

P6: A well designed service guarantee, increases customer loyalty among the customers

Oliver (1999) defines customer loyalty as: "A deeply held commitment to re-buy or re-patronize a preferred product/ service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing despite situational influences and marketing efforts having the potential to cause switching behavior". (Soderlund, 2006). Service guarantee is an important mean for getting the customers' loyalty toward all services given to them(Tareq Hashem Isra University, Jordan). Customer satisfaction performs a mediating role in the link between service quality and service loyalty. Service quality has been found to be an important input to customer satisfaction and customer loyalty (Albert Caruana).

P7: Increased service quality and reduced perceived risk will improve customer satisfaction.

Hoover, Green & Saegert, 1978, Mitchell & Greatedorex, 1993, Roselius, 1971 have contended that reducing consumers' perceived risks is central to motivating consumers' purchasing of products and services and service guarantee could be the most powerful risk relievers among consumers (Fitzsimmons & Fitzsimoons, 1998).

P8: Dissatisfied customers complain and provide useful feedback for the firm.

An increased proportion of dis-satisfied customers complain provide useful feedback for the firm. Past research showed that consumers who complain are less dissatisfied, less likely to engage in negative word-of-mouth, and more likely to buy again, even when the complaint is not resolved. Customer dissatisfaction and customer defection rates are further decreased when the complaints are resolved through service recovery or guarantee payouts.

SUMMARY DESCRIPTION OF THE MODEL

The propositions developed in this paper are summarized into a conceptual model presented in Figure 1.

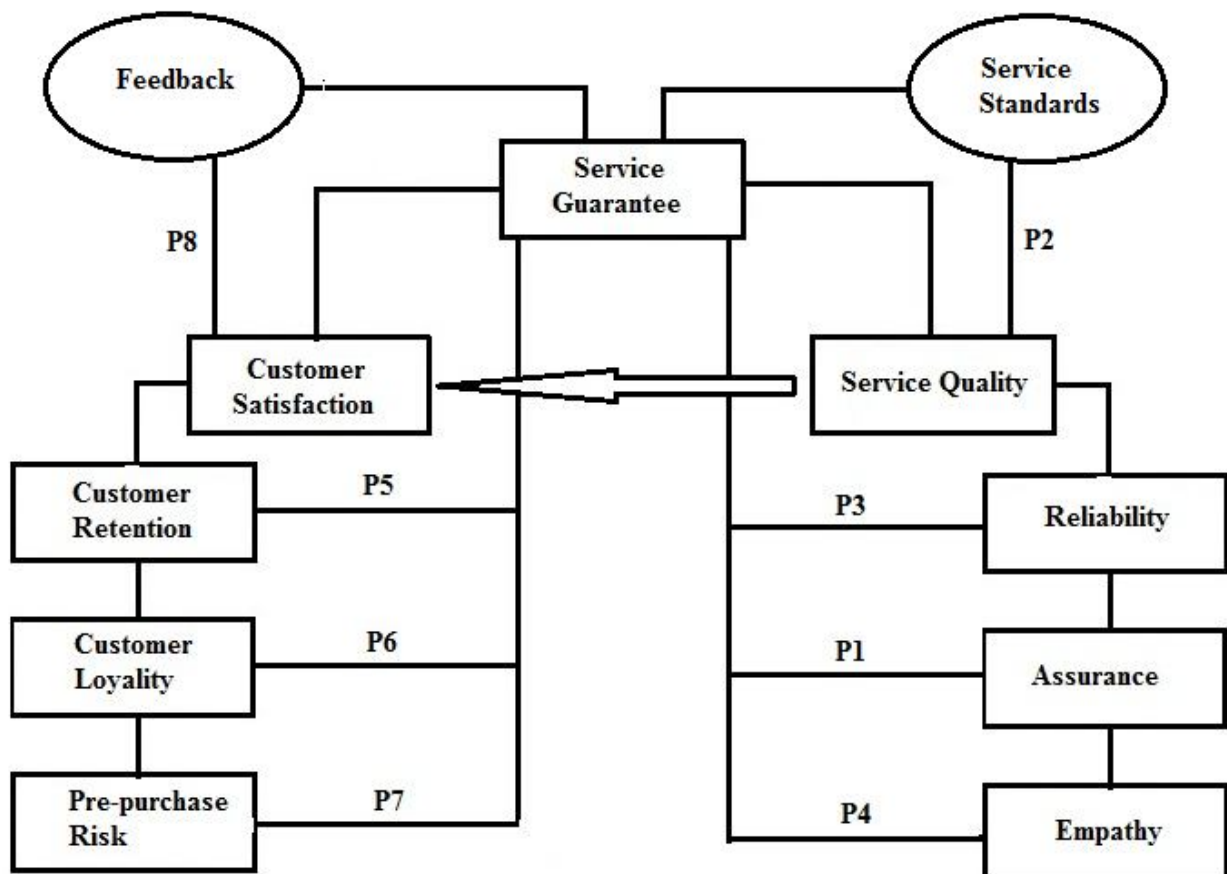


Figure 1

THE CONCEPTUAL MODEL OF SERVICE GUARANTEE

The model starts with the implementation of a well designed service guarantee (e.g., Heskett, Sasser and Hart 1990). The formulation and implementation a well designed service guarantee have a direct impact on service quality. The process of designing a guarantee causes the firm to clearly state the level at which service will be delivered and provide assurance to the customers (P₁) a well designed service guarantee set the clear performance standards to its employees (P₂). Furthermore, a well designed service guarantee forces the management to identify the fail points and make service more reliable. (P₃), it also have an impact on customer buying behaviour as it reduces the perceived risk and in order to deliver quality the firm has to show empathy towards the customers . (P₄).

A well-designed guarantee not only improves service quality but also affects the customer satisfaction in a positive way and increases customer retention rates (P₅) A well designed guarantee provide customers a clear promise of a particular standard and compensation in case of standards are not met. Service guarantees inform customers about how the firm expects to resolve complaints and compensate them in case of service failure.

A well designed service guarantee, increases brand loyalty among the customers (P₆) Customer satisfaction performs a mediating role in the link between service quality and service loyalty. Service quality has been found to be an important input to customer satisfaction and customer loyalty.

A well-designed guarantee reduces the risk consumers perceive when deciding on the purchase of a service (P₇). A well designed service guarantee reduces risk perceived by consumers because negative consequences of service failure are reduced through the guaranteed payout. The reduction in perceived risk increases the strength of the belief that purchasing a service will result in a favorable outcome. This results in the formation of a more favorable attitude, a stronger intention towards purchasing, and to more customers actually buying.

Dissatisfied customers complain and provide useful feedback for the firm. This increases the strength of the belief that complaining, if dissatisfied with a sub-standard performance, results in a favorable outcome. As a consequence, an increased proportion of dis-satisfied customers complains and provides useful feedback for the firm (P₈). Past research showed that consumers who complain are less dissatisfied, less likely to engage in negative word-of-mouth, and more likely to buy again, even when the complaint is not resolved. Customer dissatisfaction and customer defection rates are further decreased when the complaints are resolved through service recovery or guarantee payouts.

A MODEL OF THE IMPACT OF SERVICE GUARANTEES ON service Quality AND CUSTOMER SATISFACTION

Two mediating variable on the impact on consumer behaviour are proposed. First, the impact of a well-designed guarantee increases customer retention and improve brand loyalty (P₅) & (P₆). Second, the potential impact of a guarantee increases when better service quality is being provided by the firm or its service guarantee have better features than the competitors.

It has been proposed that the well designed guarantee has a positive impact on reliability, assurance, and empathy thus increases overall service quality of the firm. The effect of service guarantee on service quality and retention of customers are finally reflected in customer satisfaction which results in improved overall business performance. Service promises can foster and strengthen customer-firm relationships as a well designed service guarantees favorably influence customer attitudes and beliefs, thereby increasing purchase intention. A well designed service guarantee plays an important role in convincing a customer to choose a product and the same factors are also responsible for the consumer satisfaction after the post purchase behavior

Service guarantees are often seen as an effective way to jump-start quality improvements, maintain superior quality levels and credibly signal high quality. A well designed Service Guarantee clarifies the standards of performance a customer can expect from the firm. It also reduces negative consequences should the service fail by promising a substantial payout and/or the service being offered again. In addition, a service guarantee increases expected service quality which results in customer satisfaction. Customers reason that if a company had not achieved high levels of service quality, it could not offer a guarantee. Thus reducing the pre-purchase risk, this makes it more likely that a consumer will buy the service in the first place.

SUMMARY AND FURTHER RESEARCH

This paper presents a comprehensive model which studies the impact of well designed service guarantee on service Quality and customer satisfaction. The literature on service guarantees was reviewed, and the impacts and relationships between various variables in the literature were transformed into explicit propositions which were then integrated into a single model (see Figure 1).

A number of avenues for further research can be pursued. In this paper we study the impact of well designed service guarantee on service quality were we study only three variable further research could be done to include all the variables second, a few in-depth case studies with service firms could be conducted to test the relationship between the various variables of quality . It has been assumed that all seven criteria for well-designed guarantees have to be fulfilled to have a positive impact on customer satisfaction and it remains unclear what constitutes a well-designed guarantee.

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COST BENEFIT ANALYSIS OF LARGE CARDAMOM CULTIVATION IN ANJAW DISTRICT OF ARUNACHAL PRADESH

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ABSTRACT

India is the largest seller of large cardamom in the international market and the second largest producer after Nepal. The favourable conditions prevailed in the Himalayan foothill has induced a geometric growth in large cardamom cultivation and trading. With the striking success of this cash cropping in Sikkim, the farming communities of Arunachal Pradesh had shifted to large cardamom farming, commercially, from the traditional subsistence farming with some indications of success. This paper has aimed to analyse the cost-benefit-return of the large cardamom cultivation in the Anjaw District of Arunachal Pradesh. The study is empirical in nature and based on the primary data collected from 5 circles of Anjaw District. The data were collected from 200 cardamom growers (40 each from each 5 circles), selected at random through a questionnaire schedule. The earning from commercialized large cardamom cultivation in the study area i.e., Anjaw District of Arunachal Pradesh is very highly remunerative (27.67%) compared to other traditional and cash-crops which is a reason for the popularity of the large cardamom as a substitute for the traditional subsistence farming in these areas. The failure in the subsistence farming in Arunachal Pradesh made the masses diverted from the agrarian activities hampering the balance of employment and livelihood.

Keywords: Anjaw District, Benefit, Cost, Large Cardamom, Profit, ROI.

1. INTRODUCTION

It's a natural phenomenon that modernization in the agriculture practices have to have properly thought out, which requires a very good care and caution. There are many ways which causes impediments. So, the most important barriers observed in the farming of large cardamom is inability of the government policy making level to take a strong decision. Until and unless a clear-cut direction is available in terms of technical and financial supports from the center to the gram levels, only regulation making will bring nothing [1].

Commercial cultivation and trading of large cardamom in the Anjaw district of Arunachal Pradesh is comparatively new and has undertaken only during 2000. However, it has a prodigious potentiality and sustainability. It is now gaining widespread popularity in the state in a geometrical progression. This transition from the traditional small-scale subsistence farming to commercial cash-cropping is very rapid owing to the low volume, high value of the large cardamom.

Arunachal is emerging as a hotspot for large cardamom farming. It becomes one of the main cash crops grown in the northern side of the state, which has a huge contribution in revenue and employment generation. The problems and constraints associated with the farming of large cardamom are inevitable. Despite having been occupied first slot in production of large cardamom in the district, the farming communities of the Anjaw district is not free from various constraints and laxity. In fact, it has got many nightmares to overcome.

3. LARGE CARDAMOM FARMING IN ANJAW DISTRICT, ARUNACHAL PRADESH

Due to the Himalayan climatic zone, the 8 north-eastern states of India have massive potential for the production and export of various spice produces. The suitable climatic condition of the region supports for high yield of many spices like ginger, turmeric, chilly, tejapata, large cardamom, coriander, and garlic. Recently, with the introduction of the commercial cultivation of black pepper, cumin, vanilla and saffron, the region has been flourished with export-oriented produces. Among all spices, large cardamom cultivation of in Upper Arunachal Pradesh which was started a decade ago has supported the livelihood of the farming communities and improving their socio-economic status [2].

Anjaw District is bifurcated from Lohit District on 3rd December'2003. It is situated in the most extreme eastern part of Arunachal with 8600 sq. kms area. It stretches from snow-capped mountains in the north to the plains of Lohit river valley in the south. It lies approximately between the Latitudes 28° 1' N and the Longitude 96° 34' E. Hawai is the Head Quarter of Anjaw District of Arunachal Pradesh and located at an altitude of 1369 MSL. The population of Anjaw District is 21,089 according to 2011 census having 38.4% literacy rate and is scattered over 4 blocks and more than 365 villages. The District has the density of 3 persons per sq. Km. With sex ratio of 814 females to 1000 males in the Anjaw District. The researcher selected five circles for the present study viz., Chaglagam, Goiliang, Manchal, Hayuliang and Hawai.

Table-1: Area, Production & Productivity of Large Cardamom in Anjaw District

Year	Area (in hectare)	% of the state	Production (in MT)	% of the state	Productivity (in Kg/hectare)
2007/08	1,200	39.06	65.00	8.51	54.00
2008/09	1,400	42.99	80.00	9.69	57.00
2009/10	1,750	50.70	95.00	10.66	54.00
2010/11	2,000	55.49	120.00	13.23	60.00
2011/12	5,300	38.07	328.60	47.21	62.00
2012/13	5,430	36.77	340.80	11.54	62.76
2013/14	5,690	33.92	352.84	11.37	62.01
2014/15	6,130	34.09	443.00	10.80	72.26

Source: Horticulture Department, Anjaw district

Anjaw district is the largest producer of Large cardamom in the state of Arunachal Pradesh which is accounted for 34.09 percent of total area with Large cardamom cultivation and 10.80 percent of the total production of Large cardamom in the state, as per 2014-15. In 2010-11, the district covered 55.49 percent of the total areas devoted to large cardamom cultivation in the state. The higher profit margin in this sector motivated other farmers in the state opted for this cash crop. The productivity of large cardamom per hector is highest in the state with a figure of 72.26 kg per hector as per 2014-15 statistics (Table no. 1). The Large Cardamom cultivation is being done in a large scale with a higher feasibility in marketing of the same in domestic as well as in international market in the Anjaw district. This is being proved from the fact and figures of the large Cardamom cultivation, productivity and its marketing practices which shows a constant upward trend for last decades i.e., since 2007.

3. OBJECTIVES OF THE STUDY

The present paper has the objective to analyze the cost and benefit as well as the rate of return (ROI) of the large cardamom cultivation in the Anjaw District of Arunachal Pradesh. Manchal, Chaglagam, Hayuliang, Goiliang and Hawaii circles were selected among all circles of Anajw district for the study as large cardamom farming has been undertaken in these areas only.

4. METHODOLOGY ADOPTED

Irrespective of the region, successful cultivators and growers can be found and marketing and production can be developed. The need is a scientific approach which can cross examine the people and the potential opportunities and delineate linkages for developing cultivation, productivity and marketing activities by properly diagnosing the problems and limitations. To achieve the laid down objectives this method has been undertaken in Anjaw District of Arunachal Pradesh. For the present study, those data and methods used would be chosen based on their suitability and reliability. The study is empirical in nature and descriptive in analysis.

To collect primary data, different participatory community-based tools had been used like observation, personal interview, focused group discussion, scheduled questionnaire, etc. Field works are to be carried out in the large cardamom producing areas viz., Manchal, Chaglagam, Hayuliang, Goiliang and Hawaii circles of Anjaw District. For the study, a total of 200 cardamom growers (40 each from each 5 circles) had been selected at random. However, while selecting the respondents, due considerations have also been given to women cultivators. But as such very smaller number of women farmers are found in the study areas as the land ownership are generally vested with the senior male members of the family or household.

Various descriptive statistical analysis was undertaken to analyze the secondary data or objective data to bring out the analysis of cost and benefits.

5. PRODUCTION OF LARGE CARDAMOM AND LAND USAGES

Calendar for inter-cultural operations: The essential features for cultivation of large cardamom can be studied under three headings viz., i) General Agricultural Activities, ii) Field Planting, and iii) Calendar for Inter-Cultural Operations. The selection of the land for cultivation has been made on the basis of accessibility for easy transportation. Too sloppy land is not feasible for the large cardamom plantation. As the large cardamom is growing in shade, the land chosen should have less exposure to the scorching sunlight and should be shady with long forest trees. Large cardamom is shade loving plant. The habitat of this spice is semi evergreen forest, sub-tropical and humid of eastern region of Sub-Himalaya. Large cardamom can be grown in the altitude of 1000 - 2000 m MSL with a rainfall: 300-350 cm distributed in 200 days in a year with a range of temperature 6-25°C. The organic rich matter and loamy soil with well drained is favorable for growing large cardamom [3]. There are many local varieties of large cardamom grown in Himalayan regions such as *Bharlangey*, *Golsey*, *Ramla*,

Ramsey, Sawney, Seremna, Chibaysai, Jirmale, DzonguandDammersai. However, the cultivars commonly grown in Anjaw district are *Ramsey, Golsey, Ramla* and *Sawney*. There are mainly five popular cultivars of large cardamom, viz., *Ramsey, Sawney, Golsey, Varlangey* and *Seremna. Bebo, BoklokTali, JakerandBelak* are the other cultivars found in Arunachal Pradesh [4] [5] [6]. The crop cycle or calendar presented in fig. 1.

Figure-1: Calendar for Inter-Cultural Operation (Crop Cycle)

Activities	Jan	Feb	Mar	Apl	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Field Preparation												
Planting Saplings												
Shade Regulation												
Manure Application												
Irrigation												
Drainage												
Weeding												
Thrashing and Pruning												
Forking and Mulching												
Earthling Up												
New Spike Germination												
Flowering												
Fruiting												
Maturation of Capsules												
Harvesting												
Curing/Drying												
Selling												

Source: Field Survey 2017 and Analysis Thereafter

- The very first stage of the large cardamom cultivation cycle is field preparation which begins in the month of February and the season extends upto April, followed by the transplanting of the saplings during April - June.
- Shade regulation is done during March to April for new field and May – June for already existed field.
- Manure is applied during April and May.
- Irrigation is done in two phases, first during the month of January to March and second phase on October – November.
- Drainage is prepared during May to August.
- Weeding is performed during March – April and September –October.
- Thrashing & pruning is initiated in the month of July – August.
- Forking and mulching activities carried out during January –February and November –December.
- Earth filling is done in the month of November – December.
- In case of existing plantation, the germination of new spike begins in January-February, followed by flowering in the month of March.
- The fruiting season starts in the month of March and the season last upto first half of June.
- The capsules maturation begins in the middle of June and extends upto August.
- Harvesting season begins in the mid of August and last upto first half of November.
- Curing is done simultaneously with harvest.
- Selling of the produce is undertaken in the month of November.

The average annual production of the sample growers has been presented in the table 2. The statistics revealed that the average annual production of the sample respondents during the financial year 2012-13 was 87.22 kg and has reached to 190 kg in 2016-17. The production of the cardamom showed progressive growth in every succeeding year i.e., from 125.87 kg in 2013-14 (rise of 44.31% than FY 2012-13) to 156.43 kg in 2014-15 (rise

of 24.28% than FY 2013-14); and there was further rise by 11.68% during 2015-16 to reach 174.70 kg which ends up at 190.41 kg with a rise of 8.99% during FY 2016-17. The minimum production was increased from 12 kg per respondents to 54 kg in last 5 FYs and so as the maximum production per respondents from 800kg to 1000kg. The compound annual growth rate (CAGR) during the last five years is 0.22%.

Table-2: Descriptive Statistics of the Production in Kg.

Year	N	Min	Max	Mean	SD	% Change
2012 -13	200	12	800	87.22	86.700	-
2013-14	200	22	850	125.87	99.497	44.31
2014-15	200	20	900	156.43	107.849	24.28
2015-16	200	26	1000	174.70	121.483	11.68
2016-17	200	54.0	1000	190.41	118.170	8.99

Source: Field Survey 2017 and Analysis Thereafter

Table-3: Production of Large Cardamom in different Circles

FYs	Per Head Production in Kg					Grand Average
	C1	C2	C3	C4	C5	
2012-13	90.15	86.92	86.15	86.38	86.50	87.22
2013-14	132.78	120.80	125.39	122.89	127.49	125.87
2014-15	160.90	154.20	156.10	154.10	156.85	156.43
2015-16	180.50	172.75	175.05	170.40	174.80	174.70
2016-17	195.90	188.35	190.80	188.00	189.00	190.41
Average	152.05	144.60	146.70	144.35	146.93	146.93
SD	41.87	40.90	41.71	40.31	40.85	41.11
CAGR	+0.21	+0.21	+0.22	+0.21	+0.22	+0.22

NB.: C1-Chaglagam, C2 -Goiliang, C3-Manchal, C4-Hayuliang and C5- Hawaii

Source: Field Survey 2017 and Analysis Thereafter

Comparing the figures of production among the five circles of Anjaw district, it is found that Chaglagam circle is the highest producing large cardamom for last five FYs at an average of 152.05 kg per year and the Manchal circle registered a lowest average of 144.35 kg and the grand total average production is 146.93 kg per year in last five FYs, among the sample respondents. Other three circles - Goiliang, Hayuliang and Hawaii registered a five years average of production of 144.60 kg, 146.70kg, and 146.93 kg respectively. The CAGR of Manchal and Hawaii circle is 0.22 whereas other three circles registered a CAGR of 0.21. The production was increased from 87.22 kg in FY 2012-13 to 190.41 kg in FY 2016-17 which indicated that a slow and steady progression is registered in the large cardamom farming among the respondents in the study areas.

The basic trend in production and productivity of the large cardamom found in the study area is on the rise which has been reflected in the growth of land uses for it by the respondents. Table 4 depicts the average or per head land holding for large cardamom farming of different circles in Anjaw district. The per capita land holding per each responding farmer has increased from 3.25 acres in 2012-13 to 4.52 acres in 2016-17. All the circles show a positive cumulative annual growth rate (CAGR) ranging around 0.08%. The highest CAGR has been recorded for Goiliang circle at 0.11%, closely followed by Hawaii circle at 0.09% and Hayuliang circle at 0.09%. Manchal circle recoded a CAGR of + 0.07%. The CAGR for all the respondents is +0.08% during the period of 2012-13 to 2016-17. In the absolute terms, the growth recorded in different periods are 9.66% in 2013-14, 4.94% in 2014-15, 5.35% during 2015-16 and 14.72% during 2016-17.

Table-4: Land Holding for Large Cardamom Farming

FYs	Per Head Land Holding in Acres					Grand Average	Change in %
	C1	C2	C3	C4	C5		
2012-13	3.10	3.12	3.18	3.45	3.40	3.25	
2013-14	3.20	3.37	3.85	3.85	3.55	3.56	9.66
2014-15	3.37	3.45	3.95	4.23	3.70	3.74	4.94
2015-16	3.45	3.75	4.10	4.45	3.95	3.94	5.35
2016-17	3.85	4.70	4.25	4.95	4.85	4.52	14.72
CAGR	+0.05	+0.11	+0.07	+0.09	+0.09	+0.08	-

NB.: C1-Chaglagam, C2 -Goiliang, C3-Manchal, C4-Hayuliang and C5- Hawaii

Source: Field Survey 2017 and Analysis Thereafter

6.0. COST BENEFIT ANALYSIS OF LARGE CARDAMOM CULTIVATION IN ANJAW DISTRICT OF ARUNACHALA PRADESH

Cost-Benefit Analysis (CBA) estimates the equivalent money value of the benefits against the sacrifices or costs to the farmers of large cardamom to prove and establish the worth of their endeavour or efforts or changes from the traditional farming activities to large cardamom farming. Broadly, CBA has the main implications to evaluate the investment or decision taken by the farmer is sound with respect to its benefits, costs, and return with respect to the present research.

Analysis of Cost of Production, Revenue and ROI: The cost benefit analysis is performed with respect to the life span of the produce, i.e., 8 years which includes 3 years plantation and growing period and 5 years productive period. The costs involved were – i) labor costs (imputed and hired costs), ii) input costs and farming maintenance and management cost, iii) transportation cost, etc. The depreciation cost is not considered as the land value is appreciated, and other fixed assets used for farming is very negligible in its value. The per head labour cost is calculated on the basis of the real wage rates prevailed during the study periods i.e., from 2010-2017 and averaging the labour wages for male and female wage rates. The average sales figure is calculated on the basis of the average production figure as calculated from the field study 2017 and presented in the table– 3 and the average land holding in those years by the respondents as presented in the table– 4.

The calculation of marketable surplus and marketed surplus is calculated through the following formula and presented in the table 5.

- Marketable Surplus (MS) = Total Production (TP) – Total Requirement or consumption by the household (PC)
- Marketed Surplus or Total Actual Sales (TS) = Marketable Surplus (MS) – Loss incurred during the handling and marketing (LM)

Table-5: Calculation of Marketable Surplus and Marketed Surplus

Year	Average Land Holding (in ac.)	Average Production (in kg)	Average Per Acre Production (TP) (in kg)	HH Consumption (PC) @ 0.5%	Marketable Surplus (MS=TP-PC)	Loss in marketing Product (LM) @ 1%	Marketed Surplus (TS=MS-LM)
2012-13	3.25	87.22	26.84	0.13	26.70	0.27	26.43
2013-14	3.56	125.87	35.32	0.18	35.14	0.35	34.79
2014-15	3.74	156.43	41.83	0.21	41.62	0.42	41.20
2015-16	3.94	174.7	44.34	0.22	44.12	0.44	43.68
2016-17	4.52	190.41	42.13	0.21	41.92	0.42	41.49

Source: Field Survey 2017 and Analysis Thereafter

Table-6: Types and Sources of Labour for Cultivation of Large Cardamom (Multiple Responses) (in %)

Types of Labour	Sources & Uses of Manpower (in %)			Total
	Self	Family Members	Outsiders	
Skilled	-	-	4%	4%
Semi- Skilled	12%	10%	20%	42%
Unskilled	10%	32%	12%	54%
Total	22%	42%	36%	100%

Source: Field Survey 2017 and Analysis Thereafter

Imputed labor here means the family members as a labor, because majority of the growers rather opt for family member as a labor than going for hiring labor from other sources. As per the data presented in the table 6, 22% and 42% of the total labour force used by the respondents are self and members of the household. Thus, in total 64% of the total labour is imputed labours i.e., labour without wages. With respect to the price of the large cardamom, the average price of the large cardamom during 2013-2017, i.e., ₹1125.00 has taken for the calculation of the total revenue earned by the respondents.

From the table 7, it is inferred that the gross costs of production during a cycle of production of a single crop which has 8-years life period per 1-acre farming land in the Anjaw district is ₹1,65,297.89 which includes imputed labor costs and other expenditures including farm maintenance and management expenditures and transportation cost. Total labour cost for the cropping cycle is ₹ 1, 10,725 out of which ₹ 70,864 (64% of the total labour cost) is the cost of imputed labours in the forms of self and members of the HHs. The total revenue earned in the cycle (2011-2017) is ₹ 2, 11,038.89 which is earned by selling the large cardamom in the last 5 years of the farming cycles known as productive period. The ROI is 27.67% which has been reiterated after informed through the table no – 7. The Return on Investment (ROI) recorded above is reasonably high at 27.67 percent, with respect to the agricultural activities. The respondents of the study opined that 64% of the labour force used for the farming is unpaid labours and either self or from the HH. Thus, removing the cost factor of the imputed labours from the total cost gives rise to a profit of ₹1, 16,605.04 and the ROI is 123.48%. Calculating the NPV or deflated cost and revenue, as presented in the table 8, it is inferred that a net profit in present value of ₹ 36,571.70 was earned per acre of large cardamom farming and the ROI is 19.54%.

Table-7: Cost Benefit Analysis for Large Cardamom Farming in 1 Acre of Land

S.N.	Particulars	Unit	Qty.	₹/ Unit	Total in ₹
A	FIRST YEAR - 2010				
1	Inputs				
1.1	Saplings	No.	300	15.00	4,500.00
1.2	Equipment, tools, fertilizers etc.			6,000.00	6,000.00
	Input Cost (C_{11})				10,500.00
2	Labour (Imputed / Hired)				
2.1	Land preparation	Person Days	6 x 4	300.00	7,200.00
2.2	Trench digging	Person Days	5 x 4	300.00	6,000.00
2.3	Transplanting	Person Days	4 x 4	300.00	4,800.00
2.4	Weeding	Person Days	4 x 4	300.00	4,800.00
	Labour Cost (C_{12})				22,800.00
3	Transportation Cost (C_{13})				3,000.00
	Total Cost in 1 st Year = $C_1 = (C_{11} + C_{12} + C_{13})$				25,800.00
B	SECOND YEAR - 2011				
1	Inputs				
1.1	Equipment, tools, fertilizers etc.			1,000.00	1,000.00
	Input Cost (C_{21})				1,000.00
2	Labour (Imputed / Hired)				
2.1	Firm management	Person Days	4 x 3	300.00	3,600.00
2.2	Weeding (3 times)	Person Days	4x3x3	300.00	10,800.00
	Labour Cost (C_{22})				14,400.00
	Total Cost in 2 nd Year = $C_2 = (C_{21} + C_{22})$				15,400.00
C	THIRD YEAR - 2012				
1	Inputs				
1.1	Equipment, tools, fertilizers etc.			1,000.00	1000.00
	Input Cost (C_{31})				1,000.00
2	Labour (Imputed / Hired)				
2.1	Firm management	Person Days	3 x 2	325.00	1,950.00
2.2	Weeding (3 times)	Person Days	3x3x3	325.00	8,775.00
	Labour Cost (C_{32})				10,725.00
	Total Cost in 3 rd Year = $C_3 = (C_{31} + C_{32})$				11,725.00
D	FOURTH YEAR - 2013				
1	Inputs				
1.1	Equipment, tools, fertilizers etc.			1,000.00	1,000.00
	Input Cost (C_{41})				1,000.00
2	Labour (Imputed / Hired)				
2.1	Firm management	Person days	3 x 2	325.00	1,950.00
2.2	Weeding	Person Days	3 x 3	325.00	2,925.00
2.3	Harvesting etc.	Person Days	6 x 4	325.00	7,800.00

Labour Cost (C ₄₂)					12,675.00
3	Transportation Costs (C ₄₃) to carry produces to market				1,000.00
Total Cost in 4 th Year = C ₄ = (C ₄₁ + C ₄₂ + C ₄₃)					14,675.00
E	FIFTH YEAR - 2014				
1	Inputs				
1.1	Equipment, tools, fertilizers etc.			1,000.00	1,000.00
Input Cost (C ₅₁)					1,000.00
2	Labour (Imputed / Hired)				
2.1	Farm management	Person days	2 x 2	350.00	1,400.00
2.2	Weeding	Person Days	2 x 3	350.00	2,100.00
2.3	Harvesting etc.	Person Days	6 x 5	350.00	10,500.00
Labour Cost (C ₅₂)					14,000.00
3	Transportation Cost (C ₅₃) to carry produces to market				1,000.00
Total Cost in 5 th Year = C ₅ = (C ₅₁ + C ₅₂ + C ₅₃)					16,000.00
F	SIXTH YEAR - 2015				
1	Inputs				
1.1	Equipment, tools, fertilizers etc.			1,000.00	1,000.00
Input Cost (C ₆₁)					1,000.00
2	Labour (Imputed / Hired)				
2.1	Firm management	Person days	2 x 2	350.00	1,400.00
2.2	Weeding	Person Days	3 x 2	350.00	2,100.00
2.3	Harvesting etc.	Person Days	6 x 5	350.00	10,500.00
Labour Cost (C ₆₂)					14,000.00
3	Transportation Cost (C ₆₃) to carry produces to market				1,000.00
Total Cost in 6 th Year = C ₆ = (C ₆₁ + C ₆₂ + C ₆₃)					16,000.00
G	SEVENTH YEAR - 2016				
1	Inputs				
1.1	Equipment, tools, fertilizers etc.			1,000.00	1,000.00
Input Cost (C ₇₁)					1,000.00
2	Labour (Imputed / Hired)				
2.1	Firm management	Person days	2 x 2	375.00	1,500.00
2.2	Weeding	Person Days	3 x 2	375.00	2,250.00
2.3	Harvesting etc.	Person Days	6 x 4	375.00	9,000.00
Labour Cost (C ₇₂)					12,750.00
3	Transportation Cost (C ₇₃) to carry produces to market				1,000.00
Total Cost in 7 th Year = C ₇ = (C ₇₁ + C ₇₂ + C ₇₃)					14,750.00
H	EIGHTH YEAR-2017				
1	Inputs				
1.1	Equipment, tools, fertilizers etc.			1,000.00	1,000.00
Input Cost (C ₈₁)					1,000.00
2	Labour (Imputed / Hired)				
2.1	Firm management	Person days	2 x 2	375.00	1,500.00
2.2	Weeding	Person Days	2 x 3	375.00	2,250.00
2.3	Harvesting etc.	Person Days	5 x 3	375.00	5,625.00
Labour Cost (C ₈₂)					9,375.00
3	Transportation Cost (C ₈₃) to carry produces to market				1,000.00
Total Cost in 8 th Year = C ₈ = (C ₈₁ + C ₈₂ + C ₈₃)					11,375.00
I	Cost of Capital @ 7% pa (Compound Interest) (C ₉)				₹ 39,572.85
Gross Total Cost of Production (TC)					1,65,297.85
Revenues Earned in 8 FYs (2010-2017)					
1st year productive period income		(R1) 26.43 kg @ ₹ 1,125.00			₹29,733.75
2nd year productive period income		(R2) 34.79 kg @ ₹ 1,125.00			₹39,138.75
3rd year productive period income		(R3) 41.20 kg @ ₹ 1,125.00			₹46,350.00
4th year productive period income		(R4) 43.68 kg @ ₹ 1,125.00			₹49,140.14

5th year productive period income	(R5) 41.49 kg @ ₹ 1,125.00	₹46,676.25
Total Revenue (TR)	(R₁ + + R₅)	₹2,11,038.89
Profit = Total Revenue – Gross Total Cost of Production		₹45,741.04
ROI		27.67%
Real Gross Total Cost of Production (RTC)	(TC – Imputed Labour Cost which is 64% of the total labour cost) (1,65,297.85 – 64% of 1,10,725 = 2,72,793 – 70,864)	₹94,433.85
Real Profit	TR – RTC	₹1,16,605.04
Real ROI		123.48%

Source: Field Survey 2017 and Analysis Thereafter

Table-8: Cost-Benefit Analysis for a Cycle of Large Cardamom Farming in 1 Acre through Deflated Values

Year	Deflated Index*	Actual Cost	Deflated Cost	Actual Revenue	Deflated Revenue
2010	93.12	₹25,800.00	₹34,660.44	0	₹ 0.00
2011	95.38	₹15,400.00	₹20,198.57	0	₹ 0.00
2012	100.0	₹11,725.00	₹14,667.98	0	₹ 0.00
2013	107.90	₹14,675.00	₹17,014.3	₹ 29,733.75	₹ 34,473.51
2014	114.60	₹16,000.00	₹17,465.97	₹ 39,138.75	₹ 42,724.76
2015	118.40	₹16,000.00	₹16,905.41	₹ 46,350.00	₹ 48,972.85
2016	120.90	₹14,750.00	₹15,262.41	₹ 49,140.14	₹ 50,847.24
2017	125.10	₹11,375.00	₹11,375.00	₹ 46,676.25	₹ 46,676.25
Opportunity Cost (Cost of the Capital)			₹39572.85	-	-
Total Deflated Cost / Revenue			₹1,87,122.91	-	₹2,23,694.61
Deflated Profit					₹ 36,571.70
ROI					19.54%

* Source: <https://tradingeconomics.com/india/gdp-deflator>, Ministry of Statistics and Programme Implementation (MoSPI) and Field Survey 2017 and Analysis Thereafter

7.0. RESULTS AND DISCUSSION

The earning from commercialized large cardamom cultivation in the study area i.e., Anjaw District of Arunachal Pradesh is very highly remunerative (27.67%) compared to other traditional and cash-crops. By obliterating the imputed labour cost from the total cost gives rise to a return of 123.48%. Calculating the NPV or deflated cost and revenue earned per acre of large cardamom farming and the ROI is 19.54%. Thus, the high return is a reason for the popularity of the large cardamom as a substitute for the traditional subsistence farming in these areas.

8.0. CONCLUSION

The Indian agricultural sector is a resilient sustainer of the economy in terms of food supply, employment and national income generation. One of the biggest challenges of Indian agriculture is the market which is fluctuating and not supportable. The market today, will not be there tomorrow. Majority of the farmers suffer heavily due to this problem. The sector has struggled to accomplish since the 1980s due to policy neglect, economic distraction, diverted attitude of the youth and economic indiscretion of successive governments. The shift from traditional farming to cash and horticulture cropping shows some light at the end of the tunnel of despair. The large cardamom farming in Anjaw district is one of the examples of such prospect. High and recurrent demand in global and domestic market and a constant rise in the production of the large cardamom, cultivatable lands and producers in the study area ensure a justifiable prospect for the farmers in this region. The higher return on investment is the supporting vibe for the prospect and sustainability of the trade. The present paper justifies the reason for the high adoptability of this cash cropping in the Anjaw district with the cost-benefit analysis.

