A STUDY ON ANALYSIS OF CHALLENGES FACED BY BANGALORE METROPOLITAN TRANSPORT CORPORATION

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ABSTRACT

The Bangalore Metropolitan Transport Corporation (BMTC) is the state – run Bus Company in Bangalore, India. Headquters is in Bangalore. The performance of the BMTC transport Corporation is perilous. The study of literature reveals that there are issues penetrating in income of this transport services. Travelling from one place to the other place has turned out to be a crucial in the pandemic time when health is the priority of the people .Researchers have made much prominence on its assistance but not much is discussed on the problems of Bangalore Metropolitan Transport Corporation. This broadsheet segregates the challenges faced by BMTC and also productivity of the Public transport company using Ratio analysis. The broadside further provides for the suggested measures to be adopted by the Bangalore Metropolitan Transport Corporation in the Transport sector.

Key words: *Bangalore Metropolitan Transport Corporation, Productivity, PublicTransport, Ratio analysis.*

Introduction

Bangalore Metropolitan Transport Corporation was the leading transportation in Bangalore which is used by common people to travel from one place to other in a cheap cost charged by BMTC which provides a good services to each nook and corner of Bangalore .it is a government agency that operates the public transport bus services in Bangalore, India.

There are various other transportation facility in a city like Bangalore like Bus, Metro Train, Cab services, Taxi etc., but the services provided by BMTC is reasonable , they provide Monthly pass, day pass

It has been a demanding sector for common people in the city. The day to day activities was taking place with bus transportation. A sudden covid hit in the world had total changed the status of transportation in the world , when health is the priority in life , transportation sectors are suffering with loss in the world which needs a long time to overcome the loss.

Objectives

To identify the conflicts faced by BMTC

To analyze the varying revenues and expenses of BMTC

To suggest the measures to overcome encounters faced by BMTC

Research Methodology

Secondary sources: Data involves the Bangalore Metropolitan Transport Corporation manual, Bangalore Metropolitan Transport Corporation website, annual administrative report BMTC magazines (sanchara) and existing records.

Review of the literature

Dr. R.Malini, Dr.A.meharaj Banu (2019)"Ratio" refers to relationship between the two numerical variables in quantitative term. It simply means expressing one item in relation to another in numerical term To know the financial position of the Indian Tobacco Corporation Limited,The information that are mainly derived from profit and loss account and balance sheet and it refers to a treatment of the information contained in the ratio analysis as to afford diagnosis of the profitability and financial soundness of the company. **Dr.R.Saminathan, Hemalatha P (2020)** The Research papers purpose is to study the performance of the BMTC using ratio analysis. The study was based on secondary data from the records, reports and profile of the BMTC

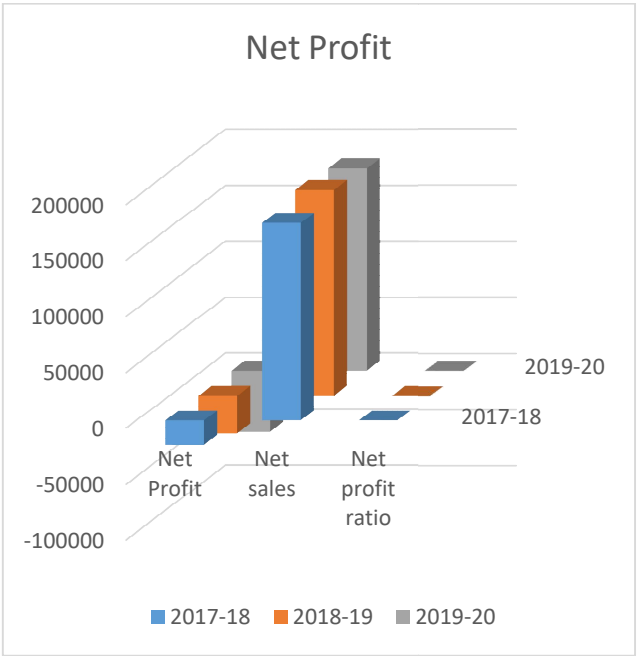
Analysis and Interpretation

Table: 1: Table showing the Net Profit Ratio

1.Net Profit Ratio			
Year	**Net Profit**	**Net sales**	**Net profit ratio**
2017-18	**-21761.46**	**176470.6**	**-12.33149318**
2018-19	**-33948.74**	**183884.05**	**-18.46203627**
2019-20	**-54934**	**180700.09**	**-30.40064894**

Source: secondary data

Chart 1: Chart Showing the Net profit Ratio



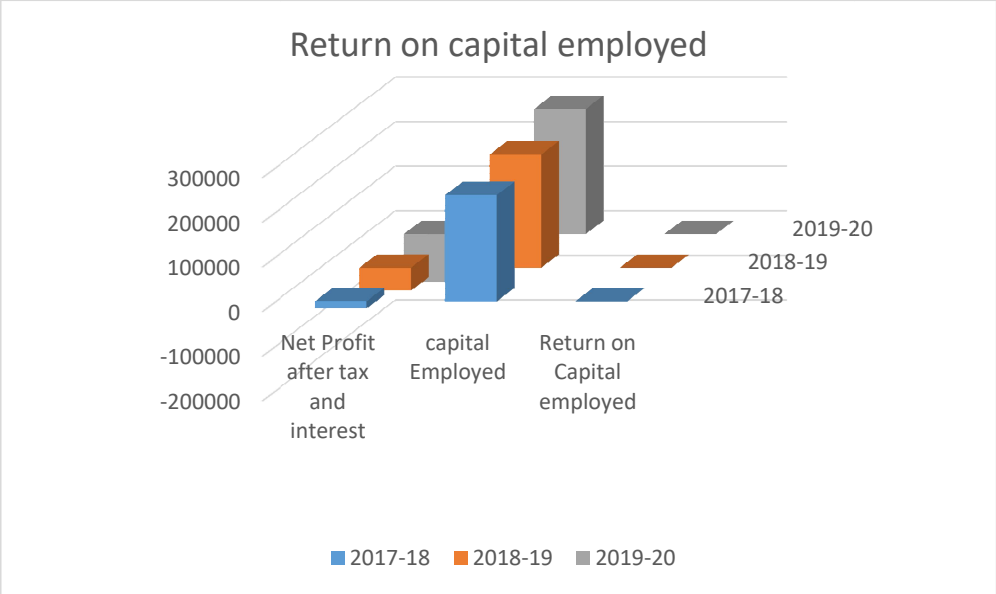
Inference:From the above table and chart it is identified that in the year 2017-18 the net profit ratio is showing the negative ratio value of (12.33) further the ratio is increased in the year 2018-19 showing more Negative balance of (18.46) and in the year 2019-2020 the net profit ratio is depicted as (30.40) . The economic downturns, expansion expenditures can contribute to negative net profit in BMTC. The analysis of Net profit Ratio in BMTC is not satisfied in Bangalore Metropolitan Transport Corporation. Hence it is suggested that the selling of tickets price should be increased to get good returns and also by reducing the expenses of BMTC.

Table 2: Table showing the Return on capital Employed

2.Return on capital employed			
Year	**Net Profit after tax and interest**	**capital Employed**	**Return on Capital employed**
2017-18	**-16219.57**	**238699.5**	**-6.794974434**
2018-19	**-51168.31**	**254182.47**	**-20.13054244**
2019-20	**-106102.64**	**280576.46**	**-37.81594507**

Source: Secondary data

Chart 2: Chart Showing the Return on Capital employed



Inference: From the above table and chart it is depicted that the return on capital employed in BMTC during the year 2017-18 was (6.79) and in the year 2018-19 it shows (20.13) which further increased in the year 2019-2020 the value was (37.815) . The Negative return on capital employed in BMTC also suffers from Negative working capital exceeding the size of their Net fixed assets. It is noticed that Return on capital employed in BMTC is not

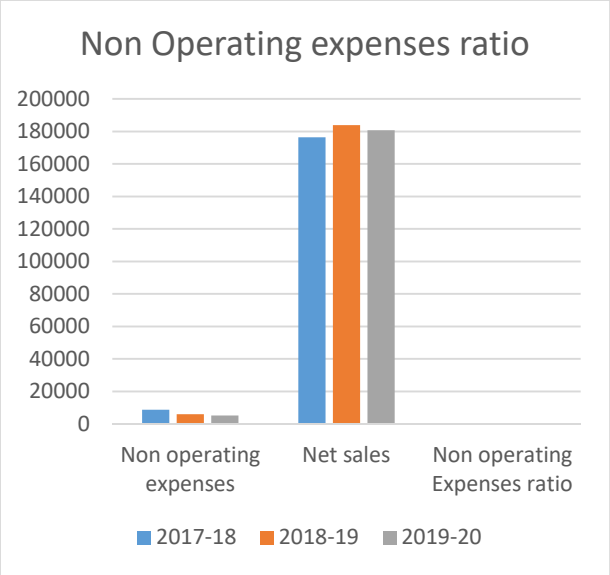
satisfactory hence it should concentrate on improving its profits.

Table No: 3 Table showing Non-operating expenses Ratio

3.Non-operating expenses Ratio			
Year	**Non-operating expenses**	**Net sales**	**Non-operating Expenses ratio**
2017-18	**8670.43**	**176470.6**	**4.913243339**
2018-19	**5956.09**	**183884.05**	**3.239046562**
2019-20	**5162.39**	**180700.09**	**2.856882916**

Source: Secondary data

Chart No:3 Chart showing Non-operating ratio



Inference: The Non-operating expenses ratio analysis is shown using the above table and chart it is noticed that during the year 2017-18 the non-operating expenses ratio value was 4.91 and further it was decreased to 3.23 comparing to the previous year and in the year 2019-2020 the non-operating expenses ratio is declined to the value 2.85. The non-operating expenses are often considered to be the cost that a company must incur to fulfil certain monetary obligations it is suggested that an decrease in the non-operating expenses if satisfactory hence the company should concentrate on further ways to reduce its expenses.

Findings

It is identified that in the year 2017-18 the net profit ratio is showing the negative ratio value of (12.33) further the ratio is increased in the year 2018-19 showing more Negative balance of (18.46) and in the year 2019-2020 the net profit ratio is depicted as (30.40)

It is depicted that the return on capital employed in BMTC during the year 2017-18 was (6.79) and in the year 2018-19 it shows (20.13) which further increased in the year 2019-2020 the value was (37.815)

It is noticed that during the year 2017-18 the non-operating expenses ratio value was 4.91 and further it was decreased to 3.23 comparing to the previous year and in the year 2019-2020 the non-operating expenses ratio is declined to the value 2.85.

Suggestions

Hence it is recommended that the vending of tickets price should be improved to get worthy yields and also by reducing the expenses of BMTC.

It should deliberate on improving its revenues.

It is suggested that a decrease in the non-operating expenses if satisfactory hence the company should concentrate on further ways to reduce its expenses.

Conclusions

BMTC is the oldest and well established public limited company which has a sufficient name and fame in the minds of public for the services offered by them. Based on the study the revenue has reduced du rot the reasons are introduction of Metro, lockdowns , the two wheeler loans were cheaper and it depicts that the passenger luggage has also reduced due to the reasons the the complaints received from passengers stating that buses do not arrive on time. It shows that the cost towards employees as increased the reasons are increase in the salary of the staffs, it is witnessed that there is loss in the income of the BMTC which is the result of lock down in the city due to Covid-19 and increase in the cases lead to decrease in the income and the strikes from BMTC for the betterment of the scale also one of the reason for the declining performance of BMTC.

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A STUDY ON GROWTH AND PRODUCTIVITY OF INDIAN CHEMICAL INDUSTRY: A COINTEGRATION TECHNIQUE APPROACH

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ABSTRACT

In this modern world, chemicals are part of several aspects of human life.Chemicals are used to purify drinking water, medicine, quality buildings, fuels and many more.Several industries are manufacturing chemical and chemical products. Chemical industries contribute to enhance the quality of the modern-day life of every individual. The earth's natural resources like soil, minerals, water, air, plants, and animals provide the raw materials required for chemical industries.Among the global chemical trading nations, India got 14th placein its exports (excluding pharmaceutical products)and 6th in chemical imports globally during 2018. Since natural resources are scarce and the demand for natural products increases, the chemical industry provides a solution with alternative products. Hence the demand for chemical products is increasing every day. Keeping this in mind this paper aims to analyse the growth and productivity in the Manufacture of Chemical Industry in India. The present study focuses on the growth and productivity of Indian chemical industries from 1990-91 to 2017-18. Data on the gross output, material, service, energy, employment, capital stockarecollected from the India KLEMS database for analysis. This paper attempts to study the chemical industry's growth and productivity by using the econometric analysis viz., the unit root test, ARDL model, cointegration and error correction model.

Keywords: *Growth, Productivity, Chemical industry, Econometrics, KLEMS, India.JEL Code*: O47, L65, C01.

Introduction

Both the agricultural and industrial sector uses the chemicals as an important input. The industries like Textiles, papers, detergents, pharmaceuticals, paints, soaps, and varnish use the chemical products extensively. Chemical involved in thousands of commercial products and have a link with various industrial activities. Petrochemical products contribute around 40 % of the global chemical market. The value-added products from petrochemicals cater for the need of various industries.Since natural resources are scarce and the demand for natural products increases, the chemical industry provides a solution with alternative products. Hence the demand for chemical products is increasing every day and also estimated to have a 9 per cent annual growth rate by 2025 and contribute around 300 billion US$.

Chemical industry – Global Scenario

As per the specific report 2020, world chemicals (excluding pharmaceuticals), sales in 2018 are around 3347 Euro billion. India ranks fourth in Asia and sixth globally, with chemicals sales valued at 89 Euro billion in 2018. India's Capital spending in World Chemicals (excluding pharmaceuticals) is valued at 4.6 Euro billion in 2018, compared to 3.6 Euro billion in 2008. India's chemical R&D spending was around 1.4 Euro billion in 2018, as compared to 0.7 Euro billion in 2008. Table 1 presents the details of the top ten countries in World Chemical sales during 2018.

Table 1Top ten countries in World Chemical sales

Rank	Country	Sales in 2018 (in Billion)
1	China	1198
2	European Union (EU)	565
3	USA	468
4	Japan	180
5	South Korea	127
6	India	89
7	Taiwan	76
8	Russia	76
9	Brazil	69
10	Saudi Arabia	53

Source: cefic report 2020

Among the global chemical trading nations, India got 14th placein its exports (excluding pharmaceutical products) with 2.37 per cent share and 6th in chemical imports with 3.65 per cent of global share during 2018.

Indian chemical industry

The chemical manufacturing industry in India has its food prints in history and made a considerable contribution to Indian economic

development. Chemicals are the broadly used material in most industries globally. When the industrial activity extends, the demand for chemical products will also increase, resulting in greater global trade.

Table 2 Production of Major Chemicals and Petrochemicals

(Figures in 000'MT)

Group	Basic Major Chemicals	Basic Major Petrochemicals	Aggregate Basic Major Chemicals &Petrochemicals
2015-16	9884	14905	24788
2016-17	10234	15510	25744
2017-18	11069	15670	26739
2018-19	11589	16269	27858
2019-20	11943	19041	30984
CAGR	4.84	6.31	5.74

Source: Ministry of Chemicals & Fertilizers, GoI, Annual Report 2021.

Table 2 presents the details of the production of selected Major Chemicals and Petrochemicals from 2015-16 to 2019-20. The production of aggregate major chemicals and petrochemicals recorded a CAGR of 5.74% during 2015-16 to 2019-20.[1]

The production of alkali chemicals contributed around 71% of the production of major chemicals for the year 2020-21. The production of major chemicals recorded 4.84% growth from 2015-16 to 2019-20.

The production of polymers accounts for around 72% of the production of basic major petrochemicals for 2020-21.The production of basic major petrochemicals recorded an annual growth of 6.31% during 2015-16 to 2019-20.India's growing demand for agriculture associated chemicals provides abetterscope for the development of the sector in the future.

[1] Government of India, Ministry of Chemicals & Fertilizers, Annual Report 2021. https://chemicals.nic.in/sites/default/files/Annual_Report_2021.pdf

Literature Review

A survey of available literature reveals that studies undertaken in India's chemical industry are limited in number; most of the available study in India's chemical industry has been undertaken in recent years.

Murat SekerFederica Saliola (2018) states that the total factor productivity is a fundamental measure of effectiveness and an essential tool for policymakers. Since the non-availability of consistent firm-level data of the developing nations, the researcher found it difficult to pursue the analysis. To overcome this issue,the researcher surveyed 69 developing nationsby adopting a uniform methodology. The data's homogenous nature and the various set of questions protected in the surveys supply an extraordinary chance to examine firms' average productivity performances across different characteristics and the factors of the enterprises. The analysis performed here presents the groundwork for trying out various stylised statistics about TFP and its associated factors such as exporting, innovation, access to finance, foreign ownership, and policies across developing countries.

Asmita Mukherjee (2015)[2] states that the chemical industry of India passing through several constraints like paucity of some raw materials (sulphur, soda ash, crude oil), lack of hydel power, scarcity of skilled personnel. However, regional factors determine industrial development. As chemical products enter every corner of daily life andthe economy, the government should give special impetuous to flourish this industry by overcoming the regional factors. Above all,one should not ignore the hazardous characteristics of the chemical industry.

Sandeep Kumar Baliyan, Sanjeev Kumar and KavitaBaliyan (2015)[3]tried to develop an analytical procedure to testthe impact of

[2]Asmita Mukherjee (2015). Status of Chemical Industry – West Bengal and States of India. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*. Volume 20. Issue 10. Ver. IV. PP 91-97.

[3] Sandeep Kumar Baliyan, Sanjeev Kumar and KavitaBaliyan (2015) Total Factor Productivity Growth of Indian Manufacturing: An Analysis of after Liberalization. *Asian Journal of Research in Social Sciences and Humanities*. Vol. 5. No. 5. pp. 38-51. DOI -10.5958/2249-7315.2015.001.

liberalisation on the TFP growth in the Indian manufacturing sector empirically and examined technical efficiency and change. Finally, the paper concluded with general observations and suggestions. The study also tried to measure the productivity growth in the Indian manufacturing sector at the unit level. In the past twenty years, the available literature on the measurement of productivity growth was updated from the basic measurement of TFP with a production function methodology to a highly sophisticated decomposition method. To measure the growth and to finding the components of productivity change, methods have been established based on the TFP index's decomposition. The study applied the Malmquist index to measure the TFP.

SubrataMajumder, Sarmila Banerjee, SimantiBandyopadhyay (2012)[4]attempted to analyse the contribution of the chemical sector in India in terms of manufacturing and international trade. The authors used the non-parametric DEA and observed the technological heterogeneity across the products and indicating significant insights regarding firms' internal characteristics like age and size. By analysing the performance of the open market, the study found that a higher export growth due to the price competitiveness and a shift from the fully finished and processed chemicals products to intermediate goods during 1991 and 2006. The analysis of Intra-Industrial trade helped to understand the products and outsourcing destination or subcontracting systems in the sector with significant input. Using the Malmquist Index, the paper analysed the sector's performance by decomposingTFP during 2002 and 2006.

Sarbapriya Ray (2011)[5], in her study, adopted the partial factor productivity and found a growth in material productivity. The study also observed that capital and labour productivity are declining. At the post-reform period, the growth in the TFPrecorded a declining trend than the pre-reform era. The results indicated that the Indian chemical industry's output growth depends on input level than its productivity.

Sampath Kumar. T (2006)[6] attempted to analyse the assumption of homogeneity in India's sub-sectors of the chemical industry. The effect of the reforms in the economy on the industry's productivity levels at the cumulative and sub-sectors level ishighly significant. Like that, the productivity level differs at the firm level as well. During the post-reform period, the productivity levels of the small firms experienced a fall while the large firms managed to increase their productivity. The productivity variations among the small and large firms and the sub-sectors show the heterogeneity in the Indian chemical industry.

Objectives

The present paper attempts to describe the Indian Manufacture of Chemical industry's growth and productivity in the Indian economy. The specific objectives of the study are.

1. To study the trend and growth of the manufacturing of the chemical industry in India.
2. To analyse the long-run relationship between gross output and other variables in the Indian chemical industry.
3. To analyse the partial productivity of the Indian chemical industry.

Research Methodology

The present paper used secondary data for analysis. The chemical industry data is compiled from the KLEMS database published by the RBI for 28 years from 1990-91 to 2017-18 based on 2011-12 constant prices. The data has been collected for the following variables viz., the number of factories, gross output, employment, capital stock, energy, material, service. For analysing the data,the study used the following statistical and econometric tools viz., mean, standard deviation, coefficient of variance, average growth rate, compound

[4]SubrataMajumder, Sarmila Banerjee, SimantiBandyopadhyay (2012) Productivity Performance of Indian Chemical Sector: Post-Reform Perspective. *The Journal of Industrial Statistics*, 1 (2).Pp. 182 – 207.

[5]Sarbapriya Ray (2011) Growth and Productivity Performance in Indian Chemical Industry: An Empirical Investigation under New Trade Regime. *Seoul Journal of Economics.* Vol. 24. No. 3. pp. 357-387.

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growth rate, unit root test, ARDL, cointegration and ECM.

Empirical Results

Trend Analysis

Table 3 shows that the growth of selected variables of the Indian chemical industry. It is evident from the table that the gross output recorded a seven per cent growth rate during the study period. The year 1995-96 and 2010-11 witnessed a high growth rate with 0.17 and 0.16 per cent during the reference period. The periods viz., 2008 and 2009 recorded negative growth rates among the reference periods. The coefficient of variation shows moderate stability in the gross output during the study period.

The analysis shows a compound growth with ten per cent in the material. The year 2011-12 witnessed a better growth rate with 0.27 per cent, and a negative growth rate was recorded during 2009. The coefficient of variation shows better stability during the study period in terms of the material.

It is evident from the table that the energy recorded a four per cent compound growth rate during the study period. The year 2011-12 and 2010-11 witnessed a better growth of energy with 0.15 per cent and 0.14 respectively in the period in reference. The year 1993, 2005, 2009, 2012, 2013 and 2016 recorded negative growth rates among the reference periods. The coefficient of variation witnessed a moderate degree of volatility in the study period.

It is evident from the table that the services recorded 4 per cent growth rate during the study period. The year 2009-10 witnessed high negative growth rates with -0.18 per cent during the period in reference. The year 1998, 2001, 2009, and 2012 to 2016 recorded negative growth rates among the period in reference. The coefficient of variation witnessed moderate volatility in the study period.

It is evident from the table that the employment recorded a one per cent compound growth rate during the study period. The year 1991 to 1993 witnessed a growth rate with 0.05 per cent in reference. The year 2006 and 2007 recorded negative growth rates among the period in reference. The coefficient of variation witnessed a high-level variance in the study period.

It is evident from the table that the capital stock recorded a 7 per cent compound growth rate during the study period. The year 1997 and 1995 witnessed a growth rate with 0.19 and 0.17 per cent in reference. The year 2001 recorded negative growth rates among the period in reference. The coefficient of variation witnessed a moderate stability variance in the study period.

Unit Root Test

Table 4 presents the ADF test results for all the selected variables used in the analysis at levels and first difference. The Schwartz Bayesian information criterion determines the number of lags used in the test. In the ADF test, the null hypothesis is that the series is non-stationary or has a unit root (Aung, N. G. (2009). The computed test statistic values are compared with the critical values, and the probability values are used for rejecting the null hypothesis. Suppose the computed value of the t-statistic is more than the critical value and probability values are less than 5 per cent. In that case, the null hypothesis is rejected, and the variable is assumed to be stationary.From the table, it can be seen that the ADF test confirmed that the included variables are stationary at I(0) (stationary at their level) and I (1) (integrated of order first difference).

ARDL Model

Table 5 shows that there aresignificant effect of the first and second lags of capital stock, employment and service 5 per cent and one per cent level significant. Gross output, energy, material there are insignificant.

F-Bound Test

Table 6 presents that the bound test is the test to determine a long-run relationship as a null hypothesis. According to the value of F-statistics (4.047), if this value is greater than the upper bound, I (1) reject the null hypothesis. The results indicatealong relationship, including at levels of significanceat5%, and 10%.

Error Correction Model

After establishing the cointegration relationship, an error correction model (ECM) can be established to determine the long-run dynamics of the regression model. The estimated error correction model was given to determine a long run variable in table 7. These results suggest that out of error correction model was positive and significant at a 1 percent level. It is seen that the error correction coefficient is quite high. The results of explanatory variables of ln capital stock and ln service establishing a long term relationship with output variable is statistically significant at 1 percent level—their effects on output in the long run relationship. The signs are corrected even for all of the variables that are dropped from the ECM for their insignificance.

Labour and Capital Productivity

Table 8 presents the labour productivity and capital productivity in the Indian manufacturing of the chemical industry. It is evident from the table that labour productivity is recorded positive growth in the following years viz, 1991, 1993, 2008, and 2009 among the periods in reference. The coefficient of variation shows a moderate level of variance in labour productivity during the study period.

It is evident from the table capital productivity was recorded a positive growth rate during the year viz, 1993, 1995, 1998, 2007, 2009, 2015, and 2016 during the study periods. The coefficient of variation shows better stability of capital productivity during the period in the analysis.

Conclusion

It is evident from the study that gross output, material, and capital stock have a high average annual growth rate. The energy, service and employment havea low average annual growth rate during the reference period. The econometric analysis shows that the unrestricted vector autoregressive model coefficients provided evidence of a short-run relationship with the following variables: Value of Output, Inputs, Fixed Capital, and Workers. The study also found moderate stability in the labour productivity of the Indian paper manufacturing industry. The study found that Capital productivity registered with better stability. The growth of labour productivity was negative during most of the years in reference.

In contrast, capital productivity was recorded positive growthdue to technological advancement during the reference period.Irrespective of the present pandemic outbreak, the chemical industry in India have more opportunities due to the interruption in China's supply chain and its emerging conflicts with Europe, the U.S.A and other nations. Apart from that, the Government of China introduced various legal measures to control the pollution, which created further prospects for the chemical industry in certain segments.The Indian government introduced various measures to encourage the industries in India. R&D activities in the chemical sector should be encouraged to increase India's chemical industry competitiveness.

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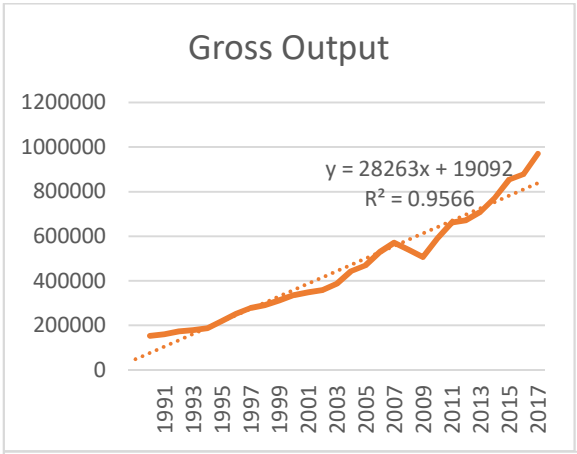
Table 3 Trend and Growth of Indian Manufacture of Chemical Industries

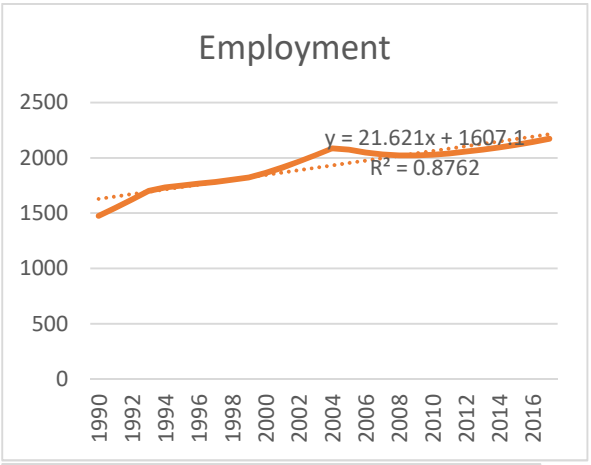
Year	Annual Growth Rate					
	Gross Output	Material	Energy	Service	Employment	Capital Stock
1991	0.05	0.06	0.05	0.09	0.05	0.05
1992	0.07	0.05	0.00	0.08	0.05	0.05
1993	0.04	0.05	-0.12	0.04	0.05	0.05
1994	0.04	0.08	0.10	0.08	0.02	0.04
1995	0.17	0.14	0.12	0.13	0.01	0.17
1996	0.15	0.17	0.13	0.10	0.01	0.11
1997	0.10	0.23	0.06	0.15	0.01	0.19
1998	0.05	0.06	0.05	-0.01	0.01	0.07
1999	0.07	0.16	0.14	0.12	0.01	0.07
2000	0.07	0.06	0.04	0.07	0.02	0.04
2001	0.04	0.02	0.01	-0.01	0.03	-0.01
2002	0.03	0.04	0.09	0.00	0.03	0.01
2003	0.08	0.05	0.11	0.03	0.03	0.01
2004	0.15	0.09	0.01	0.10	0.03	0.04
2005	0.06	0.12	-0.01	0.12	0.00	0.08
2006	0.13	0.11	0.02	0.10	-0.01	0.10
2007	0.08	0.08	0.02	0.08	-0.01	0.09
2008	-0.06	0.26	0.13	0.10	0.00	0.08
2009	-0.06	-0.04	-0.11	-0.18	0.00	0.03
2010	0.16	0.32	0.14	0.15	0.00	0.05
2011	0.12	0.27	0.15	0.13	0.01	0.06
2012	0.02	0.08	-0.03	-0.05	0.01	0.08
2013	0.05	0.09	-0.06	-0.04	0.01	0.05
2014	0.09	0.14	0.08	-0.02	0.01	0.06
2015	0.11	0.05	0.07	-0.14	0.01	0.09
2016	0.03	0.00	-0.01	-0.03	0.01	0.11
2017	0.10	0.10	0.13	0.09	0.01	0.07
AAGR	0.07	0.10	0.05	0.05	0.01	0.07
CV*	52.00	81.84	36.09	37.05	9.89	50.76
CAGR*	7%	10%	4%	4%	1%	7%

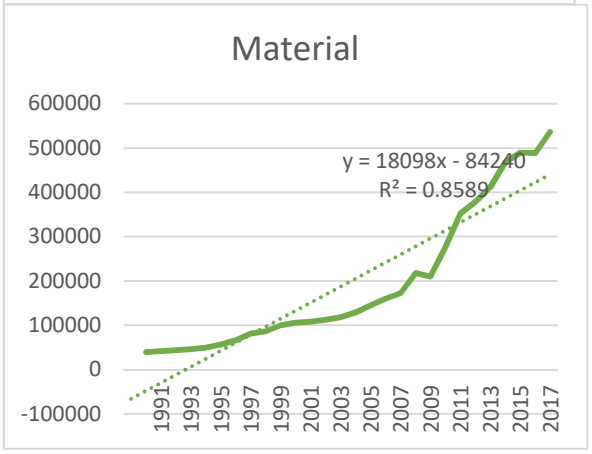
Note : * *Calculated based on the actual data*

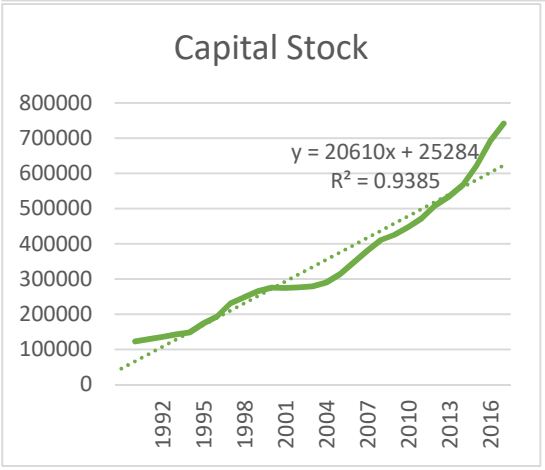
Diagram 1

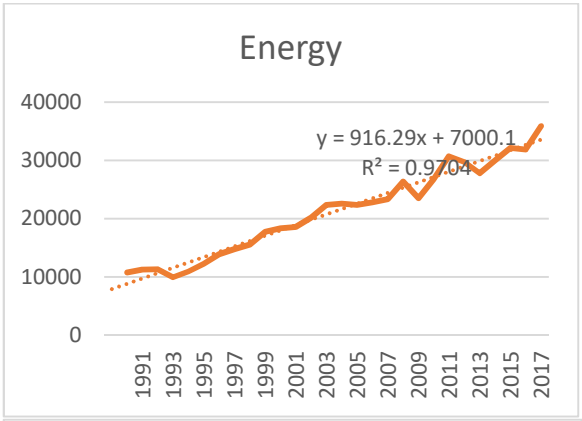
Trend and Growth of Indian Manufacture of Chemical Industries











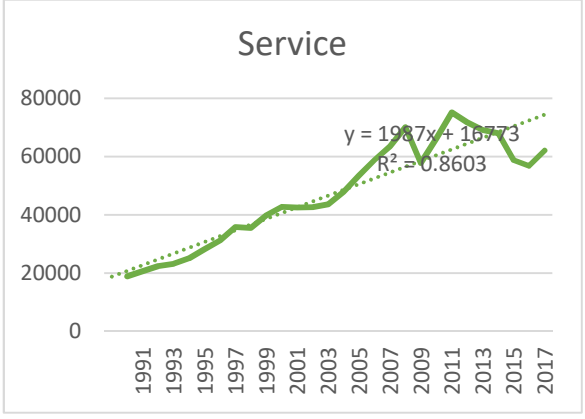


Table 4
Augmented Dickey-Fuller (ADF) Test of the Variables for the Manufacture of Chemical Industry in India

Variables	Level			1st difference			Remarks
	Inter	Trend	None	Inter	Trend	None	
Lngross output	-0.8298 0.7930	-2.9351 0.1685	4.4693 1.0000	-5.3602 0.0002***	-5.3242 0.0012***	-0.7288 0.3902	(1)
Lncapital_Stock	-1.3853 0.5714	-4.2549 0.0130**	3.4202 0.9995	-3.8218 0.0086***	-3.9882 0.0242**	-1.3825 0.1510	(0)
Lnemployment	-2.7656 0.0795	-2.9665 0.1599	1.0907 0.9237	-2.3066 0.1774	-2.2853 0.4267	-2.0804 0.0382**	(1)
Lnenergy	-0.6711 0.8365	-1.5674 0.7770	3.3400 0.9994	-4.8883 0.0006***	-4.8069 0.0038***	-0.7525 0.3793	(1)
Lnmaterial	0.0250 0.9530	-2.1461 0.4986	6.6978 1.0000	-5.0796 0.0004***	-4.9719 0.0025***	-0.8075 0.3556	(1)
Lnservice	-2.3469 0.1655	-0.8857 0.9433	2.5727 0.9964	-4.5443 0.0014***	-4.537 0.0070***	-3.8211 0.0005***	(1)

Note: * significant at 0.05, ** significant at 0.01.