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HEAT SOURCE / SINK EFFECT ON FLOW PAST AN IMPULSIVELY STARTED VERTICAL PLATE WITH VARIABLE HEAT AND MASS TRANSFER

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ABSTRACT

Heat source/sink effect on hydro magnetic flow past an impulsively started vertical plate with variable heat and mass transfer is investigated. The governing equations of the flow are solved by Laplace transformation technique. The profile of temperature, concentration and velocity are shown graphically for different parameters like radiation parameter, magnetic field parameter, Prandtl number, Heat source/sink parameter, Thermal Grashof number, Mass Grashof number and Schmidt number. Numerical values of Skin-friction, Nusselt number and Sherwood number are tabulated. The study clearly reveals that temperature of the fluid decreases with increase in Source/sink parameter or Prandtl number. Concentration in the fluid flow decreases with increase in Schmidt number. It is also shown that mass diffusion, thermal buoyancy forces and mass buoyancy forces accelerate the fluid flow.

Keywords: Radiation, MHD, Skin-friction, Nusselt number, Sherwood number, Heat and mass transfer, Temperature, Heat Source/Sink.

INTRODUCTION

The study of MHD flow has many biological, technological and geothermal applications. The study of effect of various parameters on human body can be helpful in suggesting peoples working in unsafe areas having effects of heat variation and magnetism. In engineering it has many applications like in MHD pumps; MHD bearings etc. The study of MHD flow with mass transfer has enormous applications in power engineering and thermal physics. This study is useful in many industrial and environmental processes such as energy processes, heating and cooling chambers, astrophysical flow, water reservoirs and solar power technology etc. Hughes and Young [1] found an excellent summary of applications. Raptis [2] studied two dimensional natural convective flow of an incompressible, electrically conducting fluid along an infinite vertical porous plate embedded in a porous medium. Helmy [3] investigated MHD unsteady free convection flow past a vertical porous plate embedded in a porous medium. The study of heat transfer and flow field is necessary in many industrial application such as the extrusion of polymers involving cooling of a molten liquid, drawing and tanning of copper wires, glass blowing, paper production, the cooling of metallic plates, the aerodynamic extrusion of plastic sheets etc. This study is important to determine the quality of final quality of products of such manufacturing processes. Many works have been reported on mass and heat transfer flow over a stretched surface. Elbashbeshy [4] analyzed heat and mass transfer along a vertical plate in the presence of magnetic field. Recently, Singh et al. [5] investigated effect of hall current on visco-elastic MHD oscillatory convective flow through a porous medium in a vertical channel with heat radiation.

Heat generation or absorption is important in certain situations such as those dealing with chemical reactions and dissociating fluids. The earliest study of flow with heat source/sink which varies with time is provided by Sparrow and Cess [6]. Pop and Soundalgekar [7] studied unsteady free convection flow past an infinite plate with constant heat suction and heat source. Takhar et al. [8] provided studies of thermal and concentration boundary layers with MHD effects in the case of a point sink. Later on, Takhar et al. [9] extended this work to examine combined variable wall inject/suction, heat source effects and hall current effects on double diffusive boundary layers under strong magnetic fields. Vajravelu and Hadjinicalaou [10] have considered hydro magnetic convective heat transfer from a stretching surface with a uniform free stream and in the presence of internal heat generation or absorption effects. Sahoo et al. [11] studied MHD unsteady free convection flow past an infinite vertical plate with constant suction and heat sink.

The effects of radiations are very important in context of space technology and processes involving high temperatures such as rocket combustion chambers, hypersonic flights, power plants for planetary flights, gas cooled nuclear reactors etc. Several authors have studied applications of thermal radiating MHD boundary layer flows. Takhar et al. [12] studied radiation effects on MHD free convection flow past a semi infinite vertical plate where the viscosity and thermal conductivity were assumed to be constant. Chamkha [13] studied effects of thermal radiation and buoyancy forces on hydro magnetic flow over an accelerating permeable surface with heat source or sink. Later on, Chamkha et al. [14] investigated the effects of thermal radiation on MHD forced convection flow of an electrically conducting and heat generating or absorbing fluid over an isothermal wedge. Singh and Garg [15] investigated radiative heat transfer in MHD oscillatory flow through porous medium

bounded by two vertical porous plates. Rajput and Kumar [16] studied the radiation effects on MHD flow past an impulsively started vertical plate with variable heat and mass transfer. Recently Garg et al [17] analyzed mixed convective MHD flow in hot vertical channel through porous medium with spanwise cosinusoidal temperature and thermal radiations. Very recently Garg et al. [18, 19] studied unsteady free convective flow through porous medium in vertical channel under different boundary conditions with thermal radiations.

In this paper, we are considering heat source/sink effect on hydro magnetic flow past an impulsively started vertical plate with variable heat and mass transfer. The solutions are obtained in terms of exponential and complementary error functions. The results are shown with the help of graphs and tables.

MATHEMATICAL ANALYSIS

Here, we are considering an electrically conducting, viscous, incompressible fluid past an impulsively started infinite vertical plate. The x -axis is taken along the plate in vertically upward direction and y -axis is taken normal to the plate. Initially, the plate and surrounding gas are at same temperature T_∞ and concentration C_∞ at the stationary condition. At time $t > 0$, the plate temperature is slightly raised to T_w . The plate is given an impulsively motion with a velocity u_0 . Also the concentration level near plate is raised to C_w linearly with respect to time. The flow is governed by the following set of equations:

$$\frac{\partial u}{\partial t} = g\beta(T - T_\infty) + g\beta^*(C - C_\infty) + \nu \frac{\partial^2 u}{\partial y^2} - \frac{\sigma B_0^2 u}{\rho} \quad (1)$$

$$\rho c_p \frac{\partial T}{\partial t} = k \frac{\partial^2 T}{\partial y^2} - Q^*(T - T_\infty) \quad (2)$$

$$\frac{\partial C}{\partial t} = D \frac{\partial^2 C}{\partial y^2} \quad (3)$$

The initial and boundary conditions are

$$\left. \begin{aligned} u &= 0, T = T_\infty, C = C_\infty \quad \forall \quad y, \quad t \leq 0 \\ u &= u_0 \\ T &= T_\infty + (T_w - T_\infty)At \\ C &= C_\infty + (C_w - C_\infty)At \end{aligned} \right\} \text{at } y = 0, \quad t > 0 \quad (4)$$

$$u \rightarrow 0, T \rightarrow T_\infty, C \rightarrow C_\infty \text{ as } y \rightarrow \infty, \quad t > 0.$$

Where $A = \frac{u_0}{\nu}$.

Here u is velocity in x direction, t is time, g is acceleration due to gravity, T is temperature of the fluid, T_w is the plate temperature, T_∞ is temperature of fluid far away from plate, C is species concentration, C_w is the species concentration near the wall, C_∞ is species concentration in the fluid far away from the plate, β is the coefficient of volume expansion, β^* is the coefficient of thermal expansion with concentration, σ is electrical conductivity of the fluid, ν is the kinematic viscosity, ρ is the density, B_0 is electromagnetic induction, c_p is specific heat at constant pressure, k is thermal conductivity, Q^* is heat source/sink, D is chemical molecular diffusivity

Introducing the following non- dimensional quantities:

$$\bar{u} = \frac{u}{u_0}, \bar{y} = \frac{yu_0}{\nu}, \bar{t} = \frac{tu_0^2}{\nu}, \theta = \frac{(T - T_\infty)}{(T_w - T_\infty)} \quad (5)$$

$$M = \frac{\sigma B_0^2 \nu}{\rho u_0^2}, H = \frac{Q^* \nu}{u_0^2}, Pr = \frac{\mu c_p}{k}, Gr_r = \frac{g\beta \nu (T_w - T_\infty)}{u_0^3}, Gr_m = \frac{g\beta^* \nu (C_w - C_\infty)}{u_0^3}$$

$$\bar{C} = \frac{(C - C_\infty)}{(C_w - C_\infty)}, Sc = \frac{\nu}{D}, \mu = \rho \nu$$

where Pr the Prandtl number, H the heat source/sink parameter, M the magnetic field parameter, and θ the dimensionless temperature, Gr_r is thermal Grashof number, Gr_m is mass Grashof number.

Then in view of (5), equations (1), (2) and (3) reduce to

$$\frac{\partial \bar{u}}{\partial \bar{t}} = G_r \bar{\theta} + G_m \bar{C} + \frac{\partial^2 \bar{u}}{\partial \bar{y}^2} - M \bar{u} \quad (7)$$

$$\frac{\partial \bar{\theta}}{\partial \bar{t}} = \frac{1}{Pr} \frac{\partial^2 \bar{\theta}}{\partial \bar{y}^2} - H \bar{\theta} \quad (8)$$

$$\frac{\partial \bar{C}}{\partial \bar{t}} = \frac{1}{Sc} \frac{\partial^2 \bar{C}}{\partial \bar{y}^2} \quad (9)$$

The Boundary conditions becomes

$$\begin{aligned} \bar{u} &= 0, \bar{\theta} = 0, \bar{C} = 0 \quad \forall \bar{y} \text{ and } \bar{t} \leq 0 \\ \bar{u} &= 1, \bar{\theta} = \bar{t}, \bar{C} = \bar{t} \quad \text{at } \bar{y} = 0 \text{ and } \bar{t} > 0 \\ \bar{u} &\rightarrow 0, \bar{\theta} \rightarrow 0, \bar{C} \rightarrow 0 \quad \text{as } \bar{y} \rightarrow \infty \text{ and } \bar{t} > 0 \end{aligned} \quad (10)$$

Dropping bars from (7)-(10), we have

$$\frac{\partial u}{\partial t} = G_r \theta + G_m C + \frac{\partial^2 u}{\partial y^2} - M u \quad (11)$$

$$\frac{\partial \theta}{\partial t} = \frac{1}{Pr} \frac{\partial^2 \theta}{\partial y^2} - H \theta \quad (12)$$

$$\frac{\partial C}{\partial t} = \frac{1}{Sc} \frac{\partial^2 C}{\partial y^2} \quad (13)$$

The Boundary conditions becomes

$$\begin{aligned} u(y, t) &= 0, \theta(y, t) = 0, C(y, t) = 0 \quad \forall y \text{ and } t \leq 0 \\ u(y, t) &= 1, \theta(y, t) = t, C(y, t) = t \quad \text{at } y = 0 \text{ and } t > 0 \\ u(y, t) &\rightarrow 0, \theta(y, t) \rightarrow 0, C(y, t) \rightarrow 0 \quad \text{as } y \rightarrow \infty \text{ and } t > 0 \end{aligned} \quad (14)$$

The governing equations of flow (11)-(13), subject to the boundary conditions (14), are solved using Laplace Transformation Technique. The solutions are derived as below:

Transforming equation (13), we have

$$\begin{aligned} L\left(\frac{\partial C}{\partial t}\right) &= L\left(\frac{1}{Sc} \frac{\partial^2 C}{\partial y^2}\right); \\ i.e. sL(C(y, t)) - C(y, 0) &= \frac{1}{Sc} L\left(\frac{\partial^2 C}{\partial y^2}\right) \end{aligned} \quad (15)$$

Using boundary conditions (14), we have

$$sL(C(y, t)) = \frac{1}{Sc} L\left(\frac{\partial^2 C}{\partial y^2}\right)$$

$$\text{Or } \frac{d^2 L(C(y, t))}{dy^2} - sScL(C(y, t)) = 0$$

Its solution is given as

$$L(C(y, t)) = B_1 e^{y\sqrt{sSc}} + B_2 e^{-y\sqrt{sSc}}, \text{ where } B_1 \text{ and } B_2 \text{ are constants.} \quad (16)$$

Again using boundary conditions (14), we get

$$\frac{1}{s^2} = B_1 + B_2. \quad (17)$$

$$\text{Since } C(y, t) \text{ is bounded as } y \rightarrow \infty, \text{ therefore we must choose } B_1 = 0 \quad (18)$$

Using (17) and (18), equation (16) becomes,

$$L(C(y, t)) = \frac{1}{s^2} e^{-y\sqrt{sSc}} \quad (19)$$

Therefore, $C(y, t) = L^{-1} \left(\frac{1}{s^2} e^{-y\sqrt{sS_c}} \right)$

$$\therefore C(y, t) = t \left(1 + S_c \frac{y^2}{2t} \right) \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{S_c} \right) - y \sqrt{\frac{t}{\pi}} \sqrt{S_c} e^{-\frac{S_c y^2}{4t}} \quad (20)$$

Also transforming equation (12), we have

$$L \left(\frac{\partial \theta}{\partial t} \right) = L \left(\frac{1}{P_r} \frac{\partial^2 \theta}{\partial y^2} - H\theta \right)$$

$$\text{i.e. } sL(\theta(y, t)) - \theta(y, 0) = \frac{1}{P_r} \frac{d^2 L(\theta(y, t))}{dy^2} - HL(\theta(y, t))$$

Using boundary conditions (14), its solution will be

$$L(\theta(y, t)) = B_3 e^{y\sqrt{(H+S)P_r}} + B_4 e^{-y\sqrt{(H+S)P_r}}, \text{ where } B_3 \text{ and } B_4 \text{ are constants.} \quad (21)$$

Using (14), we have $B_3 = 0$, $B_4 = \frac{1}{s^2}$

Therefore, equation (21) becomes

$$L(\theta(y, t)) = \frac{1}{s^2} e^{-y\sqrt{(H+S)P_r}} \quad (22)$$

Taking inverse Laplace transformation of equation (22), we get

$$\theta(y, t) = \left(\frac{t}{2} - \frac{y\sqrt{P_r}}{4\sqrt{H}} \right) \left(e^{-y\sqrt{HP_r}} \operatorname{erfc} \left(\frac{y\sqrt{P_r}}{2\sqrt{t}} - \sqrt{Ht} \right) \right) + \left(\frac{t}{2} + \frac{y\sqrt{P_r}}{4\sqrt{H}} \right) \left(e^{y\sqrt{HP_r}} \operatorname{erfc} \left(\frac{y\sqrt{P_r}}{2\sqrt{t}} + \sqrt{Ht} \right) \right) \quad (23)$$

Now, transforming equation (11),

$$L \left(\frac{\partial u}{\partial t} \right) = L \left(G_r \theta + G_m C + \frac{\partial^2 u}{\partial y^2} - Mu \right)$$

$$\text{i.e. } sL(u(y, t)) - u(y, 0) = G_r L(\theta(y, t)) + G_m L(C(y, t)) + \frac{d^2 L(u(y, t))}{dy^2} - ML(u(y, t)) \quad (24)$$

Using boundary conditions (14), we get solution as

$$L(u(y, t)) = \left[\frac{1}{s} - \frac{G_r}{(1-P_r)s^2(s-a)} - \frac{G_m}{(1-S_c)s^2(s-b)} \right] e^{-y\sqrt{s+M}} + \frac{G_r}{(1-P_r)s^2(s-a)} e^{-y\sqrt{(H+S)P_r}} + \frac{G_m}{(1-S_c)s^2(s-b)} e^{-y\sqrt{sS_c}} \quad (25)$$

Taking inverse Laplace transformation of equation (25), we get

$$\begin{aligned} u(y, t) = & U_1 e^{-y\sqrt{M}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} - \sqrt{Mt} \right) + U_2 e^{y\sqrt{M}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} + \sqrt{Mt} \right) \\ & - K_4 \left[e^{-y\sqrt{M+a}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} - \sqrt{(M+a)t} \right) + e^{y\sqrt{M+a}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} + \sqrt{(M+a)t} \right) \right] \\ & - K_5 \left[e^{-y\sqrt{M+b}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} - \sqrt{(M+b)t} \right) + e^{y\sqrt{M+b}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} + \sqrt{(M+b)t} \right) \right] \\ & + K_4 \left[e^{-y\sqrt{(H+a)P_r}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{P_r} - \sqrt{(H+a)t} \right) + e^{y\sqrt{(H+a)P_r}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{P_r} + \sqrt{(H+a)t} \right) \right] \\ & - \frac{K_5}{2} \left[e^{-y\sqrt{HP_r}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{P_r} - \sqrt{Ht} \right) + e^{y\sqrt{HP_r}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{P_r} + \sqrt{Ht} \right) \right] \\ & - aK_1 \left[\left(\frac{t}{2} - \frac{y}{4} \sqrt{\frac{P_r}{H}} \right) e^{-y\sqrt{HP_r}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{P_r} - \sqrt{Ht} \right) + \left(\frac{t}{2} + \frac{y}{4} \sqrt{\frac{P_r}{H}} \right) e^{y\sqrt{HP_r}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{P_r} + \sqrt{Ht} \right) \right] \\ & + K_5 \left[e^{-y\sqrt{bS_c}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{S_c} - \sqrt{bt} \right) + e^{y\sqrt{bS_c}} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{S_c} + \sqrt{bt} \right) \right] \\ & - K_2 \left[\left\{ 1 + bt \left(1 + \frac{S_c y^2}{2t} \right) \right\} \operatorname{erfc} \left(\frac{y}{2\sqrt{t}} \sqrt{S_c} \right) + by \sqrt{\frac{t}{\pi}} \sqrt{S_c} e^{-\frac{S_c y^2}{4t}} \right] \end{aligned}$$

NUSSELT NUMBER

The Nusselt number is the measure of rate of heat transfer .It is derived from temperature field

The dimensionless Nusselt number is given by

$$N_u = - \left(\frac{\partial \theta(y,t)}{\partial t} \right)_{y=0}$$

$$= t \sqrt{HP_r} \operatorname{erf} \sqrt{Ht} + \frac{1}{2} \sqrt{\frac{P_r}{H}} \operatorname{erf} \sqrt{Ht} + \sqrt{\frac{tP_r}{\pi}} e^{-Ht}.$$

SHERWOOD NUMBER

The Sherwood number is the measure of rate of mass transfer at plate and it is derived from Concentration field .The dimensionless Sherwood number is given by

$$S_h = - \left(\frac{\partial C(y,t)}{\partial t} \right)_{y=0} = 2 \sqrt{\frac{t}{\pi}} \sqrt{S_c}$$

SKIN FRICTION

Skin Friction is derived from velocity field. The effect of t, H, M, Sc and Pr on Skin Friction coefficient in the dimensionless form is given by

$$\tau = - \left(\frac{\partial u(y,t)}{\partial t} \right)_{y=0}$$

$$= 2 \left(\sqrt{M} \operatorname{erf} \sqrt{Mt} + \frac{1}{\sqrt{\pi t}} e^{-Mt} \right) + K_3 \left[e^{-Mt} \sqrt{\frac{t}{\pi}} + \left(t \sqrt{M} + \frac{1}{2\sqrt{M}} \right) \operatorname{erf} \sqrt{Mt} \right] + (K_1 + K_2) \frac{1}{\sqrt{\pi t}} e^{-Mt}$$

$$- K_1 \left[e^{at} \sqrt{M+a} \operatorname{erf} \sqrt{(M+a)t} - e^{at} \sqrt{(H+a)P_r} \operatorname{erf} \sqrt{(H+a)t} + \sqrt{\frac{P_r}{\pi t}} e^{-Ht} \right]$$

$$- K_1 \sqrt{P_r} \left[\frac{(a+2H+2aHt)}{2\sqrt{t}} \operatorname{erf} \sqrt{Ht} + a \sqrt{\frac{t}{\pi}} e^{-Ht} \right]$$

$$- K_2 e^{bt} \left[\sqrt{M+b} \operatorname{erf} \sqrt{(M+b)t} - \sqrt{bS_c} \operatorname{erf} \sqrt{bt} + 2bt \sqrt{\frac{S_c}{\pi t}} e^{-bt} \right].$$

RESULTS AND DISCUSSION

To understand the physical meaning of the problem, numerical calculations are carried out to demonstrate the effect of different parameters upon the nature of flow. The numerical values of concentration, temperature, velocity, Nusselt number, Sherwood number and Skin friction coefficient are computed at different parameters like Prandlt number Pr, Schmidt number Sc, thermal Grashof number Gr, mass Grashof number Gm , Magnetic field parameter M, Heat source/sink parameter H and time t. The numerical results are shown graphically by Figs. 1-5.

Fig. 1 demonstrates the concentration profile for different values of Schmidt number Sc. The values of Schmidt number are taken as 0.78, 2.01, 3 and 4. The graph of concentration shows that concentration of plate decreases when Schmidt number increases. Here time is chosen as t= 0.4.

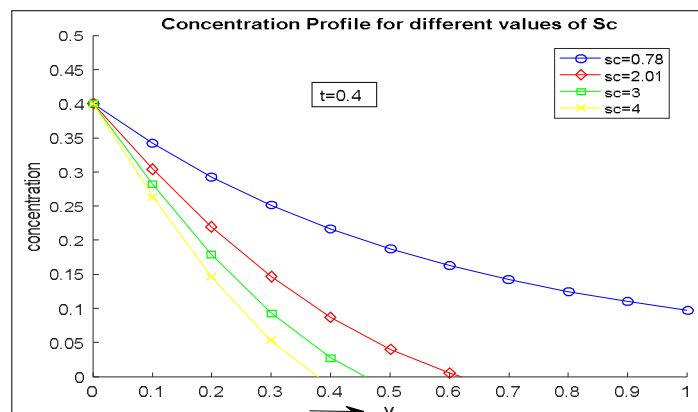


Fig-1: Concentration profile for different values of Schmidt Number

The effect of Prandlt number on temperature is shown in Fig.2. Here the values of Pr are chosen such as they represent noble gases with hydrogen (0.16), water (0.71) and air (7). Here heat source/sink parameter is taken as $H=4$ and time is taken as $t = 0.4$. From the graph, it is observed that temperature decreases when Prandlt number increases.

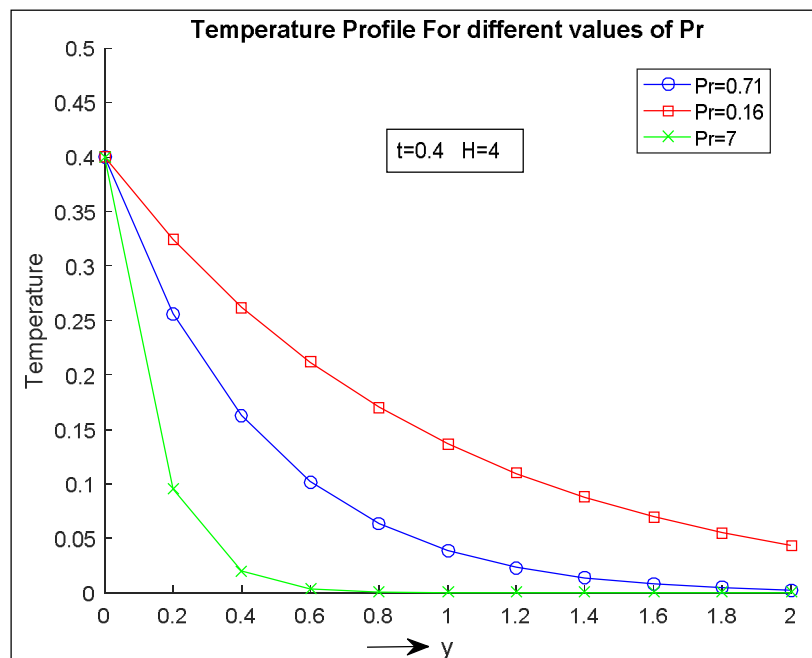


Fig-2: Temperature profile for different values of Prandlt Number

Fig.3 depicts the effect of heat source/sink parameter H on the temperature profile. Here values of heat source/sink parameter are chosen as $H = 2$, $H = 4$, $H = 6$ and $H = 8$. The value of Prandlt number is taken as 0.71 and time is chosen as 0.4. It is observed from the graph that increases in heat source/sink parameter results in decrease in temperature when other parameters are kept constant.

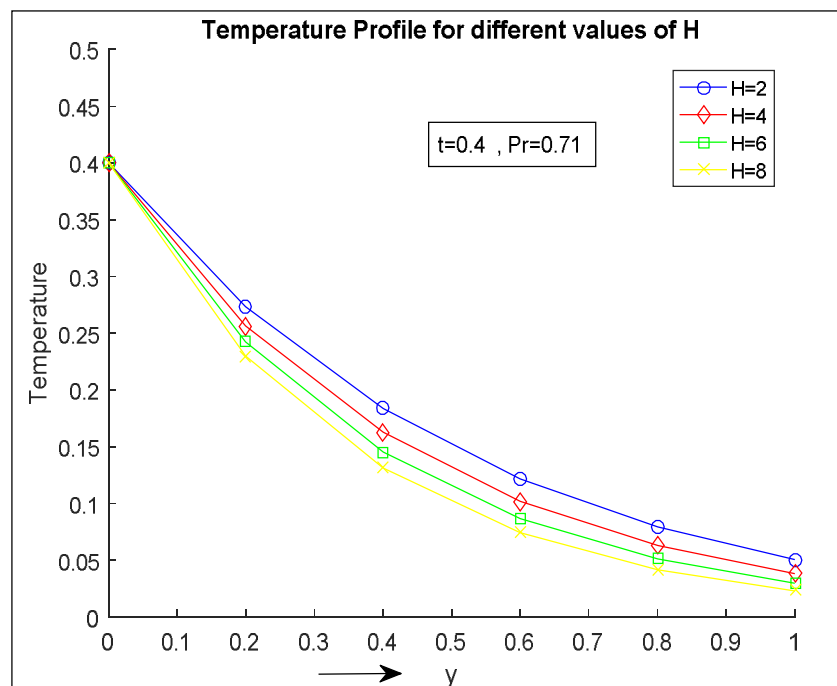


Fig-3: Temperature profile for different values of Heat Source/Sink Parameter

The velocity profiles for different parameters like heat source/sink parameter, magnetic field parameter, mass Grashof number, thermal Grashof number, Prandtl number, Schmidt number and time are shown by Fig. 4. Here heat source/sink parameter is increased ($H=2$, $H=4$) when other parameters ($Pr = 0.71$, $t = 0.2$, $M = 1$, $Sc = 2.01$, $Gr = 2$, $Gm = 3$) are kept constant. It is observed that velocity decreases when heat source/sink parameter increases.

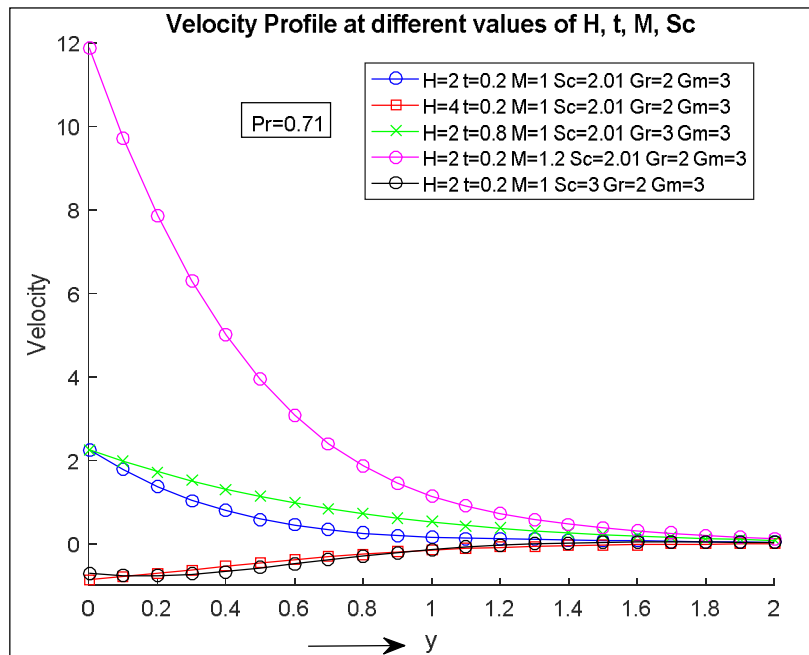


Fig-4: Velocity Profile for different values of heat source/sink parameter, time, magnetic field parameter and Schmidt number

Fig.4 also shows profile of velocity for $t = 0.2$ and 0.8 for other parameters ($Pr = 0.71$, $H = 2$, $M = 1$, $Sc = 2.01$, $Gr = 2$, $Gm = 3$) as constant which predicts that velocity increases as time increases. The effect of magnetic field parameter in this graph clearly shows that velocity increases as the magnetic field parameter is increased.

Fig.4 also depicts the effect of Schmidt number on velocity Profile. The values of Schmidt number are chosen as $Sc=2.01$ and 3 and other parameters ($Pr=0.71$, $t=0.2$, $M=1$, $H = 2$, $Gr = 2$, $Gm = 3$) are kept constant. The graph depicts that velocity decreases with increase in Schmidt number.

The Effects of Thermal Grashof number and Mass Grashof number on velocity profile are shown by Fig. 5. In this graph the values of thermal Grashof number are chosen as $Gr = 2$, 3 and 5 . Other parameters are taken as $H = 2$, $t = 0.2$, $M = 1$, $Sc = 2.01$ and $Gm = 5$.

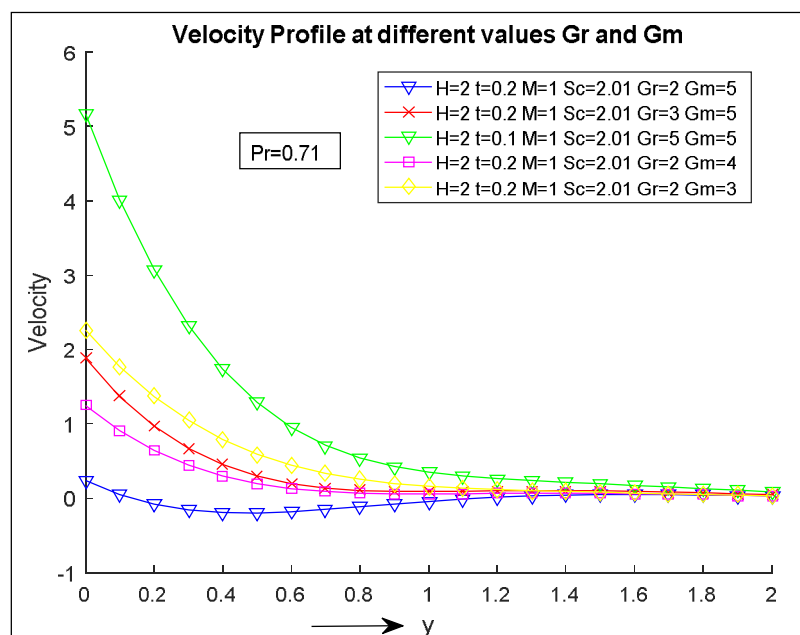


Fig-5: Velocity Profile for different values of Thermal Grashof number and Mass Grashof number

The graph clearly depicts that velocity decreases with increase in thermal Grashof number. Same graph also shows variations in velocity at different values of mass Grashof number. When values of mass Grashof number are taken as $Gm = 3$, 4 and 5 (keeping other parameters constants), the graph shows that velocity decreases with increase in mass Grashof number.

Table-1 shows the variations of time, heat source/sink parameter, magnetic field parameter and Schmidt number on Nusselt number. Nusselt number determines the rate of heat transfer. The value of Nusselt number increases with increase in time or heat source/sink parameter or Prandlt number.

Table-1: Variations of Nusselt Number at different values of Time, Heat Source/Sink Parameter and Prandlt Number

Time(t)	Heat Source/Sink Parameter(H)	Prandlt Number(Pr)	Nusselt Number(Nu)
0.2	2	0.71	0.479791
0.2	4	0.71	0.530479
0.2	6	0.71	0.577888
0.2	8	0.71	0.622476
0.4	2	0.71	0.750211
0.6	2	0.71	1.000932
0.8	2	0.71	1.244951
0.2	2	0.16	0.227763
0.2	2	7	1.50651

Sherwood number is given in Table-2. Sherwood number increases with increase in time or Schmidt number.

Table-2: Variations of Sherwood Number at different Values of Time and Schmidt Number

Time(t)	Schmidt number(Sc)	Sherwood Number(Sh)
0.2	0.3	0.276465407
0.2	0.6	0.390981127
0.2	0.78	0.445787073
0.2	2.01	0.715612962
0.2	3	0.874260379
0.2	4	1.00950893
0.4	2.01	1.012029556
0.6	2.01	1.239478008
0.8	2.01	1.431225923

Table-3 shows the effect of governing parameters on Skin friction. It is observed that Skin friction increases when M increases, while decreases with increase in t or Gr or Gm or Sc or Pr.

Table-3: Variations of Skin Friction at different Parameters

Time (t)	Heat Source/Sink (H)	Magnetic field (M)	Thermal Grashoff Number(Gr)	Mass Grashoff Number(Gm)	Schmidt number(Sc)	Prandlt Number(Pr)	Skin Friction τ
0.1	2	1	5	3	2.01	0.025	1.452671
0.1	2	1	5	4	2.01	0.025	-0.95863
0.1	2	1	5	5	2.01	0.025	-2.18714
0.1	3	1	5	3	2.01	0.025	0.109048
0.1	4	1	5	3	2.01	0.025	0.038557
0.2	2	1	5	3	2.01	0.025	-3.58934
0.3	2	1	5	3	2.01	0.025	-261.329
0.1	2	1.5	5	3	2.01	0.025	2.435964
0.1	2	2	5	3	2.01	0.025	3.284176
0.1	2	1	6	3	2.01	0.025	-1.20572
0.1	2	1	7	3	2.01	0.025	-2.22415
0.1	2	1	5	3	3	0.025	-6.1755
0.1	2	1	5	3	4	0.025	-11.1942
0.1	2	1	5	3	2.01	0.16	-4.21288
0.1	2	1	5	3	2.01	4	-4.26825

APPENDIX

$$a = \frac{M - HF_r}{F_r - 1}, \quad b = \frac{M}{S_c - 1}$$

$$K_1 = \frac{G_r}{a^2(1-P_r)}, \quad K_2 = \frac{G_m}{b^2(1-S_c)}, \quad K_3 = \frac{G_r}{a(1-P_r)} + \frac{G_m}{b(1-S_c)}, \quad K_4 = \frac{K_1 e^{at}}{2},$$

$$K_5 = \frac{K_2 e^{bt}}{2}, \quad K_6 = 1 + K_1 + K_2 + \frac{K_3 t}{2}, \quad U_1 = 1 + K_1 + K_2 + \frac{K_3}{2} \left(\frac{t}{2} - \frac{y}{4\sqrt{M}} \right),$$

$$U_2 = 1 + K_1 + K_2 + \frac{K_3}{2} \left(\frac{t}{2} + \frac{y}{4\sqrt{M}} \right)$$

$$\operatorname{erfc}(x) = 1 - \operatorname{erf}(x), \quad \operatorname{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-u^2} du.$$

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CONCLUSION

The effect of heat source/sink on hydro magnetic flow past an impulsively started vertical plate with variable heat and mass transfer can be concluded as:

- (i) Velocity decrease with the increase in heat source/sink parameter, Schmidt number, thermal Grashof number and mass Grashof number which indicates that mass diffusion, thermal buoyancy forces and mass buoyancy forces accelerate the fluid flow
- (ii) Velocity increases when time or magnetic field parameter is increased.
- (iii) Concentration in the fluid flow decreases with increase in Schmidt number which shows that mass diffusion increases the species concentration.
- (iv) Temperature of the fluid decreases with increase in Source/sink parameter or Prandtl number.
- (v) The rate of heat transfer increases with increase in time or Source/Sink parameter or Prandtl number
- (vi) The rate of mass transfer increases as time or Schmidt number increases.
- (vii) Shear stress increases magnetic field parameter is increased.
- (viii) Shear stress decreases with progression in time or thermal Grashof number or mass Grashof number. Also it is observed that skin friction decreases with increase in Schmidt number and Prandtl number.

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INFLUENCE OF AN INTERVENTION PROGRAM TO FOSTER ADAPTABILITY SKILLS AMONG TEACHERS

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ABSTRACT

In any educational setting, teachers experience challenging situations like being asked questions to which the teacher don't know the answers, the technology that their lesson depends on failing or being unavailable, multilevel classrooms that demand differentiated instruction, students not responding to the lesson as planned and exhibiting behavioural problems in the classroom, etc. These situations are not unfamiliar to anyone who makes a career out of teaching. Developing an adaptability skill that helps to embrace such challenges and deftly adapting to fit the need makes teachers to play vital role in their organizations and in their students' education. Adaptability is the capacity to adjust or alter one's thoughts, behaviours, and emotions in order to manage changing new or uncertain demands. In the present study the researcher has made an attempt to study the influence of an intervention program on adaptability skills of teachers. Experimental research design was employed for the present study. A sample of 90 teachers including 45 teachers for experimental group and 45 teachers for control group were selected for the study. The collected data was analysed using appropriate statistical tests. The results of the study revealed a strongly significant difference in the post test scores of experimental group respondents for Problem solving and flexibility dimensions of adaptability indicating the effectiveness of intervention program.