Table 5

Results of ARDL model (1, 1, 0, 0, 1, 1)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**P-value**
Lngrossoutput(-1)	0.346800	0.176102	1.969321	0.0654
Lncapital_Stock	0.577920	0.239907	2.408932	0.0276*
Lncapital_Stock(-1)	-0.525399	0.241857	-2.172357	0.0443*
Lnemployment	0.867594	0.294061	2.950392	0.0090**
Lnenergy	0.196013	0.134557	1.456730	0.1634
Lnmaterial	-0.107800	0.220030	-0.489935	0.6304
Lnmaterial(-1)	0.327504	0.252133	1.298935	0.2113
Lnservice	0.388272	0.225781	1.719684	0.1036
Lnservice(-1)	-0.368103	0.172632	-2.132298	0.0479*
C	-3.554971	1.513326	-2.349111	0.0312*
R^2	0.996925	AIC		-3.491491
Log-likelihood	57.13512	SIC		-3.011551
F-statistic	612.4588	HQC		-3.348779
Prob(F-statistic)	0.000000	DW		2.374675

Note: * significant at 0.05, ** significant at 0.01.

Table 6
F-Bounds Test

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.047524	10%	2.08	3
k	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Actual Sample Size	27	Finite Sample: n=35		
		10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419

Table 7
Error Correction Model Estimation

Variable	Coefficient	Std. Error	t-Statistic	P-value
D(Lncapital_Stock)	0.577920	0.131790	4.385165	0.0004**
D(Lnmaterial)	-0.107800	0.115946	-0.929746	0.3655
D(Lnservice)	0.388272	0.100982	3.844956	0.0013**
CointEq(-1)*	-0.653200	0.105502	-6.191319	0.0000**
R-squared	0.702699	Mean dependent var		0.068148
Adjusted R-squared	0.663921	S.D. dependent var		0.054493
S.E. of regression	0.031591	Akaike info criterion		-3.935935
Sum squared resid	0.022954	Schwarz criterion		-3.743959
Log-likelihood	57.13512	Hannan-Quinn criter.		-3.878851
Durbin-Watson stat	2.374675			

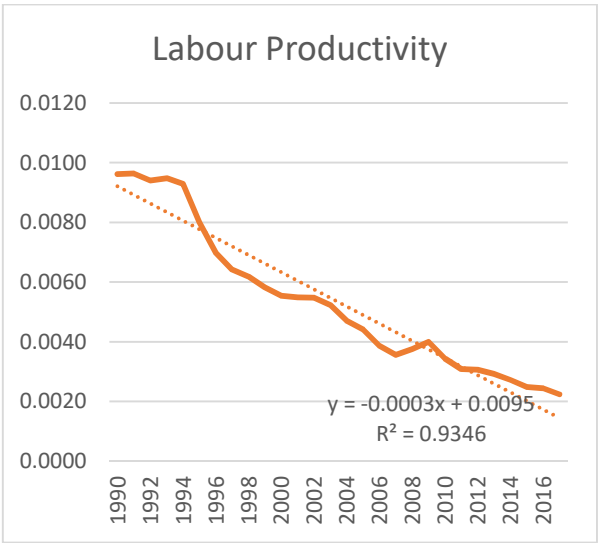
Note: ** significant at 0.01.

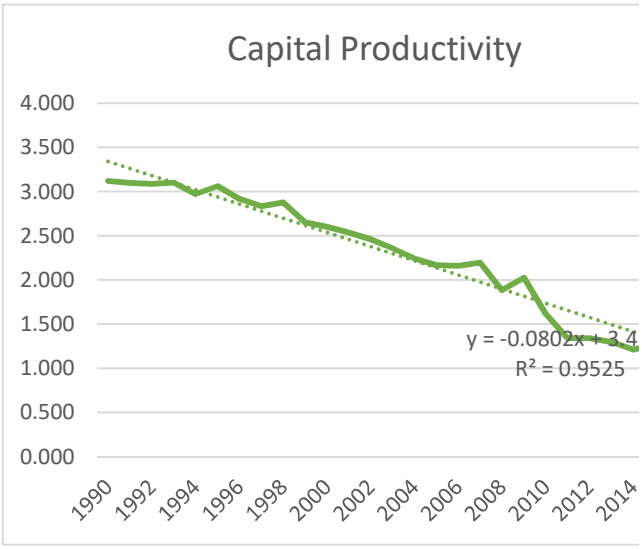
Table 8
Labour and Capital Productivity in Indian Manufacturing of Chemical Industry

Year	Labour Productivity	AGR	Capital Productivity	AGR
1990	0.0096	-	3.120	-
1991	0.0096	0.24	3.097	-0.73
1992	0.0094	-2.43	3.088	-0.29
1993	0.0095	0.78	3.103	0.47
1994	0.0093	-2.09	2.972	-4.22
1995	0.0080	-13.80	3.063	3.05
1996	0.0070	-12.56	2.916	-4.79
1997	0.0064	-8.25	2.834	-2.79
1998	0.0062	-3.65	2.876	1.47
1999	0.0058	-5.84	2.654	-7.71
2000	0.0055	-4.80	2.601	-2.01
2001	0.0055	-1.00	2.535	-2.52
2002	0.0055	-0.15	2.462	-2.88
2003	0.0052	-4.49	2.360	-4.16
2004	0.0047	-10.17	2.245	-4.88
2005	0.0044	-5.99	2.167	-3.49
2006	0.0039	-12.42	2.162	-0.23
2007	0.0036	-8.14	2.198	1.66
2008	0.0037	5.47	1.885	-14.24
2009	0.0040	6.49	2.025	7.47
2010	0.0034	-13.80	1.619	-20.08
2011	0.0031	-10.39	1.343	-17.03
2012	0.0031	-0.74	1.342	-0.08
2013	0.0029	-4.40	1.298	-3.28
2014	0.0027	-7.23	1.213	-6.54
2015	0.0025	-8.70	1.269	4.62
2016	0.0024	-1.48	1.413	11.38
2017	0.0022	-8.20	1.383	-2.13
X	0.0053		2.259	
SD	0.0024		0.676	
CV	45.91		29.92	

Source: Calculated by the author.

Diagram 2Labour and Capital Productivity in Indian Manufacturing of Chemical Industry





DEVELOPING ISLAMIC FINANCE IN FRAGILE STATES

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ABSTRACT

This exploratory paper is an inquiry into the problem of how to go about developing Islamic finance in fragile states. A qualitative analysis was conducted regarding the context in which Islamic financial intermediaries currently operate. The first finding is that an unconventional look has to be taken at the nature of fragility. This paper proposes looking beyond the impediment of failed political institutions and into the possibilities available to the private and third sectors, as well as a possible cooperative approach between IFIs and fragile state governments. Several unique approaches cater to various challenges that recur in fragile states including targeting the private and third sectors when political institutions lack reliability, getting around absorptive capacity constraints using Islamic microfinance, increasing financial participation through microfinance products and mobile services and enticing cooperation of governments through financing development. The existing challenges could also be turned into opportunities ifs framed properly. The opportunity exists for the Islamic finance infrastructure to aid Islamic financial intermediaries in expanding to fragile state markets, to develop the financial sector in such markets and in turn formalize the economy.The lack of development in fragile states allows their authorities as well as Islamic financial intermarries to leverage the opportunity presented by technology. Digital finance allows for greater inclusion and instills greater confidence in consumers due to the transparency and ease of access provided by technology.

Keywords: *Islamic Finance, fragile states, development, opportunities*

The Development of Islamic Finance from a Niche to a Mainstream Industry

One cannot advocate for the development of Islamic finance without a compelling argument. After a 55 year-long experiment, Islamic finance has attained heights that exceeded the expectations of many. Islamic finance asset size and historical growth speak volumes about the progress of the industry. In the late-1980s, when the industry was just beginning to take shape, Islamic finance assets had been valued at approximately $US 5 billion according to some reports (Naz & Gulzar, 2020). This had quickly grown 30-fold by the mid-1990s to $US 150 billion (The Asset Publishing and Research, 2014). Today, global Islamic finance assets stand at $US 2.88 trillion, an almost 20-fold increase since the mid-1990s(Thompson Reuters and DinarStandard, 2019). While this growth is largely limited to the South-East Asia, MENA and Asia Minor regions, the penetration in such regions is remarkable surpassing 31% in such countries as the GCC, Malaysia, Indonesia and Turkey (Moody's Investors Services, 2020).

Complementing this astounding growth is product variety which has expanded from a limited range of simple vanilla retail finance products offered in the early 1980s to a variety and complexity of product offering that has become a formidable contender with that of the conventional finance industry. In light of this expansion, complex financial structures have also been developed to meet the growing variety of needs and demands of the market.

This growth in size, depth and sophistication could not be achieved without the infrastructure and institutions required to support it. Only in the last decade were many Islamic finance jurisdictions relying on domestic conventional regulation to regulate the business of Islamic financial institutions (IFIs). Today, various Islamic finance jurisdictions have developed either comprehensive or partial Islamic finance regulations to regulate IFI activity including those in regions such as South-East Asia and the GCC. This is reinforced by the development of international Shariah, audit, accounting, and regulatory standards as well as guidance on best practices such as those developed by AAOIFI, IFSB and CIBAFI. Important complementary roles are played by other development, liquidity management, dispute resolution, research and educational institutions that enjoy wide-spread appeal among the over 1000 IFIs that exist today. These IFIs are spread over 105 countries having more than doubled their presence since the past decade (IFSB, 2020).

Other growth factors and pivotal events in Islamic Finance development

While the development of Islamic finance is primarily founded on the steady development of the infrastructure supporting it, there are other key factors and economic events that have had a special impact. Islamic finance developed primarily in emerging economies where Muslims are concentrated, and in the context of an increasingly fragile global financial system.

Islamic finance's largest and most advanced markets feature proportions of Muslim participants that are vastly greater than non-Muslim populations. Islamic finance's Shariah-compliant product offering possesses a natural advantage over its conventional counterpart in such markets. Furthermore, such markets either were or still are considered emerging markets which had not attained full functional form until lately. This naturally gives the nascent Islamic finance industry a chance to develop in unison with the emerging conventional finance industry. Had such markets already attained an advanced level of sophistication early on, Islamic finance would have found it hard to compete for market share considering it had largely assumed a primitive form only until the past decade.

Complementing all of this was the wealth that had flowed into certain Arab and non-Arab states that has allowed them to leap into the emerging class of economies. The GCC, Iran and various other Middle-Eastern countries as well as Malaysia had all been producing more oil than they consumed allowing oil to comprise a large portion of their exports. This natural resource put such countries in a very favorable trade position during a period where fuel demand had eclipsed anything witnessed in human history. The income from exports would ultimately flow towards the development of fundamental economic and financial institutions like IFIs (Arnold, 2007).

Last but not least, the global financial system had witnessed both economic and financial shocks that left it more and more susceptible to outright collapse in the past half-century. This increasing fragility is exacerbated not only by political and economic instability, but by the growing complexity of the global financial system which was not met by sophistication in regulations that are capable of stabilizing it. Examples of the former are the OPEC oil crisis and the September 11 attacks while the latter is best exemplified by the various debt crises that have transpired around the world, the worst of which was the Subprime Mortgage Crisis in 2008. In a search for alternatives, conventional financial institutions would turn their attention to the promise of Islamic finance.

The combination of these factors, along with the fundamental institutions in place, the Islamic finance industry would prove a formidable force vying with its conventional counterpart for market share and is now positioned as a viable alternative for consumers.

Islamic Finance as an Alternative

Having proven its resilience, Islamic finance's other bargaining chip is its ability to add value through various features unique to Islamic finance theory which have witnessed a gradual translation into the Islamic finance industry practice. Islamic finance theoreticians almost unanimously hold that the Shariah system of values and objectives lie at the heart of Islamic finance. These values are gradually translated into modern conceptions of corporate ethical practice and corporate social responsibility (CSR).

Since Islamic finance is not value-neutral, values and ethics are inherent to its theoretical foundations. To demonstrate, the Quran, which forms the basis for Islamic finance theory, requires proper documentation and fulfillment of contracts, that transacting be based on mutual consent, upholding justice, transparency, prudence on behalf of IFIs as fiduciaries, and avoiding unjust or immoral profiteering such as through riba (usury), uncertainty, immoral business, etc. Furthermore, the objectives of Islamic finance are delineated in the Quran and which include the emphasis on justice, preservation, stability, circulation, and transparency of wealth. The modern conceptions of values and ethics in Islamic finance are derived based on these important Quranic principles and objectives (Quran, 2:175, 282-283; 4: 5, 26; 5:1; 6:152; 59:7; al-Tirmidhi, 1975, pp. 3:527-528).

Furthermore, the Quran and the Prophet Muhammad's practice (the Sunnah) also

provide guidance on the social responsibility of individuals (and by inference, collective entities). CSR is based on this guidance where corporations governed by Shariah are required to contribute to the economically-marginalized segments of society such through zakat and waqf (alms and endowments), to conduct business in a sustainable manner, to reduce negative externalities affecting people and environment, to commit to socioeconomic development objectives, and to set objectives that transcend material ends, such as through a sincere intention to serve a higher Divine purpose. Islamic finance has great value to provide to consumers and investors looking for finance alternatives.

The core discussion on developing Islamic finance in fragile states will revisit the factors that have bolstered the growth of Islamic finance as well as the value-adding features of Islamic finance that make it a viable alternative to addressing state fragility. The ensuing discussion will review the expansion of Islamic finance and the key contributors to this expansion with a focus on the infrastructure and its constituent institutions in order to pave the way for the core discussion on developing Islamic finance in fragile states.

The Expansion and Potential of Islamic Finance

The various factors and value-adding features of Islamic finance that have contributed to its development into a mainstream industry and a viable alternative are facilitating its expansion and reach into the broader market. While a normative argument can be made that the value-adding features of and infrastructure supporting Islamic finance are what perpetuated its growth, a positive analysis reveals yet other contributors to this growth. These contributors are what facilitate the reach of Islamic finance to the broader market.

How Islamic finance is reaching the broader market?

The following list of contributors to the expansion of Islamic finance assumes no particular order. In aggregate, the following list contributors play the most significant role in the reach of Islamic finance to the broader market:

The growing demand for Shariah-compliant products from a growing middle class of Muslims has allowed IFIs to match a greater number of suppliers and users of funds. IFI assets under management (AUM) grow as a result. With greater asset size, IFIs expand their profits furthering allowing them to expand their operations to other markets. This growth in demand was in part due to awareness campaigns of IFIs themselves, as well as the advocacy of experts, researchers and educators. However, a large part of raising awareness was played by Islamic finance's initial success which instilled confidence in the general public, especially among middle-class Muslims who were looking for Shariah-compliant ways to invest their savings.

This demand and expansion to other markets require that IFIs diversify their product offering. This has a feedback effect in that the greater number of consumers in the market attracts new providers of Islamic financial services. With a healthy diversity in product offering and market players, Islamic finance build had positioned itself well for expanding to broader markets.