Keywords: Adaptability, flexibility, problem solving, reality testing, teachers

INTRODUCTION

Teaching work is characterised by experiences of change, novelty, and uncertainty. Being able to effectively adapt and respond to these changes is known as adaptability. Adaptability is the capacity to adjust one's thoughts and behaviors in order to effectively respond to uncertainty, new information, or changed circumstances (Martin, Nejad, Colmar, & Liem, 2013). It encompasses cognitive, behavioral, and emotional adjustments (Martin, Nejad, Colmar, Liem, & Collie, 2015). As a disposition and skill, adaptability is essential to an individual's psychological health, social success, and academic and workplace achievement. Individuals who are adaptable exhibit key behaviors like thinking and acting effectively under pressure, and adjusting timelines, results, and expectations appropriately when needs change (National Institutes for Health, 2015).

The literature has regularly discussed teachers' adaptability or flexibility as a central factor in effective teaching and learning (e.g., Corno, 2008; Bransford, Derry, Berliner, Hammerness, & Beckett, 2005; Kunter et al., 2013; Mansfield, Beltman, Price, & McConney, 2012; Parsons, Williams, Burrowbridge, & Mauk, 2012). Much of this work has considered teachers' adaptability in instructional practices (e.g., Corno, 2008, Parsons et al., 2012; Vaughn & Parsons, 2013). Corno (2008) highlights the importance of adaptive teaching practices to meet the needs of students who may have diverse developmental levels, cognitive abilities, language and cultural backgrounds, social-emotional competencies, and socio-economic backgrounds.

Similarly, Parsons, Williams, Burrowbridge, and Mauk (2012) discuss the importance of innovation and "in-the-moment adaptation" in the classroom in order to respond to students' needs and interests. More precisely, Parsons and colleagues (2012) observed teachers' use of adaptations in their instruction such as spontaneous modeling or scaffolding, adjusting instructions, or working one-on-one with different students. Researchers have also considered the role of adaptability more broadly—that is, beyond instructional adaptation and with respect to teachers' functioning at work (Hargreaves, 2005; Mansfield et al., 2012). For instance, Mansfield, Beltman, Price, and McConney (2012) examined descriptions from early career teachers of what it means to be a resilient teacher and demonstrated that being adaptable and flexible was a central theme in participants' responses. Moreover, the participants indicated that adaptability involves actions such as adjusting to new roles, accepting changes, and having a "plan b."

Adaptability is comprised of three dimensions namely; problem solving, reality testing and flexibility. Problem solving is the ability to find solution to problems in situations where emotions are involved and to understand how emotions impact decision making (BarOn 1997). It is associated with being conscientious disciplined, methodical and systematic in persevering and approaching problems (Stein and Book, 2006). A teacher with good problem solving abilities helps students overcome both emotional and cognitive barriers to learning

effective problem-solving skills by creating a comfortable classroom environment and helping students overcome their fears and anxieties related to problem solving, teachers lay the necessary foundation for successful learning.

Flexibility in the classroom is another most important quality that every teacher must possess. A flexible teacher is someone who is responsive and attentive to the needs of individual students, create a learning environment that focuses on the progress of individual learners. Acutely conscious about what is happening in the context of learning and teaching, in tune with their students and slows down or speeds up the material based on the competency of the class, and does not adhere to a rigid schedule (Yoo Julia Hyunjeong, 2009).

Thus adaptability is key capacity for teachers. The examination of teachers' training programs reveals that the programs had always focused on technique over curriculum. Many teachers are struggling with poor soft skills to manage diversity within class. By learning how to be more adaptable, a teacher become better equipped to respond when faced with a crisis in or outside classroom. Teachers with better adaptability skills often use these events as an opportunity to branch out in new directions, while others may be crushed by abrupt changes. Hence promoting adaptability skills among teachers to bring out significant teacher wellbeing, work commitment and student academic outcome is the need of the hour. In view of the above discussion the present study was undertaken to find out the influence of an intervention program to foster the adaptability skills among teachers.

METHODS

a. Aim of the study

To study the Influence of an intervention program to foster adaptability skills among the teachers

b. Objectives:

1. To assess adaptability skills of the teachers.
2. To design and develop appropriate modules for fostering adaptability competencies among teachers
3. Administration of the developed modules for the selected teachers
4. To assess the influence of intervention program on adaptability scores of the respondents

c. Hypotheses

1. The intervention program will not have any significant influence on the overall adaptability skills of teachers
2. The intervention program will not have any significant influence on the following dimensions of adaptability
 - a) Problem solving
 - b) Reality testing
 - c) Flexibility

d. Participants

The research design used for the study was experimental design. There were two groups that participated in the research, viz. Experimental group and Control group. Experimental group consisted to 45 secondary school/ high school teachers from two schools located in southern part of Bangalore city. The control group consisted of 45 secondary school/ high school teachers from two schools located in northern part of Bangalore city to avoid any spill over effect of the intervention program on control group participants.

e. Instrument

BarOn's (1999), Emotional Quotient Inventory- Adaptability subset was identified as the suitable instrument to assess adaptability competencies of the participants. Intervention modules were prepared based on adaptability competencies enlisted in BarOn's socio emotional model.

f. Procedure

The participants of control group and intervention group were administered the EQ-i- adaptability subset simultaneously. Then the intervention modules were introduced to the experimental group in a phased manner. After the completion of the intervention program, the participants were reassessed to find out the influence of intervention program. The control group participants who were not exposed to any such intervention program were also reassessed after six months to see if there is any change in the adaptability scores. The obtained scores were tabulated and analysed using student ' t '.

1. RESULTS AND DISCUSSION

Figure-1: Age distribution of respondents

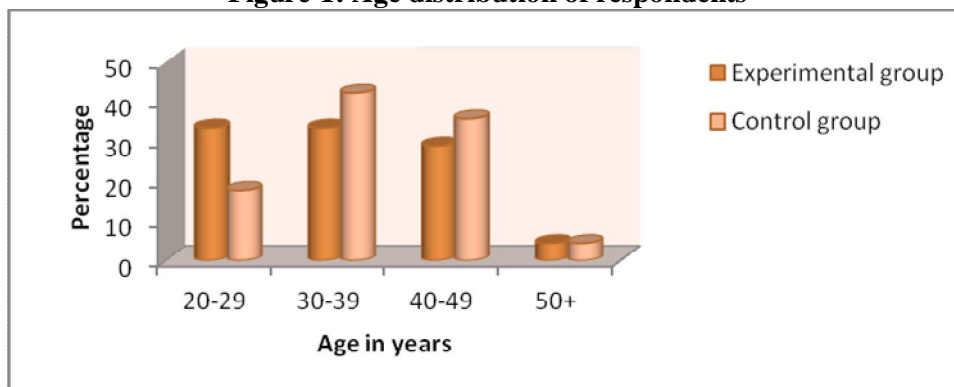


Figure-2: Gender distribution of respondents

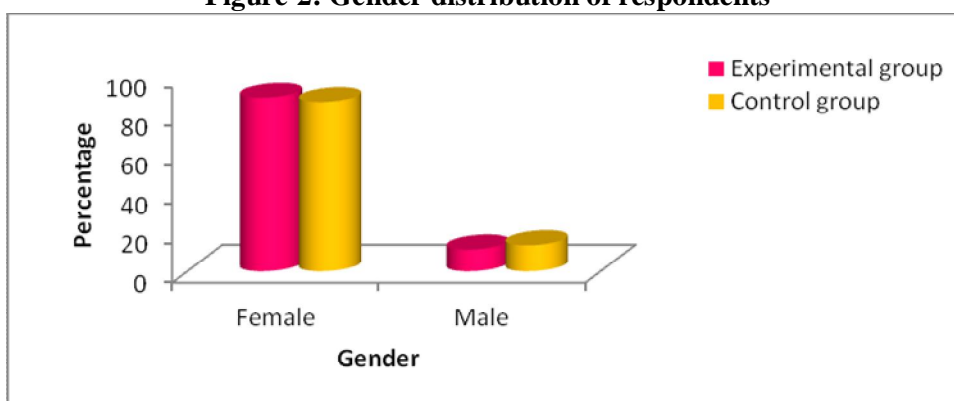


Figure-3: Educational qualifications of the respondents

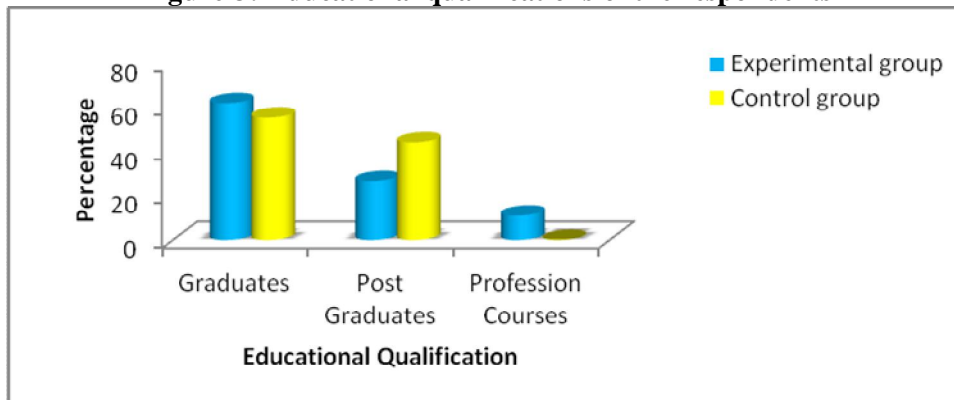


Figure-4: Work experience of the respondents

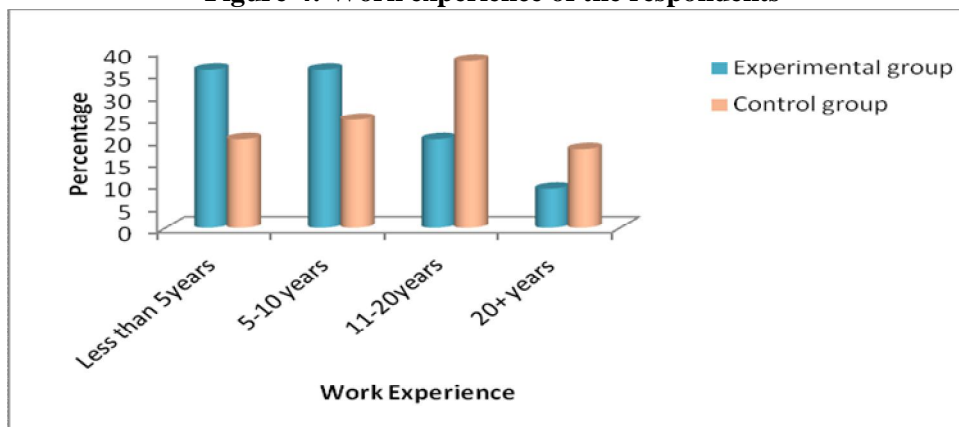


Figure 1 to figure 4 provides the demographic details of the respondents considered for the study. From the table it can be inferred that;

AGE

Figure 1 shows that the majority (42.2%) of the experimental group respondents were in the age group of 30-39 years while majority (37.8%) of the control group respondents were in the age group of 40-49 years followed by 30- 39 years (28.9%). An examination of Figure 2 reveals that in both the experimental and control group majority (88.9% and 87.8% respectively) of the respondents were female. This could be due the cultural beliefs of men 'naturally' wanting to go into technical careers in science and technology, and carer roles being viewed as a "natural female" trait (Drudy et al, 2005). This has led to a social construction of the primary teacher being synonymous with constructs of 'female' and 'mother' (Smith, 2004).

EDUCATION AND EXPERIENCE

Figures 3 and 4 reveals that majority of both the experimental group and control group (62.2% and 55.6% respectively) respondents were qualified at the bachelor degree level .Highest percentage of the experimental group respondents had less than 10 years of experience while majority (37.8%) of the respondents in the control group had 20-25 years of experience.

Table-1: Pre –Post Assessment of Adaptability Skill

Overall Adaptability	Experimental group	Control group	P Value	Effect size
Pre Test	88.33±13.71	91.27±17.87	0.3836	0.184599
Post test	98.44±11.35	91.34±17.76	0.0263*	0.476392
P value	<0.001**	0.137	-	

When the experimental group respondents were compared to control group respondents a non significant difference was observed in the pre test scores while a suggestive significant difference was noted in the post test scores. Within the experimental group respondents a strongly significant differences was observed between pre and post test scores.

Hence the hypothesis (1) stating that "The intervention program will not have any significant influence on the overall adaptability skills of the respondents" has been rejected.

Table-2: Pre and Post Assessment of problem solving skills

Problem solving	Experimental group	Control group	P Value	Effect size
Pre Test	93.21±16.78	90.60±16.44	0.4581	0.157126
Post test	100.47±10.86	90.61±16.41	0.006**	0.708612
P value	0.001**	0.493	-	

It can be understood from the Table that there was a **strongly significant difference** between the pre and post test scores among the experimental group respondents. When the experimental group respondents scores were compared with the control group respondents scores a non significant difference was noted in the pre test scores while a **strongly significant difference (0.006**)** was observed in the post test with medium (0.70) effect size. This shows that the intervention program was very effective.

Hence the hypothesis (2a) stating that "The intervention program will not have any influence on the Problem solving dimension of adaptability" has been rejected.

Table-3: Pre –post assessment of Reality testing Dimension

Reality Testing	Experimental group	Control group	P Value	Effect size
Pre Test	84.74±14.02	88.40±17.91	0.2833	0.227569.
Post test	93.32±12.56	88.41±17.89	0.1354	0.317666
P value	<0.001**	0.448		

Table 3 shows that there was a **strongly significant difference** among the experimental group respondents between pre and post test scores in the reality testing dimension. When the experimental group respondents scores were compared with the control group respondents scores a non significant difference was noted in both the pre and post test scores.

Hence the hypothesis (2b) stating that "The intervention program will not have any influence on the Reality testing dimensions of adaptability" has been rejected.

Table-4: Pre-post assessment of Flexibility dimension

Flexibility	Experimental group	Control group	P Value	Effect size
Pre Test	94.19±14.95	91.97±15.73	0.4944	0.144673
Post test 1	103.41±10.91	91.96±15.76	<0.001**	0.844788.
P value	<0.001**	0.621		

The table 4 depicts a **strongly significant** difference between the pre and post test scores among the experimental group respondents. This indicates that the intervention program has influenced the participants flexibility dimensions scores.

When the experimental respondents were compared to control group respondents a non significant differences was observed in the pre test scores while a strongly significant difference with large (0.84) effect size was noted in the post test scores.

Hence the hypothesis (2c) stating that “The intervention program will not have any influence on the Flexibility dimension of adaptability” has been rejected.

CONCLUSION

Adaptability is the extent to which an individual is able to employ strategies to help them best manage situations of change, novelty, and uncertainty. Adaptability skills are very much essential for teachers because they are frequently faced with challenging situations that require adaptability. Developing an attitude that embraces such challenges and supports deftly adapting to fit the needs make teachers critical role in their organizations and in their students' education. Hence the present study focussed on improving the adaptability skills of teachers through an intervention program. The results of the study revealed that the intervention program has strongly influenced adaptability skills of the respondents.

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A STUDY ON THE EFFICACY OF EMPLOYEE TRAINING AND DEVELOPMENT

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ABSTRACT

This study is an earnest effort to analyze the effectiveness of training and development among the employees of SE ELECTRICALS LTD, Coimbatore. The purpose of the study is to evaluate the training programmes, to justify the worthiness of the training programmes, to give a feedback of the training results, to make necessary changes in the training needs and the development needs of the individuals and to propose the suitable solution in order to improve the training programmes in future. The study conducted among 100 employees of different categories from various departments (Production, Human Resource, Quality Control, Stores and Testing) of the company. The sampling technique used is Simple Random Sampling and the data is collected through questionnaire method. The statistical tool used is percentage analysis, Chi – Square analysis and weighted average method. The analysis of the data exposed that all the employees had an opportunity to attend training programmes. The employee's attitude towards training is positive in terms of necessity and participation. But the training requirements of the employees were not considered for the preparation of training programme. The study clearly establishes the scope for improvement in organizing and conducting the training programmes in the company.

Keywords: Effectiveness, Training, Development, Improvement, Quality Control.

1. INTRODUCTION

Training and development is very vital in any company or organization that aims at progressing. Training merely refers to the method of feat the essential skills needed for a definite job. It targets specific goals, for instance understanding a process and operating a certain machine or system. Career development, on the other side, puts emphasis on broader skills, which are applicable in a wide range of situations. This includes deciding, thinking creatively and managing people. Help in addressing employee weaknesses. Every worker will have certain weaknesses in their workplace, which hinder them from giving the best services. Training assists in eliminating these weaknesses, by strengthening workers' skills. A well organized development program helps workers gain similar skills and information, thus bringing them all to a higher uniform level. This merely means the complete personnel is reliable, so the company or organization doesn't have to rely only on specific employees. A properly trained worker becomes a lot of privy regarding procedures for numerous tasks. The employee confidence is additionally boosted by coaching and development. This confidence comes from the actual fact that the worker is absolutely conscious of his/her roles and responsibilities. It helps the worker to carry out the duties in a better way and even find new ideas to incorporate in the daily execution of duty. A well organized coaching and development program offers the workers' constant information and knowledge. Consistency is extremely very important once it involves AN organization's or company's procedures and policies. This principally includes body procedures and ethics throughout execution of duty. Training and development makes the employee feel satisfied with the role they play in the company or organization. This is driven by the nice ability they gain to execute their duties. They feel they belong to the corporate or the organization that they work for and also the solely thanks to reward it's giving the simplest services they will. Through training and development the employee acquires all the knowledge and skills that is to be performed in their day to day tasks. Workers will perform at a quicker rate and efficiently so increasing overall productivity of the corporate. They also gain new tactics of overcoming challenges. Employees gain customary strategies to use in their tasks. They are additionally ready to maintain uniformity within the output they provide. This results in giving services or goods with improved quality. Training and development results with optimum utilization of resources during a company or organization. There is no wastage of resources, which may cause extra expenses. Accidents. are also reduced during working. All the machines and resources are used economically, reducing the expenditure. The moment they gain the mandatory skills and information, workers can become a lot of assured. They will become self reliant and require only little guidance as there will be improvements in their performance. This relieves supervisors' from giving the constant directions on what should be done.

2. OBJECTIVES

- To analyze the intelligence of the trainers
- To find out the relevance of training programmes to that of the current job
- To analyze the satisfaction levels of the employees to the different trainings

3. RESEARCH METHODOLOGY

Research Methodology comprises of defining & redefining problems, collecting, organizing & evaluating data, making deductions and researching to conclusions. The technique of sampling has been employed in the analysis of the info. Random sampling from a finite population refers to that method of sample selection which gives each possible sample combination with an equal probability of being picked up and each item within the entire population have associate equal likelihood of being enclosed within the sample. This sampling is while not replacement i.e) once associate item is chosen for the sample, it cannot seem within the sample once more.

4. REVIEW OF LITERATURE

Anupama Narayan and Debra Steele-Johnson had found that Employee's development, and more specifically training, can help individuals and organizations work more effectively adapt to the changing environment and achieve individual and organizational goals.

Kules had found that Performance and attitudinal outcomes were generally examined across four training designs: classroom training only, classroom training with self-coaching, classroom training with multi- source feedback and classroom training with self-coaching and multi- source feedback.

Bivainis, Morkvenas had found that Constant changes take place in the internal and external levels of business units. It is necessary for the organization to reconstitute and reinforce the human assets to adapt itself to changes. Business doesn't have unanimous methodologies for analysis and it depends on quality.

Bates and Davis had found that quality coaching[of coaching] programme is feasible only if the beginner is in a position to observe the theoretical aspects learned in training programme in actual work surroundings. They highlighted the use of role playing, cases, simulation, mediated exercises, and computer based learning to provide exposure to a current and relevant body of knowledge and real world situations.

David Mc Guire and Mammed Bagher had found that Diversity training has a significant role to play in fostering greater equality, inclusion and fairness in the workplace. Finally they say that as globalization effects increase and the participation of diverse groups in the workplace grows, there is a clear need in the field of Human Resource Development.

Muhammad Zahid Iqbal had found that Most influencing training characteristics was training method followed by training management, training objectives, training environment, and trainer.

Karthik.R had found that coaching objectives tell the beginner that what's expected out of him at the tip of the educational program. Training objectives area unit of nice significance from variety of neutral perspectives; Trainer, trainee, designer, evaluator.

5. ANALYSIS AND INTERPRETATION.

5.1. Organized Programmes Are Relevant To the Work

Organized programmes are relevant to work	No of respondents
strongly agree	12
Agree	76
neutral	7
Disagree	4
strongly disagree	1
Total	100

Table No-1: Organized Programmes are relevant to the work

From the above table it is inferred that 12% of the respondents strongly agreed that the organized programmes are relevant to the work, 76% of the respondents agreed that the programmes are relevant to the work, 7% of the respondents either agreed or disagreed that these are worthy and 4% of the respondents disagreed to this statement whereas 1% of the respondents strongly disagreed to this statement.

5.2 There Is a Transformation of Knowledge

Transformation of knowledge	No of respondents
strongly agree	8
Agree	66
neutral	21
Disagree	5
Total	100

Table No-2: Transformation of Knowledge.

From the above table it is inferred that 8% of the respondents strongly agreed that there is a transformation of knowledge in the training sessions, 66% of them agreed to this statement, 21% of the respondents either agreed or disagreed to this statement and 5% of the respondents disagreed to the statement that there is a transformation of knowledge

5.3 Growth of New Thoughts and Process by the Training

Growth of new thoughts and process	No of respondents
strongly agree	18
Agree	55
neutral	25
Disagree	2
Total	100

Table No-3: Growth of new thoughts and process by the Training

From the above table it is inferred that 18% of the respondents strongly agreed that there is a growth of new thoughts and process by the training, 55% of them agreed that there is a growth of new thoughts and process, 25% of the respondents either agreed or disagreed to this statement and 2% of them disagreed to this statement.

5.4 Ability to Meet Anticipated Future Changes Through Training

Ability to meet anticipated future changes	No of respondents
strongly agree	10
Agree	41
neutral	49
Total	100

Table No-4: Ability to Meet Anticipated Future Changes Through Training

From the above table it is inferred that 10% of the respondents strongly agreed that the skills acquired from training helps to meet the anticipated future changes in the industry, 41% of the respondents agreed to this statement, 49% of the respondents either agreed or disagreed to this statement.

5.5 Chi Square Analysis

H0: There is no relationship between consideration of training as a part of organizational strategy and improvement in terms of quality and quantity

H1: There is a relationship between consideration of training as a part of organizational strategy and improvement in terms of quality and quantity

This table shows the relationship between consideration of training as a part of organizational strategy and improvement in terms of quantity and quality

Content	Value	df	Significance Value
Pearson Chi- Square	27.836(a)	9	0.03
Likelihood Ratio	22.174	9	
Fisher's Exact Test	21.082		
Linear-by-Linear Association	4.938(c)	1	
N of Valid Cases	100		

Table No-5: consideration of training as a part of organizational strategy and improvement in terms of quality and quantity

The chi square value is .030 at 95% confidence level. Since the chi square value is lesser than 0.05 the null hypothesis is rejected. ie) There is a relationship between consideration of training as organizational strategy and improvement in terms of quality and quantity.

6. FINDINGS

60% of the employees are male and 40% of the employees are female. 63% of the employees have completed diploma/ITI and the rest are graduates and post graduates. 29% of the employees possess 2 – 5 years of experience and the rest possess more than 6 years of experience. 37% of the employees have attended more than 10 training programmes. It is found that 57% of the employees say that the subject knowledge of the trainers are good. 56% of the employees agreed that their trainers have good ability to solve the queries. 78% of the employees agreed that the organized training programmes are worthy. 55% of the employees disagreed that these are waste of time and 6% agreed that these programmes are waste of time. 73% of the respondents are satisfied with the training provided by T&D on the voluntary request and 75% are satisfied with the training on the new product introduction. 66% agreed and 21% have given their neutral feedback on the transformation of knowledge from the training. 12% of them strongly agreed that the knowledge acquired by them can be shared with others. About 89% of the employees said that they can improve employer employee relationship through training. 54% of the employees said that agreed that there is an improvement in terms of both quality and quantity through training. About 66% of them said that training programmes are helpful in achieving organizational goals

7. CONCLUSION

The study was carried at SE Electricals Ltd to analyze the efficiency of training and development that is provided to the employees. From the research, I understand that Training and development department of SEEL frequently conducts various training programmes with the objectives of improving the employee efficiency. In a nutshell, the training programmes offered by the company are good and appropriate but still the quality of training in some aspects is not up to the level. So the company has to analyze and find out the suitable factors to be included in the training methodology and I think my suggestions will help the T&D to make these training programmes more efficient.

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LITERATURE REVIEW: SYNTHESIS OF ZNO NANO PARTICLES USING NATURAL AND SYNTHETIC METHODS

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ABSTRACT

Nowadays many efforts have been made for achieving ZnO Nanoparticles through the various approaches to obtain desired shapes. The present paper discussed about these methods such as Microemulsions, molucualr beamepitaxy, spray pyrolysis, common thermal evaporation, and chemical varour methods. The present paper portrays a brief review of the methods that have been used for synthesise and characterizes Zinc Oxide nanoparticals

Keywords: Zinc Oxide, nanoparticals, Nanoparticles Microemulsions

1. INTRODUCTION

Wang (2004) research exhibits that using solid–vapour phase thermal sublimation technique, nanocombs, nanorings, nanohelices/nanosprings, nanobelts, nanowires and nanocages of ZnO have been synthesized under specific growth conditions. ZnO is a semiconducting, piezoelectric and pyroelectric material. Utilizing individual nanobelts, devices and applications have been demonstrated for field effect transistors, gas sensors, nanoresonators and nanocantilevers. These derives will have important applications in nanosystems and biotechnology.

Moreover, unlike their bulk counterparts, nanoparticles have reduced size associated with high surface/volume ratios that increase as the nanoparticle size decreases. As the particle size decreases to some extent, a large number of constituting atoms can be found around the surface of the particles, which makes the particles highly reactive with prominent physical properties. Nanoparticles of particular materials show unique material properties, hence, manipulation and control of the material properties via mechanistic means is needed. In addition, synthesis of nanoparticles having uniform shape and size via easy synthetic routes is the main issue in nanoparticle growth. For the past decade, scientists have been involved in the development of new synthetic routes enabling the precise control of the morphology and size of the nanoparticles. In addition, nanoparticle synthesis can be possible via liquid (chemical method), solid, and gaseous media [3–15], but due to several advantages over the other methods, chemical methods are the most popular methods due to their low cost, reliability, and environmentally friendly synthetic routes, and this method provides rigorous control of the size and shape of the nanoparticles. In general, nanoparticles with high surface-to-volume ratio are needed, but the agglomeration of small particles precipitated in the solution is the main concern in the absence of any stabilizer. In this regard, preparations of stable colloids are important for nanoparticle growth. In addition, nanoparticles are generally stabilized by steric repulsion between particles due to the presence of surfactant, polymer molecules, or any organic molecules bound to the surface of nanoparticles. Sometimes van der Waals repulsion (electrostatic repulsion) also plays important role in nanoparticles stabilization.

2. RELATED WORKS

McLaren et al., (2009) study illustrated the photolytic activity of ZnO crystals and states that it would be better to deduce the specific photo-catalytic activity of a particular crystallographic plane (100, 101, 001) if one could compare quantitatively its surface area. Such quantitative analysis could be compared with photo-catalytic behaviour of ZnO surfaces made using UHV methods. Since these process of ZnO fabrications have shown a pronounced effect on size and shape dependent catalytic activity.

Alias et al., (2010) concluded that ZnO nanoparticles were processed at different pH values by the sol–gel process and centrifuged at 3000 rpm within 30 minutes. The ZnO powders agglomerate when synthesized in acidic and neutral conditions (pH 6 and 7). They stated that Fine powders were obtained when the pH of the sols was increased to 9. The maximum crystallite size of the ZnO powder was obtained at pH 9. The particles sizes of the ZnO synthesized ranged between pH 6 and 11 were in the range of 36.65–49.98 nm. Ultraviolet–visible studies (UV–vis) also revealed that ZnO processed ranging from pH 8 to 11 has good properties with band gap energy (E_g) between 3.14 and 3.25 eV.

Sangeetha et al.,(2011).reported on the production of nanostructure zinc oxide particles by both chemical and biological process. Highly stable and spherical zinc oxide nanoparticles are produced by using zinc nitrate and Aloe vera leaf extract and stated that greater than 95% conversion to nanoparticles has been achieved with aloe leaf broth concentration greater than 25%. Structural, morphological and optical properties of the synthesized

nanoparticles have been characterized by using UV–Vis spectrophotometer, FTIR, Photoluminescence, SEM, TEM and XRD analysis. SEM and TEM analysis shows that the zinc oxide nanoparticles prepared were poly dispersed and the average size ranged between 25 to 40 nm. The particles obtained have been found to be predominantly spherical and the particle size could be controlled by varying the concentrations of leaf broth solution.

Bora et al.,(2011) research conclude that Zinc oxide (ZnO) nano-rods decorated with gold (Au) nanoparticles have been processed and used to fabricate DSSE- dye-sensitized solar cells. The pico-second resolved time-related/dependent singlephoton-count TSCPC spectroscopy technique was used to study the charge-transfer mechanism in the ZnO/Au-nano composite DSSC. Due to the formation of the Schottky barrier at the ZnO/Au interface and the higher optical absorptions of the ZnO/Au photo-electrodes arising from the surface plasmon absorption of the Au nanoparticles, enhanced powerconversion efficiency (PCE) of 6.49% for small-area (0.1 cm²) ZnO/Au-nano composite DSSC was achieved compared to the 5.34% efficiency of the bare ZnO nanorod DSSC. They concluded that incorporation of Au nanoparticles into the ZnO-nano rod photo-electrode led to higher optical absorption by the photo-electrode and high dye intake, resulting in an ~35% enhancement in the photocurrent in the case of the ZnO/Au-nano composite DSSC (active area = 0.1 cm²) with J_{sc} equal to 14.89 mA/cm² compared to the bare ZnOnanorod DSSC with J_{sc} equal to 11.01 mA/cm². As a result, the overall power-conversion efficiency was increased ranging from 5.34%- 6.49% for the small-area (0.1 cm²)

Thaweesaeng et al.,(2013) research explained Pure ZnO and Cu-doped ZnO nano-powders (1, 2, 3, 4 and 5 wt% Cu) were synthesized by co-precipitation method without further postheat treatment .It reveals that's synthesized ZnO and Cudoped ZnO nano powders have been successfully prepared using co-precipitation technique. The XRD results confirmed that the crystal structure of all not synthesized samples is hexagonal wurtzite with a average crystallite sizes is approximately 25-27 nm corresponding to inter-planar spacing, lattice constant and micro-strain of as-synthesized powders.

Jain et al., (2013) study concluded that a positive correlation between zinc metal tolerance ability of a soil fungus and its potential for the synthesis of zinc oxide (ZnO) nanoparticles. A total of 19 fungal cultures were isolated from the rhizospheric soils of plants naturally growing at a zinc mine area in India and identified on the genus, respectively the species level available. *Aspergillus* isolate NJP12 has been shown to have a maximum zinc metal tolerance ability and a potential for extracellular synthesis of ZnO nanoparticles under ambient conditions. UV–visible spectroscopy, Fourier transform infrared spectroscopy, X-ray diffraction analysis, transmission electron microscopy, and energy dispersive spectroscopy studies further confirmed the crystallinity, morphology, and composition of synthesized ZnO nanoparticles. Their results revealed the synthesis of spherical nanoparticles coated with protein molecules which served as stabilizing agents. Investigations on the role of fungal extracellular proteins in the synthesis of nanoparticles indicated that the process is nonenzymatic but involves amino acids present in the protein chains.

Bagabas, et al.,(2013).This paper deals with a simple, fast, cost-effective, room-temperature wet chemical route, based on cyclohexylamine, for synthesizing zinc oxide nanoparticles in aqueous and enthanolic media was established and tested for the photodegradation of cyanide ions. The paper concludes that Zinc oxide nanoparticles were readily prepared at room temperature from zinc nitrate hexahydrate and cyclohexylamine either in aqueous or ethanolic medium. The calcined ZnOE had a regular, polyhedra morphology while the calcinedZnOW had irregular spherical morphology, mixed with some chunky particles. The morphology was a key factor in the superior photocatalytic behavior of ZnOE over that of ZnOW. The differences in morphology and photocatalytic behavior are strongly influenced by the physicochemical properties of the synthesis medium.

Sindhura et al.,(2013) study explained the biogenic zinc nanoparticles were synthesized using the leaves of *Parthenium hysterophorus* by green synthesis method. UV–VIS absorption spectroscopy was used to monitor the quantitative formation of zinc nanoparticles. The properties of the synthesized zinc nanoparticles were studied using scanning electron microscopy and nanoparticle analyzer. Zinc nanoparticles were seen to be spherical in shape with size ranged between 16-108.5 nm. They came to a conclusion that the zinc nanoparticles were synthesized using *Parthenium hysterophorus* leaf extract by green synthesis method. The optical absorption peaks recorded at 327.50 and 330.00 nm confirms the formation of zinc nanoparticles. The estimated particle size was 16.10– 58.60 nm, grain size was 108.50 nm and zeta potential was 100.40–117.20 mV, respectively. Sample-1 (100 %) exhibited maximum zeta potential and minimum particle size. The enzyme and microbial activities and physiological traits were tested with the help of sample-1, which resulted in significant variations among the nanoparticles treated samples compared to the control. The potential microbial activity of as prepared zinc nanoparticles is different variety. Zinc nanoparticles coupled with microbial activity promises potential applications in agriculture where zinc is one of the essential micronutrients which is need to be supplied to the crop plants.

Alenezi et al.,(2014) research emphasizes on the path for structure induced enhancement of gas sensing performance by designing a desirable nanostructure, which could also be extended to synthesize other metal oxide nanostructures with superior gas sensing performance. As a result it concludes, novel hierarchical ZnO structures built by growing secondary ZNWs with controllable density on initial 1D and 2D ZnO nanostructures have been produced on a vast scale through a simple and economical hydrothermal process. Control experiments reveal that the formation of these hierarchical structures is based significantly on the concentration of the growth solution as well as the growth time and PEI concentration. Essentially, the grown hierarchically structured ZnO has displayed a strong structure induced enhancement of gas sensing performance with a much better sensitivity toward acetone and fast response compared to other mono-morphological ZnO, such as ZnO nanoparticles, nanorods, and nanosheets. This is primarily attributed to their high surface-to-volume ratio, increased strength of active (0001) exposed facets as well as the formation of the secondary NW–initial nanostructure junctions. These hierarchical ZnO structures are also expected to be useful for other applications such as dyesensitized solar cells and photo-catalysis.

Khalil et al., (2014) research reports that ZnO nanoparticles were obtained by thermal decomposition of a binuclear zinc (II) curcumin complex as single source precursor. Research explained that low heat energy was applied to degrade the organic moiety. Nanoparticles with a size ranging from 117 ± 4 nm were obtained from an easily prepared organic moiety consisting metal complex precursor. Such a type of precursors has potential for synthesizing metal oxide nanoparticles.

Kumari et al., (2015) studied influence of nitrogen doping on structural and optical properties of ZnO nanoparticles. Undoped and N doped ZnO nanoparticles were synthesized by using chemical precipitation method. The prepared samples were differentiated through X-Ray Diffraction technique (XRD), Transmission Electron Microscopy (TEM) equipped with Energy Dispersive X-ray (EDAX) spectroscopy, UV–visible spectroscopy, Fourier Transform Infrared (FTIR) and came to a conclusion that the formation of impurity free wurtzite phase for undoped and N doped samples was uncertain through XRD analysis. The crystallite size was found increasing with increase in N doping concentration.

Sutradhar et al.,(2015) research conducted on the synthesis of zinc oxide (ZnO) nanoparticles and its composite with natural graphite (NG) powder for application in solar cells working. ZnO nanoparticles were prepared using green tea leaf extract as non-toxic and eco-friendly reducing material under microwave irradiation. A facile approach has been reported using green tea leaf extract, acting as reducing agent for the synthesis of ZnO nanoparticles of well-defined dimensions in bulk amount. Excellent reproducibility of these nanoparticles, without using any additional capping agent or stabilizer, will have a huge advantage as compared with microbial extraction, avoiding all the difficult and hygienic problems. ZnO nanoparticles were successfully used to produce thin film of ZnO/NG composite material for photovoltaic application.

Sutradhar et al., (2016) study used green synthesis of zinc oxide nanoparticles (ZnO) by thermal method and under microwave irradiation using the aqueous extract of tomatoes as non-toxic and also nature-friendly reducing material. They concluded that microwave-assisted green chemistry has been used for the preparation of ZnO NPs. A facile approach has been reported using tomato extract, acting as reducing agent for the synthesis of ZnO NPs of well-defined dimensions in huge amount. This eliminated the need of toxic chemicals for the production of nanoparticles. The synthesis has been done by thermal process as well as under microwave irradiation using different power and the synthesized nanoparticles were successfully used to prepare nanocomposites for photovoltaic application.