Not surprisingly, the growth in the demand and supply of Islamic finance products and services necessitated support from governments and regulatory bodies. In order to organize and regulate a strong competitor in the market, the IFI, governments of Muslim and non-Muslim countries maneuvered significant resources in an attempt to enact law and develop regulation that is unique to Islamic finance and IFIs. To give an example, a prominent survey reported that India and the UK ranked first and second, respectively, among Muslim-minority countries in the Islamic finance law and regulation development category. They are followed by Thailand, Singapore and Sri Lanka as Muslim-minority jurisdictions with the most Islamic finance law and regulation development initiatives (DDCAP Group, 2019). Each of these countries rank better than some Muslim-majority jurisdictions in developing enabling legal and regulatory environment for IFIs.

The development of Islamic finance legislation and regulation was complimented by the establishment of other institutions that are essential to the global infrastructure of the

Islamic finance industry. They mainly comprise international standard-setters such as AAOIFI and IFSB, liquidity management centers such the LMC and IILM, development financial institutions such as the IsDB, dispute resolutions and rating agencies, as well as research and educational institutions including ISRA, IRTI, INCEIF and IIiBF. These institutions have played and continue to play important roles in the development of the industry globally. The individual roles of these institutions will be discussed in due course.

When the Islamic finance industry had started to take full form, its appeal to non-Muslim jurisdictions had grown. Islamic finance had attained a degree of global acceptance and had proven its flexibility to adapt to unique contexts and environments. The IFCI report (2019) ranks a significant number of non-Muslim jurisdictions who have lately, till the end of 2019, witnessed a significant overall increase in ranking in Islamic finance development (DDCAp Group, 2019). While the specific reasons for the increase vary widely, the ranking is a good gauge of the appeal of Islamic finance to non-Muslims.

Target countries and markets

The Global Finance Magazine recently reported various countries in Europe as having positioned themselves to be hubs of Islamic finance whereas, in the US, conventional banks have started offering Shariah-compliant products, albeit on a limited scale (Domat, 2020). It is to be expected that institutions as well as laws and regulations take time to develop. The good news is that there are several existing developed Islamic finance markets that could prove to be a good model for emerging and potential Islamic finance markets. However, there are other aspects of Islamic finance that face lesser bureaucratic impediments and are able to grow much faster.

Certain Islamic finance products and instruments have attracted a lot of common interest, namely sukuk instruments. MIFC's Islamic Finance in Africa report cites various developments in the laws and regulations of various African states that aim to facilitate the issuance of or investment in sukuk securities (Malaysia Islamic Finance Centre, 2017). European private investors are also heavily involved in sukuk investment. Various European countries have made their own sukuk issuances (Mohammed, 2014). While sukuk may seem like a niche instrument, the widespread appeal is certainly not a niche appeal.

A last notable mention is Islamic fintech. Besides the 1.9 billion potential customer base available for IFIs to leverage, Wintermeyer (2017) reports various innovative ways in which Islamic finance can and is leveraging fintech to attain the potential awaiting it. Digital banks, digital sukuk, digital commodity trading, digital takaful products, blockchain-based Islamic contract execution, Islamic crowdfunding and the transfer of Shariah-complaint investment funds to digital platforms are all fitting examples.

While fragile states are a subject of the following section, they mostly fall under the categories of emerging and potential markets. The majority of fragile states generally feature no or very sporadic market development activities in which Islamic finance has little to no presence. The possible approaches, in that case, are for IFIs to either "wait and see," monitor development, maintain a minimum presence, or to seriously explore market potential.

The institutional framework of Islamic finance that can support its expansion

There are functions played by IFIs that are key in upholding a strong Islamic finance infrastructure. The roles of domestic legislative and regulatory bodies, as well as commercial IFIs are generally kept out of this discussion since their activities are largely self-interested. That does not preclude their important role in the development of Islamic finance. Such key functions include:

Education, training and research: Islamic finance practice started with the advocacy of scholars and experts. The IDB's IRTI and ISRA play important roles in conducting theoretical and applied research to develop Islamic finance theory and standards of practice. Fiqh and fatwa councils have also played a pivotal role in formulating a comprehensive database of Islamic legal verdict on Islamic finance theory and practice. Thus far, however, Islamic finance talent

development is largely attributed to Islamic finance educational programs including those offered by AAOIFI and IBFIM, and faculties such as INCEIF and IIiBF.

Shariah, audit, accounting and regulatory standards: an international standard for Shariah compliance, audit and accounting convention and regulation is essential for an industry that is based on the same reference worldview, that of Islam. Luckily, AAOIFI, IFSB and CIBAFI have advanced significantly in this regard. The set of standards developed by AAOIF and IFSB are very technically competent and are indicative of the state-of-the-art which explains why various countries have imposed that their standards be adopted by domestic IFIs. However, it is prudent that these bodies look to the successful example of Malaysia, and specifically the initiative by Bank Negara Malaysia to develop Shariah and regulatory standards to an extent not witnessed by any country. Malaysia's (and Bahrain's) tried and tested experiments in this regard are good models for other countries to follow. CIBAFI also plays a role in enhancing best practices of IFIs including imbuing IFI practice with Shariah values and objectives.

Liquidity management: liquidity had always been an issue for IFIs considering that their operations only permit dealing with Shariah-compliant instruments. In case Shariah-compliant alternatives were lacking, IFIs were given a concession to use conventional instruments. The development of the Islamic money market and sukuk had allowed IFIs to park large amounts of capital that they had accumulated over the years as well as access capital when needed. Besides the global sukuk market and domestic money markets, liquidity management corporations such as the LMC in Bahrain and IILM in Malaysia facilitate the issuance of Islamic financial instruments through their investment banking expertise.

Development banks: the single most contributive development institution in the Muslim world is the IsDB which has also contributed greatly to Islamic finance issuing large volumes of sukuk and investing directly in development using other Islamic financial instruments (IDB, n.d.).

Instrument rating: various organizations exist to rate Islamic finance instruments and institutions including S&P, Moody's and Fitch. The IIRA is another rating agency that rates IFIs and Islamic financial instruments on a global level. These ratings match the nature of IFIs and Islamic financial instruments which largely resemble their credit-based conventional counterparts with the exception of asset-backed instruments and investment accounts offered by IFIs. Although ratings remain subject to the rating agency's opinion, they are generally transparent and work to instill confidence in investors.

Dispute resolution: the last key function is dispute resolution. While various dispute resolution avenues exist at different Islamic finance jurisdictions, the IICRA has played an important role in alternative dispute resolution through its reconciliation and arbitration services. The IICRA has also incorporated international arbitration standards and custom-tailoring its approach to the unique nature of IFI disputes (Al-Shibli, 2018).

These international bodies will prove invaluable to the expansion of Islamic finance into fragile markets where Islamic finance infrastructure is expected to be weak. IFIs then have the choice to turn to international institutions to facilitate their expansion into such markets.

Understanding Fragile States

Defining fragile states

While a comprehensive definition for what comprises, a fragile state is lacking, a good place to start is the UN's adopted definition: a fragile state is when the government either cannot or will not deliver core functions [of the state] to the majority of its people. This is extended to encompass states in which public institutions, political processes and social mechanisms are ineffective, not inclusive or illegitimate and are vulnerable in many respects (UNODC, 2009, pp. 4-5). The OECD characterizes fragility as the combination of exposure to risk and insufficient coping capacity of the state, systems and/or communities to manage, absorb or mitigate those risks (OECD, 2020). The Fragile States Index indicates four major attributes of fragile states, that is:

- The loss of physical control of its territory or a monopoly on the legitimate use of force;
- The erosion of legitimate authority to make collective decisions;
- An inability to provide reasonable public services;
- The inability to interact with other states as a full member of the international community (Fragile States Index, n.d.)

The OECD and the Fragile States Index point out an extensive list of state failure risk indicators and considerations which include economic, political, social, security, and foreign intervention categories. However, this paper proposes an alternative approach to addressing state fragility considering the intended goal is to address the prospects of developing Islamic finance in such states.

An alternate perspective on state fragility

Sara Batmanglich in the 'Trends' section of OECD's States of Fragility report (2018) makes an insightful observation that challenges the commonly held assumption that state fragility is primarily be addressed by remedying the loss of government legitimacy and capacity. If a shift in mindset were to occur to look beyond the legitimacy and capacity of state institutions, then resources and efforts could instead be directed to the private sector and societal drivers.

Considering that state fragility is an extensive interdisciplinary issue, what is of concern here is the ability of the state to provide financial services. The provision of financial services may be conceived to be highly dependent on the quality of public and private institutions. For example, if the government is not able to enforce the basic rule of law, how could it be expected to enforce any sort of property rights? In this case, judicial institutions and law enforcement institutions fail to play their roles. However, an alternative approach would be to transcend the idea of fundamental institutions, without diminishing their importance, and to underscore the important role that private and third sector institutions can play in the provision of financial services.

A discussion on the ability of a fragile state to provide financial services requires extensive space. The authors focus on addressing the aspects from which state institutions can contribute to the development of Islamic finance in fragile states. A greater focus is given to the role that private sector and third sector IFIs could play in developing Islamic finance in fragile states.

Developing Islamic Finance in Fragile States

Before discussing how Islamic finance could be developed in fragile states, a couple of preliminaries need to be addressed.

First of all, not all fragility is identical. Fragility takes different forms. The magnitude of fragility also varies greatly. This has serious implications on the propositions of developing Islamic finance in such states. A one-size-fits-all approach will not work. Instead, custom-tailored approaches that are robust have and will arguably work far better. To demonstrate, whereas some fragile state governments are committed to reform, others may not. An approach that focuses on the private sector may work better with the former where property rights are better enforced.

Second, there are recurring challenges in fragile states that will stifle Islamic finance development. Islamic finance is not equipped to provide solutions to these challenges, but it may pave the way for improving the situation. For example, Islamic finance cannot hope to address the issues of weak state institutions, but Islamic finance can instill financial practice with a set of governance values that are contagious. This contagion may spread to the rest of the private sector to imbue it with quality governance practices in turn compelling the state authorities to develop good governance standards and enforce them in public institutions, such as the central bank and ministry of finance.

In light of the previous two points, the following discussion proposes approaches for IFIs to navigating the challenges presented by fragile states in an attempt to develop Islamic finance there. The following section elaborates on how such challenges can be presented as opportunities by the players in the Islamic finance industry.

Targeting the private sector and third sector when political institutions are fragile

A fragile state's defining feature is failing or broken political institutions. Recurring

problems include the high turnover of officials and change of governments, poor policy design, corruption, and security issues. These are further extricated with the lack of organization and openness of government. The people, along with private and 3rd sector corporations lose faith in the government's ability to uphold the rule of law and provide the necessary public services. Yet, in light of all this, the private sector works much better than would be expected.

Profit incentives push self-interested participants of the private sector to organize themselves. For example, agreements signed between strong market players garner more respect since such agreements interest both parties, regardless of whether the law exists to uphold property rights. The fact of the matter is that there are currently organized Islamic finance activities and significant asset shares in relatively fragile states such as Egypt, Pakistan and Bangladesh . While state institutions generally do a poor job to uphold the rule of law in these countries, the private sector continues to push its way past such obstacles in pursuit of its profit motive. This is a strong indication of the ability of the private sector to do better than it is expected in light of the poor state of state institutions such as law enforcement and private sector regulators.

The third sector is another viable option. IFIs that lead third sector initiatives such as the IsDB may do well to offer development programs through third sector financing in such states in order to build their reputation and prove the viability of Islamic financing. Considering the lack of profit motive in the third sector, it may prove very difficult to sustain development activities on behalf of IFIs in such fragile states.

Getting around absorptive capacity constraints

Absorptive capacity is generally associated with a fragile state's inability to properly take the aid money from outside and allow it to trickle to the individual economic agents (Feeny& McGillivray, 2009). What of the absorptive capacity of markets? Is the fragile state able to accommodate new products, firms or even industries? Introducing Islamic finance to fragile state markets means ascertaining the ability to absorb new product offerings and business. IFIs may find it prudent to consider Islamic microfinancing in order to meet the low absorption capacity constraint generally associated with fragile states by virtue of their undeveloped economies. This should allow IFIs to still be able to expand into such markets.

Islamic finance also introduces a new financial ideology. The malleability of local perceptions of other worldviews is an important consideration. Certain states feature a high level of ideological intolerance in which case an IFI may find introducing Islamic finance products into such markets very hard. An IFI may choose to leverage the existing developments of Islamic finance in the respective state, such as those in various African states discussed earlier. IFIs that lead third sector initiatives such as the IsDB may do well to offer development programs through third sector financing in such states in order to build Islamic finance's reputation. Hence, a concerted effort by the likes of the IsDB and commercial IFIs is called for in order to allow for the absorption of an innovative financial system that is ultimately based on a religious worldview.

The absorptive capacity of markets in fragile states is extricated with recurring political and economic issues such as corruption and poverty that may seriously exacerbate the issue of absorptive capacity. In that case, various supports exist for IFIs, in general, to approach the financial sector in fragile states.

Increasing financial participation through microfinance products and mobile services

The third world is commonly associated with a large portion of the population being financially-excluded. Although economic development expert Thomas Ditcher (2019) attributes this to poverty, a reverse causality of financial exclusion on poverty is also cited (Blake & De Jong, 2008). In other words, reducing poverty results in greater financial inclusion and increasing financial inclusion results in lesser poverty. Be it as it may, this exclusion is more pronounced in fragile states (Demirgüç-Kunt et al., 2013). IFIs, like individuals, have a moral obligation to serve the economically- and financially

disadvantaged and marginalized segments of society.The fulfillment of this CSR must further be made transparent through various forms of reporting. This is a common practice in Islamic finance jurisdictions with developed financial infrastructure. This makes IFIs ideal solutions to the financial exclusion problem in fragile states. However, the reality remains that most IFIs are profit-oriented businesses that do not make strategic decisions based on outright altruism.

In that light, IFIs can start by tapping the savings of unbanked segments of the population in fragile states. This provides a relatively risk-free and low-cost point of entry for IFIs. Gradually, Islamic microfinance products may be introduced. Financially-excluded segments generally find it expensive to participate in the financial system. Microsavings, microfinance, microtakaful and collective investment offer a good starting point.

Furthermore, such unbanked individuals find the physical proximity of access to services another limiting factor. The lack of exposure of some segments of such societies to technology may further exacerbate their predicament. Islamic microfinance can be structured to dodge these problems by lump sum repayments of financing, or lump sum microtakaful contributions. IFIs can offer microfinancing through the facilities of a mobile office or certified agents.

A difficult issue to tackle would be the opportunity cost of such an endeavor. While it may be profitable to apply the aforementioned proposition and entail low risk to the IFI, the opportunity cost may likely be high. That is where development institutions can play a role. Joint cooperation between commercial and third sector IFIs can work to benefit both parties. A development financial institution like the IsDB can pave the way by developing an IFI consumer base. Commercial IFIs can then step in to do what they do best, which is incentivizing those seeking to deposit, to finance, to insure or to invest their capital to do so at a cost.

Financing development through cooperation with governments

An alternative route that features high risk and high reward is a cooperation between IFIs and governments in fragile states. The issuance of sukuk among various African states classified as fragile, among others, is indicative of investor's intent on committing capital to high-risk investments. The rating agencies that were introduced earlier play an important role in instilling such confidence. However, the opinion of the raters must emphasize objectivity in order not to stain the reputation of sukuk, nor of Islamic finance for that matter. The ultimate problem that lingers is of the dependability on such state institutions to properly absorb the invested funds and govern development prudently – something raters can hardly gauge with accuracy. However, past performance of sukuk may be a strong indicator of future performance.

Turning Challenges into Opportunities

Presenting challenges as opportunities can entice fragile state and IFI leadership to act with greater resolve. The state of the Islamic finance industry is that of simultaneous high competition and high risk. IFI leadership may be incentivized to remain in its comfort zone such as the markets in which the IFI currently operates and well-developed markets. However, spurring political leadership and domestic businesses in fragile states to act can also be a daunting task. How, then, can Islamic finance hope to develop in light of such challenges?

The key lies with perspective and the existing channels of support available to Islamic finance initiatives. If the previously discussed challenges are presented instead as opportunities, along with the available channels of support, global IFI leadership, as well as the domestic public and private sector leadership in fragile states can be incentivized to act.

First, with support from the current global Islamic finance infrastructure, IFIs may be enticed to expand operations into fragile states. Various approaches to this that consider the unique cases of fragility have been discussed above. Of notable mention is the role of IFIs like the IsDB in building Islamic finance awareness and a consumer base for commercial IFIs. Islamic rating agencies may serve to instill investors with confidence in investing in sukuk issuances of fragile state governments.