Hasnidawani et al.,(2016) study conducted to synthesize zinc oxide nanostructures with the most practical ways by making use of sol-gel method and characterize the nanostructures. The zinc oxide nanostructure was successfully synthesized by using sol-gel process. Result revealed that the ZnO rod like structure was successfully synthesized by sol gel method in nano-size range about 84.98 nm and exhibit good crystallinity.

Rao et al.,(2016) stated that study has been to use a biologically mediated, low temperature approach for the synthesis of zinc oxide nanoflowers. “Green” methods have a number of advantages over conventional approaches; these include the use of environmentally benign reactants and its economic feasibility. The cell free extract of *Chlamydomonas reinhardtii*, a fresh water microalga was used to synthesize the nanoflowers. The nanoflowers were composed of individual nanorods that assembled to form flower-like structures. The nanorods measured 330 nm in length and these nanorods self-assembled to form porous nanosheets that were found to measure 55–80 nm. Particle size analysis revealed that the larger porous nanoflowers approximately measured 4 μ m. Powder X-ray diffraction studies revealed that the zinc oxide nanoflowers had a hexagonal wurtzite crystal structure. Fourier transform infrared spectroscopy analysis suggested that algal biomolecules were responsible

for the synthesis and stabilization of zinc oxide nanostructures. These nanoflowers demonstrate enhanced photocatalytic activity against methyl orange (MO) under natural sunlight.

Mohan, et al.,(2016) conducted a study on the preparation of zinc oxide nanoparticles using conventional process and the preparation using surfactant and with characterization of the prepared zinc oxide using Scanning Electron Microscopy (SEM) and X-Ray Diffraction in order to find out which method is more feasible in terms of particle agglomeration, particle size, particle separation. They stated that zinc oxide nanoparticles were successfully prepared with and without using surfactants. The characterization results it's clear that the conventional method of preparation highly affected by particle agglomeration and also the particle separation is not good enough. And the most important thing is that the particle size of zinc oxide prepared using PVA is in the nano meter's range whereas in conventional method of preparation particle size in the micron range.

Hameed et al.,(2016) pure ZnO and Neodymium (Nd) doped ZnO nanoparticles (NPs) were synthesized by the co-precipitation method. The synthesized nanoparticles retained the wurtzite hexagonal structure. From FESEM studies, ZnO and Nd doped ZnO NPs showed nanorod and nanoflower like morphology respectively. The FT-IR spectra confirmed the Zn-O stretching bands at 422 and 451 cm^{-1} for ZnO and Nd doped ZnO NPs respectively. From the UV-VIS spectroscopic measurement, the excitonic peaks were found around 373 nm and 380 nm for the respective samples and concluded that from the FESEM images, the pure and doped samples were found to exhibit nanorod and nanoflower like morphologies respectively. From the EDAX analysis, the chemical compositions were estimated for the prepared samples. From the recorded FTIR spectra, the various vibrational frequencies were assigned for the pure ZnO and Nd doped ZnO NPs samples. The band gap of ZnO and Nd doped ZnO NPs were estimated as 3.34 and 3.26 eV from the UV-Vis spectroscopic measurements. The photoluminescence studies showed that the doping with ZnO NPs altered the band emission due to zinc vacancies, oxygen vacancies and surface defects.

Pulit-Prociak et al.,(2016) study presents a method for functionalization of textile materials using fabric dyes modified with silver or zinc oxide nanoparticles. Embedding of these nanoparticles into the structure of other materials makes that the final product is characterized by antimicrobial properties. Indigo and commercially available dye was involved in studies. It is worth to note that silver nanoparticles were obtained in-situ in the reaction of preparing indigo dye and in the process of preparing commercial dye baths. Such a method allows reducing technological steps. The modified dyes were used for dyeing of cotton fibers. The antimicrobial properties of final textile materials were studied. *Saccharomyces cerevisiae* strain was used in microbiological test and concluded that the results confirmed biocidal activity of prepared materials.

Rochman et al., (2017) explained the synthesis of ZnO nanoparticles made by Sol-Gel method. The process parameters used are variations in pH, in increasing order, of 7 to 12, in steps of 1 by using two principal reactions method to produce compound oxide, such as hydrolysis and condensation by considering Sodium hydroxide as an agent. Research reveals that greater the pH of the sol-gel will increase the agglomeration of particle and vice-versa.

Datta et al., (2017) research conducted to check the potential of *Parthenium hysterophorus* leaf extracts for the extraction of zinc oxide nanoparticles for their anti-microbial properties. Nanoparticles were extracted with the help of aqueous, methanolic and ethanolic solutions. Synthesised nanoparticles were distinguished using UV-V is spectroscopy with maximum absorbance peak at 400 nm. SEM and TEM analysis illustrate the particles were spherical and cylindrical in shape with average particle size ranging between 16-45 nm.

Matinise et al., (2017) research conducted to develop a better and reliable process for the bio-fabrication of Zinc oxide nanoparticles through green method using *Moringa Oleifera* extract as an effective chelating agent and concluded, Zinc oxide nanoparticles with particle size ranging from 12.27 and 30.51 nm have been successfully synthesized natural by *Moringa-oleifera* extract and characterized using different methods. The XRD and EDS studies have shown that an annealing at about 500°C in air is required for the synthesis of pure wurtzite ZnO phase. This was stated via the XRD investigations shed-lighting on the polycrystalline nature of the nanoparticles.

Ahmed et al., (2017) depicts the Structural, optical, and magnetic properties of Mn-doped ZnO samples deals with the microstructure, optical, and magnetic properties of $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ powder samples with $x = 0.02-0.08$ synthesized by a solid-state reaction method. X-ray diffraction showed that the cell characteristics between a and c , increased with the increase in Mn content, which showed that Mn ions substitute into the lattice of ZnO. It states that Mn-doped ZnO nanopowders have been successfully prepared by a solid-state reaction route. XRD studies showed the incorporation of Mn into the ZnO lattice. UV-v is measurements showed that the band gap decreased due to the decrease in incorporation of Mn. PL studies confirmed the formation of VO in all the

samples. Magnetic measurements revealed that all the samples exhibited RTFM, and the average magnetic moment per Mn atom decreased with the increase both in the Mn content and TA. However, the structural, optical and magnetic investigations showed that FM observed at room temperature is an intrinsic property of the ZnO: Mn powder samples due to VO and defects, and it does not originate from any secondary magnetic phase or cluster formation.

Jiang et al., (2018) argued that Zinc oxide nanoparticles (ZnONPs) are used in an increasing number of industrial products such as rubber, paint, coating, and cosmetics. ZnO NPs have exhibited promising biomedical applications based on its anticancer, antibacterial, anti-diabetic, anti-inflammatory, drug delivery, as well as bio-imaging activity. Due to inherent toxicity of ZnO NPs, they possess strong inhibition effects against cancerous cell and bacteria, by inducing intracellular ROS generation and activating apoptotic signaling pathway, which makes ZnO NPs a potential candidate as anticancer and antibacterial agents. In addition, ZnO NPs have also been well known to promote the bioavailability of therapeutic drugs or biomolecules when functioning as drug carriers to achieve enhanced therapy efficiency. Moreover, with the ability to decrease blood glucose and increase in insulin levels, ZnO NPs have shown the promising potential in treating diabetes and attenuating its complications, which can be further evaluated.

V. CONCLUSION

Zinc oxide nanoparticles (ZnO) have advantages because of its physical, chemical properties, its usage and manufacturing methods. To manufacture this ZnO leads to increases in pollution and environmental hazardous, this paper exhibits the both natural and artificial synthesis of ZnO using different method.

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A CONCEPTUAL STUDY ON INVESTMENT PATTERN OF EMPLOYEES FROM SELECT SECTORS

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ABSTRACT

Investment is the employment of funds with the hope of getting return. It is an activity engaged by people who have savings. Generally salaried people invest their savings in order to lead future requirements. A variety of investment alternatives namely Stock market, Post office savings, gold and Jewellery, Real estate, Life insurance products, Commodity market, Bank deposits and Government securities are available in the market, in which investors deposits their money from the current earnings. This paper tries to explore the factors that influence the investment preference by taking into consideration the various studies conducted on the same and related sectors. This paper tries to highlights on the basic concepts of investment patterns of Individuals belonging to different sectors.

Keywords: Investment, Savings, Employees, Sectors

INTRODUCTION

An investment is a commitment of funds made in the anticipation of some positive rate of return. If the investment is properly undertaken, the return will be proportionate with the risk the investor assumes. The true investor is interested in a good rate of return, earned on a rather consistent basis for a relatively long period of time. Investment preferences differ from Individual to Individual depending on the circumstances in which they invest. The important characteristics of investment are return, risk, safety, income stability, appreciation, liquidity and transferability. Deciding on the selection of investment avenues becomes more complex as plenty of investment alternatives are available in the market. The investors able to invest their money in the various investment alternatives based on their risk tolerance. This paper tries to analyse the basic concepts of investment preferences of employees from select sectors.

OBJECTIVES OF THE STUDY

1. To highlights on the basic concepts of investment patterns of Individuals belonging to different sectors.
2. To explore the factors that influence the investment preferences by taking into consideration the various studies conducted on the same.

REVIEW OF LITERATURE

K V Ramanathan and Dr. K S Meenakshi Sundaram (2015) studied on "A Study on Investment Preferences of Bank Employees" and examined that most of the investors look after the safety of their investment rather than considering high returns. Taking decision on investment avenues becomes quite complex. Researchers have collected primary data from 130 Bank Employees through a close ended questionnaire. From the study, it is proved that investment in Life Insurance being the first preference for Respondents whose investments are up to Rs. 7.5 lakhs and that of respondents above Rs. 7.5 lakhs category prefer gold/ Jewellery as their first preference of investment. Bank deposit and Gold/ Jewellery placed second preferences of investors. Also found that positive correlation exists between the variables Income and Investment. There is strong relationship between the variables. It is proved by Chi-square test that there is significant relationship exist between income and investment of the respondents.

Deepak Sood and Dr. Navdeep Kaur (2015) studied on "A Study of Saving and Investment Pattern of Salaried Class People with Special Reference to Chandigarh" and study analysed that the main objective is to determine the relationship between the savings and investment pattern among the salaried class people of Chandigarh. It is proved from the study that there is relationship between Annual Savings and Age, Income, Sector wise Employment, Education of people at Chandigarh. It was propounded by the study that the most preferred investment options are LIC and Bank Deposits and most of the factors influencing investment decisions were high returns, tax benefits and safety.

Prof. CA Yogesh P. Patel and Prof. CS Charul Y. Patel (2012) studied on "A Study of Investment Perspective of Salaried People (Private Sector) and examined that majority of Investment of Male respondents is in the Stock market and least into Gold but whereas the Female respondents preferences for Government securities and Gold and least into Real estate. And also proved from the study that the majority of Male

respondents invest in those Avenues of Investment where the Return on Investment is more than the Prevailing Market Return. Whereas the majority of Female respondents invest in those Avenues of Investment where the Return on Investment is less than or Equal to the Prevailing Market return.

Dr. Varsha Virani (2013) studied on “saving and investment pattern of school teachers – A study with reference to Rajkot city, Gujarat” and study says that, the objective of the study was to determine the relationship between the savings and investments pattern among the school teachers. The study was done on the different government and private school teachers. The data was collected by distributing a structured questionnaire to 100 school teachers in different schools of Rajkot city. In spite of low income the teachers have been saving for future needs. The major impact on savings is due to the level of income of the school teachers. She analysed that majority of the respondents are saving money as Bank deposits for the safety of an unpredictable future. The main avenues of investment are Bank deposits and the main purpose of investment is for children education, marriage, and security after retirement.

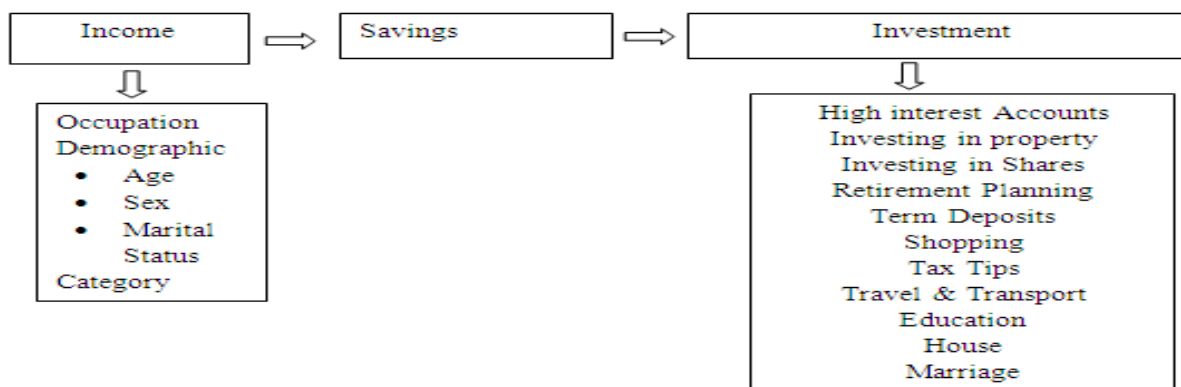
Genanew Timerga, Butte Gotu and Yegnanew Alem(2011) studied on “Statistical analysis of saving habits of employees: a case study at Debre Birhan Town in North Shoa, Ethiopia” The result indicates that 47.29% employees had no saving experience and 52.71% of the respondents have been involved in saving part of their income. It was also found that government employees have lower saving habits than the private employees. The results obtained from the analysis of binary logistic regression indicate that age, education, number of dependent family members, transport service, job satisfaction in the sector, cost of expenditures and inflation significantly affect the saving habits of employees.

Pornanong Budsaratagoon, Suntharee Lhaopadchan, Iain Clacher, David Hiller, Allan Hodgson (2012) studied on “Employee Savings & Investment Preferences in Public Sector Pension Plans” and examined examine the savings and investment preferences of Thai public sector pension plan members. While much research has concerned the savings and investment decisions of private sector workers, very little is known about the investment decisions underlying public sector pension funds and the savings and investment preferences of the employees who are their members. They found that the degree of risk aversion and approach to investment and savings decision-making is heterogeneous across the spectrum of respondents. Public sector employees do not rely solely on their pension contributions to ensure an adequate income in retirement and the range and choice of asset classes are a function of members’ perceived financial sophistication and their approach to savings. The research provides much needed insight into the preferences of public sector workers and the appropriate asset allocation distribution for public pension funds.

Dr. Bhawana Bhardwaj, Dr. Nisha Sharma, Dr. Dipanker Sharma(2013) studied on “ Income, Savings and Investment pattern of employees of Bahra University, Solan and examined that majority of the employees (80) have knowledge about the industrial securities, cross-tabulation of knowledge about securities and income level reveals that as the income of the employee’s increases, awareness about securities also increases. Though 80 percent of the employees are aware of industrial securities but only 8 percent of them are investing in it. Further, analysis shows that some employees have invested in equity shares and very few in debentures while most of the employees do not invest in industrial securities. Further, none of the employees are satisfied with such investments. Thus at last it could be concluded that most of the employees are aware of investments in securities but they are not investing in it as they consider it as an unsafe investment.

CONCEPTUAL FRAMEWORK

From the Review of Literature the conceptual framework has been drawn and it will examine the relationship between income and savings and the role of investment in mediating this relationship.



OBSERVATIONS

1. Majority of the investors invest money their money into safety avenues rather than investing in risky investment avenues
2. From the study it is clear that majority of the investors opt Life Insurance Policy as their first preference of investment. Main reason behind this lack of knowledge on the various investment avenues.
3. It is proved that private sector employees save more than the public sector employees.
4. From the study it is clear that most of the employees are aware of investments in securities but they are not investing in it as they consider it as an unsafe investment.
5. Public sector employees do not rely solely on their pension contributions to ensure an adequate income in retirement and the range and choice of asset classes are a function of members' perceived financial sophistication and their approach to savings.
6. In spite of low income the teachers have been saving for future needs from their earnings.

CONCLUSION

From the various study undertaken, it is evident that most of the employees they save the money from their earnings for children's education, marriage and fulfil the future goals of life. It is also found that most of the investors unaware of various investment avenues and they fail to lead their life in better way. It is clear from the study that, employees they earn but they don't know where exactly they suppose to invest because of lack of knowledge on investment alternatives. In order to build their standard of living they have to save the money from their current earnings.

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PRADHAN MANTRI KAUSHAL VIKAS YOJANA (PMKVY): A UNIQUE WAY TO SKILL DEVELOPMENT

Benny C

ABSTRACT

PMKVY has been found by the Govt of India with an objective of making India the skill capital of world. This project was implemented in 2015 by the ministry of skill development and entrepreneurship for this program providing skill training to the youth of India and by utilizing them for make India, digital India and other various industries such as manufacturing and construction .it enable and mobilize large number of Indian youth to take up skill training and become employable and earn their livelihood.

Keywords: PMKVY, Skill development, employability, skill training, skill capital

INTRODUCTION

A visionary platform to make India a skill capital of the world. It is an interactive skill platform for learning and acquiring new skills. India being one of the world's largest populated countries has almost 70% of population below the age of 30-35 years. An urgent need to provide this strong portion of the population appropriate and vibrant means of livelihood with an emphasis to development of their skills.

It is because only a meager 4% of them have the necessary skills to survive .In a country like India where emphasis has always been on professions like Engineers,Doctors,CA's that relay entirely upon bookish knowledge and memory skills practical training too is confined to the limitations of books. As per 2011 NSSO survey it was then estimated that only 45% of India's total work force went through formal skilled training compared to their US, UK counterparts, being 52% of US ,68% of UK. Therefore under the guidance of central government PMKVY was launched through National Scheme Development Mission.

PMKVY is the flagship scheme of the ministry of skill development and entrepreneurship. The objective of this skill certification skill is to enable a large number of Indian youth to take up industry relevant skill training that will help them in securing a better livelihood. Individuals with prior learning experience or skills will also be assessed and certified under recognition of prior learning. The scheme was subsequently launched on 15 July 2015 on the occasion of world youth skills day. PMKVY is implemented by National Skills Development Corporation under the guidance of the ministry of skill development and entrepreneurship. "With a vision of a skilled India "PMKVY is the flagship scheme that is driving towards greater realization of this vision. The objective of this skill certification scheme is to enable a large number of Indian youth to take up industry-relevant skill training that will help them in securing a better livelihood. Individual with prior learning experience or skills will also be assessed and certified under recognition of prior learning. Under this scheme training and assessment fees are completely paid by the government. The union cabinet owing to the its successful first year of implementation. The union cabinet has approved the scheme for another four years to impart skilling to ten million youth of the country.

OBJECTIVES

- Encourage standardization in the certification process and initiate a process of creating registry of skills
- Enable and mobilize a large number of Indian youth to take up skill training
- Provide monetary award for skill certification to boost employability and productivity of youth by incentivizing them for skill training
- Reward candidate undergoing skill training by authorized institution at an average monetary reward of rupees eight thousand per candidate
- Benefit 25 lakh youth at an approximate total cost of Rs 1500 crores

IMPLEMENTING AGENCY

The scheme will be implemented through the National Skill Development Corporation (NSDC). **National Skill Development Corporation** The National Skill Development Corporation India (NSDC) was setup as a one of its kind, Public Private Partnership Company with the primary mandate of catalyzing the skills landscape in India. The program is ambitious plans to skill 500 million youth by 2020. The NSDC has taken the right approach of understanding the prevailing challenges and then preparing a roadmap that is aligned with industry needs and trainee expectations. Hopefully, the youth will be able to match up to the opportunity and contribute in realizing India's potential as a developed nation.

STEERING COMMITTEE

Steering Committee for PMKVY would be responsible for providing direction for implementation of the scheme. The Steering Committee will be empowered to review the framework and make suitable modification as and when required in the scheme. The Committee will oversee dynamic fixation of targets for skilling, amount of monetary reward by job roles, activities related to awareness building and trainee mobilization, mentorship support. The Steering Committee may appoint sub-committees at national or state level (s) to assist in exercise of its functions. It is recommended that sub-committees at the district level are also formed especially to focus on

FEATURES & BENEFITS OF PMKVY

1. Objective is to train 24 lakh youths
2. To create registry of skills
3. Increasing the productivity of the skilled individuals which would be used for nation's development
4. On an average trainee will get Rs. 8000 as a reward. This would be given by third party assessment body. However in order to receive the reward, trainee will have to appear for assessment test and based on the test results, reward would be given.
5. Training would be provided based on the National Skill Qualification Framework (NSQF) and industry led standards and it would be need based training.
6. Most of the skills do not require any educational qualification or experience.
7. Feedback would be collected by all the trainees who undergo assessment. This will help in calculating the effectiveness of Kaushal Vikas Scheme.

BACKGROUND

Currently, only a very small proportion of India's workforce has any formal skill training. Not surprisingly therefore several sectors of the country's economy face shortage of skilled people and are mired with low productivity levels due to poor quality of workforce. At the same time, large sections of the country's youth are looking for economic and livelihood opportunities. In this context, skill development has become a key priority area for the country. This is not only essential for economic development, but would help to fulfill youth aspirations for good quality, better paid jobs and self-employment opportunities. This would also enable the country to take advantage of its favorable demographic profile. With a large pool of skilled people, India has an opportunity to become a skill provider for the world, particularly the ageing developed world.

Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is the flagship outcome-based skill training scheme of the new Ministry of Skill Development & Entrepreneurship (MSDE). This skill certification and reward scheme aims to enable and mobilize a large number of Indian youth to take up skill training and become employable and earn their livelihood. Under the scheme, monetary reward would be provided to trainees who are successfully trained, assessed and certified in skill courses run by affiliated training providers. This will boost the productivity of the country's workforce by enabling them to acquire high quality skill training across a range of sectors. It will also bring about a paradigm shift from input-based to outcome-based skill training in the country. It also seeks to significantly scale up skill training activities in the country and enable skill training to happen at a fast pace without compromising quality. Institutional arrangements comprising of the National Skill Development Corporation (NSDC), Sector Skill Councils (SSCs), Assessing agencies and Training Partners are already in place for implementation of the scheme.

POLICIES TO BE COVERED**While formally launching the Skill India Campaign, Also launched the Following Development Policies**

1. National Policy for Skill Development and Entrepreneurship 2015: This will offer policy direction to all stakeholders for skill development and growth of entrepreneurship ecosystem.
2. Pradhan Mantri Kaushal Vikas Yojana (PMKVY): Also launched this flagship scheme with the objective of providing reward-based skill training. According to this scheme financial incentive will be offered to those who complete the approved skill training programmes successfully. In the first phase (over the next one year), PMKVY is planning to provide skill training to 24 lakh youth all over India.
3. Recognition of Prior Learning (RPL): The skills of the youth who lack formal certification as well as education will be recognized. This will cover young workers in the country's large unorganized sector. The youths can be accessed on the basis of their skills and they will be Certified for this. Over the next one year, the government aims at certifying 10 lakh youth under the RPL category of PMKVY.

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4. Skill loan: A skill loan initiative will also be started where more than 34 lakh youth, who want to attend skill development programmes, will be given Rs. 5000 to Rs. 1.5-lakh loan.

CONCLUSION

PMKVY scheme is freely accessible and open for everyone. It provides all skill development courses like computer courses, mechanical courses, electrical courses, health care courses etc. which are needed for our life. A person can choose a course as per his own will. The main benefit is person can develop yourself in own choice field. By this people can start their own business and can also generate more employment. Under the scheme trainees will be offered a financial reward and A Govt certification on successful completion of training and assessment which will help them in securing a job for a better future with the help of NSCD the Govt of India started this program for the skill development and entrepreneurship opportunity development. It helps to create income and increase more employment opportunities. The PMKVY was thus envisaged as key measure to impart skill based training to young men and women.

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PRIVACY AND SECURITY SURVEY: IMPLEMENTING RESPONSIBLE RESEARCH OF BIG DATA ANALYTICS USED IN AYUSH SECTOR

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ABSTRACT

Today there are various corporate sectors that generate lot of databases and one of them is AYUSH (Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy) sector. AYUSH sector generates large amount of heterogeneous data sets and we can easily handle these data sets with the help of big data technologies. This paper focuses and applicability of big data technologies in AYUSH, their benefits, challenges, conclusions and highlights the need for large, complex observational and empirical studies and represents the kind of studies that will advance our understanding of cyber security.

Keyword: AYUSH, Hadoop, Map reduce, IoT, Cloud Computing.

1. INTRODUCTION

In December 2013, hackers broke into the St. Joseph Health system server and accessed personal information on approximately 405,000 people in one of the largest healthcare-related breaches in US history. The server that the hackers compromised contained Social Security numbers, birth dates, addresses, and medical information for patients and employees. St. Joseph officials say the intruders' IP addresses were traced to China and several other places. US intelligence officials have advised President Barack Obama's administration to check the new healthcare system's website and network for malware that could threaten the privacy of millions of people. The potentially endangered website and network link more than 300 medical facilities and providers with people who signed up for health insurance under the Patient Protection and Affordable Care Act. In India the era of big data has begun in AYUSH sector. AYUSH sector has large amounts of heterogeneous data such as patient's clinical data, clinical references, claims data, medical imaging data, health surveys etc. This data should be effectively analyzed and managed for selection of appropriate treatment paths, improvement in AYUSH system. These large data sets are difficult to process using traditional data processing applications. The need to process, analyze and manage these massive data sets in AYUSH can be gratified with the use of big data and big data technologies such as Hadoop, IoT (Internet of Things), Cloud Computing.

2. BIGDATA IN AYUSH

Internet's crucial role in modern life, commerce, and government underscores the need to study the security of the protocols and infrastructure that comprise it. For years, we've focused on endpoint security and ignored infrastructure weaknesses. Recent discoveries and initiatives highlight a simple fact: the core is just as vulnerable as the edge.

In the past few years, attackers have increasingly targeted infrastructure. Internet protests, vigilantism, nation-state attacks, distributed denial of service for hire, public-key infrastructure lapses, and the market for 0-day exploits have shifted our attention to the increased risk in which we place not only our data but also our livelihood. The Internet's infrastructure, protocols, and processes are therefore getting attention from researchers, not just practitioners. AYUSH includes patient's care data such as prescribed machines, lab reports, x-ray reports, diet chart etc. to be managed by the use of big data.

Big data is a collection of large and complex digital data based on **4 V's** (Volume, Velocity, Variety, Veracity), followed by three phases – Data Acquisition, Data Organization and Data Processing.

2.1 "4V's" OF BIGDATA IN AYUSH**2.1.1 Volume** – means size of data.

In AYUSH system, volume represents incredible data generated by medical equipments such as radiology images, 3D imaging, biometric sensor readings etc.

The Volume of worldwide health care data estimated to grow 25000 PB (nearly equals to 500 billion 4-drawer file cabinets) by 2020.

2.1.2 Velocity – means how fast the data is being produced to satisfy the requests and demands for making decision based output.

In AYUSH system, with traditional paper files, X-rays etc. velocity of data increases with the data streamed from mounting devices that represents regular monitoring such as blood pressure readings, diabetic glucose

measurements etc. And the ability to perform real time analytics against such high volume data in motion revolutionizes health care.

2.1.3 Variety– means type of data. The data may be structured, unstructured and semi-structured.

In AYUSH system, structured and semi-structured data includes instrument readings, office medical records etc. And unstructured data includes handwritten nurse and doctor notes, radiograph films, MRI and other images.

Use of big data in AYUSH gives efficient ways to combine and convert variety of data including automating conversion from structured to unstructured data.

2.1.4 Veracity– Veracity or “data assurance” deals with uncertain and imprecise data.

Traditional data warehouses were based on assumptions that the data is certain and accurate. But it is not so in big data analytics.

In AYUSH, the data quality issues are extremely important because of life or death decisions based on having accurate information and the quality of AYUSH data. The big data analytics and outcomes are error-free and believable.





Volume	Velocity	Variety	Veracity
			
Data at Rest	Data in motion	Data in many forms	Data in Doubt
TB to XB of data to process	Streaming data	Structured, unstructured	Uncertainty due to data ambiguity

Fig 1: Big Data - 4 "Vs"

3. PHASES OF BIG DATA IN HEALTH CARE SECTOR

Big data analysis in AYUSH followed by three phases – Data acquisition, Data organization and Data processing, because it necessitates a mechanism on how to collect data, organize these data and process it to derive some meaningful information.

3.1 Data Acquisition – Data acquisition is the process of gathering, filtering and cleansing data before the data is placed on some storage location.

AYUSH sector generates large amount of data and Data acquisition in AYUSH involves

- Collection of data from various sources such as case history, medical images etc. and storing it in HDFS (Hadoop Distributed File System).
- Removal of junk data, if exists.
- Filtering of data based on their structure.

3.2 Data Organization – To manage large volume of data, AYUSH system needs some mechanism to take and process data from original storage location.

Apache Hadoop, a big data technology to process these large volumes of data.

3.3 Data Processing – In big data analytics, after the data acquisition and data organization the next step is to query the data.

To respond a query, it necessitates distributed processing of data. Data processing in AYUSH system includes generation of reports after processing data. For example, a report on birth rate in a particular location.

4. NEED OF BIG DATA IN AYUSH

The big data analytics in AYUSH improves the quality of AYUSH by taking into account the following:

4.1 Providing patient centric services: By detecting diseases at earlier stages, minimizing drug doses based on clinical data provides faster relief to patients.

4.2 Providing provider centric services: Big data provides real-time access to patient's clinical data and other significant data for improved decision making and facilitate effective, efficient and error free care.

4.3 Detecting spreading diseases earlier: By analyzing the patients suffering from a disease in a particular location, earlier prediction of viral diseases before spreading is possible. This helps AYUSH professionals to take necessary preventive actions.

4.4 Improving the treatment methods: Continuous monitoring of patients vital signs and based on analysis of continuous monitoring, dosages of medications can be changed for faster relief. This helps in providing customized patient treatment.

4.5 Reduction in AYUSH cost: Use of big data in AYUSH reduces the cost of clinical care.

5. BIG DATA AND TECHNOLOGIES

5.1 Hadoop in AYUSH

Hadoop is the most demanding computing technology for big data processing. It fundamentally changed the way of storing and analyzing information.

Hadoop uses Map reduce as a default algorithm to work with large quantity of data sets. Map reduce divides the work in two phases – mapper phase and reducer phase. Each phase has key or value pairs as an input/output. The key or value pairs are chosen by the user of the program.

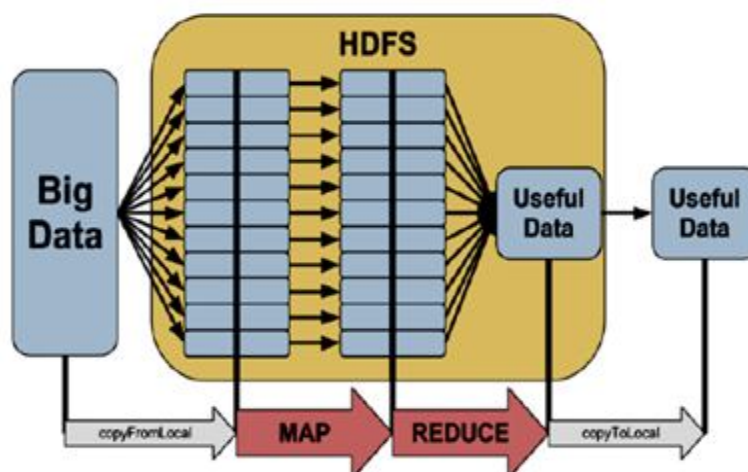


Fig 2: Hadoop's Map Reducing

In AYUSH sector, data is growing day by day, which is difficult to manage and process by AYUSH organizations. Beyond that 80% of medical data is “unstructured” and Hadoop is the only technology that allows AYUSH to store data in its original form.

Hadoop facilitates distributed parallel processing on large volume of data. Hadoop also provides **Hadoop Image Processing Interface (HIPI)** to analyze the large number of medical from various sources and extracts the necessary data to give right diagnosis.

5.1.1 Challenges and suggestion

Even though big data analytics and hadoop for AYUSH optimize the cost there are some challenges like

- Difficult to understand and use by a non technical medical professional.
- Privacy and security issue in real time capturing of data.
- Scalability of data includes capability to handle growing amount of data.
- Also, Hadoop process use-cases into batch processing and AYUSH sector needs real time interactivity with data.

Cloud based technologies and cloud based hadoop can be improves the performance of AYUSH system.

5.2 Cloud Computing in AYUSH

Cloud computing allows use of latest technologies at low cost or we can say at pay-per-use and with minimum resources for clients.

Cloud computing is a technology that supports ubiquity, it supplies on demand access to network for sharing computing resources (for example- networks, storage, application, services etc.) without service providers interaction.

In AYUSH system, cloud computing provides quick access to medical history of each person at any location can speed up diagnosis and treatment quality and saving lives. Also it can help patients to gain access to their medical history from anywhere in the world via Internet.

5.2.1 Challenges and suggestion

Yet cloud computing improves access to information, lowers the cost, increases interoperability but still privacy and security challenges exists.

The use of Private clouds ensures the security of data and communication between various departments of AYUSH sector.

5.3 IoT (Internet of Things) in AYUSH

Internet of things or we can say “Things on internet” is one of the notable technology which has the ability to change and affect the way people work, learn and live. IoT connects everyday objects (like smart phones, sensors, TVs etc.), considered them as smart object and allows them to communicate with each other through internet technologies physically or virtually.

The IoT in AYUSH systems improves access to care, increases quality of care and reduce cost of care. Internet of things used by clinical care to monitor physiological condition of patients through sensors by collecting and analyzing their information and then sending analyzed patient's data remotely to processing centers to make suitable actions. For example, monitor an aging family member, continuous heart rate monitoring etc.

5.2.1 Challenges and suggestion

Since both patients and providers stand to benefit from IoT in AYUSH but there may be a possibility of overloading of physician with too much data, results in distracting the treatment paths.

6. CONCLUSION

The program is designed to develop software that can work with big datasets without causing errors or crashing under the sheer volume of information, which is a priority of technology policy. Big data analytics has potential to transform AYUSH sector and with the digitization of health information most AYUSH system can do plenty with the help of big data technologies. This paper includes various technologies and their possible challenges in AYUSH sector with some possible suggestions. With more advancement in big data analytics, the future of AYUSH is promising. The **National Institute of Standards and Technology (NIST)** has released its long-awaited cyber security framework—a set of voluntary guidelines designed to help organizations make their communications and computing operations safer. The framework's core component lists high-level activities and reference information regarding security-related issues such as how to identify risks, protect against threats, and respond to and recover from attacks. The profile component helps organizations make sure their cyber security approach aligns with their business requirements, risk tolerances, and resources. The implementation-tier component offers a way for organizations to examine their cyber security approach and processes.

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THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON FINANCIAL PERFORMANCE OF NSE LISTED MID-CAP AND SMALL-CAP COMPANIES

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ABSTRACT

The study examines the impact of CSR on financial performance of Mid-Cap and Small-Cap companies and also studies the relationship between CSR and financial performance of Mid-Cap and Small-Cap companies, as the past researchers have omitted the variables that governs the association between CSR and financial performance leading to Mid-Cap and Small-Cap companies. Our study is based on secondary data where 50 samples are collected from NSE listed which is inclusive of 25 each for Mid-Cap and Small-Cap companies for period of 5 years (April 2012 to March 2017). The implication of our study aims at serving for the growth and development in the field of CSR which helps in increasing the shareholders' wealth, financial performance and long-term benefits that leads to increase in productivity and efficiency simultaneously. From the empirical indication of the study it is observed that there is a significant impact and positive relationship of CSR on financial performance of NSE listed Mid-Cap and Small-Cap companies of India. The finding of the study is vibrant that CSR is a treasured and rear resource. It can be effectively utilized as one of the superlative business strategies to create a competitive advantage of Mid-Cap and Small-Cap companies.

Keywords: Corporate Social Responsibility, Financial Performance, Mid-Cap Small-Cap.

INTRODUCTION

CSR is a business organization's arrangement for social values, practices of social approachability, policies, plans, and evident outcomes as they rely on the firm's financial performance. Old concept of business was only to do business that is profit maximization. New concept of business includes both economic and social features in order to create customer loyalty and good corporate citizenship. CSR activities include the actions that goes beyond the legal requirements along with the pressure from various stakeholders. CSR drives a business in successful route, they are intrinsic in nature. CSR is a key marketing tool as per managers' significance in order to enrich an affirmative reaction from consumers. Many researchers have done their studies based on relationship between CSR and financial performance of the companies and have demonstrated a positive relation between CSR and financial performance. This study focuses on the Mid-Cap and Small-Cap firm's effect on the financial performance with reference to CSR. Mid-Cap and Small-Cap companies' participation is low in taking up the CSR activities when they are compared with large scale companies. Mid-Cap and Small-Cap companies are facing constraints due to firm size, lower management and constraints in resource accessibility which results in decreasing the financial performance. The association of CSR and financial performance is different for each firm because it depends on internal Capability of a firm and outside investment policy of a firm (Sunghee Lee, 2016).

STATEMENT OF PROBLEM

At present every scale of business are taking up CSR activities as it is one of the best strategies to increase companies long-term return and stakeholders' wealth, also there is a significant evidence to prove the companies has positive impact on their financial performance through CSR activities but it has not evidently proved for Mid-Cap and Small-Cap companies apart from their larger counterparts. So, this study aims at explore whether there is any gap between CSR practices of Mid-Cap and Small-Cap companies and to state if any connection between CSR and its effect on financial performance? if yes, then is it impacted negatively or positively.

REVIEW OF LITERATURE

Investment in CSR brings some financial returns as there are many contingencies that causes variability in returns to CSR (Barnett, 2007), though ethical CSR can build reputation as it is non-monetary in nature, it will not make the managerial role efficient as there is no monetary reward to motivate a manager (Cheol Lee2, 2017). Managers knowingly would not involve in CSR activities as they should meet the demands of the huge stakeholders, societal demands, and spending on green technology (Martin, 2012). As (Gossling, 2008) have said that organization should account for societal demands and be socially responsible as it holds good for the corporation also increase the shareholders wealth and World Bank identified CSR a positive action (Blowfield, 2005). Financiers and shareholders look into socially responsible activities of the firm to reduce their financial risk (Louvet, 2014) but when the connection between corporate social performance and the financial risk is investigated, it was insignificant to systematic risk (Ioannis Oikonomou, 2012). Successful CSR is a key

marketing tool to enhance customers in a positive way and also it is important to advertise CSR activities (Orlitzky, 2011), (Siegel, 2001). Corporate Social Responsibility is accounting based measure of Corporate Financial Performance as it is one of the important non-market strategies (Marc Orlitzky, 2003). The other strategy in CSR can be Benefit Corporation as the legal integration of BC is based on CSR theories (Hiller, 2013). CSR is the tool to improve the company's public image, increase in sales and for corporate identity, hence the quality report must also include the companies CSR activities (Andersen, 2011), (Bosque, 2012). Scholars have presented a model of supply and demand which provides chances to invest in socially responsible companies (Alison Mackey, 2007). We can explore investors decision making model in two stages that is firms relationship between innovation effort, CSR, and financial performance and effect of CSR on accounting and market-based financial performance procedures, there is still a question does the firm really benefit through its contribution in CSR actions, it has been examined in stakeholder's theory (1984), (Waymond Rodgers, 2013), (Harjoto, 2011). Abi-directional association between CSR and firm's financial performance is observed, the contrasting view also do exist (McGuire, 1988) (Othman, 2012). Most of the researchers have taken business case for analyzing the connection between the CSR and Financial Performance through theoretical and empirical literature that had led to controversies of business in society (Francesco Perrini, 2011). The studies also have focused on the different critical factors like financial sector and financial analysts that would evaluate a firm competitiveness with relationship to CSR (Marc Vilanova, 2009). Mostly there is neutral relationship between them, it can be negative or positive but in negative CSR we cannot deduct the linkage (Darren D. Lee, 2009), (Supriti Mishra, 2010) and the relation between CSR and FP are mostly not concluded (Nuttaneeya Ann Torugsa, 2012), it is usually said the firm with positive CSR will reduce the risk when it comes to idiosyncratic risk (Modi, 2013). (Otgontsetseg Erhemjamts, 2013) have absorbed the link of CSR on the determinants such as investment policy and organizational strategy which is positive. Companies with large size take up CSR participation because of access to resources and stronger operation level (Udayasankar, 2008), the stakeholder theory addresses CSR activity only to large firms this can be because of difference in economic or financial structure, therefore it should also explain and understand stakeholder's view of CSR towards SME (Perrini, 2010). The relationship of CSR towards firm's financial performance has created much scope for research and manifested interest among the researchers.

OBJECTIVES

1. To find the impact of CSR on financial performance of listed Mid-Cap and Small-Cap companies in India.
2. To examine the association between CSR and financial performance of selected Mid-Cap and Small-Cap companies in India.

HYPOTHESIS

1. H₀: There is no significant impact of CSR on financial performance of Mid-Cap and Small-Cap companies in India.
2. H₀: There is no association between CSR and financial performance of Mid-Cap and Small-Cap companies in India.

SIGNIFICANCE OF THE STUDY

According to the review the research areas focused on CSR impact of Mid-Cap and Small-Cap companies on financial performance is very less when compare to large firms, the significant of our study aims at serving for growth and development in the field of CSR which helps in increasing the interest of the different stakeholders in order to come forward and invest in the Mid-Cap and Small-Cap companies which will rise their Capital intensity.

RESEARCH METHODOLOGY

Secondary data has been utilized in this study which are collected from financial statements using ACE Analyzer, CMIE the electronic database, other websites and annual reports. The study period is of 5 years that is from 2012 - 2017 (financial year). The sample size for the study was 50 companies collected from NSE website which has been listed under Nifty Mid-150 and Nifty Small-250 companies that are engaged in CSR activities irrespective of sectors 25 each based on market Capitalization. For analyzing the data descriptive statistics, correlation matrix and panel regression model were used.

Measurement of Financial Performance

1. ROA: Return on assets is an accounting-based measures which helps in determining how efficiently and effectively a firm uses its assets in order to maximize profit. The earnings are defined as profit after tax but in some schools of thought defines as Profit before interest and tax (Rabi'U Saminu Jibril, 2016).

2. ROE: Return on Equity is measured on the earnings of company's ordinary funds. (Rabi'U Saminu Jibril, 2016).

Measurement Corporate Social Responsibility (CSR)

This study extracts CSR activities from the annual reports and were classified into four (Community involvement, Environmental Contribution, Workplace and Diverse) which covers the inventory of 39 activities. The 'CSR Model' was constructed on review of literature (Corporate social responsibility and financial performance: An empirical analysis of Indian banks) and Companies Act 2017 – Schedule 7, scanning of annual reports of different companies covered by Indian NGOs. To show the participation and non-participation of a company in each activity we have used 1 and 0 as scale and applied following formula:

$$\text{CSR Score} = \text{No. of CSR activities participated by a company} / \text{Total no. of CSR activities}$$

Control Variables

1. Capital Intensity (CAP): It is measured by proportion of fixed asset to total asset, it is better for the companies to have a high percentage of fixed assets over total assets.
2. Firm Size (F. SIZE): The firm size is controlled and it is calculated based on the total assets (taking its Natural Logarithm)(Setiadharm S, 2017)
3. Financial risk (RISK): It is used as a proxy to the risk, which shows its capacity to endure uncertainty by management for societal purpose, it is calculated by using total debt and total equity (Shafat Maqbooln, 2017)

ANALYSIS AND INTERPRETATION

Table-1: Showing Descriptive Statistics of Mid-Cap

Variables	Min.	Max.	Mean	Std. Dev	N
ROA	0.119	28.237	8.480544	6.119792	125
ROE	0.148	135.34	17.76173	17.37034	125
CSR	2.564	28.205	10.91282	5.959361	125
CAP	0.002	0.981	0.304618	0.259608	125
F. SIZE	10.232	15.111	12.87698	1.220993	125
RISK	0.00	5.770	0.591796	0.961513	125

Source: Computed

The Min. as 0.119 and Max. as 28.237, which infers that the Mid-Cap companies with higher return on assets perform more than those lower return on assets. The table also shows the minimum and Maximum of return on equity are 0.148 and 135.34 respectively. This infers that the Mid-Cap companies with high return on equity perform more than those with the lower return on equity. The mean score of CSR is 10.9, which portrays that CSR in Mid-Cap companies has taken roots in India, this shows the companies need to effectively practice CSR for better performance. The standard deviation co-efficient of corporate social responsibility is 5.9593 which implies the level of CSR contribution to the financial performance of Mid-Cap companies.

Table-2: Showing Descriptive Statistics Of Small Cap

Variables	Min.	Max.	Mean	Std. Dev.	N
ROA	-4.119	38.11800	9.502064	7.064865	125
ROE	-90.625	46.27800	17.61000	14.56673	125
CSR	2.564	38.46154	10.91282	7.773926	125
CAP	0.000	1.638740	0.453708	0.313228	125
F.SIZE	0.000	13.91332	11.68670	1.319821	125
RISK	0.000	28.20000	1.051920	2.857807	125

Source: Computed

The minimum and maximum values of Return On Asset are -4.119 and 38.1800 respectively. This shows there is a high performance in those firms with high return on assets than those with lower ROA. The Min. and Max. values of Return On Equity are -90.625 and 46.278. This shows there is a high performance in those firms with high return on equity than those with lower return on equity. The mean score of CSR is 10.9, which portrays that CSR in small Cap companies has taken roots in India, CSR activities need to be effectively implemented in order to practice it as one of the business strategies. The standard deviation of CSR is 7.77 which implies the contribution level of CSR towards firms' financial performance.

Table-3: Showing Correlation Matrix of Mid-Cap

Variables	ROA	ROE	CSR	CAP	F. SIZE	RISK
ROA	1					
ROE	0.649	1				
CSR	0.142	0.107	1			
CAP	0.338	0.266	0.142	1		
F. SIZE	-0.708	-0.465	0.003	-0.440	1	
RISK	-0.402	-0.115	-0.233	-0.318	0.520	1

Source: Computed

The degrees of relationship between the ROA, ROE, CSR, CAP, F. SIZE and RISK. The reported results states that CSR and financial performance (ROA and ROE) has a positive association of NSE listed Mid-Cap companies. This is shown in the table as 0.142 and 0.107 respectively. But the relationship between ROA and ROE is positive which is 0.649. The Firm size is negatively correlated with dependent variable ROA and ROE but has a positive relationship with independent variable CSR at 0.003 which is significant. The other control variables that is CAP which has positive relationship and Risk which is negatively correlated with ROA and ROE respectively. The F. SIZE and RISK are negatively correlated with CAP whereas RISK is positively correlated.

Table-4: Showing Correlation Matrix of Small Cap

Variables	ROA	ROE	CSR	CAP	F.SIZE	RISK
ROA	1					
ROE	0.669	1				
CSR	-0.143	-0.029	1			
CAP	-0.202	-0.205	-0.020	1		
F.SIZE	-0.116	-0.032	0.299	0.054	1	
RISK	-0.362	-0.666	-0.030	0.302	0.117	1

Source: Computed

The degree of relationship between the ROA, ROE, CSR, CAP, F.SIZE and RISK. it is observed that CSR and financial performances (ROA and ROE) of the NSE listed small Cap firms has a negative association as the value is -0.143 and -0.029 respectively. But the relationship between the dependent variables that is ROA and ROE is positive as the value is 0.669. One of the control variables, F.SIZE is positively related with CSR with the value of 0.299, whereas the other two control variables CAP and RISK has negative relation with the independent variable CSR, the values are -0.020 and -0.030 respectively. The dependent variables and control variables shows a negative association. Control variables are positively correlated among themselves.

Table-5: Showing Panel Regression of Mid-Cap

VARIABLES	ROA		ROE	
	Coefficients	Sig.	Coefficients	Sig.
CSR	0.071	0.3465	2.161	0.033
CAP	-10.340	0.0040	0.328	0.743
F. SIZE	-3.101	0.0332	-2.934	0.004
RISK	-2.050	0.0380	-2.071	0.041
Constant	51.993	0.0054	249.272	0.0023
R-Square	0.807		0.547	
Adjusted R-square	0.750		0.415	
F-Statistics	14.321		4.143	
Hausman Test	0.0365		0.0118	

Source: Computed

The Panel Model Results depicts the Hausman test is significant ($p < 0.05$), for Model 1 and 2 which favors Fixed-effect model. In model 1 the independent variable CSR shows a positive insignificant impact ($p > 0.05$) on the financial performance that is ROA of NSE listed Mid-Cap companies with the P value of 0.3465. Therefore, we accept the hypothesis there is no significant impact of CSR on financial performance of Mid-Cap companies in India. In model 2 the independent variable CSR shows positive significant impact ($p < 0.05$) towards ROE of NSE listed Mid-Cap companies with the p value of 0.033. Therefore, we reject the hypothesis that is no significant impact of CSR on financial performance of Mid-Cap companies in India. The firm size and risk

influences ROA and ROE negatively at 5% level of significant, the Capital intensity (CAP) negatively influences ROA but statistically insignificant with p value of 0.743 that does not influence ROE. CSR and financial performance have a positive association, we reject the hypothesis that is there is no relationship between CSR and financial performance of Mid-Cap companies of NSE listed. R² which explains the explanatory power of the model that is at 81% for model 1 and at 55% for model 2. It signifies that 81% and 55% of the total changes in ROA and ROE respectively are caused by the CSR activities, while the remaining 19% for model 1 and 45% for model 2 are caused by other factors which is not included in the study.

Table-6: Showing Panel Regression Small Cap

Variables	ROA		ROE	
	Coefficient	Sig.	Coefficient	Sig.
CSR	0.163	0.0146	0.407	0.0087
CAP	-6.332	0.0109	-10.831	0.0576
F. SIZE	1.151	0.0004	1.165	0.1100
RISK	-0.136	0.4094	-3.824	0.0000
Constant	-2.716	0.4288	8.493	0.2851
R-Square	0.834		0.791	
Adjusted R-Square	0.785		0.730	
F-Statistics	17.206		12.988	
Hausman Test	0.0017		0.0111	

Source: Computed

The Panel model results depicts that Hausman test is significant ($p < 0.05$), for model 1 and 2 which favors Fixed-effect model. In model 1 the independent variable corporate social responsibility has a positive significant ($p < 0.05$) impact on financial performance that is ROA of NSE listed Indian small Cap firms with the P value of 0.0146. In model 2 the independent variable corporate social responsibility has a positive significant ($p < 0.05$) impact on financial performance that is ROE of NSE listed Indian small Cap firms with the P value of 0.0087. Therefore, we reject the hypothesis that is no significant impact of CSR on financial performance of Small-Cap NSE listed companies. Control variables, CAP which is influencing ROA and ROE shows a negative significant, SIZE which is statistically significant influences ROA and insignificantly influencing ROE, and the other control variable RISK is negatively insignificantly influencing return on asset whereas it negatively significantly influences return on equity at 5% level of significance. This shows a positive association between CSR and financial performance, we reject the hypothesis that is there is no association between CSR and financial performance of Small-Cap companies in India. R² which explains the explanatory power of the model that is at 83% for model 1 and at 79% for model 2. It signifies that 83% and 79% of the total change in ROA and ROE respectively are caused by CSR activities while the remaining 17% and 21% of the changes are caused by the other factors which is not included in the study.

CONCLUSION

From the empirical indication of the study observes a significant impact of CSR on financial performance of selected Mid-Cap and Small-Cap companies in India except for ROA of Mid-Cap companies, this shows the CSR activities of the companies are improving their financial performance specified to ROA and ROE. Also resulted in a positive association between CSR and financial performance of NSE listed Mid-Cap and Small-Cap companies in India. It can be concluded that the CSR activities followed by both Mid-Cap and Small-Cap companies benefits financial performance. From the finding, it is vibrant that CSR is a treasured and rear resource. It can be effectively utilized as one of the superlative business strategies to create a competitive advantage of the company. Our finding suggests as there is a positive impact of CSR on financial performance, Mid-Cap and Small-Cap companies can actively involve in the CSR activities in order to Capture market and attract stakeholders. The limitations of the study are firstly, the study is not based on industrial classification. Secondly the sample size of both the Mid-Cap and Small-Cap are limited to 50. The study suggests that the further research can focus CSR impact on industry-based financial performance at large and on SMEs. Also, a further study can be done on CSR impact for non-financial performance of Mid-Cap and Small-Cap companies.

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WOMEN ENTREPRENEURSHIP THROUGH MICROFINANCE- WAY FOR ECONOMIC EMPOWERMENT

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ABSTRACT

This study assessed the influence of microfinance on women entrepreneurship and examined impact of microfinance led entrepreneurship on economic empowerment. This study mainly employed descriptive analytical tools to achieve the objectives. Using Multi-stage mixed sampling, the study has been conducted in Kashmir valley of Jammu and Kashmir state, India. The data has been collected from 367 women Self Help Group members formed and nurtured under National Rural Livelihood Mission. In order to analyze impact of microfinance led entrepreneurship on economic empowerment of women, independent samples t test was used for two groups i.e. women entrepreneurs and women non-entrepreneurs. The results revealed that women entrepreneurs are better off than women non-entrepreneurs in terms of economic empowerment. Women entrepreneurs have been able to increase their income, savings and have been taking part in decision making regarding household income, savings as well as large purchases. However, women entrepreneur have been unable to generate assets either for themselves or households. It can be concluded that microfinance through entrepreneurship paves a strong way to women's economic empowerment.

Keywords: microfinance, women entrepreneurship, economic empowerment, SHGs

INTRODUCTION

Worldwide, women are more likely to be poorer than men, deprived of higher education, under-represented in power and decision making in both private and public spheres and even subjected to all forms of violence-physical, sexual, psychological or even economical (United Nations, 2015). Women, if utilized properly, are very crucial for economic development of the developing countries besides that of developed nations. The developmental policies are required to focus on women so as to achieve best results in reducing birth rates, child mortality, health and nutrition, education, HIV/AIDS, building self-sustaining community organizations and encourage grass roots democracy (Coleman, 2004). In this direction, Microfinance as one of the emerging interventions is aimed to end world poverty and has become an essential field in which many of the relevant issues are yet to be discovered by academic researchers (Braun and Woller, 2004). Microfinance, ensuring access to the very basic small financial services to the poor and deprived sections who have no access to such services for lack of collateral to offer, is believed to be an effective initiative to address the issues of 'Feminization of Poverty' (Chant, 2014). Microfinance is basically an alternative source of finance to the poor especially women who otherwise rely on informal sources of finance. It has also reduced household borrowing from informal lenders and has increased household savings capability. Though the savings impact has been seen more pronounced on women than that of men (Khandker, 2000). Microfinance being dominant through **Self Help Groups (SHGs)**[1] can play a vital role in eradication of poverty mostly in rural areas of India by casting positive socio-economic impact on women who subsequently are expected to improve overall economic conditions of their families (Vatta, 2003). While targeting low income families with micro-type of basic financial services, an exclusive focus on women is justified on the grounds that women are more responsible than their men counterparts (Sinha, 2003). The huge literature on microfinance documents that poor have good potential to borrow, save and repay the small amount of loans more successfully with less default rate. However, it is women who take more intense and active role in microfinance sector mostly through group mechanism i.e. Self Help Group Approach (Srinivasan and Sriram, 2003). Microfinance is believed to provide economic opportunities in the form of micro-entrepreneurship or self employment options to women that further improve their education, asset base, jobs and hence raise women's standard of living (Muhammad et al, 2012). Moreover, compared to all other traditional employment options, self employment or micro-enterprises have an intense impact on women's economic empowerment. Research evidence reveals that economic factors i.e. income, savings, own assets that actually result from involvement in entrepreneurial activities have much more influence on women overall empowerment (Swain and Wallentin, 2012).

RATIONALE OF THE STUDY

In Jammu and Kashmir State of India, National Rural Livelihood Mission has been implemented on a mission mode to ensure rural low income masses access to several basic financial services so as to foster them towards entrepreneurship and empower women economically. This program replaced earlier similar flagship program 'Swarna Jayanti Swarozgar Yojana' in 2013. The main focus of these programs has been on women belonging

to low income households. According to census 2011, literacy rate of women is comparatively poor than their counterparts and women in rural areas of J & K live in marginalized conditions. Therefore, it is of primary concern to evaluate the livelihood mission program in terms of the achievement of its objectives. As such no study has been conducted in Jammu and Kashmir State.

RIVIEW OF LITERATURE

Microfinance, no doubt, emerged as a powerful means to poor people who create small businesses, generate new jobs and earn more income. With the increased income health, nutrition and education of children are also improved. But, the poorest of the poor are still neglected and are not benefited with microfinance. The world will not develop in true sense unless and until the poorest families with the potential to work and the vision to get out of poverty are reached by micro-credit organizations, international donors and private sector together with the intervention of training and capacity building programs (Dokmo and Reed, 1999). A study of 185 women entrepreneurs in rural Kenya finds after access to finance 57 per cent of the women were encouraged to start business even at high interest rates and had no prior business experience. In addition, access to credit positively influenced sales turnover, number of employees and profits of women entrepreneurs (Mbiti et al, 2015). Administering structured questionnaire to 117 women entrepreneurs together with in-depth interviews with 27 women entrepreneurs finds 87 per cent of women entrepreneurs at pre-start and survival stage of business and only 13 per cent at growth level. Mainly the business is of start-up type (75%). Women entrepreneurs generate employment and exert decision making power in the households in the areas of family health expenses, children's education and family planning. The micro-entrepreneurial activities started comprise mainly of retail business and services (69%), manufacturing and wholesale merchandise (18%) and home-based enterprises (13%) such as baking, hawking, hairdressing, clothing, sewing, education, tailoring, trade, personal retail services (Ahmad, 2012). An interview with women entrepreneurs reveals access to microfinance loans lead women either to establish a new enterprise or invest in already existing business. The enterprises created or expanded are of micro nature and comprise of retail outlets, selling clothes, electronic items, blankets and food items, wooden decoration, limited level of production by manufacturing carpets, car mats and hosiery. While few of the entrepreneurs were involved in livestock and services business, stitching and sewing clothes (Mahmood et al, 2014). Access to micro-credit schemes, females in rural Vietnam were involved in **Necessity driven entrepreneurship** [2] which was believed as the only option for survival and support to their families. Women were engaged in micro-entrepreneurial activities such as water recycling dealer, home-based herbalist, traditional medicine manufacturer, home based local convenient store and motor bike wash services, fish and poultry dealer, construction materials trader and transport service provider, confectionary manufacturer and seller. These entrepreneurs had employed 0-5 employees in their enterprises (Nguyen et al, 2014). However, the critics note that the participation of women in micro-credit programs has no effect on their entrepreneurship. Women borrowers are unable to invest their loans in starting their own business. An irony is, women loan recipients contribute to expansion of already established businesses operated by male members in the household (Chowdhury, 2008). Another study of similar nature reports that being micro-credit recipients women are unable to start micro-enterprises. Women's participation in micro-credit programs enable their husbands to start micro-enterprises and expand the already established micro-enterprises owned and controlled either by their husbands or other male members in the household (Chowdhury, 2009). On the other side, the latest empirical investigation in rural and urban areas of Pakistan taking a sample of 37 women borrowers of MFIs, reports 62 per cent of the women utilized microfinance loans for business purposes (mainly raising of animals for milk). Out of women who used loans for business, 24 per cent of women started new businesses and 38 per cent of women invested in already established own businesses. Besides own business use, microfinance loans were also used for husband's or family business (14%) and children's or relatives business (5%). In addition, loans were also diverted to non-business uses as well such as repaying old debts and consumption needs. However, the use of loans for consumption purposes is more pronounced for women in rural areas. Hence, it is concluded, on an average, microfinance has a positive effect on women entrepreneurship (Mahmood, 2011).

Self-employment or micro-enterprises have a great potential to facilitate low-income women's economic empowerment compared to all other traditional employment options striving for the same purpose. Self-employment options are more likely to overcome the hindrances of culture, racism, classism and sexism what low-income women often face in traditional jobs. Self-employment increase women's personal advancement (power, wealth and status) and in patriarchal society women gain independence from male dominance in the home, work place as well as collective male control of the social welfare system (Raheim and Bolden, 1995). Women are more likely to engage themselves in labor intensive activities such as small trading. Entrepreneurship has the potential for improving women's personal economic conditions as well as reducing poverty through their continuous contribution to household welfare in terms of health, education, nutrition,

family planning, immunization and savings. In view of these benefits, more and more efficient programs together with knowledge are needed to boost entrepreneurial women who act as a catalyst for socio-economic development of the nation (Ardrey IV et al, 2006). Hence, there is a firm belief that through entrepreneurship, women earn sufficient income and generate employment for family as well for people outside (Das, 2012). At this juncture, microfinance is believed to be a powerful intervention with an aim to boost economic empowerment of women by providing them with economic opportunities in the form of jobs and self-employment (Chhay, 2011). Women who are economically well off are more likely to be empowered in political arena. A study of 150 women SHG members confirms that being members of SHGs and undertaking economic activities to generate income, women's awareness about politics increases and they gain confidence to take part in Village Panchayat, Taluk Panchayat and Zilla Panchayat. Women in SHGs are more likely to show interest in contesting elections and attend various meetings of Grama Sabhas to raise their demands for developmental schemes for the benefit of their villages (Sreeramulu and Hushenkhan, 2008). Microfinance has a major impact on women's decision making power not only regarding household matters but beyond that. A survey of 185 women borrowers and 209 non-borrowers reports increase in women's decision making power in Practical Gender Needs (household consumption and income, children's education, equipment expenses and community activities) and Strategic Gender Needs (decision to borrow money, trade of goods and use of income). The women borrower could contribute more to family welfare by enhancing the household asset base which further strengthened their bargaining position (Fofana et al, 2015).

OBJECTIVES OF THE STUDY

1. To study the influence of microfinance on women entrepreneurship
2. To analyze the impact of microfinance led entrepreneurship on women's economic empowerment

H0: women entrepreneurship through microfinance has no impact on economic empowerment

RESEARCH METHODOLOGY

The study has been conducted in Kashmir Valley of J & K state, India and is mainly based on primary data collected, using structured Interview Schedule, from women SHG members mobilized and nurtured under mission mode programme 'National Rural Livelihood Mission' implemented since 2013. The study uses Multi-Stage sampling method. Out of the total of ten districts, four leading districts have been purposively selected viz. Budgam, Baramulla, Ganderbal and Kupwara, for there is higher concentration of SHGs in these districts and respondents have been graduated to dose-III of bank loans. As per Monthly Progress Report (MPR) of Kashmir Division for September 2017, the total number of SHGs in these districts is 3736 and total number of members are 8249 (Office of the Mission Director, Jammu and Kashmir State Rural Livelihood Mission). A sample of 367 has been drawn from the total number of SHG members using Krejcie and Morgan's (1970) formulae for sample size determination. The total sample size has been proportioned into four selected districts. From each of the selected districts, one block has been selected as in rest of the blocks bank loans have not been disbursed. Respondents from each of the four blocks have been selected at random. Economic empowerment has been measured with six indicators (increase in income, increase in savings, asset generation, control over household income, control over household savings and control over large purchases) found in the literature. Structured Interview Schedule was utilized to collect primary data. To collect data regarding women's economic empowerment, respondents were asked to state their level of agreement or disagreement on a five point Likert scale ranging from 'strongly disagree to strongly agree'. Quantitative data collected has been analyzed in SPSS version 20. Descriptive analysis has been mainly utilized to achieve the objectives of the study.

RESULTS AND DISCUSSIONS

The results for the present study are presented in three sections. One section contains results of demographics of the women microfinance beneficiaries. In the next section, microfinance characteristics are presented. Finally, the results of the impact of microfinance on women entrepreneurship and its effect on economic empowerment are discussed in the third section.

1. Demographic profile

Majority of respondents are of child bearing age i.e. 38.9% respondents are of the age of 26 to 35 years and 38.9% respondents are of the age of 36 to 45 years, while as, 16.2 % respondents are less than 26 years old, 4.9 % fall in the age group of 46 to 55 years and only 1.9% are above 55 years of age. Most of the women respondents are illiterate (59.5%), 5.1% respondents have completed primary education, 8.9% respondents have completed middle level education, 13.8% respondents have passed secondary class of education, 6.8% respondents have completed higher secondary education, 3.8% respondents have completed graduation and

only 2.2% respondents have completed their post-graduation. All the respondents are Muslims and no one belong to any other religion. Majority of women respondents are married (79.2%) and only 20.8% respondents are unmarried. Most of the respondents belong to nuclear family type (82.7%) and only 17.3% respondents are from joint family structure.

2. Microfinance

It is vividly clear from the table I, low income families have been the main target of Microfinance program in Kashmir Valley as most of the women (75%) stated their household income prior to intervention was less than 60000. Prior to program participation, women workforce had been untapped as majority of women respondents were either homemakers (49.5%) or working for wages (34.9%). Majority of sample consist of mature borrowers i.e. 40.5% respondents have completed 4 years. Mostly, women had primary purpose of obtaining microfinance loans to establish their own businesses. Of the total number of respondents, RBL (responsibility to pay back loans) primarily lies with women themselves.

Table-I: Microfinance Characteristics

Variable	Frequency	Percentage	Variable	Frequency	Percentage
Pre-intervention H.income (Annual)			Pre-intervention occupation of respondents		
Less than Rs 60,001	280	75.7	Engaged in business activity	20	5.4
Rs 60,001 to Rs 120,000	63	17.0	Looking for work	1	.3
Rs 120,001 to Rs 180,000	12	3.2	Working for wages	129	34.9
Above Rs 180000	15	4.1	Homemaker	183	49.5
Total	370	100	Studying	36	9.7
			Others	1	.3
			Total	370	100
SHG Duration (in years)			Total amount of loans		
1.00	20	5.4	Less than Rs 50,001	195	52.7
2.00	74	20.0	Rs 50,001 to Rs 100,000	133	35.9
3.00	126	34.1	Rs 100,001 to Rs 150,000	32	8.6
4.00	150	40.5	Rs 150,001 to Rs 200,000	5	1.4
Total	370	100	Rs 200,001 to Rs 250,000	2	.5
			Rs 250,001 to Rs 300,000	2	.5
			Rs 300,001 to Rs 350,000	1	.3
			Total	370	100
Loan purpose			RBL		
Own business	213	57.6	Women herself	246	66.5
Other's business	134	36.2	Husband	69	18.6
Personal expenditure	5	1.4	Women and her husband	21	5.7
Others	18	4.9	Family head (other than husband)	19	5.1
Total	370	100	Others	15	4.1
			Total	370	100

3. Impact of microfinance on women entrepreneurship and its effect on empowerment

Out of the total sample of women beneficiaries, 132 (35.7%) women have been able to start or expand already established business venture. However, rest of the huge number 238 (64.3%) have diverted their microfinance loans i.e. either handed over to their husbands/any other male member in the households or used to pay back previous loans, for personal use and consumption purposes. However, these findings are contradictory to a study based on a small sample of 37 women conducted in Pakistan that found majority (62%) of women microfinance clients utilize loans for their own business (Mahmood, 2011). Women have started various types of business ventures that include dairy and livestock (15.1%), souzni (2.1), tailoring (3.0%), retail store (3.5%), vegetables(1.4%), paddy (8.0%), walnut (1.4), crewel (5.4), knitting (0.3%), honey production (0.3%), poultry (0.5%) and Tilla douzi (1.4%). Women have started micro-enterprises as they are able to employ people ranging from 0-5 either from household or outside for wages. However, majority of women entrepreneurs do not employ any worker in their micro-enterprise (15.7%) and manage all the business affairs themselves, 8.9% women entrepreneurs employ one worker, 5.4% women entrepreneurs employ 2 workers, 3.0% women entrepreneurs employ 3 workers, 1.4% women entrepreneurs employ 4 workers and 1.4% women entrepreneurs

employ 5 workers in their business venture. Hence, though not significantly microfinance influences women entrepreneurship. Overall, the findings are consist with Ahmad (2012) and Mahmood et al (2014)

In order to analyze the impact of microfinance led entrepreneurship on economic empowerment of women, t test has been used to assess the difference in empowerment between two groups of respondents' viz. women entrepreneurs (132) and non-entrepreneurs (238). Women entrepreneur in this study is one who establishes a new business venture or invests in already established business venture (Mahmood et al, 2014). The data collected related to economic empowerment was found approximately normally distributed. In the table II, the t test results indicate women who have been able to start and manage their own business ventures or in other words involved in entrepreneurship have significantly ($p < 0.05$) increased their own income and savings compared to those who could not utilize their loans. Women who could utilize loans for business purpose are significantly involved in decision making regarding household income, savings as well as large purchases. However, women engaged in business venture could not generate assets (personal or household) ($P > 0.05$) and so considering this particular variable are similar to those women who are not involved in any kind of business venture. Overall, women entrepreneurs are significantly different to that of women non-entrepreneurs, as revealed by t test the value (-4.084) of t is significant ($P < 0.05$) at 95% confidence level. The hypothesis 'women entrepreneurship through microfinance has no impact on economic empowerment' gets rejected. Hence, women entrepreneurs are significantly different from those of women non-entrepreneurs. The findings are in line with Raheim and Bolden, 1995; Chhay, 2011 and Das, 2012. It can be concluded that if microfinance is utilized for business ventures by women it can significantly lead to their economic empowerment.

Table-II: Impact of women entrepreneurship on economic empowerment

Variable		N	Mean	Std. Error Mean	Mean difference	t	Sig. (2-tailed)
Increase in income	women non-entrepreneur	238	2.86	.062	-.620	-5.579	.000
	women entrepreneur	132	3.48	.084			
Increase in savings	women non-entrepreneur	238	3.18	.060	-.255	-2.481	.014
	women entrepreneur	132	3.43	.085			
Increase in assets	women non-entrepreneur	238	2.96	.064	-.136	-1.235	.217
	women entrepreneur	132	3.10	.094			
Control over h.income	women non-entrepreneur	238	3.21	.064	-.385	-3.697	.000
	women entrepreneur	132	3.59	.080			
Control over h.savings	women non-entrepreneur	238	3.41	.057	-.209	-2.187	.029
	women entrepreneur	132	3.62	.078			
Control over purchases	women non-entrepreneur	238	3.40	.057	-.237	-2.499	.013
	women entrepreneur	132	3.64	.075			
Economic empowerment (composite)	women non-entrepreneur	238	3.1688	.03949	-.30724	-4.084	.000
	women entrepreneur	132	3.4760	.07170			

CONCLUSIONS AND SUGGESTIONS

Microfinance in Kashmir has mainly targeted women belonging to low income families who are mostly of childbearing age, illiterate and married. Thus marginalized and destitute women have been the target client group of microfinance. Before participation in microfinance programme through Self Help Group mechanism, women were untapped as majority of them were either looking after household chores or wage laborers. Though majority of women have taken microfinance for own business purpose and are mostly responsible themselves to pay back these loans. Ironically, majority of women (64.3%) have diverted their loans to unintended purpose i.e. handed over loans to their husbands or other male members in the household, or even used for consumption and paying back other loans. While as, only 35.7% of women have been able to start or expand already established own business ventures in various activities such as dairy and livestock , tailoring, retail store, vegetables, crewel, knitting, honey production, poultry and so on. These women have employed people (0 to 1) both from household as well as outside in their micro-enterprises. Women engaged in their own microfinance led business ventures have significantly increased their income and savings but could not generate personal\household assets. They have been also able to exercise greater control over household income, savings and large purchases. In contrast, women who have been unable to utilize microfinance loans for their business are less likely to increase income, savings and asset base and also have least control over income, savings and large purchases in their households. Hence, microfinance through entrepreneurship leads to economic empowerment

of women. It is suggested to policy makers to give a boost to microfinance programs that target low income women and who need to be stimulated to involve in entrepreneurship that fosters a way to their empowerment.

The future studies would take large geographic area and also identify microfinance variables or proxy indicators to examine the impact of microfinance on women entrepreneurship using more sophisticated statistical tools. In addition, there is a need to analyze women's empowerment in various domains as it is believed women empowerment is multidimensional in character. Hence, further studies would give a broader view of women empowerment and also find out the challenges faced by women in entrepreneurship in Kashmir as in this study, only 35.7% have been found able to engage in business ventures.

NOTES

1. **Self Help Group** is a small group of 10-20 members belonging to homogeneous socio-economic background who come forward and assemble to address their common problems (Swain and Wallentin, 2012)
2. **Necessity-Based Entrepreneurship** is a type of entrepreneurship in which entrepreneurs are pushed into entrepreneurship for the reasons of dissatisfaction with jobs, unemployment, low paying jobs and so on. These entrepreneurs are also called 'Lifestyle Entrepreneurs' whose objective is to support family income or to maintain a desired lifestyle.

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HEALTH STATUS OF AGED PERSONS AND ITS DETERMINANTS IN RURAL TAMILNADU: A STUDY WITH SPECIAL REFERENCE TO MADURAI DISTRICT

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ABSTRACT

Background: The proportion of aged persons has risen from 5.63 per cent in 1961 to 6.58 in 1991, 7.4 in 2001 and is expected to be 9.87 in 2021 in India. Health care of the aged is a major concern of a society as old people are more prone to morbidity than young age groups. Most primary surveys have reported that the aged in India in general and the aged population in the rural areas in particular have serious health problems. The aged are differing from not only in their socio-demographic and economic but also differ by their health characteristics in various aspects of life. This paper explores the health status of the aged population in their socio-demographic and economic characteristics in rural areas of Madurai district in Tamil Nadu. Methods: Madurai South Taluk in Madurai district has been taken for the present study. The researcher selected 160 households with aged persons to get 40 aged persons comprising 20 males and 20 females from four rural areas giving an area sample of Madurai District. Findings: There is an increase in the number of widowed which may be due to more number of deaths among male aged persons in rural areas. The expenditure pattern among aged persons shows that the rural aged spent more money on medical expenditure than the personal habitual expenditure. As far as the morbidity pattern is concerned, Fever was noticed to be the cause for most common short-term morbidity among males, females in rural residents. Demographic variables such as gender and education and health variables such as LTM and STM have greater influence than household income on health status of the aged persons which justifies the hypothesis. The Government may take steps to increase its economic support especially to female aged persons in rural areas so that they can rely on their own strength.