Various international Shariah and regulatory standards for IFIs exist which can be adapted by the regulatory authorities in fragile states. Various examples of this exist where experts in such states are training lawmakers and regulators in certain fragile states in Central Asia and Sudan. Educational and research institutions may offer funded programs to develop new talent and build the capacity of students and conventional finance practitioners from fragile states. Similar initiatives to this have already been taken by Malaysia which hosted Sudanese central bankers before and can be replicated by other countries. This integration of talent and capacity building is an opportunity for existing IFIs and local authorities of fragile states to leverage the existing infrastructural support that exists to develop the financial system and economy as a whole.

The development of the financial system can be the first step to formalizing the economy as a whole. Without good economic institutions, it is difficult for the already waning governments of fragile states to affect any positive public policy changes. This is an important selling point for Islamic finance. Islamic finance inherently aims to complement the economy in order to reduce friction in the activities of economic agents by mobilizing capital. Islamic finance's value-adding features and CSR emphasis make it a sustainable financial model for the economy to develop healthily. The emphasis on justice, inclusion, transparency, stability, and social responsibility all bind self-interested commercial IFI activity to such values. The authorities of fragile states are incentivized to seriously consider paving the way for IFIs to enter their markets or to develop local talent and capacities leveraging such features of Islamic finance, as well as the existing Islamic finance infrastructure that exists to support IFIs around the world.

By extension, the existing financial institutions in fragile states also have an incentive to provide Islamic financial services if the existing Islamic finance infrastructure is able to support them. Considering local financial institutions have greater expertise regarding the local market, they may be in a better position to oversee the provision of Islamic financial services. The Shariah compliance attribute of Islamic finance products is sure to appeal to Muslim populations of fragile states whereas awareness campaigns are required to inform non-Muslims about the distinguishing value-adding and social responsibility features inherent in Islamic finance dealings. A proven track record will serve local financial institutions that provide Islamic financial services well to entice the large non-Muslim populations in fragile states to participate in Islamic financial services. Efficiency and the governance issues of transparency and supervision remain at the top of the list of problems in the financial systems of developing countries (IFC et al., 2010).

This leads us to another major opportunity presented by the development in technology and digital platforms. The development of digital platforms and smart mobile technology can work to remedy such problems. Due to the cost of physical facilities, online and mobile banking, for example, reduce the resources a bank or insurance company needs to commit to physical facilities. The digitalization of financial services has essentially affected a great leap forward in the governance standards of institutions offering financial services. Customers are now able to access a complete list of transactions in a matter of minutes, while financial institutions can hide less information since availability of smart mobile technology allows authorities to impose more stringent reporting requirements, even to basic customers. The use of mobile payments and transfers also instills a lot more confidence in consumers in their dealings with each other. All of this will arguably attract an increasing number of people to participate in the financial system. Where the monetary authorities fail to oversee the physical currency that is being circulated, online money remittance services become the cheap alternative. All such challenges are indeed opportunities that Islamic finance can leverage in order to enter the markets of fragile states.

As for government authorities in fragile states, a compelling case is made of the involvement of a greater segment of the population in financial services. Not only will the advances made in digital and mobile technology ease oversight functions, but law enforcement functions and government revenue agencies

should experience greater facilities in fulfilling their duties. An inherent value-adding feature of Islamic finance is that any IFI must disclose all direct and indirect material information related to the provision of financial services to the relevant parties. This and other self-regulating features of Islamic finance which are bolstered by the leveraging of such technology can instill greater confidence in the supervisory authorities and consumers as well.

These points represent key aspects in which challenges facing fragile states become opportunities that can be leveraged by fragile states and IFIs for bettering the well-being of consumers in fragile states and further boosting the reputation of the Islamic finance industry.

The Conclusion and a Call to Action

The argument advanced in this paper is that Islamic finance has great potential in developing in fragile states. Islamic finance's nascent days were filled with promise in various respects due to factors related to the environment in which the early Islamic finance industry developed. However, a very different set of contributors will allow Islamic finance to expand to new markets. The global institutional framework of Islamic finance is the hallmark of the industry is an important pivoting factor in such expansion.

Developing Islamic finance in fragile states means understanding that not all fragility is the same and acknowledging that various recurring challenges in fragile states may impede Islamic finance's development there. Unique challenges that require unique solutions include:

- Targeting the private sector and third sector when political institutions are fragile
- Getting around absorptive capacity constraints by employing Islam microfinancing
- Remedying low financial participation through microfinance products and mobile services
- Remedying the poor economic development through financial cooperation with governments

The last point that is made is that challenges can convincingly be presented as opportunities. Although support may be lacking from a fragile state, IFIs may find support from the current global Islamic finance infrastructure particularly useful. Islamic finance, although lacking in fragile states, can help formalize the financial system and the economy at large through its self-regulating and value-adding features. Last but not least, government authorities in fragile states can involve of a greater segment of the population in financial services by paving the way for Islamic microfinancing and Islamic fintech.

The need for fragile states to act is dire. Adopting Islamic finance could be tabled at the meetings of regional unions including ASEAN, the Arab League and the African Union. The IsDB vast network of connections with developing country governments may be leveraged if IFIs commit unanimously to expending resources on joint Islamic finance initiatives in fragile states. The World Bank, IMF, OECD and UN have incentives to support and channel aid to organized financial development initiatives organized by IFI leadership considering a significant amount of support exists from the current Islamic finance global institutional infrastructure. Development activists and academics also need to coordinate their advocacy work to build a strong case for the support of Islamic finance's intended expansion into fragile states.

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DOING GOOD IN RELATION TO ORIENTATIONS TO HAPPINESS: EXAMINING ORGANISATIONAL CITIZENSHIP BEHAVIOUR AND HAPPINESS AMONG SCHOOL TEACHERS

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ABSTRACT

The purpose of this study is to propose a method for achieving the relationship between Organizational Citizenship Behavior (OCB) and Orientations to Happiness in Indian educational institutions. The study's statistical population included all secondary school teachers. A statistical sample was chosen at random from among them. The descriptive, t-test, correlation, and regression research methods were used. Data was collected using two questionnaires: Orientations to Happiness Scaleand Organizational Citizenship Behavior Scale. Overall, the findings revealed positive and significant relationship between the aspects of Orientations to Happiness and Organizational Citizenship Behaviour. According to the results of the regression analysis, Meaning Orientation to Happiness substantially predicts Organizational Citizenship Behaviour and all of its dimensions.

keywords: *Orientations to Happiness, Organisational Citizenship Behaviour, School Teachers*

Introduction

Organisational Citizenship Behaviour

After studies regularly demonstrated its correlations with a variety of beneficial organisational outcomes, including various aspects of organisational performance, there has been a significant growth in the study of organisational citizenship behaviour (OCB) in recent years (Podsakoff et al., 2009).Organ defined 'Organisational Citizenship Behavior' as "individual behaviour that is discretionary, not explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization" (Organ, 1988). Organizational citizenship activity is not directly remunerated and formally acknowledged by the organisation through increased salary increments and promotions. Organizational citizenship activity may result in improved performance reviews, favourable supervision, and higher ratings from co-workers. As a result, "organisational citizenship behaviour" might be said to promote receiving future rewards in an indirect way (Organ, 1988). Organizational citizenship activity is commonly regarded as "extra-role" behaviour, but employees who regard it as "in-role" behaviour demonstrate and perform it more frequently, which is critical for the smooth and effective functioning of the workforce. As a result, supervisors and coworkers might reasonably expect employees to exhibit good citizenship within the organisation. Organ then redefines its definition as "contributions to the maintenance and enhancement of the social and psychological context that supports task performance" (Organ, 1997). Organ (1988) proposed a five-factor model for measuring organisational citizenship.

Orientations to Happiness

In 2005, Peterson, Park, and Seligmen proposed the orientation to happiness theory. According to this notion, people have diverse approaches to happiness. These orientations direct the pursuit of various activities; "we assume that given orientations shape conduct." The "hedonic" technique of pursuing happiness is through pleasure. It is the process by which a person pursues happiness through the experience of pleasure and positive feelings. The other option is the "eudaimonic" way, which involves meaning. It entails participating in activities that contribute to and link the person to something larger than themselves, giving the person a sense of purpose. Engagement is the third technique of looking for happiness. Psychologists study engagement. The psychological experience of flow experiences is referred to as engagement (Csikszentmihalyi, 1997).

Review of Literature

A study of the literature had done to find out previous researches about how organisational citizenship behavior and orientation to

happiness related to each other and affect other factors in the workplace.

Earlier researches show effects of happiness on organisational outcomes. Swart&Rothmann (2012) study investigated managers' orientations to happiness in the agricultural sector in South Africa (N = 507) and its relationship to individual and organisational outcomes. The results showed that orientations to happiness (i.e. pleasure, meaning and engagement) had strong direct impact on organisational citizenship behavior, subjective well-being, job satisfaction. Orientations to happiness (i.e. pleasure, meaning and engagement) also impacted job satisfaction and organisational commitment indirectly through subjective well-being. Mat &Selamat(2013) study investigated the impact of intrinsic and extrinsic motivation on organisational citizenship behaviours (OCBs) among secondary school teachers. The findings revealed that intrinsic motivation positively benefited teachers' OCB, although extrinsic motivation did not.

Avci(2016) study looked into teachers' opinions of organisational citizenship behaviours and to assess them in terms of educational administration. According to the findings of the study, teachers showed a high level of positive attitudes toward organisational citizenship activities. Respondents' attitudes varied greatly based on gender, professional seniority, level of education, and working time at the institution where they worked. A high level of organisational citizenship behaviours in the school will positively affect educational activities, contribute to the creation of a good school climate, and positively influence student success.Salas-Vallina, Alegre& Fernandez (2017) investigated the association between workplace happiness (HAW), organisational learning capability (OLC), and organisational citizenship behaviour. The findings indicate that OLC fully mediates the association between HAW and organisational citizenship behaviour. As a result, OLC plays an important role in describing how HAW increases organisational citizenship behaviour. HAW fosters learning motivation and improves the quality of employee interactions, resulting in pro-social behaviours. The findings support HAW's direct and positive impact on organisational citizenship behaviour.

Raj, Tiwari and Rai(2019) conducted a study to investigate the influence of gender, types of school organisations, and citizenship behaviour in determining the interdependent happiness of male and female secondary school teachers. Gender and the nature of school organisations both had significant influence on organisational citizenshipbehaviour and interdependent happiness. When compared to central and state teachers, private school teachers had much higher mean scores on organisational citizenship behaviour and interdependent happiness. Interdependent happiness correlated positively with organisational citizenship behaviour scores regardless of gender or school type. For the overall sample, there was a positive association between these variables. The hierarchical regressions revealed that gender and central school type contributed significantly to teachers' interdependent happiness scores, whereas state and private school types did not. In essence, gender and school structure kinds have major significance to emphasise citizenship behavior and interdependent happiness.

Akçakanat (2020)examined the probable consequences in the organisational setting within the scope of positive organizational behaviour on the basis of pleasure at work. To that purpose, the study focused on the impact of workplace happiness on organisational citizenship behaviour (OCB), as well as the roles of intrinsic motivation and psychological resilience in this relationship. According to the findings of the study, there are low and moderate degrees of significant correlation between all variables. Furthermore, the effect of job satisfaction on OCB was found to be mediated by intrinsic motivation as a result of the mediation experiments. Psychological resilience was discovered to play no role in this interaction.

Employees are currently concerned not just with the compensation they receive for their labour, but also with the work surroundings, relationships with bosses and coworkers, and the expectation of self-respect and ownership of one's own work. As a result, employees want their employers to provide them with long-term, consistent happiness at work. As a

result, firms focus on retaining a stable staff by increasing employee happiness, which eventually leads to the development of high levels of organisational citizenship behaviour. Employee satisfaction and organisational citizenship behaviour have a strong beneficial association. Thus, Palihakkara&Weerakkody (2019) study went on to examine the impact of the two factors, and the findings revealed that employee satisfaction had a considerable impact on organizational citizenship behaviour.

Objectives

Given the study's setting and past research findings, the researcher determined that it was critical to do research on organisational citizenship behavior and its relationship to Orientation to Happiness at educational institutions.

1. To find out the gender difference between orientations to happiness among school teachers.
2. To find out the gender difference between organisational citizenship behavior among school teachers.
3. To find out the difference between orientations to happiness among public and private school teachers.
4. To find out the difference between organisational citizenship behavior among public and private school teachers.
5. To find out the relationship between orientations to happiness and organisational citizenship behavior among school teachers.
6. To find out if Orientations to Happiness significantly predict Organisational Citizenship Behaviour.

Hypotheses

1. There would be significant gender difference between orientations to happiness among school teachers.
2. There would be significant gender difference between organisational citizenship behavior among school teachers.
3. There would be significant difference between orientations to happiness among public and private school teachers.
4. There would be significant difference between organisational citizenship behavior among public and private school teachers.
5. There would be significant relationship between orientations to happiness and organisational citizenship behavior among school teachers.
6. Orientations to Happiness would significantly predict Organisational Citizenship Behaviour.

Methodology

Participants & Procedure

The sample of this investigation was obtained from the population of all the school teachers of public and private schools located in the Haryana region of India. The researcher made use of stratified proportionate random sampling for the data collection. The sample consisted of 400 school teachers i.e. 100 male public school teachers, 100 female public school teachers, 100 male private school teachers, 100 female private school teachers. Teacher'steachingsecondary sections of the schools were selected to be the paerticipants of the study. When it comes to the time horizon of the study, it is the cross sectional study because data was collected at a particular time and is not repeated. Questionnaires were administered to only those participants who gave informed consent after giving all details of the research and instructions. Instructions and queries were get cleared and explained well that no answer is right and wrong. They have to tick the options according to their point of view after reading statements carefully without skipping any statement. School teachers who were not interested in filling the questionnaires were not coerced to fill.

Total sample = 400

Gender / Schools	Public school	Private school
Male	100	100
Female	100	100

Inclusion criteria: 1. Age: 25-45 years
2. Minimum 4 years experience in present school

Exclusion criteria: 1. Age: less than 25 years and more than 45 years
2. Less than 4 years experience in present school
3. Severe psychic illness

The major demographic variables were noted in the following manner: majority (75.2%) of the participants were in the age group of 35-45 years and 24.8% of the participants fall under the age category of 25-34 years. Study includes 50% male and 50% female. In terms of type of school, there were 50% school teachers of public schools and 50% school teachers of private schools. Besides, the results also revealed that majority of the participants were from urban area (64.8%) as compared to rural area (35.3%). Furthermore, most of the participants were from arts stream (73%) as compared to science stream (20.3%) and commerce stream (6.8%).

Instruments

Two measures were used in this study,
The Orientations to Happiness Questionnaire: Peterson, Park and Seligman (2005)
The "Orientations to Happiness questionnaire" is given by Peterson, Park and Seligman in 2005. This scale has three measures related to orientations to happiness. Each measure consists of 6 items. Therefore, this scale consists of 18 items. These measures are "Pleasure" (e.g. "Life is too short to postpone the pleasures it can provide"), "Meaning" (e.g. "what I do matters to the society") and "Engagement" (e.g. "Regardless of what I am doing, time passes very quickly"). Each statement has 5-point likert scale i.e. "Very much unlike me, More unlike me**,** Like me**,** More like me, Very much like me". All items are positive items and were scored in positive manner like 1 score was given to "very much unlike me" and 5 scores were given to "very much like me". High scores in particular measure indicate respondent use that orientation more to be happy in his life. Internal consistency values of pleasure, meaning and engagement are $\alpha = 0.84$, $\alpha = 0.88$ and $\alpha = 0.77$ respectively.

Organizational Citizenship Behaviour Scale: Podaskoff and colleagues (1990)
Organizational Citizenship Behaviour scale is developed by Podaskoff and colleagues in 1990. This scale measures five constructs of organizational citizenship behavior of an individual. These constructs are Conscientiousness (e.g. "I believe in giving an honest day's work for an honest day's pay"), Sportsmanship (e.g. "I am classic "squeaky wheel" that always needs greasing"), civic virtue (e.g. "I keep abreast of changes in the organization"), courtesy (e.g.**"**I try to avoid creating problems for co- workers") and altruism (e.g. "I help others who have heavy workloads"). Items 3, 18, 21, 22, and 24 represent Conscientiousness construct. Each statement has 7-point likert scale ranging from 1(strongly disagree) to 5(strongly agree) upon which participants were asked to mark the option on the level of agreement or disagreement after reading each statement concerning their behavior. All dimensions have to be scored in positive manner like 1 score to strongly disagree to 5 score to strongly agree except sportsmanship dimension that have to be scored in reverse manner. High score in specific dimension except sportsmanship represents participants engaged more in that particular assessed behavior. The internal consistency reliability using coefficient alpha of this scale is 0.76.