Keywords: Health status, Madurai, Rural Aged, Tamil Nadu, etc.

INTRODUCTION AND EARLIER LITERATURE

In recent years, there has been a sharp increase in the number of older persons worldwide (Hafez, 2000). The proportion of the population elderly 60 and over is also growing each year. By the year 2025, the world will host 1.2 billion people aged 60 and over and rising to 1.9 billion in 2050 (United Nations, 2003). Currently, most countries' health systems cannot meet the needs of older persons. Moreover, age-friendly and barrier-free environments are needed for older persons to enjoy continued freedom of movement and to actively participate in society.

The health problems of the aged persons vary not only based on their economic conditions but also due to their different lifestyles, such as food habits, chewing tobacco, petals, smoking, etc. The men and women differ in many health problems in terms of the level of suffering due to diseases and the subsequent morbidity. Poverty condition and poor hospital facilities affect the health of the aged to a greater extent. Studies by Mutharayappa and Bhat (2008) reveal that lifestyle adversely affected health and increased morbidity conditions among the aged. The health condition of the aged people is mostly influenced by the place of residence and availability of medical facilities.

As the aged population is increasing, morbidity conditions of the aged are also increasing. Studies by Dilip (2001) and Mao (2001) reveal that gender differentials were observed with males having higher levels of morbidity than females in the context of hearing and loco-motor disability. The annual hospitalization rate was 185 per thousand for aged males and 130 for aged females. The increasing importance of the studies on aged and senior citizens has been emphasized by a series of national and international conferences and seminars. In India, over the past two decades a number of studies have focused on health issues of aged (Audinarayana, et. al., 2002; Sandhya and Suguna, 2002; Mutharayappa and Bhat, 2008; Deaton, 2009; Hariharan, 2013). Keeping these in view, the present paper tries to study the following objectives.

OBJECTIVES

The specific objectives of this paper are: (1) to study the socio-demographic and economic profile of the aged persons in the rural areas of Tamil Nadu; (2) to understand the health problems, morbidity pattern and determinants of health status of the aged persons, and (3) to suggest some policy measures to improve the health status of the aged persons.

DATA AND METHOD

Madurai District has been chosen for the present study of rural aged persons. The rationale behind selecting the district is that the share of the aged persons in the district is closer (8.5%) to that of Tamil Nadu (8.8%) and this district is an average district in most of the demographic, socio-economic and health characteristics. Out of seven taluk in Madurai District, Madurai South Taluk was selected on the basis of the highest number of rural households, highest total population and highest number of aged persons than the other rural areas is the rationale behind for the selection one taluk in the rural area. Out of 60 villages in Madurai South Taluk, four villages were selected on the basis of the highest number of households.

The selected villages are Vilacheri, Nilaiyur, Thanakkankulam and Perungudi. The required data for this study were collected from 160 aged persons (60 years and above) from four villages of Madurai South Taluk of Madurai District comprising of 80 males and 80 females through household survey and personal interview with the help of a well-administrated and pre-tested interview schedule.

The primary data were collected through direct personal investigation from 160 aged respondents by adopting pre-tested interview schedule method. The items of the data collected were- background and household data such as age, family size, family type, education, number of children, present living arrangement, and number of earners in the family and nature of employment; economic data such as household, personal wealth, personal income, expenditure on food, non-food, medical and personal habits, personal savings and personal borrowings. Besides, the data on health status such as long-term morbidities (LTM) namely back pain, blood pressure, diabetes, heart problem and asthma, and short-term morbidities (STM) namely fever, body pain, headache, cough and wheezing and physical incapacities- visual, walking, memory, sleeping and hearing were also collected. The collected data were tabulated and analyzed using appropriate statistical tools with the help of SPSS 16.0.

RESULTS AND DISCUSSION

Socio-Demographic Characteristics

The problems of aged differ with respect to age, sex, religion, community, education, family type and living arrangement. These characteristics are considered for further analysis. The selected rural aged persons (160) for the study are classified into three groups by their age as young-old (60-69 years) with 81 persons, middle-old (70-79 years) with 56 persons and old-old (80 years and above) with 23 persons. The aged persons are distributed equally among males (50%) and females (50%) respectively in rural areas. People belonging to Hindu religion are higher in proportion among the inhabitants of India. In the study area also, Hindus have the higher representation compared to Christians and Muslims. It was found that majority of the aged persons belonged to Hindu religion (79.4%) followed by Muslim (15.4%) and Christian (5.6%). The majority of the aged persons (51.9%) were from backward caste followed by scheduled caste (23.8%), and most backward caste (7.5%). As far as the marital status of the aged persons is concerned, most of them were widowed (50.0%) followed by married (48.1%) and separated (1.9%). An increase in the number of widowed may be due to a greater number of deaths among male aged persons. Majority of the aged persons were from nuclear families (85.0%) as compared to that of joint families (15.0%), which imply an advent of industrialization and modernization. The number of aged persons, those who live in nuclear families increases due to the breakdown of joint family system in the rural areas. The number of illiterates (71) and literates with primary level education (56) were greater in rural areas. In this study, the results also focus that majority of the aged persons were living with their children (47.5%) followed by spouse (36.3%). Only 13.7 per cent aged respondents stayed alone and 2.5 per cent of aged by their friends or relatives home, respectively (**Table 1.1**).

Table-1.1: Socio-Demographic Characteristics of the Sample Aged Persons

Socio-Demographic Characteristics	Number	Percentage
Age		
Young-old	81	50.6
Middle-old	56	35.0
Old-old	23	14.4
Gender		
Male	80	50.0
Female	80	50.0
Religion		
Hindu	127	79.4
Muslim	24	15.0
Christian	9	5.6

Community		
SC	38	23.8
BC	83	51.9
MBC	12	7.5
FC	27	16.9
Marital Status		
Married	77	48.1
Widowed	80	50.0
Separated	3	1.9
Family Type		
Joint Family	24	15.0
Nuclear Family	136	85.0
Educational Status		
Illiterate	71	44.4
Primary	56	35.0
Secondary	28	17.5
Graduate & above	5	3.1
Living Arrangement		
Living Alone	22	13.7
Living with Spouse	58	36.3
Living with Children	76	47.5
Living with others	4	2.5

Note: Computed from Primary Data

Economic Characteristics

Economic characteristics of the aged persons in the study are discussed with the help of results in **Table 1.2**. The family wealth in the form of physical and financial aspects shows the economic security of the family. The average value of physical wealth has been calculated based on the procession of land, house/building, farm structures, live stocks, consumer durables like cooker, stove, bridge, oven, AC, Fan, furniture, cycle, moped and telephone etc., and the average value of financial wealth was calculated based on gold and silver, bank deposits and cash in hand. It was found from the results that the financial wealth is very much higher (Rs. 169040) as compared to physical wealth (Rs. 25140).

Wage income and income coming from self-employment are considered as occupational income, and income coming from various asset sources like land, building, interest etc., other family members' income and respondent's income are considered as household income. It was found that nearly one third of the respondents have their occupational income. Their average income was Rs. 3250 and the overall average household income was Rs. 7000. The average monthly expenditure pattern of the aged persons for food, non-food, medical and personal expenses are discussed. Out of the total amount in all the categories, nearly half the amount of money was spent on food expenditure followed by non-food, medical and habitual expenditure. The medical expenditure was four times more than the personal habitual expenditure of the rural aged persons.

Table-1.2: Economic Characteristics of the Aged Persons by Residence

Economic Characteristics	In Rupees
Asset	
Physical Wealth	25140
Financial Wealth	169040
Total Wealth	194180
Current Income (Rs. Average)	
Occupational Income	3250
Household Income	7000
Mean Expenditure (Rs. Per month)	
Food	1220
Non-Food	865
Medical	620
Personal Habits	155

Note: Computed from Primary Data

Health Problems

The study of morbidity pattern will reveal the health problems of the aged. It was found that more than half of the aged persons suffer from back-pain (56.3%) and blood pressure (50.5%), whereas, few had diabetes (32.0%), heart disease (14.6%) and asthma (8.7%). More or less the same pattern is noticed among both males and females in rural areas. The results reveal that male aged had less suffers with short-term morbidity than female aged in rural areas. This shows that body pain, cough and wheezing are the most common short-term morbidity among females than males and fever and headache was more prevailing in male aged than the female aged, which may be due to physical and psychological stress while travelling or doing skilled and mechanical works. Majority of the aged persons with physical incapacity had visual problem (63.9%) followed by problems in walking (27.8%) and memory loss (25.8%), sleeplessness (20.6%) and hearing impairment (16.5%). More or less the same pattern is noticed among both males and females in rural areas (**Table 1.3**).

Table-1.3: Morbidity-wise Distribution of the Aged Persons by Residence

Morbidity	Male (N=80)	Female (N=80)	Total (N=160)
LTM (320)	50	53	103
Back Pain	54.0	58.5	56.3
Blood Pressure	42.0	58.5	50.5
Diabetes	30.0	34.0	32.0
Heart Problem	14.0	15.1	14.6
Asthma	14.0	3.8	8.7
STM (320)	17	28	45
Fever	35.3	53.6	46.7
Body Pain	47.1	32.1	37.8
Headache	23.5	32.1	28.9
Cough	35.3	25.0	28.9
Wheezing	35.3	25.0	28.9
PIC (320)	42	55	97
Visual	71.4	58.2	63.9
Walking	21.4	32.7	27.8
Memory	31.0	21.8	25.8
Sleep	19.0	21.8	20.6
Hearing	11.9	20.0	16.5

Note: figures mentioned in bold letters are number of persons affected for that particular category

DETERMINANTS OF HEALTH STATUS

In order to study the determinants of health status among aged persons in both rural and urban areas, a hypothesis was formulated. Verification of this hypothesis was performed in two steps, to explore the predictors of health status. The first analytical step was on mean tests to delineate significant differences in the determinants of health status between the aged persons classified into those with the health status (0-6), which was derived from the addition score values of long-term morbidity (LTM), short-term morbidity (STM) and physical incapacity (PIC) using F-test. Back pain, blood pressure, diabetes, heart problem and asthma were taken for LTM. Fever, body pain, headache, cough and wheezing were taken for STM and PIC comprises visual, walking, memory, sleeping and hearing. For all these variables three-point scale (0,1,2) was used for scoring each component of health status and they were classified into low health status for score values of 0-3 with 3 equal to mean-SD and high health status for score values of 4-6 with 4 equal to mean+SD. The lower score value denotes low health status as it represents more number of illness and higher score values are indicating less number of illness.

Table-2.1: Description of Variables in the Binary Logistic Regression Model for Health Status of the Aged Population

S.No	Name of Variable	Description of Variable
1	Health Status	Low Health Status=0, High Health Status=1
2	Economic Security	Financial Dependence=0, Financial Independence=1
Demographic Variables		
1	Age	Number of completed years

2	Gender	Female=1, Male=2
3	Religion	Hindu=1, Muslim=2, Christian=3
4	Community	SC/ST=1, MBC=2, BC=3, FC=4
5	Marital Status	Married=1, Widowed=2, Separated=3
6	Educational Qualification	Completed years of schooling
7	Present Occupation	Not working=0, Wage employment=1, Self employment=2
8	Type of Family	Joint family=1, Nuclear family=2
9	Size of Family	Total members in the family
10	Number of children	Total number of children of the respondent
11	Present living arrangement	Living alone/friends/relatives =1, Living with spouse=2, Living with children=3,
Economic Variables		
12	Personal Wealth	Respondents' Physical & Financial Wealth (in Rs.)
13	Household Wealth	Total Assets of the Household (in Rs.)
14	Personal Income	Respondents Income (Rs. per month)
15	Household Income	Total income of the Household (Rs. per month)
16	Personal Expenditure	Total Expenditure of the Respondents (Rs. per month)
17	Personal Saving	Saving of the Respondents (Rs. per year)
18	Personal Borrowing	Borrowing of the Respondent (Rs. per year)
Health Variables		
19	Long term morbidity	Number of long term illness (score)
20	Short term morbidity	Number of short term illness (score)
21	Physical incapacity	Number of physical incapacities (score)
22	BADL	Level of BADL (score)
23	IADL	Level of IADL (score)

In the second step, the contribution of these determinants in health status was derived by using Binary Logistic Regression Model. The results of these two steps illustrate the determinants of health status of the aged persons in Madurai District. Description of demographic variables, economic variables and health variables has been included in the model for predicting Health Status (Table 2.1).

Table-2.2: Mean Difference Tests for the Health Status of the Sample Aged Persons

S. No	Determinants of Health Status (HS)	Mean for Low HS (n=128)	Mean for High HS (n=192)	F – Test	P – Level Sig.
I	Demographic Variables				
1	Age (years)	70.26	69.94	0.150	0.699
2	Gender (score)	1.34	1.60	22.145	0.000
3	Religion (score)	1.16	1.15	0.044	0.835
4	Community (score)	2.51	2.56	0.173	0.678
5	Marital Status (score)	1.69	1.47	12.461	0.000
6	Education (years)	3.91	5.33	8.049	0.005
7	Present Status of Employment (score)	0.23	0.38	5.892	0.016
8	Type of Family (score)	1.82	1.82	0.003	0.953
9	Family Size (No.)	3.13	3.21	0.329	0.567
10	Children (No.)	2.49	2.54	0.076	0.782
11	Present Living Arrangement (score)	2.43	2.48	0.476	0.491
II	Economic Variables				
12	Personal Wealth (Rs.)	94140	73028	0.947	0.331
13	Household Wealth (Rs.)	213000	189000	1.479	0.225
14	Monthly Personal Income (Rs.)	2140	3867	9.115	0.003
15	Monthly Household Income (Rs.)	7926	10681	5.126	0.024
16	Monthly Personal Expenditure (Rs.)	2306	2721	4.139	0.045
17	Annual Personal Savings (Rs.)	8418	14559	5.706	0.017
18	Annual Personal Borrowings (Rs.)	2580	2443	0.035	0.851
III	Health Variables				

19	Long Term Health (score)	0.29	1.35	321.335	0.000
20	Short Term Health (score)	1.38	1.87	82.755	0.000
21	Physical Capacity (score)	0.75	1.64	241.539	0.000
22	BADL (score)	10.98	11.40	4.032	0.045
23	IADL (score)	12.10	12.03	0.023	0.881

Source: Computed from Primary Data, Note: HS – Health Status

Note: $P \leq 0.05$ implies that the estimated parameter is statistically significant

The information regarding the variables denoting significant differences between their mean values for low health status and high health status with F – test is presented (**Table 2.2**). It is seen from the results that among the demographic variables, gender, marital status, education and present status of employment show significant differences with relatively greater values for higher health status. Regarding economic variables, monthly personal income, monthly household income, monthly personal expenditure and annual personal savings of aged persons have significant differences with relatively greater values. Thus, aged persons with high health status have significantly higher score for long term health, short term health, physical capacity and BADL. In order to predict the health status of the aged persons, the Binary Logistic Regression Model was estimated with the health status as dummy dependent variable by assigning one for high health status and zero for low health status. The predictor variables showing significant mean differences using F – tests are included in the model to explain health status of aged persons.

All the characteristics of the aged persons showing significant differences in demographic variables, economic variables and health variables are originally included in the model and then eliminated on the basis of how much they contributed to the overall ability of the model to predict the higher level of health status. The overall fit of the model is good (85.9% predicted correctly) with significant values of estimated parameters for some of the variables with significant differences in mean values. The B-values associated with each predictor variable is the portion of the log odds ratio due to that variable. Wald statistic associated with each predictor variable is similar to T-statistic. It provides the level of significance of the variables in predicting the health status of the aged persons. The final value presented for each predictor variable is the exponential of B or the simple – odds ratio associated with one unit change in the predictor variable in terms of the dependent variable (**Table 2.3**).

Table–2.3: Binary Logistic Regression Model for the Health Status of the Aged Persons

S. No	Predictor Variables	B	Wald Statistic	P-Level Sig.	Exp.(B)
	Demographic Variables				
1	Gender	0.805	6.278	0.012	2.237
2	Education	0.074	6.935	0.008	1.076
	Economic Variables				
3	Monthly Household Income	0.003	8.327	0.004	1.000
	Health Variables				
4	Long Term Health	4.601	73.028	0.000	99.550
5	Short Term Health	3.430	45.071	0.000	30.891
	Constant	-8.919	64.890	0.000	0.000
	Percentage Predicted Correctly	85.9	-	-	-

Source: Computed from Primary Data

Note: $P \leq 0.05$ implies that the estimated parameter is statistically significant.

The likelihood of aged persons' health status is best predicted by gender (more likely to have a high health status for male aged persons), education (more likely to have a rising health status with increasing years of schooling), household income (more likely to have a rising health status of aged persons with increasing household income), long term health (more likely to have a rising health status with increasing long term health conditions of the aged persons), and short term health (more likely to have a rising health status with increasing short term health conditions of the aged persons).

It can be inferred from the results that for improving overall health status of the aged person, the activating factors are his/her income and education (Gupta et al., 2001 and Alam, 2004) as well as short term and long term illness (Firpo et al., 2009). These results confirm the findings of Alam (2004), Gupta et al., (2001) and Firpo, (2009). Thus Exp (B) values of the Binary Logistic Regression Model imply that these personal factors comprising demographic variables (gender and education) and health variables (LTM and STM) have greater influence than household income on health status of the aged persons, which verifies the hypothesis.

CONCLUSIONS AND SUGGESTIONS

Hindus among the aged persons had more representation in the study as compared to Christians and Muslims. The aged persons who belonged to BC were more in rural areas. There is an increase in the number of widowed which may be due to more number of deaths among male aged persons. The number of nuclear families shows an increasing trend revealing the breakdown of joint family system in the rural areas. More than one-third of the aged persons had primary education. The number of illiterates and literates with primary level education was greater in rural areas. More than half of the aged persons perceived that they were their children, and more than one-third stated that they stay with their spouse. Economically speaking, the financial wealth was very much higher as compared to physical wealth in the selected rural region. More number of rural aged persons had physical wealth. Nearly one third of the aged persons had occupational income. The expenditure pattern among aged persons shows that the rural aged spent more money on medical expenditure than the personal habitual expenditure.

As far as the morbidity pattern is concerned, more than half of the aged persons suffered from back-pain and blood pressure in both sex. Fever was noticed to be the cause for most common short-term morbidity among males, females in rural residents, which believed to be physical and psychological stress while travelling or doing skilled and mechanical works. Majority of the aged persons with physical incapacity had visual problem among both males and females in rural areas. Regarding determinants of health status of the aged it can be stated that the likelihood of aged persons' health status is best predicted by gender, education, household income, long term health, and short term health. It can be understood that for improving the overall health status of the aged person, the activating factors are his/her income and education as well as short term and long term illness. These personal factors comprising demographic variables such as gender and education and health variables such as long-term morbidity and short-term morbidity have greater influence than household income on health status of the aged persons which justifies the hypothesis.

The following remedial and corrective measures are suggested for improving and sustaining the economic security and health status of aged persons. The Government may take steps to increase its economic support especially to female aged persons in rural areas so that they can rely on their own strength. The Government may also encourage the female aged those who could save the considerable portion of the income in bank or post office by offering them higher interest rate on their balance. There is a need to increase geriatric centres for the treatment of the aged especially in rural areas as there is an increase in the number and proportion of the aged having a direct impact on the demand for health services. The family members may be encouraged by giving education/counselling to provide proper care, especially, food, clothing and shelter for the aged in their houses.

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A STUDY ON THE IMPACT OF SERVICE INCLINATION AND COMPETENCE OF EMPLOYEES ON SERVICE QUALITY AND CUSTOMER SATISFACTION

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ABSTRACT

In order to be competitive a firm must develop a strategy for providing quality service which can be achieved only when they understand how the customers perceive service quality and also need to identify ways in which service quality is influenced. Since essence of effectiveness in managing service quality lies in selecting right type of individuals, which is the major contributor for providing quality service. Employee performance plays major role in satisfying customers which depend upon hiring the quality manpower. Service Delivery depends upon the employee competence and their inclination towards that particular service. Service inclination refers to individual's interest in doing service related work and competence refers to the various skills and knowledge necessary to be effective. The purpose of this paper is to study how service inclination and competence of employees are important in providing the quality service. It also studies how well trained employees affect the customer satisfaction. Services being intangible, it is the encounter between the employees and the customers in real time which determine the quality of service. So employees play an important role and they need to be trained well so as to inculcate in them the critical competencies required for delivering quality services. The paper is descriptive in nature.

Keywords: Competence, Customer Satisfaction, Service Employees, Service Inclination, Service Quality.

PURPOSE OF THE STUDY

- The purpose of the paper is to study how service inclination and competence of employees are important in providing the quality service.
- It also studies how well a trained employee affects the customer satisfaction

THE SPECIFIC OBJECTIVES

- To assist in hiring the best employees who have competence as well as service inclination to provide quality service.
- To assist in identifying training areas important in providing quality service.

Methodology: The study is based on secondary data.

LITERATURE REVIEW

Kotler and Keller (2006) defined service as any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product. Due to the role of the employees in service organizations and the value customers place on service quality, the management would have to adopt a system or approach that can yield satisfactory results. Various studies in service management have shown that the perception of the quality of services through the eyes of the customer is formed by a judgment of many encounters, with an organization. According to Zeithaml, Bitner and Dwayne (2006:106), "customers perceive services in terms of quality of the service and how satisfied they are overall with their experiences." However, these encounters are mainly the joint effort of the employees who have contacts with the customers, and the customers themselves, who therefore may be in better position to understand them, and solve their service related problems. The issue of customer service has attracted more attention in recent years than ever before, with a big influence Harris (2000, p. 32) states, "Customer service is anything we do for the customer that enhances the customer experience". A similar perspective comes from Zemke & Woods (1998) which claims that customer service is a relationship with people who are essential to everything you do meeting the needs and expectations of the customer as defined by the customer and used to create a mutually beneficial relationship between itself and those it serves. Being the increasing sensitivity on the behalf of the customer (Gregory, 2000), businesses who closely track their customers' wants and needs typically enjoy greater success. Service quality is considered to be a successful method of differentiation in the service-oriented business (Parasuraman, Zeithaml, & Berry, 1988).

Quality service cannot be forced, but comes out of a shared passion in the value of working together to serve customers. The quality of an organization's service is based on how the customer perceives it. According to Lewis (1990), service quality is a measure of the degree to which customer expectations matches the experience

of the service delivered. This awareness leads to an emotional reaction that is obvious in the satisfaction or dissatisfaction of the products or services being purchased (Woodruff et al., 1983). Delivering quality service means yielding to customer expectations on a consistent basis. Customers will remain loyal to a service organization if the value of what they receive is determined to be relatively greater than their expectations (Zeithaml & Bitner, 1996). The amount of importance a company places on quality of service is directly related to their future. Service management literature has repeatedly emphasized the importance of the human element in the delivery of superior service (Crosby & Stephens, 1987; Gronroos, 1990; Parasuraman et. al., 1985; Solomon et. al., 1985). Service loyalty is a service organization's commitment to its customers that is undertaken by the organization for the development of a long-term relationship with the customer. Berry (1987) projected the idea that companies earn loyalty by first being loyal themselves. Service loyalty precedes customer loyalty, and therefore it is vital that service organizations convince their customers of their commitment to superior quality of service. Customer loyalty is time-specific, and as a result is unstable. Organizations must constantly strive to develop and maintain their customer's loyalty or, as is common in the majority of relationships, risk losing it to someone else (Kandampully, 1998). Understanding what the customers expect from an organization is a prerequisite for delivering superior service. Studies have defined customer service expectations in a variety of ways. One of the most popular ways for researchers to evaluate customer expectations is by using the rater method. This method categorizes customer service expectations into five overall dimensions: reliability, tangibles, responsiveness, assurance, and empathy (McColl-Kennedy & White, 1997). Reliability means that the employee should have the capabilities to carry out the service in a consistent manner. Furthermore, it involves considering the needs and perspectives of others (Dube, Renaghan, & Miller, 1994; Greenberg & Sidler, 1998). Tangibles consist of the aesthetic value of the facilities, equipment, and personnel (Booth, 1999; Parasuraman, Berry, & Zeithaml, 1991). Responsiveness refers to the employees' abilities to be assertive and ready to help customers and offer timely service (Gomez, 1999; Greenberg & Sidler, 1998). Assurance includes the ability of the employees to be polite and knowledgeable, as well as to convey a sense of trust and confidence (Cagle, 1998). Empathy deals with the caring and individualized attention received by customers. Empathy also means being able to emotionally identify with others (Dube, Renaghan, & Miller, 1994; Goodman, 2000). By focusing on these five areas organizations are able to pinpoint their customers concerns and expectations. An organization should consider these five topics while selecting and hiring their employees.

HIRING

Quality of customer service begins with the hiring process. Hiring the best possible people to perform the service is a key factor in services marketing. The best way to hire the right person is to develop ideal candidate profiles for each type of position based on customer service expectations, and use these profiles in recruiting candidates. The attraction, development, motivation, and retention of quality employees require a clear vision worth pursuing. Employees need more emotional motivation to serve customers as opposed to only monetary. The organization needs to observe how the quality of their employees affects the overall organization. On the other hand, the employees need to understand how the importance of their customer service competencies ties into the overall business (Kandampully, 1998).

TRAINING

Employee training programs are critical in improving the level of service provided by an organization, which improves customer satisfaction and loyalty. Many successful customer-service training programs begin by educating employees in human relations and teaching them technical skills (Watson, 1988). As organizations place more and more emphasis on training, it is necessary that there is a direct link between employee and customer opinions of service quality and that these programs are training employees in the areas that are important to customers.

TEAMWORK

An important dynamic in retaining service employees is the concept of teamwork. Research shows that teamwork is central to delivering excellent service (Pritchard, 2001, & Tjosvold, 1993). Many studies, conducted by different types of social scientists have documented the impact of cooperation, competition, and independence (Johnson & Johnson, 1989, Maruyama, et al. 1985). The findings consistently indicate that it is through cooperative teamwork, much more than through competition or independence. People who communicate directly, empathize, support each other emotionally, discuss different points of view constructively, solve problems successfully, achieve at higher levels, and feel confident and valued as a person more when there is a foundation of teamwork within the organization.

GOAL ORIENTATION

The organization as a whole needs to have the same goals and visions, starting with top management. One way to enhance the ability for customer service representatives to serve their customers is to have others within the organization come through for them. The way an organization treats and retains its employees is a critical component in the way the employees perform their jobs (Berry, 1994). Teams and departments throughout an organization must coordinate their goals and work together effectively to deliver value to their customers. Within this supportive environment, individuals and their teams are empowered to perform for and serve their customers (Tjosvold, 1993).

FLEXIBILITY AND EFFICIENCY OF EMPLOYEES

The way the customer service representative finds solutions to customer inquiries is a big part of how the customer is going to perceive their interaction with the business. The best customer service representatives solve problems with ease and speed. They are calm and clear headed, even under demanding situations, helpful and good-natured, and have the ability to solve problems. People who succeed in customer service are motivated to please their customers and be helpful at the same time (Greenberg & Sidler, 1998). The response time, how long it takes for a customer service representative to find a solution to a problem or find someone else who can is also important. Customers not only focus on the actual interaction taking place, but the quality of that interaction. If the interaction is negative, the customer is more likely to take note of this (Dauten, 2000). Serving customers well is a complex task that cannot be performed alone. Individuals need to pool their information, ideas, and assistance to solve customer problems.

INDIVIDUAL AND PERSONAL CHARACTERISTICS

Communication skills are critical in delivering quality customer service. Exceptional people skills and the ability to give out information in a way that is interesting to the customer are important abilities for customer service representatives to have (Booth, 1999, & Evenson, 1999). Outstanding customer service representatives enjoy interacting with other people. They typically like staying busy with a full workload and enjoy meeting challenges of their work. They are able to identify emotionally with their employers as well as their customers. These employees are able to get along with different people from diverse backgrounds. They have an ability to please most people and accept constructive criticism and feedback. They are generally pleased with their past work experiences and past employers, and tend to work at the same place for a significant period of time (Goodman 2000).

Widmier (2002) and Silvestro (2002) highlighted two basic approaches to managing people. First the staff can be supervised closely and corrective actions taken where they fail to perform to standard. Secondly, staff can be made responsible for controlling their own actions. Service quality without competent employees is a distant dream. It is thus imperative for any services provider to judge the incumbents for competency before selecting them and further giving them continuous dose of training. This will not only enhance their skill set but also keep their clients' happy and satisfied. Service Competence can be achieved by providing employees the necessary skills and knowledge to perform the service. There are several factors were a company needs to focus and provide necessary training to their employees in order to improve competence in their employees so that they provide quality service. Employee training programs are thought to be critical in improving the level of service provided by an organization, and to increase customer satisfaction and loyalty (McColl-Kennedy & White, 1997). Research has shown that training is the most important resource. A large amount of profitable companies compete by hiring, rewarding, training and retraining (Berry, 1994). A common mistake that companies make is to look at employee skill and knowledge development as an event rather than an ongoing process. If they receive training, it is either too little, too late, or not the type of training they need. Schneider et al. (1994) stresses the importance of managerial support of training. In order for organizations to expect their employees to provide quality customer service, management has to make a long-term commitment to training. Not only do they need to support the training program, but they also need to model the performance that they expect from their employees.

Successful customer-service training programs must begin by educating employees in human relations and technical skills. Organizations must place more and more emphasis on training, it is important that there is a link between employee and customer opinions of service quality and that these programs are training employees in the areas that are important to customers.

COMPETENCY DESCRIPTIONS (Coll & Zegward, 2006)

Teamwork & cooperation (fosters group facilitation and management, conflict resolution, motivation of others, creating a good workplace climate)

Flexibility (adaptability, perceptual objectivity, staying objective, resilience, behaviour is contingent on the situation)
Relationship building (networking, establish rapport, use of contacts, concern for stakeholders e.g. clients)
Computer literacy (able to operate a number of packages and has information management awareness)
Conceptual thinking (pattern recognition, insight, critical thinking, problem definition, can generate hypotheses, linking)
Technical expertise (job related technical knowledge and skills, depth and breadth, acquires expertise, donates expertise, attention to detail)
Organisational awareness (understands organisation, knows constraints, power and political astuteness, cultural knowledge)
Concern for order, quality & accuracy (monitoring, concern for clarity, reduces uncertainty, keeping track of events and issues)
Impact & influence on others (strategic influence, impression management, showmanship, persuasion, collaborative influence)
Initiative (bias for action, decisiveness, strategic orientation, proactive, seizes opportunities, self motivation, persistence, enthusiasm)
Customer service orientation (helping and service orientation, focus on client needs, actively solves client problems)
Developing others (training, developing others, coaching, mentoring, providing support, positive regard)
Directiveness (assertiveness, decisiveness, use of power, taking charge, firmness of standards, group control and discipline)
Team leadership (being in charge, vision, concern for subordinates, builds a sense of group purpose)
Analytical thinking (thinking for self, reasoning, practical intelligence, planning skills, problem analysing, systematic)
Self control (stamina, resistance to stress, staying calm, high Emotional Quotient, resists temptation, not impulsive, can calm others)
Organisational commitment (align self and others to organisational needs, business-mindedness, self sacrifice)
Ability and willingness to learn (desire and aptitude for learning, learning as a basis for action)
Interpersonal understanding (empathy, listening, sensitivity to others, diagnostic understanding, awareness of others' feelings)
Self confidence (strong self concept, internal locus of control, independence, positive ego strength, decisive, accepts responsibility)
Personal planning and organisational skills
Written communication
Information seeking (problem definition, diagnostic focus, looking deeper, contextual sensitivity)
Achievement orientation (task accomplishment, seeks results, employs innovation, has competitiveness, seeks impact, aims for standards and efficiency)
Values, ethical and social sensitivity (knowledge of values, ethical issues and standards in the discipline)

Service Inclination Service inclination means employees possess empathy i.e. they are understanding, friendly and caring and are always willing to solve the problems of customers.

It has been identified in many researches those employees who have positive inclination toward a particular service show more interest in training and developmental programs, show more interest in job advancement , and are more active in personal need fulfilment(Authors:Miller, RobertW.Prichard, Frederick N).Thus they perform better than those who have no inclination towards that service. Inclination refer to behaviours and standards such as how you carry out your work and the way in which you handle certain situations

Being a customer service professional is a job that many people can do, but not many people can truly excel at. It takes a special type of person, one who exhibits high levels of competencies, as well as service inclination,

Companies that genuinely value creating a positive experience for their customers hire the employees with positive inclination and provide the proper training.

SUMMARY OF LITERATURE REVIEW

The reviewed literature states that customer service is an important, if not the most important aspect of doing business. While both the customer as well as the service organization value quality service, the ability to deliver it is not often matched up with what the customer expects. There are numerous aspects of customer service that are seen as being vital to the overall success of an organization's efforts. The method used to attract and retain employees is the first stage in reaching customer expectations. Hiring those who have positive inclination towards that particular service and training the employees in areas the customers deem important is a crucial step.

The way the customer service representative finds solutions to customer inquiries is a big part of how the customer is going to perceive their interaction with the business. The best customer service representatives solve problems with ease and speed. They are calm and clear headed, even under demanding situations, helpful and good-natured, and have the ability to solve problems. A person who succeeds in customer service is motivated to please their customers and be helpful at the same time (Greenberg & Sidler, 1998). The response time, how long it takes for a customer service representative to find a solution to a problem or find someone else who can is also important. Customers not only focus on the actual interaction taking place, but the quality of that interaction. If the interaction is negative, the customer is more likely to take note of this (Dauten, 2000). Serving customers well is a complex task that cannot be performed alone. Individuals need to pool their information, ideas, and assistance to solve customer problems. Only those employees succeed who have service inclination and competence to perform that particular job.

Academics and practitioners alike highlight the importance of employee commitment to quality in successful service organizations (Collier, 1994; Heskett et al., 1997; Larson and Sasser, 2000; Lovelock, 1994; Poisant, 2001). *Customer perceptions of quality, particularly in service industries, are shaped by the courtesy, empathy, and responsiveness of service employees (Zeithaml et al., 1990).* The success of some quality initiatives has been found to be mediated by employee motivation (Kini and Hobson, 2002) and the commitment or vision of the organization (Bou and Beltrán, 2005).

CONCLUSION

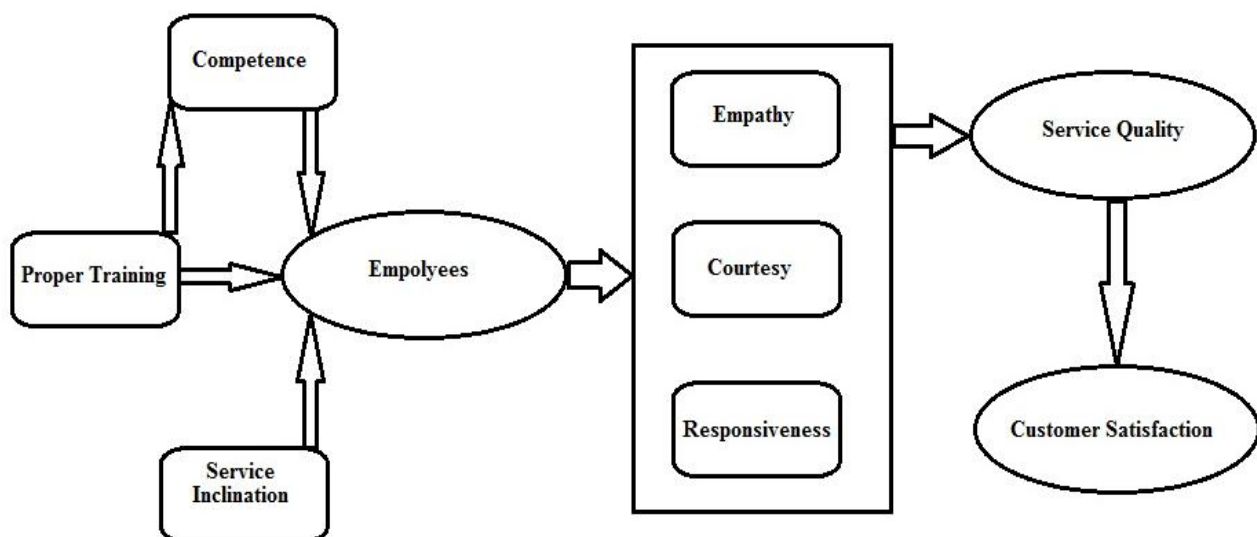


Figure: Showing the impact of Competence and Service Inclination of Employees on Customer Satisfaction

Service quality plays a prime role in the success of any business if an organization wanted to remain competitive it has to meet the customers' expectations. The whole process depends upon the employees, how well they perform. Services being intangible customers, it is the encounter between the employees and the customers in real time which determine the quality of service, so employees play an important role and they need to be trained well so as to inculcate in them the critical competencies required for delivering quality service, but training alone cannot help if we have to hire the best employees we need to select those who have service inclination. As discussed above it is quite clear that if individual have necessary competence but no

inclination he won't perform well even if the organization spend lot of money in training and development . So it is prime important that during hiring individual we need to choose those who have inclination towards particular service.