Data Analysis

The data gathered by the Orientations to Happiness and Organisational Citizenship Behavior scales have been analyzed by SPSS (Version 20). Demographic variables were analyzed using percentages and frequencies. To find out teachers' orientations to happiness and organisational citizenship behaviour, descriptive statistics (i.e., mean and standard deviation) were analysed. Independent t-test was used to compare teachers' Orientations to Happiness and Organisational Citizenship Behaviourin terms of gender and Type of school in which they work. Pearson's Product Moment correlation coefficient was used to explain the correlation between Orientations to happiness for total sample, male public school teachers, female public school teachers, male private school teachers & female private school teachers. To examine how accurately the independent variable (pleasure, meaning & engagement) predicted teachers' Organisational Citizenship Behviouras a dependent variable, Multiple Linear Regression analysis was used.

Results

The results are reported in the order of analysis that took place. First, sample characteristics are provided. Second, the results of independent t-test are provided to compare the differences between the teachers' orientations to happiness and organisational citizenship behavior based on gender, type of school in which they work. Third, the relationships among teachers' orientations to happiness and organisational citizenship behavior are examined with Pearson Product Moment correlations coefficient. Finally, the results of multiple linear regression are reported to examine the extent to which Orientations to happiness (Pleasure, Meaning and Engagement) predict teachers' Organisational Citizenship Behaviour.

Sample Characteristics

The results from this study indicated that majority (75.2%) of the participants were in the age group of 35-45 years and 24.8% of the participants in the age group of 25-34 years. Study includes 50% male and 50% female. In terms of type of school, there were 50% school teachers of public schools and 50% school teachers of private schools. Besides, the results also revealed that majority of the participants were from urban area (64.8%) as compared to rural area (35.3%). Furthermore, most of the participants were from arts stream (73%) as compared to science stream (20.3%) and commerce stream (6.8%). The results of the sample characteristics are shown in Table 1.

Descriptive Statistics and T- Test

To test whether there were differences in Orientations to Happiness (Pleasure, Meaning & Engagement) and Organisational Citizenship Behaviourlevels of teachers under gender and type of school conditions, independent samples- t-tests- were conducted. Results of descriptive statistics &Independent samples t-test for mean difference in orientations to happiness (Menaing Pleasure and Engagement), Organisational Citizenship Behaviour and its dimensionsbased on gender and type of school in which they work are shown in Table 2 & 3.

The results from the descriptive statistics analysis (Table 2) indicated that male teachers are more courtious than female teachers. Teachers were not found significantly different on whole organisational citizenship behaviour, altruism, conscientiousness, sportsmanship and civic virtue when they were compared based on gender.

Table 3 depicts no significant difference between teachers of public school and private school on meaning and pleasure. It means there is no difference in public and private school teachers in seeking happiness through meaning and pleasure. In Organisational Citizenship Behaviour, teachers of private schools scored significantly high on courtesy than teachers of public schools. However, there is no significant difference between teachers of public and private schools on "altruism", "conscientiousness", "sportsmanship", "civic virtue" and "organisational citizenship behaviour".

Correlation Analysis

After Independent t-test, Pearson Product Moment Correlation was used to explain the relationship between Orientations to Happiness and Organisational Citizenship Behaviour for total sample, based on gender as well as based on Type of Schools.

Table 4 displays results of the Pearson Product Moment correlation analysing the relationship between Orientations to Happiness (Pleasure, Meaning and Engagement) and Organisational Citizenship Behaviour. The correlation analysis suggests that Pleasure, Meaning and Engagement had significant and positive relationship with sub-dimensions of OCB (Altruism, Conscientiousness, Courtesy and Civic Virtue) as well as with the total scores of OCB whereas pleasure had significant and negative relationship with the sportsmanship sub-dimension of OCB. However, Meaning and Engagement had not significant relationship with Sportsmanship sub-dimension of OCB.

Regression Analysis

Table 5 displays results of the multiple-regression analyzing the effect of teachers' Orientations to Happiness on their Organisational Citizenship Behaviour. The multiple-regression analysis suggests that there is a statistically significant and positive relationship between teachers altruism

dimension of OCB and the dimensions of OTH (R= .35; R^2= .12; F= 18.24; p < .00). Orientations to Happiness accounted for 12% of the total variance in Altruism dimension of OCB. B coefficient value for pleasure (.16), Meaning (.23) & Engagement (-.13) indicates that these dimensions significantly predict Altruism dimension of OCB. Positive value of B coefficient of Pleasure and Meaning dimension of OTH indicates that increase in Pleasure & Meaning orientations of an individual by one unit will increase the altruism behavior of that individual by .16 & .23 respectively. Negative value of B coefficient of engagement dimension of OTH indicates that increase in engagement orientation of an individual by one unit will decrease the altruism behavior of that individual by .13. As for the standardized regression coefficient (β), the rank ordering of predictor variables for predicting Altruism is Engagement, Pleasure and Meaning.

Regarding the second dimension of OCB i.e. Conscientiousness, there is a statistically significant and positive relationship between teachers Conscientiousness and the dimensions of OTH (R= .27; R^2= .07; F= 10.67; p< .00). Orientations to Happiness accounted for 7% of the total variance in Conscientiousness dimension of OCB. B coefficient value for Meaning (.24) indicates that it significantly predicts Conscientiousness dimension of OCB at 0.01 level. Positive value of B coefficient for Meaning dimension of OTH indicates that increase in Meaning orientation of an individual by one unit will increase the conscientiousness behavior of that individual by .24. The significance of t-value makes it clear that the other dimensions of OTH do not significantly predict Conscientiousness behavior.

The multiple regression analysis for the third dimension of OCB i.e. Sportsmanship and Orientations to Happiness indicates significant and positive relationship between them (R= .29; R^2= .08; F= 12.14; p< .00). OTH accounted for 8% of the total variance in Sportsmanship dimension of OCB. B coefficient value for pleasure (-.43) & Meaning (.21) indicates that these dimensions significantly predict Sportsmanship dimension of OCB. Positive value of B coefficient of Meaning dimension of OTH indicates that increase in Meaning orientations of an individual by one unit will increase the Sportsmanship behavior of that individual by .21. Negative value of B coefficient of pleasure dimension of OTH indicates that increase in pleasure orientation of an individual by one unit will decrease the Sportsmanship behavior of that individual by .43. As for the standardized regression coefficient (β), the rank ordering of predictor variables for predicting Sportsmanship is Meaning and Pleasure. The significance of t-value of engagement dimension depicts that it does not significantly predict Sportsmanship behavior.

Regarding the fourth dimension of OCB i.e. Courtesy, significant and positive relationship exists between Courtesy and Orientations to Happiness (R= .34; R^2= .12; F= 17.61; p< .00). OTH accounted for 12% of the total variance in Courtesy dimension of OCB. B coefficient value for pleasure (.14) & Meaning (.25) indicates that these dimensions significantly predict Courtesy dimension of OCB. Positive value of B coefficient of Pleasure and Meaning dimensions of OTH indicates that increase in Pleasure and Meaning orientations of an individual by one unit will increase the Courtesy behavior of that individual by .14 & .25 respectively. As for the standardized regression coefficient (β), the rank ordering of predictor variables for predicting Sportsmanship is Pleasure and Meaning. The significance of t-value of engagement dimension depicts that it does not significantly predict Courtesy behavior.

The multiple regression analysis for the fifth dimension of OCB i.e. Civic Virtue and Orientations to Happiness indicates significant and positive relationship between them (R= .32; R^2= .10; F= 15.44; p< .00). Orientations to Happiness accounted for 10% of the total variance in Civic virtue dimension of OCB. B coefficient value for Meaning (.21) indicates that it significantly predicts Civic Virtue dimension of OCB at 0.01 level. Positive value of B coefficient for Meaning dimension of OTH indicates that increase in Meaning orientation of an individual by one unit will increase the conscientiousness behavior of that individual by .21. The significance of t-value makes it clear that the other dimensions of

OTH do not significantly predict Civic virtue behavior.

The multiple regression analysis for OCB and Orientations to Happiness indicates significant and positive relationship between them (R= .35; R^2= .12; F= 17.95; p< .00). Orientations to Happiness accounted for 12% of the total variance in OCB. B coefficient value for Meaning (1.13) indicates that it significantly predicts OCB at 0.01 level. Positive value of B coefficient for Meaning dimension of OTH indicates that increase in Meaning orientation of an individual by one unit will increase Organizational Citizenship Behavior of that individual by 1.13. The significance of t-value makes it clear that the other dimensions of OTH i.e. Pleasure and Engagement do not significantly predict Organizational Citizenship Behavior.

Discussion

Regarding Descriptive Statistics and t-test

The findings of the study indicated that there were some differences in Orientations to Happiness levels of teachers based on gender. Males were found to be higher in Pleasure and Engagement orientations to happiness than females whereas females were found to be higher in Meaning orientation to happiness than males. It means there was significant gender difference in orientations to happiness. Therefore, our first hypothesis "There would be significant gender difference in Orientations to Happiness among school teachers" is accepted. Our results are in line with previous studies. Singh& Khan (2013) study proved significant gender difference in happiness among school teachers. Females were found to be higher on the dimensions of happiness whereas Chao (2013) study indicated that male school teachers were found to be happier than female school teachers. Male school teachers seek happiness more by involving in leisure activities. Hori &Kamo (2018) study observed significant gender difference in the determinants of happiness. Raj, Tiwari &Rai(2019) study depicted significant gender difference in interdependent happiness among secondary school teachers.

Significant gender difference in only one sub-dimension of organisational citizenship behavior i.e. courtesy indicates that male teachers are proved to be remarkably higher on courtesy behavior than female teachers. Therefore, our second hypothesis "There would be significant gender difference in Organisational Citizenship Behaviour among school teachers" is partially accepted. Our finding is consistent with some studies (Beauregard, 2012; Lambert, Hogan, Dial, Altheimer& Barton-Bellessa, 2012) and not consistent with some studies (Avci, 2016; Miao & Kim, 2009; Watty-Benjamin &Udechukwu, 2014). Jenaabadi, Okati&Sarhadi (2013) study which believed that female teachers perform more organisational citizenship behavior than male teachers. Organ & Ryan (1995) study also remarked that females are more excelled in courtesy and sacrifice characteristics than males. Abdullah & Akhtar (2016) study depicted that male teachers get more often involved in sportsmanship behavior as compared to female teachers.

Descriptive statistics and independent t-test revealed that public school teachers are higher in engagement orientation to happiness than private school teachers whereas they are quite similar in pleasure and meaning orientations to happiness. Therefore, our third hypothesis "There would be significant difference in Orientations to Happiness of public and private school teachers" is partially accepted. These findings are consistent with some previous studies (Zahoor, 2015) as well as in contradict with some studies (Damasio, de Melo& da Silva, 2013). Buragohain&Hazarika (2015) study revealed that government school teachers proved to be more happier than private school teachers whereas Vaghela(2014) study did not depicted any significant difference between the psychological well being of government and non-government school teachers. Raj, Tiwari &Rai (2019) study observed that private school teachers were high in interdependent happiness than central and state teachers.

Further, private school teachers are found to be significantly different from public school teachers in only courtesy sub-dimension of organisational citizenship behavior. Therefore, our fourth hypothesis "There would be significant difference in organisational citizenship behavior of public and private school teachers" is partially accepted. This finding is consistent with the previous studies. Hasnain, Hasan &Chorath (2017) exposited

same results and find no significant difference in organisational citizenship behavior of private and public school teachers. But our finding contradicts also with the previous studies (Singh &Padmanabhan, 2017). Garg&Rastogi (2006) study found that public school teachers exhibit organisational citizenship behaviours more than private school teachers whereas Demir (2015) and Singh (2015) studies illustrated private school teachers perform organisational citizenship behavior more than public school teachers. Krishnamurthy (2018) study rendered that rural government school teachers perform high amount of organisational citizenship behavior than private school teachers.

Regarding Correlation between Orientations to Happiness and Organisational Citizenship Behaviour

Results of the current study also facilitate the relationship between Orientations to Happiness and Organsiational Citizenship Behaviour using Pearson Product Moment Correlation. It confirmed the positive relationship between Dimensions of Orientations to Happiness and OCB's Dimensions except between pleasure and sportsmanship (Compliance behavior) in which significant and negative correlation exists. Our findings are compatible with the previous studies. Though researcher did not find any study that talked about how taking different pathways to happiness by employees related to performing organisational citizenship behavior, there are some studies that proved the relationship between happiness and organisational citizenship behavior. Rego, A., Ribeiro & Cunha (2010) study observed that affective well being at work that is a primary indicator of happiness plays significant role in the execution of organisational citizenship behvaiour. Seeking happiness from external goals such as money, status and appearance indicates towards pleasure orientation to happiness (Wang, Liu, Jiang & Song, 2017). Torlak&Koc (2007) study observed negative correlations between materialistic attitude and all the dimensions of OCB. It means that employees that seek happiness through pleasure tend to execute less extra role behavior at their workplace. Contrastingly, previous researches manifested positive association between employee engagement and all the dimensions of OCB (Rurkkhum& Bartlett, 2012) as well as meaning orientation and OCB (Naderi&Hoveida, 2013) that stresses the importance of engagement and meaning orientations to happiness for enhancing organisational citizenship behvaiour at workplace. Positive and strongest link was found between employee engagement and civic virtue.

Regarding Prediction of Organisational Citizenship Behaviour based on Orientations to Happiness

The findings of the research revealed significant and positive relationship between orientations to happiness and organisational citizenship behavior. When attended keenly, pleasure and meaning proved to be significant influencers in predicting different dimensions of OCB of teachers. Engagement evinced to be a threat for altruism behavior at workplace. If an employee works in "flow state", it reduces the tendency of the execution of altruistic behavior. These results are in consistent with the previous studies (Post, 2007; Pessi, 2011; Chaiprasit&Santidhiraku, 2011). Post (2005) study summarized strong correlation between happiness and altruistic emotions and behaviours. This study concludes that happiness level manages emotional and behavioural compassion of an individual. Pillay(2012) study also concluded that happiness hold a significant predictive value for organisational citizenship behaviour. It had been disputed by universal egoists that if an individual motivated enough to execute altruistic behavior, it provides the person pleasure by reaching to his goal, so this is egoism, not altruism. However, later philosophers pointed out that individual gains pleasure as the consequences of achieving the goal, this pleasure is not the goal itself (Batson, 1987). Therefore, this pleasure is unintentional consequence of altruistic behavior and this cannot nullify the initial and selfless motivation to help the other person (Batson et al., 2011).

Multiple regression analysis for the second dimension of OCB i.e. conscientiousness revealed that meaning orientation to happiness significantly predict conscientiousness. Previous studies supports our present findings. Kaya (2015) study talked about predicting

OCB dimensions based on Spirituality Leadership among School principals. It was observed that spirituality that indicates finding meaning in their was significantly proved OCB dimensions. This finding is not consistent with the previous study (Bakker, Demerouti, &Lieke, 2012; Abd-Allah, 2016). In Demerouti, (2006) study, flow or engagement proved to be significant predictor of in-role and extra-role performance for conscientious employees. Abd-Allah (2016) study observed that absorption at work that indicates the engagement orientation predicted conscientiousness behavior at workplace.

Regarding the third and fourth dimension of OCB i.e. Sportsmanship and courtesy, pleasure and meaning proved to be significant predictors of sportsmanship and courtesy. This finding is also both consistent and contradicts the previous studies. Previous studies proved that engagement also works as a significant predictor of OCB dimensions. Kaya (2015) study support our findings which also observed that spirituality that indicates a meaning orientation to happiness which means finding meaning in their work proved to be significant influencer and predictor of all OCB dimensions. However, Abd-Allah (2016) study proved absorption, one of the indicators of engagement orientation as the significant predictor of all OCB dimensions which contradicts our findings.

Regarding Civic Virtue and total score of Organisational Citizenship Behaviour, meaning orientation to happiness proved to be significant predictor of both, Civic Virtue&Organisational citizenship Behaviour. These results shows consistency with previous studies to some extent. Yusof, Yaacob& Rahman (2018) study revealed that workplace spirituality which includes meaningfulness, sense of community and organisational values alignment has significant relationship towards organizational citizenship behaviour.Furthermore, Bozkurt (2015) study revealed spiritual leadership as a significant predictor of organizational citizenship behaviors among school teachers.