Competency can be enhanced by giving proper training but employee must have service inclination like customer focus for example if An employee who has an apathetic, or potentially even negative view towards customers would clearly be a poor fit for a customer service role. But someone with positive inclination will genuinely cares whether or not their customers are satisfied and truly wants to create the best possible experience for them is going to perform at much higher level.

An employee must have a high level commitment to not only doing job but doing it well. Someone who is ok with doing the bare minimum, or isn't concerned with being thorough, will only be able to give their customers a mediocre experience at best.

Because people are inherently unpredictable, there will be many times when you have to help a customer with an uncommon, or perhaps even unique, issue. Being able to think on your feet and problem solve on the fly is a skill critical to success. Someone who has positive inclination would think outside the box, develop alternative solutions, or handle those uncommon problems. No doubt he needs competence to handle such problems but he will perform only when he has service inclination which motivates him to perform extraordinary

It is clear from the above statement that service quality depends upon the competence, service inclination and proper training and development of the employees. As far as the employees are concerned we need to develop a new or improved reward system that gives them incentives for improving their customer service skills. This will provide them more motivation and encouragement to strive to do their best and be their best for themselves as well as for the customer's services. As performances are difficult to separate from the people and if the people do not meet customer expectations, then the organizations might fail.

Thus we conclude that if the service organization wants its employees to do a great job with its customers, it must be prepared to do a great job with its employees. Provide them proper training in tune with customer expectations and to hire those who have positive inclination and competence towards a particular service.

LIMITATION

As the research is based on secondary data so there is a scope to do the empirical analysis to study the effect of employee training on service quality and customer satisfaction. There are also other factors influencing employee performance, apart from the factors suggested in this study such as; empowerment, reward system, performance appraisal etc. It is recommended that future studies may focus on these aspects of Employees performance.

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INVESTORS PERCEPTION AND ATTITUDE TOWARDS EQUITY SHARE TRADING: AN EMPIRICAL STUDY IN MANGALURU CITY

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ABSTRACT

Stock market is a peculiar market even though investors can analyze it by using different tools and techniques before taking investment decisions. While choosing equity or stock to invest in or trade into, different factors are considered which make investment decisions complicated. The key drivers for investment decisions are demographic factors, attitudinal factors and socio-economic factors. Different sources of information are taken into consideration by investors while making investments. These sources can be magazines, journals, newspapers, television, internet, radio advertisements and company sources, information provided by friends, relatives, peers and investment advisors. This paper tries to explore the current investment trends amongst individual investors in Mangaluru and to ascertain the investor perception about professional financial advisory services. This paper tries to highlights on investor opinion about information technology / internet as a means of investment planning and trading.

Keywords: Investment, Savings, Equity

INTRODUCTION

Equity trading is a buying and selling of stocks, through internet in an area of commercial activity. The arrangement of establishment encourages the trading of stocks among purchasers and vender's. For the development of electronic exchange a vast division of securities exchange are not midway situated in a specific area as a result of each exchange are made through web based exchanging.

Exchange is the responsibility for services from one individual to another Trade is now and again inexactly called business related exchange or deal. A scheme that permits conversation is known as a market. The first type of conversation was trade, the direct trade of merchandise and enterprises. Later one side of the deal was the metals, valuable metals (shafts, coins), bill, and paper cash.

Current merchants rather all around counsel through a medium of exchange, for instance, money. Hence, acquiring can be secluded from offering, or winning. The development of money (and later credit, paper money and non-physical money) exceptionally revamped and propelled trade. Trade between two dealers is called particular trade, while trade between more than two specialists is called multilateral trade.

Trade exists for man as a result of specialization and division of work, most by far spotlight on a little piece of creation, trading for various things. Trade exists between regions in light of the way that unmistakable locale have a relative good position in the making of some tradable thing, or in light of the way that assorted territories' size considers the upsides of large scale manufacturing. Everything considered, trade at exhibit costs between regions benefits the two zones.

Retail trade contains the offer of items or stock from a to a great degree settled region, for instance, a retail establishment, boutique, or by means of mail, in little or individual bundles for organize use by the purchaser opening arrangement trade is described as the offer of items or stock to retailers, to present day, business, institutional, or other master business customers, or to various wholesalers and related subordinated organizations.

Swapping can likewise allude to the activity performed by brokers and other market specialists in the money related market.

On its affirmation as a stock exchange under the securities contract (control) Act 1956 in April 1993, NSE started exercises in the Wholesale Debt Market (WDM) segment in June 1994. The capital market (values) section started undertakings in November 1994 and exercises in Derivatives parcel began.

The research is an attempt to identify the current investment trends amongst individual investors in Mangaluru and to ascertain the investor perception about professional financial advisory services. Also an attempt is made to ascertain investor opinion about information technology / internet as a means of investment planning and trading.

This investigation required both Primary and Secondary information. Essential information was gathered through an organized poll and the Secondary information was made accessible through organization writing and Internet.

All the respondents were contacted personally which consisted of individual investors of Mangaluru, both current and potential. The information was collected by meeting them personally. The data collected above was analysed thoroughly through appropriate statistical methods and presented in the form of tables.

In this project investor's choice of investment avenues, reasons for the choice, characteristics they expect from financial advisory services and awareness levels of various equity advisory services have been dealt in length and breadth.

LITERATURE REVIEW

Petter (1970) studied the factors which influence and motivate the investors to invest in the stock market. He found out several reasons like investors want to have rapid growth, income from dividends, professional management. It has been observed that young are more risk averse than old, women are more risk averse than men, rich peoples' willingness to invest in equities is higher than poor.

Jean William, H. (1970) analysed how individuals' investment decision making process differs from that of firms'. He concluded that individual investors generally rely upon published materials, market trends, suggestions of family members / friends, their own instincts, etc. whereas the firm makes decisions on the basis of analytical reports.

Tversky, A. & Kaheman, D. (1974). Psychological research has found that people see and believe what they want to believe as per their perceptions. This means that any positive news about a company leads investors to overreact positively. High rate of returns results in increase in investors' self confidence. In general, it has been confirmed that behavioural investment psychology influences financial decision making and is one of the major areas that affects the individual's investment decisions.

Lewellen (1977) found that based on the investment objectives, investors' perceptions and attitudes are affected by age, gender, income and education.

Bawa, Vijay S.(1979) , discussed the risk associated while investment making. Every investment avenue carries benefits of returns along with 40 the risk associated with it. The degrees of risk differ from one option to another. So in case of investment portfolio when well diversified provides optimal returns as lower returns from one line of investment is compensated by higher returns of the other and same goes with risk factor too so risk can also be balanced.

Grewal, S.S. and Navjot Grewal (1984) gave few basic investment guidelines to the investors. They suggest that investors should not purchase unlisted shares, inactive shares and shares in closely-held companies. Shares become inactive as there are no buyers in the market for them. Closely-held companies have smaller number of shareholders which may result in less active shares. They also proposed not to hold shares for a long time in expectation of price rise and instead profit should be booked periodically when the desired gain is achieved.

"Lawful Aspects of Internet Stock Trading" - By Alexandre Ramos Coelho: Paper exhibits the structure the securities exchange. This covers the idea of Internet and the important legitimate viewpoints it has raised. It likewise covers the announcement of the lawful and operational perspectives that are specifically influencing the purchasing and offering stocks through Internet.

"Web based Trading and the National Association of Securities Traders 'Suitability Rule: Are Equity Investors adequately protected?'" By Renee Barnett, 2001. This exhibits internet exchanging has authorised expanded access to the safeties showcase. Empowering interest in safeties can be useful for both separate speculators and economy in general. However to save the advantages made by web based exchanging, financial specialist assurance is basic. One part of this insurance is the illumination of appropriateness commitments on the web. The trouble in figuring out what constitutes suggestion equity makes financial specialist assurance troublesome.

"Study of web based exchanging sites" – By Australian Securities and Investments Commission, August 2000. This presents utilization of equity intermediaries to direct securities exchanges on Australian Stock Exchange developed an exceptional way. Retail financial specialists have held onto web based exchanging as a shabby and simple technique to purchase and offer securities..

"Equity Stock Trading in India: An Empirical Investigation", by Nidhi Walia and Ravinder Kumar, Indian Journal of Marketing. As monetary framework is winding up more perplexing it has progressed toward

becoming need of great importance where financial specialists ought to appreciate the information and comprehend late complexities of web based exchanging. In Indian setting e-exchanging is moderately new wonder, which presently can't seem to increase some noteworthy significance. In the past speculators have no other choice to get showcase data but to contact their nearby agent.

RESEARCH DESIGN

Objectives of Study

- Perception of investor's towards fairness trading..
- To study the mindfulness and attitude of investors towards equity share trading.
- To study the service of equity share trading.
- To analyse the extent usage of technology based share trading among the investors

Research Type

The research type adopted for the proposed study is an evaluative and descriptive in nature.

Sampling Design

Sample size: The study is based on 100 respondents, of which it includes investors, intermediaries and others involved in equity trading.

Sample Area: The Sample Area selected for the study is Mangaluru City.

Sample Technique: The sample technique adopted for this study is random and convenient technique.

Data Collection

The data was collected through structured questionnaire. The selection of respondents is based on simple random sampling.

ANALYSIS AND INTERPRETATION

Table-1: Table showing types of equity trading

Types of Equity Trading	No. of respondents	Percentage	Mean
Intraday	60	60%	0.6
Investment	40	40%	0.4
Total	100	100%	

Above Chart shows that 40% of respondents interest toward Investment sort of web based exchanging and 60% of respondents incline toward Intraday kind of web based exchanging on the grounds that in Intraday exchanging the exchanges of purchasing and offering inside some exchanging day with the end goal that all positions will normally be shut before the market close of the exchanging day so financial specialists are exchanging to equity for their benefit.

Table-2: Table showing period of involvement in equity trading.

Involved in equity trading	No. of respondents	Percentage	Mean
Less than 6 months	30	30%	0.3
6 months to 1 year	20	20%	0.2
1 year to 1.5 year	10	10%	0.1
1.5 years to 2 years	25	25%	0.25
More than 2 years	15	15%	0.15
Total	100	100%	

From the table -2, it is evident that the period of involvement in equity trading wise distribution shows that 30%, 20%, 10%, 25% and 15% of the respondents involved less than 6 months, 6 months-1 year, 1 year - 1.5 year, 1.5 years - 2 years and more than 2 years respectively.

Table-3: Table showing Number of respondents preferred Equity Trading Websites

Preferred trading websites	No. of respondents	Percentage	Mean
Reliance money	25	25%	0.25
Angel Broking	15	15%	0.15
HDFC securities	10	10%	0.1
ICICI-securities	20	20%	0.2

India bulls	18	18%	0.18
Marwadi	12	12%	0.12
Total	100	100%	

Table-3 explains the most preferred equity trading websites for equity trading by the respondents. It shows that 25% prefers Reliance money, 15% prefers Angel Broking, 10% prefers HDFC securities, 20% prefers ICICI securities, 18% prefers India bulls and 12% prefers Marwadi.

As per survey Reliance money and ICICI securities both websites are most preferred to respondents but Angel Broking, HDFC securities, India bulls and Marwadi these websites are not most preferred for the respondents.

Table-4: Table showing factors responsible for the selection of equity trading to conventional trading

Factors	No. of respondents	Percentage	Mean
Time saving	30	30%	0.3
More convenience	15	15%	0.15
No dependency on others	10	10%	0.1
Real time price awareness	10	10%	0.1
Low cost	20	20%	0.2
More safe	10	10%	0.1
Others	05	05%	0.05
Total	100	100%	

Above table explains why respondents prefer equity trading to conventional trading. It also explains that 30% of respondents prefer time saving, 15% prefer more convenience, 10% prefer no dependency on others, 10% prefers real time price awareness, 20% prefers low cost, 10% prefers more safe and 5% prefer others respectively.

Table-5: Table showing factors affecting on the selection of equity trading

Factors	No. of respondents	Percentage	Mean
Better earning	30	30%	0.3
Safe investment	25	25%	0.25
High growth	20	20%	0.2
Liquidity	10	10%	0.1
Easy to access	10	10%	0.1
Speculation	05	05%	0.05
Total	100	100%	

The above table explains there are various factors affecting on the selection of equity trading. All the investors are not choosing to same factors like 30% of the respondents prefer better earning and 10% prefer liquidity this is because investors are interested in safe investment and they want to keep themselves away from risk. Then 25% prefer safe investment, 20% prefer high growth, 10% prefer easy to access and 5% prefer speculation respectively.

Table-6: Table showing sources of information that no. of respondents use for being informed about general and legal issues relevant to the equity trading.

Sources of Information	No. of respondents	Percentage	Mean
Personal contacts	15	15%	0.15
News from chamber of commerce, industry association, etc.	10	10%	0.1
Legal advisors	10	10%	0.1
Equity portal	25	25%	0.25
Newsletters	10	10%	0.1
Websites and Brokerage firms	15	15%	0.15
Newspapers and magazines, journals	15	15%	0.15
Total	100	100%	

Above table shows that there are various sources of information for equity trading. Here 15% of the respondents get the information from personal contacts, 10% from news from chambers of commerce, industry associations, etc. 10% from legal advisor, 25% from equity portal, 10% from newsletters, 15% from websites and brokerage firms and 15% from newspapers, magazines and journals respectively.

Table-7: Table showing criteria for the equity trading, which are considered to open an account in a brokerage house**(MI = Most Important, I = Important, N = Neutral, LI = Least Important, NI = Not Important)**

Sl. No	FACTORS	MI		I		N		LI		NI		TOTAL	
		No	%	No	%	No	%	No	%	No	%	No.	%
1	Variety of products offered	35	35	25	25	10	10	20	20	10	10	100	100
2	Time to open an account	30	30	20	20	15	15	20	20	15	15	100	100
3	Brokerage charges	20	20	35	35	25	25	10	10	10	10	100	100
4	Customer services	33	33	24	24	18	18	15	15	10	10	100	100
5	Software	25	25	30	30	17	17	22	22	6	6	100	100
6	Research reports	20	20	15	15	35	35	20	20	10	10	100	100
7	Efficiency at peak hours	40	40	10	10	25	25	15	15	10	10	100	100
8	Customer relationship	35	35	20	20	10	10	15	15	20	20	100	100
9	Compliance system	25	25	35	35	10	10	15	15	15	15	100	100
10	Infrastructure	20	20	15	15	10	10	20	20	35	35	100	100
11	Brand	10	10	20	20	15	15	35	35	20	20	100	100
12	Trading calls/sms	25	25	35	35	10	10	20	20	10	10	100	100
13	Effective execution	35	35	18	18	24	24	10	10	13	13	100	100
14	Regular delivery of contract notes	22	22	38	38	14	14	16	16	10	10	100	100
15	Market exposure	33	33	21	21	19	19	15	15	12	12	100	100
16	Recording confirmation	16	16	38	38	14	14	20	20	12	12	100	100
17	Access to back office	13	13	23	23	15	15	33	33	16	16	100	100
18	Comprehensive stock trading portal	24	24	37	37	19	19	11	11	9	9	100	100
19	Employees skill	10	10	40	40	25	25	12	12	13	13	100	100
20	Helpline services	16	16	34	34	20	20	15	15	15	15	100	100
21	Guidance	30	30	15	15	20	20	10	10	25	25	100	100

Source: field survey

Above table shows that various criteria for the equity trading, which are considered important for the respondent to open an account in a brokerage house.

- It shows that variety of products criteria, for 35% of respondents is most important, for 25% respondents it is insignificant, for 10% respondents it is neutral, for 20% respondents it is smallest significant and for 10% respondent it is not important
- From the above table it is evident that time to open an account criteria, for 30% respondents it is most important, for 20% respondents it is important, for 15% respondent it is neutral, for 20% respondents it is least significant and for 15% respondent it is not important.

- In the survey it shows that brokerage charges criteria, for 20% respondent's is most important, for 35% respondents it is insignificant, for 25% respondents it is impartial, for 10% respondents it is least significant and for 10% respondents it is not more important.
- From the above, it shows that customer services criteria, for 33% respondents is maximum important 24% respondents it is important, for 18% respondents it is neutral, for 15% respondents is least important & for 10% respondents is not more important.
- In the survey it shows that software criteria, for 25% respondents it is most important, for 30% respondents it is important, for 17% respondents it is neutral, for 22% respondents it is least important and for 6% respondents it is not important.
- In the survey it shows that research reports criteria, for 20% respondents it is most important 15% respondents it is very important, for 35% respondents it is unbiased, for 20% respondents it is less important and for 10% respondents it is not significant.
- It shows the efficiency at peak hour's criteria, for 40% respondents it is most important 10% respondents is important, for 25% respondents it is neutral, for 15% respondents it is least significant and for 10% respondents it is not significant.
- It shows the customer relationship criteria, for 35% respondents it is most important 20% respondents it is important, for 10% respondents it is neutral, for 15% respondents it is least important and for 20% respondents it is not significant.
- In the survey it shows that compliance system criteria, for 25% respondents it is most important, for 35% respondents it is important, for 10% respondents it is neutral, for 15% respondents it is least important and for 15% respondents it is not significant.

Table-8: Table showing investor's knowledge about equity trading

(SA = Strongly Agree, A = Agree, NA/ND = Neither Agree or Disagree, D = Disagree, SD = Strongly Disagree)

Sl. No.	Statements	SA		A		NA/ND		D		SD		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	Equity Trading has captured more investors	35	35	25	25	10	10	20	20	10	10	100	100
2.	Equity Trading has reduced chances of Fraud	30	30	22	22	15	15	18	18	15	15	100	100
3.	Equity Trading has made trading process more transparent	33	33	24	24	20	20	15	15	08	08	100	100
4.	Equity Trading has Bright future ahead	40	40	20	20	15	15	10	10	15	15	100	100
5.	Equity Trading is reducing the role of Broker	20	20	32	32	25	25	15	15	08	08	100	100
6.	Equity Trading gives more return on Fraud	15	15	20	20	10	10	35	35	20	20	100	100
7.	While Equity Trading Indian Capital Market has become efficient	15	15	33	33	20	20	18	18	14	14	100	100

Source: field survey

1. In the survey it shows that the equity trading has captured more investors criteria, 35% respondents have fully agreed, 25% respondents have agreed, 10% respondents are neutral, 20% respondents have disagreed and 10% respondents say that equity trading has not at all captured more investors' criteria.
2. From the study it shows that the equity trading has reduced chances of fraud criteria, for 30% respondents strongly agree, 22% respondents agree, 15% respondents have neither agreed nor disagreed, 18% respondents have disagreed and 15% respondents have strongly agreed.
3. In survey it shows that the equity trading has made trading process more transparent criteria, for 33% respondents have fully agreed, 24% respondents have agreed, 20% of the replies are neither agree nor disagree, 15% disagree that it is not so transparent 8% respondents have strongly disagreed.

4. In the survey it shows that the equity trading has bright future ahead, for 40% of the replies are strongly agreed, 20% of the respondents have agreed, 15% respondents have neither agreed or disagreed, 10% respondents have agreed, 15% respondents have strongly disagreed that the equity trading has no future.
5. In the survey it shows that the equity trading is reducing the role of broker ,20% respondents have strongly accepted, 32% of the replies are agreed, 25% respondents have neither agreed nor disagreed , 15% respondents have agreed and 8% respondents have strongly agreed.
6. From the study it shows that the equity trading gives more return on fraud ,15% respondents have completely agreed, 20% respondents have approved, 10% respondents have neither decided nor disagreed, 35% of the replies are disagree and 20% respondent have completely disagreed.
7. Research shows that the equity trading Indian capital market has become efficient, 15% respondents have fully agreed, 33% of the replies are agreed, 20% of the respondents have neither approved nor disagreed, 18% respondents have disagreed and 14% respondents have completely disagreed.

Table-9: Table showing problems faced by the equity trading investors

(DNK = Do Not Know, KL = Know a Little, KS = Know Something, KW = Know Well, KVV = Know Very Well)

Sl. No.	Statements	DNK		KL		KS		KW		KVV		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	Technological aspects of Equity Trading	20	20	15	15	35	35	18	18	12	12	100	100
2.	Risk of system failure	30	30	35	35	20	20	10	10	05	05	100	100
3.	Professional Management of Broker	15	15	12	12	08	08	35	35	30	30	100	100
4.	Transaction cost of Equity Trading	10	10	13	13	20	20	25	25	32	32	100	100
5.	Requisite Information for Equity Trading	10	10	12	12	15	15	35	35	28	28	100	100
6.	Possibilities of Frauds	18	18	10	10	37	37	20	20	15	15	100	100
7.	Poor Communication Network	05	05	12	12	17	17	36	36	30	30	100	100
8.	Level of Transparency	10	10	14	14	16	16	34	34	26	26	100	100
9.	Immediate Resolution when problem occurs at the time of Equity Trading	08	08	10	10	34	34	28	28	20	20	100	100

Source: field survey

1. Research shows that the technological aspects of equity trading, 20% of the respondents do not know, 15% respondents know a little, 35% respondents know something, 18% respondents know well and 12% respondents know very well.
2. From the survey it shows that the risk of system failure, 30% respondents do not know, 35% respondents know a little, 20% respondents know something, 10% respondents know well and 5% respondents know very well.
3. In the survey it shows the professional management of broker,15% respondents do not know, 12% respondents know a little, 8% respondents know something, 35% respondents know well and 30% respondents know very well.
4. In the survey it shows the transaction cost of equity trading, 10% respondents do not know, 13% respondents know a little, 20% respondents know something, 25% respondents know well and 32% respondents know very well.

5. In the survey it shows the requisite information for equity trading, 10% respondents do not know, 12% respondents know a little, 15% respondents know something, 35% respondents know well and 28% respondents know very well.
6. In the survey it shows the statement possibilities of frauds, 18% respondents do not know, 10% respondents know a little, 37% respondents know something, 20% respondents know well and 15% respondents know very well.
7. In the survey it shows the poor communication network, 5% respondents do not know, 12% respondents know a little, 17% respondents know something, 36% respondents know well and 30% respondents know very well.
8. In the survey it shows the level of transparency, 10% respondents do not know, 14% respondents know a little, 16% respondents know something, 34% respondents know well and 26% respondents know very well.
9. In the survey it shows the immediate resolution when problem occurs at the time of equity trading, 8% respondents do not know, 10% respondents know a little, 34% respondents know something, 28% respondents know well and 20% respondents know very well.

Table-10: Table showing investors general awareness for equity trading.

(SA = Strongly Agree, A = Agree, NA/ND = Neither Agree nor Disagree, D = Disagree, SD = Strongly Disagree)

Sl. No.	Statements	SA		A		NA/ND		D		SD		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	I know the procedure for Equity Trading	33	33	25	25	20	20	12	12	10	10	100	100
2.	I know how to place an order	28	28	34	34	17	17	13	13	08	08	100	100
3.	I know how to cancel an order	25	25	30	30	19	19	10	10	16	16	100	100
4.	I know how to purchase a security in a cash account	33	33	27	27	16	16	20	20	04	04	100	100
5.	I know the option for placing a trade I am unable to access my account equity	27	27	36	36	14	14	10	10	13	13	100	100
6.	I know that if I trade on margin, my broker can sell my securities without giving me a margin call	20	20	28	28	37	37	11	11	04	04	100	100
7.	I know that no regulations require a trade be executed within a certain time	23	23	35	35	19	19	13	13	10	10	100	100
8.	I know what to do if I have a complaints	28	28	37	37	17	17	11	11	07	07	100	100

Source: field survey

INTERPRETATION

1. The research shows the procedure for equity trading, 33% respondents completely agree, 25% respondents agree, 20% respondents neither agree nor disagree, 12% respondents are disagreed and 10% respondents are strongly disagreed.
2. The survey shows the investors awareness on how to place an order, 28% respondents are completely agreed, 34% respondents are agreed, 17% respondents are neither agreed nor disagreed, 13% respondents are disagreed and 8% respondents are strongly disagreed.
3. The survey shows the awareness on how to cancel an order, 25% respondents are strongly agreed, and 30% respondents agreed, 19% respondents are both agreed nor disagreed, 10% respondents are disagreed and 16% respondents are strongly disagreed.
4. The research shows the investors awareness on how to purchase a security in a cash account, 33% respondents are completely agreed, 27% respondents are agreed, 16% respondents neither agreed nor disagreed, 20% respondents are disagreed and 4% respondents are completely disagreed.

5. The research shows the investors knowledge on the choice for placing a trade if I am unable to access my equity account, 27% respondents are fully agreed, 36% respondents are agreed, 14% respondents are neither agreed nor disagreed, 10% respondents are disagreed and 13% respondents are completely disagreed.
6. This survey shows the investors awareness on if trade on margin, my dealer can wholesale my securities without giving me margin on call, 20% respondents are having a complete knowledge, 28% respondents are agreed, 37% of the respondents are neither agreed nor disagreed, 11% respondents have been disagreed and 4% respondents are completely disagreed.
7. This research shows the awareness on regulations required a skill to be performed within a certain time, 23% respondents are completely agreed, 35% respondents are agreed, 19% respondents are neither agreed nor disagreed, 13% respondents are disagreed and 10% respondents are strongly disagreed.
8. This Survey shows the awareness on what to do if I have complaints on trading, 28% respondents are strongly agreed, 37% respondents are agreed, 17% respondents are neither agreed nor disagreed, 11% respondents are disagreed and 7% respondents are strongly disagreed.

FINDINGS

- In the research it was found that Dominant part of the respondents might want to reverse their pay in exchanging.
- In the study it was discovered that speculators' goal of putting resources into shares, securities and common assets is to procure high benefit and to meet their future needs.
- It is found in the overview that all most every one of the respondents i.e., up to 90% know about web based exchanging.
- It is found in the review that through offer dealers, companions and relations, T.V. channels they will show signs of improvement guidance for putting resources into internet exchanging.
- In the study it is discovered that lion's share of the financial specialists like to put resources into here and now venture.
- The online offer exchanging prominence is relying on the degree of innovation mindfulness and exchanging propensity.

CONCLUSION

The nation economies advancement is turn in to assortment of viewpoints that the conclusion to enhance and accelerate the procedure of improvement. In this unique situation, commitment of the capital market is assents. The part capital market is omniscient as it conquers any hindrance between the capital insufficiencies and capital overflow. With a specific end goal to guarantee the straightforwardness in order to empower the financial specialists to accelerate their procedure of contributing, the stock trades are re-establishing to screen based prepare

Internet exchanging assumes an essential part in the economy by assembling reserve funds and putting them in capital market, subsequently builds up a connection amongst investment funds and capital market. Presently gradually an ever increasing number of speculators are pulled in towards internet exchanging for significant yields, charge concession and so on.

The exchanging objection framework neglected to give straightforwardness, consequently for the main fall back on pick was innovation foundation to the offer exchanging, in this manner, encouraging the open up of Dash in the nation. The procedure can succeed when it is legitimately imparted to the objectives. Toward this path, the venture cantered to examine the mindfulness level and view of financial specialists towards online offer exchanging.

Familiarity with IST is expanding in individuals step by step. A few people feel that there are security and uprightness issues with IST. Office quantities of day by day exchange have expanded at NSE and BSE in the meantime. Numerous web locales give continuous information of offers to the financial specialists readily available. Web exchanging business charges are less contrasted with the perusing specialists as no manual intercession is required.

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PREPARATION AND CHARACTERIZATION OF TRANSITION METAL COMPLEXES WITH DISACCHARIDE-D-LACTOSE

B. Pareek

ABSTRACT

A series of four different transition metals Nickle(II), Cobalt(II), Manganese(II), and Copper(II) D-Lactose mono hydrate have been synthesized and characterized by elementary analysis, molar conductivity measurements, thermo gravimetric analyses, infrared spectra, atomic emission and electronic spectral data. Even though the method for preparation of these compounds have been the same, but different compounds with different structural formula have been obtained. The infrared spectra spectrums of these complexes have demonstrated the same metal-ion-binding pattern in all these complexes. The electronic spectrums can propose the existence of the d-character of the electron transitions in these complexes to some extent. These stable, water soluble metal carbohydrate complexes can be used as a suitable metal supplements in many biological systems.

Keywords: D-Lactose; Coordination modes; Metal disaccharide complexes

INTRODUCTION

In living organisms, transition metal ions have crucial role where they are found to be coordinated to different biomolecules and participating in many biochemical reactions. Interactions between metal ions and nucleosides, nucleotides polyalcohols and other sugar-type ligands are involved in many biochemical processes in living organisms, including immunological events recognition processes, and pathological conditions [1]. Carbohydrates in general, including natural and synthetic possess a manifold of donor atoms which enable them the ability to coordinate metal center and providing some additional advantages over other ligands, e.g., biocompatibility, non-toxicity, enantiomeric purity, water solubility, and well-explored chemistry. In recent years, several examples of carbohydrate compounds have been developed for diverse medicinal applications ranging from compounds with antibiotic, antiviral, or fungicidal activity and anticancer compounds [2-3]. The applications of metal-carbohydrate complexes are not limited into the biological systems. They can be used not only for stoichiometric or catalytic stereo selective synthesis but also for separation and analysis of chiral compounds as well [4-6]. In sugar alcohols, diols, triols, polysaccharides, metal-containing polymers, membranes, gels and fibers, saccharides act as polyolato ligands due to deprotonation of one or more hydroxyl groups [7]. Studying metal saccharides binding sites are not such straight forward task. On one hand, understanding the coordination behavior of sugar molecules is difficult because of their sensitive hygroscopic properties and complicated stereochemistry. On the other hand, due to the low stability of the synthesized metal complexes in neutral or acidic aqueous solutions determining the binding sits of hydroxyl groups to the metal ions are difficult [8]. Besides, in solutions of carbohydrates, existence of anomeric and conformational equilibrium for species makes the situation even more difficult [9]. In neutral environment, water molecules bonded to metal ions do not readily substitute by donor oxygen atoms due to the low electron density of the oxygen atoms. In alkaline solutions after deprotonation of hydroxy groups complexes of the metal ions with carbohydrate can form. Due to Lactose capacity to interact with different metal ions involved in many biochemical reactions, it has a technological as well as a biological, medical, pharmaceutical, food and biomedical applications¹. Herein, metal complexes with D-Lactose mono hydrate have been synthesized and characterized by , FT- IR, UV-Vis, AA, and EA techniques

Experimental

MATERIALS AND METHODS

All materials (D-Lactose mono hydrate, $\text{Ni}(\text{OAc})_2 \cdot 4\text{H}_2\text{O}$, $\text{CoCl}_2 \cdot 2\text{H}_2\text{O}$, $\text{MnCl}_2 \cdot 2\text{H}_2\text{O}$, , $(\text{CuCl}_2 \cdot 2\text{H}_2\text{O})$, sodium metal and CH_3OH) were analytical reagent grade and were purchased from Merck and used without further purification. Infrared spectra ($400\text{--}4000\text{ cm}^{-1}$) were recorded from sodium hydroxide pellets on a Nicolet Impact 400 D spectrometer. Absorption spectra were recorded using Analyst 300.

SYNTHESIS OF THE METAL (II)/(III) CARBOHYDRATE COMPLEXES

All complexes were prepared in an analogous procedure, and a typical procedure for synthesis is given below for one case.

Synthesis $\text{Na}_2[\text{Cu}(\text{D-lac})_2]\text{CH}_3\text{OH} \cdot 5\text{H}_2\text{O}$ (1): D-Lactose mono hydrate (1.08 g, 3 mmol) was suspended in 10 mL of MeOH at 0°C and stirred for 30 min. Freshly cut sodium metal (0.138 g, 6 mmol) was added with stirring, and the stirring was continued for a further 30 min until a white suspension in MeOH was formed. Copper(II) chloride dihydrate (0.1704 g, 1 mmol) was dissolved in 10 mL of methanol and added dropwise to

the sodium salt suspension. The resulting suspension was allowed to stir for a further 12 h to develop a blue color in the reaction mixture. The solid was then filtered, recrystallized in hot methanol (40 °C) and dried under reduced pressure for 9 h, to isolate a colored solid. These reactions resulted in products $\text{Na}_2[\text{Cu}(\text{D-lac})_2]\text{CH}_3\text{OH}.5\text{H}_2\text{O}$

RESULTS AND DISCUSSION

The isolated and purified metal-D-Lac complexes (1-7) are all moderately air stable, soluble in water, but insoluble in any common organic solvents. These complexes slowly capture moisture when exposed to air for several days. However, when the complexes are stored under dry conditions, they do not change colour even for more than several month. All the complexes reported in this paper are found to yield products in the range 71-80

From the work done in the past we find that an attempt was made to prepare compounds of transition metals with saccharides. It illustrates that water solubility of the prepared compounds is the main obstacle in isolating them. To avoid this difficulty de-novo method of solid solid interaction was selected which do not involve water, either as solvent or as the reactant. Sodium salts of Saccharides were first prepared which enable them to coordinate with metal ions. Metal salts in which metals were present in their most common oxidation states were then treated with sodium salts of saccharides. Formation of coordination compounds was indicated by isolation of crystalline compounds with different colours. These compounds after purification showed solubility in water as expected M-O bonds were interpreted from I.R. spectra of the obtained compounds. The results are encouraging in explaining the coordination between metal ions and saccharides.

FT-IR SPECTRA

The FTIR spectra of all the complexes (1-7) exhibited a broadened bands pattern expected for metal bounded saccharide [11]. Usual line broadening was observed in all the saccharide complexes, revealing the existence of the coordination of the metal ion through deprotonation of the hydroxyl group of the saccharides and the presence of the covalency in metal-ligand bond as observed earlier in other cases of transition-metal-saccharide complexes [12]. A broad and intense band observed in the range 3340–3450 cm^{-1} is assigned to $\nu(\text{O-H})$ and indicates the breakage to some extent of the intermolecular hydrogen bonding, which is otherwise present in the solid of the free saccharide. However, these complexes are further indicative of the secondary interactions of saccharides through the free hydroxyl groups [13]. The $\nu(\text{O-H})$ of H_2O also appears in this region and would overlap with this band. A band observed in the range 2900–2950 cm^{-1} is indicative of the (C-H) stretching vibrations in these complexes [14]. Although one-to-one assignments were not possible, the bands that appeared in the regions 1595–1635, 1370–1465 and 1060–1070 cm^{-1} were assignable to the bending vibrations of H_2O , stretching vibration of C-O, C-C, and O-C, C-C, respectively [15]. The IR spectra of the complexes exhibit new bands in the far-IR region at 500–625 cm^{-1} . These absorptions may be assigned to $\nu(\text{M-O})$ respectively [16]. Thus, the FT-IR studies have clearly demonstrated the binding of saccharide units to the metal ion and thereby exhibit the complex formation. The FT-IR spectra of ligand and all the complexes are shown in Table 2.

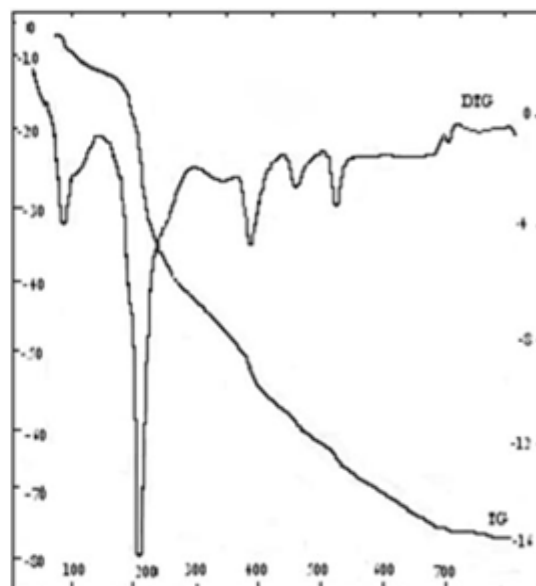
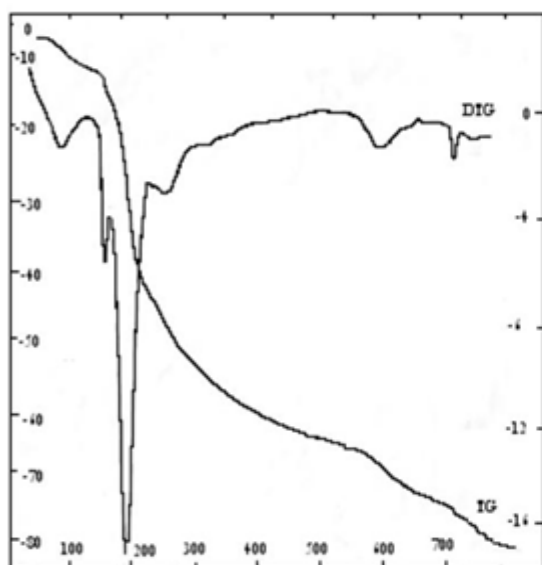
THERMAL ANALYSIS

The TG and dTG of the complexes recorded in the range of 25-900°C and showed similar thermal degradation patterns as the other cases of the metal saccharide complexes. An initial weight loss of 7.3% was observed in the range of 50-120 °C indicating the loss of NaOH [17]. The data shows the loss of all the solvent molecules and the ligating saccharide moieties (a weight loss of 40-59%) during the total temperature scan range of 25-600°C, leaving the oxides of metals behind. Typical TG and dTG curves in the case of complexes 1 and 2 are shown in Fig. 1 and Fig. 2. From these figures it can be observed that an endothermic weight loss occurs up to 190 °C, which corresponds to the loss of one molecule of NaOH and H_2O . After this initial weight loss, pyrolysis of the saccharide moiety takes place in the range of 170-500 °C. Finally, the complete thermal degradation of the complexes result formation of nickel oxide and copper oxide at 900 °C.

Table-1: FT-IR data for D-Lac-complexes (1-7)

Compound	$\nu(\text{M-O})/\text{cm}^{-1}$	$\nu(\text{C-O})/\text{cm}^{-1}$	$\nu(\text{O-H})/\text{cm}^{-1}$
$[\text{Cu}(\text{D-lac})_2]\text{CH}_3\text{OH}.5\text{H}_2\text{O}$ (1)	624 m	1068 s	3385 b,s
$[\text{Ni}(\text{D-lac})_2] 2\text{CH}_3\text{OH}.2\text{H}_2\text{O}$ (2)	468 w	1066 s	3384 b,s
$[\text{Mn}(\text{D-lac})_2] 3\text{CH}_3\text{OH}.2\text{H}_2\text{O}$ (3)	535 m	1067 s	3386 b,s
$\text{Na}_2[\text{Co}(\text{D-lac})_2] \text{CH}_3\text{OH}.4\text{H}_2\text{O}$ (5)	600 m	1070 s	3453 b,s

b = broad, s = strong, m = medium, w = weak



CONCLUSION

The associated significance of transition-metal saccharide interactions in biological systems accounts for the importance of studying these interactions [21]. This kind of compound reported in the solid state, and well extend into our on-going research in the field of transition-metal saccharide chemistry. While the FT-IR and absorption spectra have demonstrated the direct binding of the saccharide moieties with the metal ions, the procedures reported here has led to the formation of mono-nuclear complexes.

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RESEARCH IN ACADEMIA: STUDENTS PERCEPTION

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ABSTRACT

Higher education in this modern competitive world has become a model for change to the academicians and students. The new methodologies are adopted in order to make sure the quality of the students improve and they be ready for the industry. The more challenging outside environment demands the students, faculties and the institutions to innovate and modernize their teaching methodologies.

Research is one such way which will be helpful for continuous learning and upgrading the skills and knowledge. But it will be extra stressful factor to both the teachers and the students as they have to allocate extra time for the same. The institutions will support the same as quality grows higher, but the students and the staff must be interested and encouraged for the research. If there is a lack of interest among the students and staff it will be difficult to carry out the same.

In this regard, this paper tries to throw light on the students thinking on the academic research and their interest which will help the teachers and organizations to go ahead with research based activities.

Keywords: Research, Quality, higher education

INTRODUCTION

Education is the basic necessity of every citizen of a country; along with the human development it will have an impact on the prosperous society. India stands third in the world in comparison with United States and China in the number of higher education institutes, definitely quality will be the first priority amongst these institutes. In the modern era, where higher education is gaining the name only through the marketing activities held by the institutions, the quality imparted by these institutions has become a question unanswered. The heavy fees levied by the institutions also become a burden to the normal citizen. Hence for the survival it is mandatory for the organizations to bring in the quality in education and student satisfaction.

Research is the integral part of academia, maybe it is the faculty or students everyone must be needed to focus on the same in order to acquire more knowledge. The research based learning is very crucial for the students for their overall development of the students and the institution too. Research is nothing but systematic way of defining the problem, formulating the hypothesis, collecting the data, analysing the data and arriving at certain conclusions (Kothari C R, 2011). Due to this systematic approach the students will be able to develop the rational skills among them which can be considered as one of the factor to improve the quality of the students. But the teachers, students and the institution must be oriented towards the research as lot of time and dedication is needed for the quality research.

OBJECTIVES OF THE STUDY

- To know more about research and students
- To know the importance of research in academics.
- To contribute to the growing research area on students' awareness, experiences and perceptions of research by examining and analysing the data.

THE METHODOLOGY OF THE STUDY:

The study was conducted in Mangalore by distributing 110 questionnaires to the UG students. The questionnaire consists of the questions related to the various factors impacting on the students about research. They are the college infrastructure facilities to do research, students awareness about staff, and the staff inclination towards the students about promoting the research. The some questions were formulated on Likert's scale and some were the yes/no questions. The student's feedback on the questions are collected and incorporated in the study.

ANALYSIS AND INTERPRETATION

Table-1.1: Demographic Data

Gender Classification: (Percentage)		Percentage of Students interested to do research	
Male	52	Yes	42
Female	48	No	58

Marks Percentage (prev yrs. Aggre)		Age wise categorization of UG students	
Distinction	39	18 – 21 yrs	71
I class	34	22 – 25 yrs	29
II class	27		

The table above shows that the percentage of male and female are roughly equal, with marginally more male students compared to the females. Majority of the students are bright enough to score good marks in the academics. The majority of the students did not show much interest towards the research.

Table-1.2: Student's awareness and experiences research: (In Percentages)

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
The college has a good collection of books, journal articles and access to them	5	60	5	0	0
Notice boards showcase advertising research and postgraduate opportunities	22	56	13	4	5
Research posters/exhibitions/displays within the college	25	44	25	4	2
Research seminars/conferences are frequently held.	16	43	27	9	5
The college consists of existence of research units	13	31	42	7	7

From the above table it is confirmed that the graduation students in Mangalore city are exposed to many kinds of research activities like exhibitions, displays, seminars, workshops, conferences and research posters. Majority of the colleges has got research centres and a good collection of books and articles which will enable the students to inculcate the research learning within them.

Table-1.3: Research activities are you aware that the staffs who teach you are engaged in research.

	YES	NO
Undertaking research	49	51
Undertaking a research degree (PhD)	45	55
Writing for publication	64	36
Supervising research students and assistants	53	47

From the above table we can say that many of the students are not aware that their faculties undertaking the research and a research degree. But the students are very much aware that their faculties are writing research papers. This will help the students to seek guidance to attend the conferences and other co-curricular activities which can boost their self confidence and knowledge.

Table-1.4: Students gained experience

	YES	NO
Hearing a guest lecturer discuss their research work in a unit	75	25
Undertaking an independent project involving research (eg an essay, oral presentation, poster or creative work) as a part or whole of a unit	65	35
Hearing a member of staff discuss their research work in a unit	60	40
Reading a research paper or report written by a member of staff	69	31
Critically examining art/artefacts, such as an image, performance, device or design, produced by a member of staff	49	51
Undertaking a dissertation or thesis	51	49

When the focus shifted to student experiences, it is evident that a significant majority of students had certain experiences in hearing guest lectures, undertaking small projects involving research, staff members discussing and guiding them in research, reading the research papers or reports written by the staff members. This tells us the fact that majority of the students are aware of the research and they do work on them. Proper guidance and interest generation amongst the students can inculcate research culture in them.

Table-1.5: Students involvement in research had a positive impact on learning

	YES	NO
Stimulated my interest and enthusiasm for the subject	78	22
Contributed to the development of my research skills	69	31
Motivated me to consider pursuing postgraduate research in the same area	60	40
Increased my awareness of the problems and issues faced in my subject area(s)	75	25
Increased my understanding of the subject	69	31

There is substantial quantitative evidence that many undergraduates saw staff involvement in research as beneficial for their own learning. The most common benefits identified by the respondents were increased understanding of the subject, increased awareness about the problems and issues faced in the particular area, also motivating the students to pursue the research in the similar area. This shows staff involvement in uplifting the student knowledge, encouraging the students to perform better and better.

Table-1.6: Undergraduate Students' Assessment of the Value of Research	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
I have learnt most when undertaking my own research/dissertation	25	47	22	5	0
Insufficient attention is given in the subject(s) I study to developing our research skills	9	58	27	2	4
The most effective teaching is when the lecturer involves us in aspects of the research process	16	53	25	4	2
Staff research interests dominating the content of what they teach	22	40	29	2	2
Apparent lack of interest by these staff in supporting my learning	24	33	33	5	5

The above table speaks about the undergraduate students assessment of the value of research in academics. The study says that the undergraduate students are highly enthusiastic about research where they feel they can develop themselves ultimately. It will enhance their skills and abilities. But also students comment that the staff research area dominates the content and also the staff will not show much inclination towards other research topics. This can be justified by saying the staffs are burdened with the academics as well as their research work. The performance matters everywhere. Hence staff feel that doing the little things like collecting the questionnaires, data entry around the relevant topics if done by the students their burden will reduce a bit. Hence the staffs always tends to talk about their research area. But this will generate dissatisfaction amongst the students and lack of interest in a particular research area. This can only be reduced by giving a lot of free time for the staff only dedicating for research instead of classes.

THE CHI SQUARE TEST

Ho: there is no significance difference between male and female students on the perception on the availability of resources.

H1: there is a significance difference between the male and female students on the perception of availability of resources.

Table-1.7: Students perception on the availability of resources

	Books collection in the library	Research activity details shown to the students	Research knowledge spread across the campus	Conducting the conferences	Existence of research units	
Male	119	111	111	101	98	540
Female	117	101	102	94	86	500
	236	212	213	195	184	1040
Chi Square = 0.377569 d.f = 4 1% Level of significance Chi Square = 13.277 5% Level of significance Chi Square = 9.488						

The chi square test was applied on the data separately on male and female students in order to check their perception on the availability of resources to do the research in the colleges in Mangalore city. It is found that both at 1% and 5% level of significance the null hypothesis was accepted explaining the fact that the colleges have enough good resources for the research work.

Research in undergraduate colleges has its own advantages and disadvantages. Students are generally aware of the research in the colleges but over emphasis on research will also make them to lose their track in academics. It might generate more pressure amongst the staff members too. If the students not interested in research might give negative feedback towards the staff which might lead in creation of bad name for the staff members. Therefore the proper integration of research in academics is needed in order to mould the students and staff

towards the research and for the overall development of the organization. We need to create more awareness amongst the students so that they can actively involve in the research activity in their area. Also we need to integrate teaching with the research more effectively so that the staffs also can be given more liberty in carrying out the research.

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INVESTORS PERCEPTION ON CORPORATE SOCIAL REPORTING

Dr. J. Karthikeyani¹ and Dr. Jelsy Joseph²Assistant Professor¹ and Associate Professor², PSG College of Arts and Science, Coimbatore**ABSTRACT**

Social reporting is that branch of reporting, which is concerned with the functioning of social system as a whole. It may be considered as the reporting for community. Primary data relating to investor perception on corporate social reporting have been obtained by administering a structured questionnaire. Convenience sampling procedure has been followed to identify 300 investors in order to obtain their views on corporate social reporting. Data collected have been analysed making use of statistical tools which include (i) Mean, (ii) Friedman's Rank Test, and (iii) Chi-square test. It is found that the investors have remained neutral to many of the statements related to corporate social reporting. The parties, who may stand to gain from the findings of the present study, may be (i) the Government, (ii) Securities and Exchange Board of India (SEBI), (iii) Companies, (iv) Investors and other associated parties.

Keywords: Corporate Social Reporting, perception

INTRODUCTION

Social reporting is that branch of reporting, which is concerned with the functioning of social system as a whole. It may be considered as the reporting for community. The areas covered by social reporting include pollution control, community relations, product quality, plant safety, equal employment opportunity, charitable contributions, employee benefits and responsiveness to consumer complaints. Parker (1986) defines corporate social reporting as assessing the social and environmental impact of corporate activities; measuring effectiveness of corporate social and environmental programme; reporting upon a corporation's discharging of its social and environmental responsibilities; and external and internal information systems allowing comprehensive assessment of all corporate resources and impacts - social, environmental and economic.

REVIEW OF LITERATURE

Hein Schreuder (1981) examined the reactions of employees toward the Corporate Social Reports actually being published and to solicit their opinions on some controversies in the literature. From a list of corporations which were known to have published a social report, five were selected. Two hundred and forty employees were interviewed.

The findings suggested that social report was accepted by employees as a corporate means of communication.

Naser and Baker (1999) explored the perception of user groups such as public accountants, academics and government officials in addition to finance managers on social disclosure. The study used a questionnaire survey method with a total sample size of 206 from all four groups of users. While financial managers and public accountants believed that companies should accept wider social responsibilities to the extent it was necessary for the viability of the business, academics and government officials thought that business should be responsible to a wider audience.

O'Donovan (2002) conducted a study to determine manager's preferences for various approaches to environmental disclosures within the context of specifically gaining, maintaining legitimacy. He found that the significance of an environmental issue/event has a major effect on environmental disclosure decisions and that if an issue/event was of low significant, it would not in most circumstances, be considered a threat to a corporation's legitimacy and would not normally warrant the use of legitimization tactics and specific annual report disclosures.

The Business Paradigm for Corporate Social Reporting in the context of Australian Seaports was analysed by **Devinder Grewal and Nicholar James Darlow (2007)**. Interviews were conducted with managers from 13 Australian seaports. It was found that the business paradigm embraced three primary sections. It was the philosophical drivers for CSR, which were societal demands for transparency in social responsibility.

Nurlina Md Rahim (2009) made an attempt to highlight the perception of accountants towards social reporting by the Islamic Financial Institutions (IFI). Questionnaires were distributed to 1500 registered members of Malaysian Institutes of Accountants (MIA) by two methods, i.e., normal mail and email. All 105 responses were usable for the study. Annual reports of selected IFIs for the year 2006 and 2007 were used. According to the results of the perceived social items, the accountants in Malaysia desired more social reporting.

Andreas Tan, Desmiyawati Benni and Warda Liani (2016) examined the effect of firm size, media exposure and industry sensitivity to corporate social responsibility (CSR) disclosure and its impact on investor reaction. The population of the study is the companies listed on Indonesian stock exchange. The result reveals that firm size, media exposure and industry sensitivity have a significant effect on CSR disclosure; firms size, media exposure and industry sensitivity have no direct effect on investor reaction.

Okere Wisdom, Imeokparia Lawrence¹, Ogunlowore John Akindele¹ and Isiaka Muideen (2018) conducted a study on “Corporate Social Responsibility and Investment Decisions in Listed Manufacturing Firms in Nigeria” with the objective to investigate the impact of Corporate Social Responsibility on investment decisions in listed manufacturing firms in Nigeria. The study employed a panel methodology, and the results show a positive and significant relationship between CSR and investment decisions of stakeholders in manufacturing firms in Nigeria. Overall, these results suggest that improved CSR investment benefits shareholders which would promote positive performance in investment level in the firm and also improved firm performance. The study recommends that CSR activities should be connected to the corporate processes of value creation, i.e., CSR is exclusively designed as an instrument for improved performance.

The aim of corporate social reporting should be to disclose information that benefits the investors and the society at large. Therefore, the companies must decide at the outset, which investors they are targeting, find out what do they think, and what do they want. The usefulness of information for making decisions should be the key in deciding what is to be reported and how that reporting should be done. Investors may demand more information on the fulfilment of corporate social responsibility by companies so that they can take effective portfolio decisions. In this backdrop, it is necessary to know, what do the investors think about corporate social reporting? What are the variables that influence the level of perception of investors on corporate social reporting?

OBJECTIVES OF THE STUDY

The following objectives have been framed for the study. They are

- i. To ascertain the opinion of investors about corporate social reporting
- ii. To examine the factors associated with investor perception on corporate social reporting

METHODOLOGY

The study has made use of primary data. Primary data relating to investor perception on corporate social reporting have been obtained by administering a structured questionnaire. Convenience sampling procedure has been followed to identify 300 investors in order to obtain their views on corporate social reporting. Data collected have been analysed making use of statistical tools which include (i) Mean, (ii) Friedman’s Rank Test, and (iii) Chi-square test.

SOCIO-ECONOMIC PROFILE OF INVESTORS

Questionnaires were issued to 500 investors of whom 130 did not respond. Seventy questionnaires were partially filled hence had to be rejected. Hence, three hundred questionnaires could only be taken up for the study. The socio-economic profile of equity investors broadly include their area of residence, age, gender, educational qualification and the like, which are explained in the following paragraphs. Table 1 shows the socio-economic profile of the sample investors.

Table-1: Socio-Economic Profile of Investors

Profile	No. of Investors (N=300)	Percentage to Total
i. Area of Residence		
Urban	193	64.33
Rural	107	35.67
ii. Age		
Up to 30	97	32.33
31 – 40	81	27.00
41-50	57	19.00
Above 50	65	21.67
iii. Gender		
Male	252	84.00
Female	48	16.00
iv. Educational Qualification		
Up to HSC	16	5.33

Diploma	26	8.67
Degree	147	49.00
Post Graduate	93	31.00
Professional Degree	18	6.00
v. Occupation		
Agriculture	18	6.00
Business	95	31.67
Employed-Govt.,	18	6.00
Employed-Pvt.,	116	38.67
Professional	7	2.33
Retired	34	11.33
Housewife	12	4.00

Source: Primary Data

The investors, who have been selected for the study, mostly hail from urban area, and belong to the age group ranging up to 30 years. Graduate male investors are more in number. The occupation distribution reveals that investors broadly include private sector employees.

INVESTORS' OPINION ON CORPORATE SOCIAL REPORTING

The stakeholders' evaluation of organizations is based on firm reputation which in turn is influenced by the firm's performance in the social front. Not only firms which contribute to social causes find appreciation of corporate image, but it has also been reported that firms that engaged in CSR and such social initiatives suffered reputational loss because of violation or regulations or because of other crisis situations. The quantum of reporting on the social commitment of the company directly depends on how the investors perceive about the various aspects of social reporting. Table 2 consolidates the opinion of the investors on social reporting.

Table-2: Opinion on Corporate Social Reporting

Particulars	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Friedman's Rank
A. Impact of Corporate Social Reporting							
Enhances reputation	57 (19.00%)	117 (39.00%)	107 (35.67%)	13 (4.33%)	6 (2.00%)	300 (100.00%)	17.27
Builds brand image	56 (18.67%)	123 (41.00%)	91 (30.33%)	24 (8.00%)	6 (2.00%)	300 (100.00%)	17.04
Improves investor relations	55 (18.33%)	112 (37.33%)	112 (37.33%)	11 (3.67%)	10 (3.33%)	300 (100.00%)	16.87
Enhances learning and innovation	40 (13.33%)	125 (41.67%)	114 (38.00%)	12 (4.00%)	9 (3.00%)	300 (100.00%)	16.55
Improves financial results	44 (14.67%)	113 (37.67%)	117 (39.00%)	21 (7.00%)	5 (1.67%)	300 (100.00%)	16.30
Increases license to operate (e.g. Construction of school, hospitals, etc)	46 (15.33%)	112 (37.33%)	111 (37.00%)	26 (8.67%)	5 (1.67%)	300 (100.00%)	16.15
Reduces risk	33 (11.00%)	117 (39.00%)	116 (38.67%)	28 (9.33%)	6 (2.00%)	300 (100.00%)	15.57
Improves management's credibility to shareholders	31 (10.33%)	109 (36.33%)	134 (44.67%)	18 (6.00%)	8 (2.67%)	300 (100.00%)	15.33
Influences share price and returns	40 (13.33%)	87 (29.00%)	130 (43.33%)	31 (10.33%)	12 (4.00%)	300 (100.00%)	14.37
Unfavourable to a company	40 (13.33%)	80 (26.67%)	122 (40.67%)	46 (15.33%)	12 (4.00%)	300 (100.00%)	10.51
Results in diversification from its primary objectives	28 (9.33%)	87 (29.00%)	129 (43.00%)	48 (16.00%)	8 (2.67%)	300 (100.00%)	10.45
Consumes more pages in Annual Reports	31 (10.33%)	106 (35.33%)	100 (33.33%)	54 (18.00%)	9 (3.00%)	300 (100.00%)	10.33
Gives information to the competitors	27 (9.00%)	111 (37.00%)	114 (38.00%)	33 (11.00%)	15 (5.00%)	300 (100.00%)	10.03
Involves additional cost and time	24 (8.00%)	108 (36.00%)	137 (45.67%)	26 (8.67%)	5 (1.67%)	300 (100.00%)	9.25

B. Reliability of Social Report							
Reliable	43 (14.33%)	106 (35.33%)	129 (43.00%)	17 (5.67%)	5 (1.67%)	300 (100.00%)	16.14
Not critical enough since conflicts and problems insufficiently discussed	35 (11.67%)	91 (30.33%)	157 (52.33%)	10 (3.33%)	7 (2.33%)	300 (100.00%)	8.96
Contains only positive items/events	45 (15.00%)	96 (32.00%)	131 (43.67%)	22 (7.33%)	6 (2.00%)	300 (100.00%)	8.96
C. Disclosure Practice							
To be audited by an auditor	58 (19.33%)	123 (41.00%)	106 (35.33%)	11 (3.67%)	2 (0.67%)	300 (100.00%)	17.73
To reveal social policy of a company	55 (18.33%)	121 (40.33%)	110 (36.67%)	9 (3.00%)	5 (1.67%)	300 (100.00%)	17.47
To be made in a separate section in the Annual Report	38 (12.67%)	131 (43.67%)	117 (39.00%)	8 (2.67%)	6 (2.00%)	300 (100.00%)	16.77
To be made in physical terms	39 (13.00%)	130 (43.33%)	105 (35.00%)	16 (5.33%)	10 (3.33%)	300 (100.00%)	16.54
To be made in monetary terms	43 (14.33%)	120 (40.00%)	108 (36.00%)	19 (6.33%)	10 (3.33%)	300 (100.00%)	16.22
D. General							
Social Report is an important addition to the information already provided by other means	24 (8.00%)	95 (31.67%)	159 (53.00%)	18 (6.00%)	4 (1.33%)	300 (100.00%)	14.59
Social Report influences investor's investment decisions	25 (8.33%)	96 (32.00%)	141 (47.00%)	33 (11.00%)	5 (1.67%)	300 (100.00%)	14.26
Individual employee can recognize himself/herself in the Social Report	27 (9.00%)	86 (28.67%)	153 (51.00%)	25 (8.33%)	9 (3.00%)	300 (100.00%)	14.01
Social Report is not very interesting as it is mainly retrospective	22 (7.33%)	74 (24.67%)	163 (54.33%)	38 (12.67%)	3 (1.00%)	300 (100.00%)	10.53
Social Reports do not perfectly match with Annual Reports	29 (9.67%)	96 (32.00%)	135 (45.00%)	37 (12.33%)	3 (1.00%)	300 (100.00%)	9.82

Source: Primary Data

d.f.26

Table Value: One per cent level : 45.642

Calculated χ^2 Value: 1643.500

Five per cent level: 38.885

Ten per cent level: 35.563

Investors usually differ in their opinion on social reporting. They assign different levels of priority for various aspects of social reporting. The opinions expressed by the investors on social reporting are brought out in the following paragraphs.

i. Enhances Reputation

Companies tend to disclose information about the social activities in order to get favour in stock markets. Cecilia Olukemi Yekini (2008) stated that a quality report should be capable of reflecting the aspirations of all stakeholder groups including the community. Table 2 shows that of the 300 investors, 57(19.00%) strongly agree that social reporting enhances reputation of the company; 117(39.00%) just agree to this statement; 107(35.67%) are neutral to this statement; 13(4.33%) disagree to this statement while six (2.00%) strongly disagree to the statement. Most of the investors agree that social reporting enhances the reputation of the company.

ii. Builds Brand Image

Simon et al. (1972) assert that ethical investors will always be willing to pay a premium on the securities of socially conscious firms arguing that some community development programmes may help build sources of human capital that the company may tap in the future. Out of 300 investors, 56(18.67%) strongly agree that social reporting builds brand image; 123(41.00%) just agree to this statement; 91(3.33%) neither agree nor disagree to this

statement; 24(8.00%) disagree to this statement while six (2.00%) strongly disagree that social reporting builds brand image. Majority of the investors agree that social reporting builds brand image.

iii. Improves Investor Relations

There are different opinions expressed by the investors to the statement that social reporting improves investor relations. Of the 300 investors, 55(18.33%) strongly agree that social reporting improves investor relations; 112(37.33%) agree; 112(37.33%) neither agree nor disagree to this statement; 11(3.67%) disagree to this statement while 10(3.33%) strongly disagree that social reporting improves investor relations. An equal number of investors agree and stay neutral to the statement that social reporting improves investor relations. However, leaving out those who stay neutral, it may be found that investors who agree to the statement are large in number compared to those who either disagree or strongly disagree.

iv. Enhances Learning and Innovation

Companies try to educate and inform its stakeholders about actual changes in the organisation's performance and activities. Out of 300 investors, 40(13.33%) strongly agree that social reporting enhances learning and innovation; 125(41.67%) just agree to this statement; 114(38.00%) neither agree nor disagree to this statement; 12(4.00%) disagree to this statement while nine (3.00%) strongly disagree that social reporting enhances learning and innovation. Majority of the investors agree that social reporting enhances learning and innovation.

v. Improves Financial Results

Investors have differed in their opinions on the statement that social reporting improves financial results. Out of 300 investors, 44(14.67%) strongly agree that social reporting improves financial results; 113(37.67%) just agree to this statement; 117(39.00%) neither agree nor disagree to this statement; 21(7.00%) disagree to this statement while five (1.67%) strongly disagree to the statement that social reporting improves financial results. Most of the investors neither agree nor disagree that social reporting improves financial results of the company.

vi. Increases License to Operate

Murray, Power and Gray (2006) provided evidence that social information has an impact on the market. They made a general conclusion the impact on social disclosure might have on the market. The result shows that share is increased license to operate that is construction of school, hospitals, etc. Out of 300 investors, 46(15.33%) strongly agree that social reporting increases license to operate; 112(37.33%) just agree to this statement; 111(37.00%) neither agree nor disagree to this statement; 26(8.67%) disagree to this statement while five (1.67%) strongly disagree that social reporting increases license to operate schools, hospital and the like. Most of the investors agree that social reporting increases license to operate.

vii. Reduces Risk

Out of 300 investors, 33(11.00%) strongly agree that social reporting reduces risks such as financial risk, operational risk and the like a company may face; 117(39.00%) just agree to this statement; 116(38.67%) are neutral to this statement; 28(9.33%) disagree to this while six (2.00%) strongly disagree that social reporting reduces the risks of the company. Most of them agree that CSR reduces risks of the company.

viii. Improves Management's Credibility to Shareholders

Investors have expressed different opinions on the statement that corporate social reporting improves management's credibility to shareholders. Out of 300 investors, 31(10.33%) strongly agree to the statement; 109(39.33%) just agree; 134(44.67%) remain neutral; 18(6.00%) disagree while eight (2.67%) strongly disagree to the statement.

ix. Influences Share Price and Returns

Out of 300 investors, 40(13.33%) strongly agree that social reporting influences share price and returns; 87(29.00%) just agree to this statement; 130(43.33%) are neutral to this statement; 31(10.33%) disagree to this statement while 12(4.00%) strongly disagree that social reporting influences share price and returns.

x. Unfavourable to a Company

Investors may be able to compare the negative effect of disclosing social information on Earnings per Share (EPS) along with the compensating positive effect through Corporate Social Reporting. Investors have differed among themselves on social reporting being unfavourable to a company. Out of 300 investors, forty (13.33%) strongly agree that social reporting is unfavourable to a company; 80(26.67%) just agree to this statement; 122(40.67%) stay neutral; 46(15.33%) disagree while 12(4.00%) strongly disagree stating that social reporting is unfavourable to a company. Majority of the investors remained neutral to the statement that social reporting is unfavourable to a company.

xi. Results in Diversification from Primary Objectives

Corporate social responsibility is very well for the very big companies with lots of resources at their disposal. For those fighting for survival, it is a very different picture. Of the 300 investors, 28(9.33%) strongly agree that social reporting results in diversification from its primary objectives; 87(29.00%) just agree; 129(43.00%) stay neutral to this statement; 48(16.00%) disagree to this statement while eight (2.67%) strongly disagree that social reporting results in diversification from its primary objectives. Most of the investors neither agree nor disagree to the statement.

xii. Consumes more pages in Annual Reports

Organizations in emerging nations need to have greater transparency and assume more social responsibility if they are to be successful in the future competition for funding. Table 2 shows that of the 300 investors, 31(10.33%) strongly agree that social reporting consumes more pages in Annual Reports; 106(35.33%) just agree to this statement; 100(33.33%) neither agree nor disagree; 54(18.00%) disagree while nine (3.00%) strongly disagree to the statement. Most of the investors agree that social reporting consumes more pages in Annual Reports.

xiii. Gives Information to the Competitors

Investors have different opinions on the statement that social reporting gives information to the competitors. Out of 200 investors, 27(9.00%) strongly agree that social reporting gives information to the competitors, 111(37.00%) just agree, 114(38.00%) neither agree nor disagree to this statement, 33(11.00%) disagree to this while 15(5.00%) strongly disagree to the statement. Most of the investors neither agree nor disagree that social reporting gives information to the competitors.

xiv. Involves additional Cost and Time

Table 2 shows the opinion of members regarding the statement that social reporting involves additional cost and time. Of the 300 investors, 24(8.00%) strongly agree that social reporting involves additional cost and time; 108(36.00%) just agree to this statement; 137(45.67%) stay neutral; 26(8.67%) disagree while five (1.67%) strongly disagree. Most of them neither agree nor disagree that social reporting involves additional cost and time.

xv. Reliable

Because of the technological and communication revolution of the last ten years, the companies can give reliable report to the stakeholders. Global communication creates a context where organizations are more open to external expectations. Reliable CSR communication is therefore becoming increasingly important. Out of 300 investors, 43(14.33%) strongly agree that social report is reliable; 106(35.33%) just agree; 129(43.00%) are neutral; 17(5.67%) disagree to this statement while five (1.67%) strongly disagree that social report is reliable. Most of them neither agree nor disagree that social report is reliable.

xvi. Conflicts and Problems Insufficiently Discussed

Investors react negatively to companies which reported poor social performance, indicating that social performance, attract reactions. Sometimes, investors think that conflicts and problems are insufficiently discussed in the Annual Reports. Of the 300 investors, 35(11.67%) strongly agree that social report does not contain details about the conflicts and problems; 91(30.33%) just agree to this statement; 157(52.33%) are neutral to this statement; 10(3.33%) disagree to this statement while seven (2.33%) strongly disagree to the statement that conflicts and problems are insufficiently discussed. Most of them neither agree nor disagree that social report is not critical enough because conflicts and problems are insufficiently discussed.

xvii. Contains only Positive items/events

Of the 300 investors, 45(15.00%) strongly agree that social report contains only positive items; 96(32.00%) just agree to this statement; 131(43.67%) stay neutral to this statement; 22(7.33%) disagree to this statement while six (2.00%) strongly disagree to this statement. Most of the investors neither agree nor disagree that social report contains only positive items of the company.

xviii. Social Auditing

Social Reporting by Indian corporations lags significantly behind that found in developed countries. The reporting, in general, is unsystematic, piecemeal and inadequate. Of the 300 investors, 58(19.33%) strongly agree that social report should be audited by an auditor; 123(41.00%) agree to this statement; 106(35.33%) are neutral to this statement; 11(3.67%) disagree to this statement while two (0.67%) strongly disagree. Most of them agree that social report should be audited by an auditor.

xix. Social Policy of a Company

Out of 300 investors, 55(18.33%) strongly agree that social reporting reveals social policy of a company; 121(40.33%) agree to this statement; 110(36.67%) are neutral to this statement; nine (3.00%) disagree to this

statement while five (1.67%) strongly disagree that social report reveals social policy of a company. Most of them agree that social report reveals social policy of a company.

xx. Separate Section in the Annual Reports

Corporate social reporting may be given in a separate section in the annual reports in order to maintain greater transparency about the social performance of the company. Of the 300 investors, 38(12.67%) strongly agree; 131(43.67%) just agree to this statement; 117(39.00%) are neutral; eight (2.67%) disagree to this statement while six (2.00%) strongly disagree to the statement that social reporting should be made in a separate section in the Annual Report. Majority of the investors agree that social reporting should be made in a separate section in the Annual Report.

xxi. Physical Terms

Despite the growing importance of corporate social reporting, organizations still have to learn how to report their social activities. It should also be reported in physical terms. Out of 300 investors, 39(13.00%) strongly agree that social reporting should be made in physical terms; 130(43.33%) just agree to this statement; 105(35.00%) are neutral to this statement; 16(5.33%) disagree to this statement while ten (3.33%) strongly disagree that social reporting should be made in physical terms. Most of them agree that social reporting should be made in physical terms.

xxii. Monetary Terms

Social report has to be expressed in monetary terms to convey a deeper meaning to the shareholders. Table 2 shows the opinions on the statement that social reporting should be made in monetary terms. Of the 300 investors, 43(14.33%) strongly agree to this statement; 120(40.00%) just agree to this statement; 108(36.00%) are neutral; 19(6.33%) disagree to this statement while ten (3.33%) strongly disagree to the statement that social report should be made in monetary terms. Most of the investors agree CSR should be made in monetary terms.

xxiii. Already provided by other means

Social reports are the main channel for communicating the social and environmental effect of organizations' economic actions to particular interest groups within society and to society at large. Of the 300 investors, 24(8.00%) strongly agree that social report is an important addition to the information already provided by other means; 95(31.67%) agree to this statement; 159(53.00%) remain neutral to this statement; 18 (6.00%) disagree to this statement while four (1.33%) strongly disagree to this statement. Majority of them have neither agreed nor disagreed to the statement that social report is an important addition to the information already provided by other means.

xxiv. Investor's Investment Decision

The reporting of corporate social responsibility activities may have some influence on investment decision and consequently motivate ethical investment. Investors have expressed different opinions on the statement 'social report influences investor's investment decisions'. Of the 300 investors, 25(8.33%) strongly agree that social report influences investor's investment decisions; 96(32.00%) just agree to this statement; 114(47.00%) prefer to be neutral to this statement; 33 (11.00%) disagree to this statement while five (1.67%) strongly disagree to this statement. Most of them neither agree nor disagree to the statement that social report influences investor's investment decisions.

xxv. Recognition of Individual Employee

Employee details may include the details about the recognition of individual employees. Out of 300 investors, 27(9.00%) strongly agree that individual employee should be recognized in the social report; 86(28.67%) agree to this statement; 153(51.00%) stay neutral to this statement; 25 (8.33%) disagree to this statement while nine (3.00%) strongly disagree to this statement. Majority of the investors neither agree nor disagree that individual employee should be recognized in the social report

xxvi. Social Reporting is Retrospective

Corporate social reporting is an extension of the financial disclosure system or contemplating the past, which reflects the wider anticipation of society concerning the role of the business community in the economy. Out of 300 investors, 22(7.33%) strongly agree that social reporting is not very interesting as it is mainly retrospective; 74(24.67%) agree to this statement; 163(54.33%) are neutral to this statement; 38 (12.67%) disagree to this statement while three (1.00%) strongly disagree to this statement. Majority of the investors neither agree nor disagree that social report is not very interesting as it is mainly retrospective.

xxvii. Do not match with Annual Reports

The investors may think that social reports do not perfectly match with Annual Reports. Out of 300 investors, 29(9.67%) strongly agree that social reports do not match with Annual Reports; 96(32.00%) agree to this statement; 135(45.00%) are neutral to this statement; 37 (12.33%) disagree to this statement while three

(1.00%) strongly disagree that social reports do not match with Annual Reports. Most of the investors neither agree nor disagree that social reports do not match with Annual Reports.

A Friedman rank test was conducted to determine whether investors had a different rank order for items of corporate social reporting. Friedman ranking shows that the statement 'social reporting should be audited' is the first order opinion of the investors. Most of the investors, it seems, preferred corporate social reporting statements to be audited by independent auditors. The least importance is given to statements, namely, 'social report is not critical enough since conflicts and problems insufficiently discussed' and social report contains only positive items/events'. There is, however, no significant difference in how investors evaluated corporate social reporting.

CONCLUSION

It is found that the investors have remained neutral to many of the statements related to corporate social reporting. However, Alex Blackburne (2013) has stated based on his survey that the overwhelming majority of investors believe corporate social responsibility and sustainability report are "essential" for large companies. Ninety per cent of respondents in a poll conducted by the European Sustainable Investment Forum (EUROSIF) and the Association of Chartered Certified Accountants (ACCA) subscribed to this view. Meanwhile 85 per cent said annual reports were similarly important. The parties, who may stand to gain from the findings of the present study, may be (i) the Government, (ii) Securities and Exchange Board of India (SEBI), (iii) Companies, (iv) Investors and other associated parties.

Currently, the companies are likely to adopt policies and standards that best accommodate the interests of the company, with the minimum cost involved. Companies will be able to know where do they stand as far as corporate social reporting is concerned and how best they can improve their reporting. The outcome of the study will undoubtedly be of great help to the investors to assist in evaluating the extent of social disclosure by Indian firms and accordingly structure their portfolio to include such companies that are really concerned about the society. Further, they would be able to closely monitor their investment.

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