Implications

A job isn't always pleasurable. Work is difficult, and dealing with stress on a daily basis is difficult. As a result, it becomes necessary to strike a balance between the tensions and pressures of work and life outside of work. Happiness is contagious and has a multiplicative effect. Employees who are happy are loyal, and loyal employees may accomplish remarkable things. Employees who enjoy their jobs provide a good example for their coworkers and inspire others to enjoy their jobs as well. Employees that are optimistic and completely involved are more likely to help their coworkers and provide positive support and encouragement for group tasks. And happy employees are more inclined to seek assistance if it is required. Happy employees are more inclined to collaborate for the greater good, are more likely to foster organisations' loyalty, and are more likely to encourage the strong team building that is critical to the success of the organisation. Therefore, the administration must support and foster a joyful work atmosphere that inspires people to like their work, which will reap great rewards. As a result, educational institutions and administration would benefit from building more adaptive teaching and learning environments for students.

Limitations

This study sought to offer a contribution to society and science, however it still has certain shortcomings. In this study, only school teachers were included in the sample. It would be preferable if personnel from various organisations could be studied together in order to acquire a better understanding of the difficulties. This study was limited to school teachers between the ages of 25 and 45. Such investigations should be undertaken on various societal strata. Since the study used psychometric measures, additional research should include qualitative measures. In addition, cross-sectional data was used in the current study. The fact that the respondents' emotions were examined using a cross-sectional research approach limits the scope of this paper. As a result, the time impacts of these emotions could not be tested and remain unknown in our current study. Future researchers can benefit from longitudinal studies and experiments. The study was conducted in sections of Haryana, but it can be expanded to other parts of the state and

country. The current study only looked at two variables to investigate at work. In a single study, it was not possible to investigate all of the psychological elements that may influence organisational citizenship behavior and happiness. Other factors that influence workplace happiness may be considered in future studies.

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Conflict of Interests

The author declares no conflict of interests.

Data Availability Statement

Due to ethical constraints, data is not available. Because participants in this study did not consent to their data being published publically, no supporting data is available.

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Table 1 Sample Characteristics

Variables	Frequency	%	Cumulative %
Age			
25–34	99	24.8	24.8
35–45	301	75.2	100
Total	400	100	
Gender			
Male	200	50	50
Female	200	50	100
Total	400	100	
Stream			
Arts	292	73.0	73.0
Science	81	20.25	93.25
Commerce	27	6.75	100
Total	400	100	
Area			
Urban	259	64.75	64.75
Rural	141	35.25	100
Total	400	100	

Table 2 t-scores for gender differences across dimensions of Orientations to Happiness and Organisational Citizenship Behaviour

	Male (N=200)		Female (200)		
	M	SD	M	SD	t
Orientation to Happiness (Meaning)	24.48	3.34	23.24	3.83	3.43**
Orientation to Happiness (Pleasure)	22.42	4.47	21.22	4.04	2.80**
Orientation to Happiness (Engagement)	22.70	3.44	21.68	3.21	3.07**
OCB (Altruism)	20.21	3.27	20.44	3.15	-.70
OCB (Conscientiousness)	19.66	3.48	19.86	3.24	-.60
OCB (Sportsmanship)	16.99	5.93	16.40	4.79	1.09
OCB (Courtesy)	20.85	3.40	20.14	3.13	2.18*
OCB (Civic Virtue)	16.78	2.26	16.49	2.42	1.21
Organisational Citizenship Behavior	94.38	9.95	93.32	11.03	1.00

**significant at p < .01 level, *significant at p < .05 level

Table 3 t-scores for mean differences across dimensions of Orientations to Happiness and Organisational Citizenship Behaviour based on type of School

	Public School Teachers (N=200)		Private School Teachers (200)		
	M	SD	M	SD	t
Orientation to Happiness (Meaning)	23.88	3.33	23.84	3.94	.12
Orientation to Happiness (Pleasure)	21.46	4.29	22.18	4.29	-1.69
Orientation to Happiness (Engagement)	22.52	3.16	21.86	3.53	1.98*
OCB (Altruism)	20.08	3.08	20.57	3.32	-1.51
OCB (Conscientiousness)	19.85	2.85	19.67	3.81	.54
OCB (Sportsmanship)	16.66	5.66	16.74	5.12	-.14
OCB (Courtesy)	20.05	2.85	20.94	3.62	-2.74**
OCB (Civic Virtue)	16.74	1.93	16.53	2.70	.91
Organisational Citizenship Behavior	93.27	8.33	94.43	12.29	-1.10

**significant at p < .01 level, *significant at p < .05 level

Table 4 Relationship between Orientation to Happiness and Organisational Citizenship Behaviour

Variables	Altrusim	Conscientiousness	Sportsmanship	Courtesy	Civic Virtue	OCB
Pleasure	.27**	.12*	-.25**	.26**	.18**	.10*
Meaning	.29**	.27**	.01	.31**	.32**	.34**
Engagement	.12*	.17**	-.03	.13**	.14**	.13**

**significant at p < .01 level, *significant at p < .05 level

Regression Analysis

Table 5 Prediction of Organisational Citizenship Behaviour based on Orientations to Happiness (N=400)

	Organisational Citizenship Behaviour Dimensions (Dependent Variable)														
	Altruism					**Conscientiousness**					**Sportsmanship**				
Predictors Variables	**B**	**SE**	**β**	**t**	**p**	**B**	**SE**	**β**	**t**	**p**	**B**	**SE**	**β**	**t**	**p**
Constant	14.07	1.15		12.19	.00	13.51	1.24		10.88	.00	18.92	1.98		9.56	.00
Pleasure	.16	.04	.21	3.85	.00	-.01	.04	-.02	-.34	.74	-.43	.07	-.34	-5.96	.00
Meaning	.23	.05	.26	4.52	.00	.24	.06	.26	4.29	.00	.21	.09	.14	2.36	.02
Engagement	-.13	.06	-.13	-2.26	.02	.04	.06	.04	.66	.50	.09	.10	.06	.98	.33
	R= .35, R^2= .12, F= 18.24, p< .00					**R= .27, R^2= .07, F= 10.67 p< .00**					**R= .29, R^2= .08 F= 12.14, p< .00**				
	Organisational Citizenship Behaviour Dimensions (Dependent Variable)														
	Courtesy					**Civic Virtue**					**OCB (Total)**				
Predictors Variables	**B**	**SE**	**β**	**t**	**p**	**B**	**SE**	**β**	**t**	**p**	**B**	**SE**	**β**	**t**	**p**
Constant	13.81	1.18		11.67	.00	11.93	.85		14.01	.00	73.48	3.78		19.44	.00
Pleasure	.14	.04	.18	3.17	.00	.03	.03	.06	1.04	.30	-.13	.14	-.05	-.95	.34
Meaning	.25	.05	.28	4.79	.00	.21	.04	.32	5.49	.00	1.13	.17	.39	6.69	.00
Engagement	-.10	.06	-.11	-1.82	.07	-.04	.04	-.06	-1.08	.28	-.17	.18	-.05	-.92	.36
	R= .34, R^2= .12, F= 17.61, p< .00					**R= .32 , R^2= .10, F= 15.44, p< .00**					**R= 0.35, R^2= 0.12, F= 17.95, p< .00**				

EFFECT OF E-CONTENT PACKAGE IN TAMIL POETRY

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ABSTRACT

Modern society needs and creative individuals, able to make new inventions and discoveries. Hence, the teachers can use the technological devices and prepare e-content package in the Tamil language particularly in the Poetry part of an individual's learning through. The investigator selected 30 students from the Government higher secondary school, Ayothiyapattanam, Salem District of Tamil Nadu State, and fifteen each for the control and the experimental groups. The investigators analyzed both the two groups with two different tests. The traditional way was taught in the control group whereas the e-content teaching of Tamil Poetry was taught in the experimental group. The statistical analysis of the data concerning the hypotheses was formulated and analysis was made. From this study, the experimental group got more achievements than the control group indicated the effectiveness of e-content in Tamil Poetry.

Keywords: *e-Content packages, Tamil poetry, achievement, Tamil language.*

Introduction

Education has also contributed to the shaping of destinies of societies in all spheres of development and has never ceased to develop. Education is the only way to improve the status of any Nation (Marciniak, 2014). If the education system is creative, then the younger generation will achieve its goals. Hence, to provide for change, the creative function of education is necessary (Vijayakumari, 2011). From the utilization of different technological devices in the classrooms, the e-content method of teaching is effective, and to reach goals. (Nachimuthu, 2018). E-content creates a teacher into techno-teacher to develop technological content in their classrooms (Mahato, 2017). Hence, the teachers utilize the e-content method of teaching is as a supplementary one. An E-content package is a digital text designed for display for particular audiences. (Senthilkumar, 2017). This research work aimed to study the effective use of e-content package for teaching Tamil Poetry at the eleventh standard level.

Need and Significance of the Study

The beauty of the language used by a teacher can make him loveable. Several methods are used by the language teachers to teach the Tamil language. The learners of the Tamil language better than the other routine methods, to identify how the e-content package will be effective in learning of poetry among higher secondary school the following study has been taken up. The investigators develop an e-content package in Tamil Poetry in the unit of 'puratchikavi' (Revolution Poet) which would help the Tamil language learning. Every learner has a unique individuality in the classroom. Due to their needs differ from others, they fulfill the learning needs by self-learning techniques. The title of the problem is, 'e-content packages for enhancing Tamil poetry achievement among eleventh standard students'.

Method of the Study

The major objectives are; (i) to prepare an e-content package to teach Tamil poetry among higher secondary students and (ii) to design and develop the e-content package to teach to find out the level of development in model poetry between the control and the experimental groups and (iii) to study the effective use of e-content based package for teaching Tamil Poetry. The major hypotheses are; (i) there is no significant difference in learning Tamil poetry at the pre and post-test group students. The traditional way was taught in the control group whereas the e-content teaching of Tamil Poetry was taught in the experimental group.The effect of teaching and conventional method of Tamil poetry was evaluated with pre and post-tests. The investigators selected 30 students of the thirty eleventh standard students from Government higher secondary school Ayothiyapattanam Two groups were selected. Both the groups had no previous experience of learning through the e-content package. A purposive sampling technique is used for this study. The Tamil Purachihavi poem of the eleventh standard was taught for both groups for one week. The

investigators conducted pre and post-tests of both groups to know the effectiveness level.

Data Collection and Analysis

The collected data are analyzed to find out the effective utilization of e-content package for enhancing Tamil Poetry achievement among eleventh standard students, through the statistical techniques are mean, standard deviation, and 't' tests.

Table-1. Analysis ofPre-test -Male and Female – Control & Experimental Groups

Pre-test Group	Gender	N	M	S.D	't' value	p-value
Control	Male	04	13.75	3.030	0.9164@	0.1875
	Female	11	15.27	2.239		
Experi-mental	Male	05	19.61	1.854	0.9223@	0.1859
	Female	10	18.65	1.990		

(@ = No Significant at 0.05 level)

From the analysis of the above table, the pre-test control group male &female mean scores are 13.75 and 15.27 with standard deviation scores of 3.030 and 2.239 respectively. The tabulated value is more than the calculated 't' value 0.9164 (p-value=1.19), indicates no significance at a 0.05 level. Hence, there is no significant difference in the poetry achievement in Tamil in the pre-test Control group between male and female students are accepted. Likewise, the pre-test experimental group male and female means scores are 19.61 and 18.65 with S.D of 1.85 and 1.99 respectively. The tabulated value is more than the calculated 't' value 0.9223 (p-value=0.19)indicates no significance at a 0.05 level. Hence, in the pre-test, both the groups are equal concerning their gender-wise analysis.

Table-2. Analysis ofPost-test -Male and Female – Control & Experimental Groups

Pre-test Group	Gender	N	M	S.D	't' value	p-value
Control	Male	04	32.25	1.916	1.3968@	0.9211
	Female	11	33.73	1.501		
Experi-mental	Male	05	36.80	0.400	3.2585*	0.0029
	Female	10	35.20	1.446		

(* = Significant at 0.05 level, @= No Significant at 0.05 level)

From the analysis of the above table, the post-test control group male & female means scores are 32.25 and 33.73 with standard deviation scores of 1.92 and 1.50 respectively. The tabulated value is more than the calculated't' value 1.3968 (p-value=0.921), indicates no significance at a 0.05 level. Hence, in the control group, post-test students are equal concerning their gender-wise analysis. Likewise, the post-test experimental group male and female means scores are 36.80 and 35.20 with S.D of 0.40 and 1.45 respectively. The tabulated value is lesser than the calculated 't' value 3.2585 (p-value= 0.003), indicates significance at a 0.05 level. Hence, in the post-test, both the groups are not equal concerning their gender-wise analysis.

Table-3. Analysis on Control & Experimental Groups of both pre and post-tests

Pre-test Group	Gender	N	M	S.D	't' value	p-value
Control	Male	15	18.33	3.960	0.7163@	0.24275
	Female	15	19.44	4.510		
Experi-mental	Male	15	19.42	1.739	5.2206*	0.00006
	Female	15	22.46	1.436		

(* = Significant at 0.05 level, @= No Significant at 0.05 level)

Table-3. Analysis ofpre and post-tests -Control & Experimental Groups

Pre-test Group	Gender	N	M	S.D	't' value	p-value
Control	Male	15	18.33	3.960	0.9761@	0.1728
	Female	15	19.42	1.739		
Experi-mental	Male	15	19.44	4.510	2.4198 *	0.0149
	Female	15	22.46	1.436		

(* = Significant at 0.05 level, @= No Significant at 0.05 level)

The result as presented in table-4 showed that pre and post-tests in the control group mean scores are 18.33 and 19.42 with S.D of 3.960 and 1.739 respectively. The tabulated value is more than the calculated 't' value 0.976 (p-value= 0.1728), indicates no significance at a 0.05 level.

Hence, in the control group pre-test students are equal concerning their group-wise analysis indicates acceptance of hypothesis. Likewise, the pre and post-tests experimental group mean scores are 19.44 and 22.46 with S.D of 4.510 and 1.436 respectively. The tabulated value is lesser than the calculated 't' value 2.419 (p-value= 0.01), indicates significance at a 0.05 level. Hence, in the experimental group post-test students are not-equal concerning their group-wise analysis indicates rejection of the hypothesis. It indicates both groups are not-equal due to the e-content treatment in the experimental group. The Video contents of the e-contents attract the students, and it reached the masterly level. (Wang et al., 2003). Even simulation-games also developed the student's achievement in Mathematics subject of Secondary schools. (Akinsola et al., (2007).

Educational Implications of the Study

Usually, one teacher may communicate with more than 25 students at a time by using computers. The utilization of e-content in Language classrooms gave more effective than the traditional one, particularly in the eleventh standard level. As per their requirements, the peer groups can discuss and utilized the e-content package for their own time. The E-content package is used as self-learning in any class for any subject. Even though a student's strength is more, the e-content can supplement the student's knowledge.

Conclusion

From the analysis, the control and experimental groups differin Tamil Poetry achievement indicates they are not equal. The e-content package creates an improvement in their learning. (Anita Rastogi, 2009). Shiratuddin et al., (2003) found out that the e-content methodology is more effective in Tamil Language teaching is supported by this study. From the analysis, the investigators recommend the e-content method to teach Tamil Poetry at various levels. This method of the e-content package is more effective for Tamil language learning. The E-content package method of learning provides standardized learning with consistency every time. In this regard, each student goes through the same level of knowledge experiences when they take it.

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EXPERIENCE POVERTY REDUCTION IN THE COUNTRIES IN THE WORLD AND PRACTICAL LESSONS FOR VIETNAM

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ABSTRACT

In recent years, our country's economy has made remarkable progress, which is highly appreciated by many countries in the world. However, besides the achievements, we have faced many difficulties and challenges, including poverty. Poverty is a global social-economic problem that not only exists in less developed but also countries with developed economies. Depending on the natural conditions, social-political institutions and economic conditions of each country, the nature and level of poverty of each country vary. Each country has specific policies, programs and actions for poverty reduction. In the framework of this article, we would like to mention the experiences of poverty alleviation in the world, thus drawing practical lessons for Vietnam in poverty alleviation, social security, welfare for the people.

***Keywords**: Eliminate hunger; Poverty alleviation; The world; Experience; Practice.*

Definition of poverty

Poverty is a state or condition in which a person or community lacks the financial resources and essentials for a minimum standard of living. Poverty means that income from employment is so low that basic human needs cannot be met. Poor people and families can leave without housing, clean water, clean food and medical care.

The World Bank Organization describes poverty in this way: "Poverty is hunger. Poverty is a lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty has many faces, changing from place to place and across time, and has been described in many ways. Most often, poverty is a situation people want to escape. So poverty is a call to action for the poor and the wealthy alike a call to change the world so that many more may have enough to eat, adequate shelter, access to education and health, protection from violence, and a voice in what happens in their communities." (World Bank 1990)

The first group of definitions concerns poverty as a material concept. People are poor because they do not have something they need, or because they lack the resources to get the things they need. The first set of definitions understands poverty as a lack of material goods or services. People 'need' things like such as food, clothing, fuel, or shelter. Vic George writes: poverty consists of a core of necessities as well as a list of other necessities that change over time and place (George 1988:208).

Baratz and Grigsby refer to poverty as a severe lack of physical and mental well-being, closely associated with inadequate economic resources and consumption. (Baratz and Grigsby 1971: 120). Delek et al. write: Poverty is not restricted to one dimension, e.g. income, but it manifests itself in all domains of life, such as housing, education, health (Deleeck et al. 1992:3).

Vietnam has acknowledged the common definition of poverty by the Conference against poverty in Asia - Pacific by ESCAP held in Bangkok, Thailand in September 1993: Poverty is the state of a part of the population that does not enjoy and satisfy basic human needs which have been recognized by society depending on the level of socio-economic development and local customs and practices.

Poverty is one problem that every country in the world, especially in countries emerging in which Vietnam must be concerned and seek to solve (Truong et al. 2016: 67). To ensure social justice and raise a voice in the international arena, not only Vietnam but all countries must pay attention to poverty reduction (Dinh 2019).

Experience hunger eradication and poverty reduction in some countries in the world

China's poverty reduction experience

Changes in poverty incidence The Chinese case has often been cited as an example of how rapid aggregate growth and industrialization are associated with poverty reduction. Yet, it illustrates quite sharply the crucial importance of growth in agricultural incomes for poverty reduction, in a context of relatively equitable

distribution of land. What is striking about the post-reform Chinese experience with growth and its effects on poverty reduction is that while Chinese growth was consistently high across time (except in 1989), poverty reduction was concentrated in particular periods. The relationship between poverty reduction and growth has varied over time, being strong at the beginning of the "reform" period and somewhat weaker afterward.

Last year, when policies of economic reform focused on the countryside. Over these years, the “reorganization” and dismantling of the rural people's communes led to the parceling out of land to households on a broadly egalitarian basis, with peasant households being given control over the use of land without having the right to sell. Instead of the previous “grain first” policy, farmers were encouraged to diversify production to more high-value produce. At the same time, crop prices were raised 30 percent over the five years. In addition, supplies of agricultural inputs, including chemical fertilizers, were sharply increased and provided to farmers at subsidized rates. All this led to significant increases in agricultural incomes, and this translated directly into reduced poverty because most cultivators were net sellers of both cash crops and food grains.

Increasing public expenditure on health and education services is likely to have significant effects on poverty reduction, as noted above. It is therefore heartening to note that since the early part of this decade, such expenditures have been increasing, both in terms of share of total government expenditure and share of GDP. As a result, the share of out-of-pocket expenses in total spending on health care fell from around 60 percent in 2002 to just above 50 percent in 2005 (Wang Shao gang 2006).

Overall, it could be argued that poverty reduction in China has been more strongly related to changes in economic structure and inequality than to GDP growth per se. If so, China's ability to sustain the pace of poverty reduction will depend on its ability to keep in place recent policies aimed at reducing inequality as well as ensuring that structural change remains positive and dynamic. This is in keeping with lessons from the pre-reform experience as well. China was served well by a combination of egalitarian land distribution and experience with the commune, collective and cooperative forms of organization, which ensured a degree of income equality and helped release and pool labor resources for undertaking non-agricultural activities jointly managed with State support. To the extent that economic reform undermines such egalitarianism and adversely affects the growth of the TVEs, it would set back poverty reduction as well.

India's Poverty Reduction Experience

While India's recent economic growth experience has been less spectacular than China's, it has still been extremely impressed by the standards of most other developing countries in the same period and in comparison to its past.

Poverty alleviation has been a pre-eminent goal of India's development efforts since its Independence. In pursuing this objective, the country's planning process during the last six decades has been a fertile ground for devising interventions, often successful but sometimes overlapping and ill-conceived too. Public measures directed at poverty alleviation have focused on creating adequate livelihood opportunities for the marginalized segments of the population, provisioning of public services and goods that have a direct bearing on an individual's living standard and quality of life, strengthening of institutions and delivery mechanisms that empower the poor, and targeted development of backward regions through resource transfers and supportive policy measures.

The low rate of urbanization and weak rural-urban linkages have been important factors in the slow shift of workers from agriculture to non-agriculture activities. There are several states/regions where urbanization levels are less than 15 percent and in some states even around 10 percent. The rate of migration from rural to urban areas has also shown a decline recently (between 1991 and 2001) although there is a large number of circulatory migrants (S.S. Kalamkar 2009).

Due to poor transport infrastructure, rural-urban links are weak in most parts of the country, although there have been significant improvements over the years. A focused policy

for establishing rural-urban linkages is critical for development in agriculture and non-agricultural activities. The link will help the rural producers in commuting to nearby urban centers and establish channels for the flow of commodities and information. For ensuring economic growth in distant rural areas in less developed regions, it would be important to promote infrastructural development to link villages with urban areas to ensure the sustained growth of agriculture and agro-based activities. The small and medium towns and their links with rural hinterlands are very important in rural development - both agriculture and non-agriculture. This has been rather a neglected aspect of the development policy in India. As a first step, there is a need to identify a large number of such towns, particularly in backward regions and develop infrastructure and formulate appropriate policies for rural-urban linkages. Development of corridors joining two or more big cities as has happened in some states should be replicated in backward regions too (Nayyar and Sharma 2005).

The experiences show that rapid economic growth remains the best bet for reducing rural poverty in India. However, to harness the potential of economic growth on poverty reduction, a concerted effort must be made to ensure that the distribution of income doesn't further become skewed. This requires several initiatives, some of them include (1) Tilting the composition of growth to encourage agricultural growth; (2) Making adequate provision for public expenditure for anti-poverty programs. Besides, the efficiency of public expenditure and the social safety net (like NREGA, ICDS, NFSM, etc.) should be improved. Policies that can sustain and enhance social expenditure levels and are more effective for the poor should be vigorously pursued; (3) Re-orienting the design of a sound social sector policy framework, which includes: (i) emphasis on developing lasting, flexible organizations to protect the poor from the effects of macroeconomic shocks, (ii) need for developing well-targeted safety nets, which involve the appropriate transfer and credit programs. The expenditures for such programs need to be protected in real terms even when macroeconomic adjustments are made, (iii) nurturing the groups of people working for the poor to ensure the availability of enough funds for social programs and making those responsible for these expenditures accountable to the people.

Ecuador's poverty reduction experience

Looking at why Mexico suffers from poverty, you'll see a very good example of how economic cycles and poverty are intimately related. With 45% of the population living below the poverty line and more than 10% in extreme poverty (i.e. on less than $1.25 per day), the poverty level has nonetheless come a long way: from about 65% of extreme poverty in the 1950s, the number went down to 20-25% from the 1960s to 1995. The number of Mexicans living below the poverty line increased following the 1980s economic crisis and the same thing happened after the 1995 crisis which brought 35% of the population under the extreme poverty line. Since then, as the economy was recovering, things have been getting better… but that is until the global financial crisis and the chaos with the drugs cartels started recently (Poverties Project 2012).

But Mexico also reacted to limit the impact of the crises. Each time the country answered with improved social assistance programs targeted at the poorest. It's estimated that if extreme poverty didn't increase that much it's in great part thanks to these policies. Likewise, the decrease (by 20-25%) in extreme poverty since 1995 is attributed to social welfare, which has also got a lot more efficient along the way. However, there is extreme and relative poverty, and the overemphasis on social programs also obscured (if not threatened) the development of the economy. Governments should strive for a balance between social and economic spending programs (e.g. in infrastructure and institutions) as the best solution to reduce the poverty rate. To reap the benefits of its open market, the country has a dire need for a more and better-educated workforce as well as more flexibility in the labor market. Furthermore, future social policies should focus on education and health to make sure that everyone can participate in the economy.

Remains the part of improving the country's infrastructures and developing efficient institutions… good luck with that. Especially

given the official neo-liberal positions of the past governments which relied on the inherent justice of the market to solve everything, all while using social security spending on the sly.

Micro-credit programs are a great opportunity to bypass traditional financial organizations that deem the poor too risky clients to lend them anything. The experiment of ALSOL in Chiapas shows how microcredit offers wholly new opportunities to decrease Mexico's high poverty rate. Be they private or public micro-credit organizations, it shows that traditional markets do fail to cater to everyone's needs, typically the poor who are often deemed unprofitable customers in most sectors.

Most of all micro-credit breaks common clichés concerning the poor. It shows that they're capable of borrowing money responsibly and developing their business ventures, at their scale. Moreover, by allowing them to engage in new businesses, you finally include them in the "normal" market and eventually in the society at large. This is after all the end goal of poverty reduction.

But this also means that micro-credit programs aimed at poverty in Mexico work better and faster in urban areas where the poor have easier access to local markets. This implies that the country should also invest in public infrastructure (roads, public transportation) to reduce poverty. Finally, there's also the challenge of making micro-credit programs sustainable since for many of them there are still too high administrative costs due to the lending of very small amounts ($30-40 a year) as well as the monitoring and operating costs.

Results, limitations and practical lessons for Vietnam in poverty reduction

Results in the fight against poverty

According to the Report of Labour, Invalids and Social Affairs, in the past 10 years, the poverty rate has decreased continuously across the country and regions. If in 2010 the rate of poor households in the country reached 14.2%, by 2015 the poverty rate has decreased to 4.25%. Vietnam has completed the millennium target on poverty reduction 10 years ago and is considered by the international community as an effective model for poverty reduction. By the end of 2019, the poverty rate in the whole country was only 3.75%, on average, in the period 2015-2019, each year decreased by 1.53%, and it is estimated that by the end of 2020, Vietnam will only have 2.75% of poor households.

The National Target Program for Sustainable Poverty Reduction in the 2016-2020 period has achieved remarkable achievements, contributing to reducing the poverty rate nationwide from 9.88% at the end of 2015 to 3.75% at the end of the year. 2019 and below 3% in 2020 (this is a fast multi-dimensional poverty reduction compared to the world), making Vietnam one of the first countries to finish early in the implementation of the United Nations Millennium Goals on poverty reduction. Up to now, 100% of communes have car roads to the central area, 99% of commune centers and more than 80% of villages/hamlets have electricity, 65% of communes have small irrigation systems to meet production requirements and for daily life, 80% of villages have roads for motor vehicles, over 50% of communes have standard medical stations; 100% of the poor and ethnic minorities enjoy free health insurance (Loc 2021).

Since 2015, Vietnam has transformed its poverty measurement approach from unidimensional to multidimensional, with the goal of not only ensuring a minimum income but also helping to improve the poor's access to poverty. basic social services in terms of health, education, housing, clean water, sanitation, information and communication... Based on new approaches, poverty reduction policies and programs have been developed gradually redesigned to create conditions for people in general and the poor in particular to more conveniently access basic social services as prescribed by law. The program has oriented towards promoting decentralization, empowering grassroots and people, promoting the role of the community, and encouraging sustainable poverty reduction initiatives proposed and implemented by the community, especially for mountainous areas and ethnic minority areas.

Limitations in the process of hunger eradication and poverty reduction

Vietnam has issued many policies to support the poor from the state budget, but it is not

balanced with the capacity of the state budget, so it has put more or less pressure on the allocation of budget estimates. annual state book. Policies and projects have not created common cohesion in poverty reduction, lack of linkage, close coordination, rhythmicity and overlap. Policies to support the poor of poverty reduction programs do not attach importance to policies to support the poor in the diversification of livelihoods. There is no policy to encourage and support the poor and near-poor to help them actively rise out of poverty and get rich. Some promulgated policies are short-term and temporary, so they have not focused properly on addressing the causes of poverty. The policies are also not aimed at improving market capacity for the poor and supporting them to access the market but are also heavily subsidized, so it gives rise to the idea of dependence of all levels as well as of the people. poverty, creating a trend that many localities and households want to be included in the poor list for assistance. The policies to support the near-poor group have not been paid due attention, so there is an inequality between the poor and the near-poor, creating pressing psychology of the near-poor group when their life becomes difficult again more difficult than poor households after being supported by the poverty reduction program (Nhung 2012).

Practical lessons for Vietnam in the process of hunger eradication and poverty reduction

On improving access to basic social services

Experience from China shows that diversifying forms of medical service delivery and providing basic services is one of the tasks that the government needs to undertake to overcome market failures. However, the government does not always supply directly. With initial resources, the task of the government is to find the most efficient method of supply. The case of outsourcing medical service provision not only expands the scope of service, but the existence of a supply form department has increased the competitiveness of suppliers and the facility itself. Government health services also need to rethink how they operate if they are to continue operating. This is extremely important for Vietnam because currently most of the medical service delivery is still directly handled by the public sector, so the service coverage and quality are still inadequate. Especially, for low- and middle-income people in society, accessing quality health services is a difficult problem.

Specifically, at present, in Vietnam, there is a policy to diversify economic sectors in health care (ie, besides the public health network, it is necessary to develop a private health network). In recent years, the development of private healthcare has shown to be: (i) sharing with public health a part of service provision, especially medical examination and treatment, (ii) mobilizing capital to build infrastructure while the State budget cannot provide enough for health care; (ii) create a counterbalance to public health to promote dynamism in management, overcome stagnation, dependence and ensure transparency in financial management, re-establish the discipline of application culture. ethics in particular and medical professional ethics in general; (iv) create healthy competition in health care services; (v) create conditions for users of health care services to choose according to “needs” and “requirements”, especially creating opportunities for users of services to access high technology; (vi) make use of the human resources of health workers who, after years of serving the public health, are still healthy and have a lot of professional experience.

Lessons on capacity building for the poor

The appearance of legal aid organizations or legal service organizations will be a good experience for Vietnam in protecting the rights of the poor as well as strengthening their capacity in society. Vietnam also has a few legal support organizations for people, including the poor. However, these organizations have not received the trust of the people because their effectiveness is still limited. The participation of the people, especially the poor, has been implemented in Vietnam based on grassroots democracy in poverty reduction activities, but the level of participation is still limited sometimes take on form. The model of engaging the community in reconstruction activities is important for areas frequently affected by natural disasters in Vietnam.

Currently, Vietnam has actively innovated its approach and support solutions to achieve the goal of sustainable poverty reduction. The renewal of the poverty measurement approach from one-dimensional to multi-dimensional applied for the period 2016-2020 with the aim of: Together with solutions to support livelihood generation, increase income, further improve capacity People's access to basic social services, especially health, education, housing, clean water and sanitation, information, more comprehensive classification of poor households, assessment of progress Ministry of Social Affairs through each year and each period.

The multi-dimensional poverty approach is recommended by the international community to countries to tackle poverty. Vietnam is the pioneer country in Asia to apply and implement this method. The Government issued Decision 1614/2015 approving the Scheme on transforming the poverty measurement approach from unidimensional to multidimensional for the period 2016-2020 in September.

In addition, it will focus on prioritizing investment resources for poor districts, poor communes, villages with special difficulties, mountainous areas, and ethnic minorities to limit the widening gap in living standards between the two groups. regions and population groups through the implementation of the International Targeted Program for Sustainable Poverty Reduction in the 2016-2020 period. This is one of two national target programs that the Government has agreed to submit to the National Assembly for approval in the 2016-2020 period, based on the Law on Public Investment in the direction of identifying and allocating five-year medium-term investment capital for the locality to take the initiative, arrange the investment portfolio in order of priority, promote decentralization to empower the grassroots and community, increase the participation and supervision of the people before, during and after the process. implementation (Anh 2015).

Other lessons

In the coming time, Vietnam needs to continue to promote information and propaganda work on the mass media to change people's awareness in poverty reduction, their sense of responsibility from there to rise out of poverty, avoiding the thought of relying on the State.

Implement well the integration of programs, projects, and capital sources in the locality to realize the poverty reduction goal, by a centralized and unified steering mechanism from the district to the grassroots. At the same time, identify the causes of poverty in each locality, from which to develop programs and plans to reduce poverty with appropriate solutions and in the right direction, helping the poor, poor communes and difficult communes rise out of poverty.

Continue to promote the construction and replication of the poverty reduction model with the motto that each locality has an effective model; instructions on how to do business; promote the vocational training system, focusing on occupations associated with production practices, vocational training needs of each subject and employment needs; Preliminary organization, timely summary.

Conclude

Poverty is a historical category that is relative in each period and all countries. In the current trend of cooperation and globalization, poverty reduction is no longer the responsibility of one country but has become the concern of the whole international community. Vietnam is one of the lowest income countries in the world, so the national target program on poverty reduction is a long-term strategy that needs the attention and help of the international community in close combination with the spirit of self-reliance, self-reliance and solidarity of the whole nation to push back against poverty and keep pace with the economic development of advanced countries. In the period when our country is carrying out the process of industrialization, modernization and development of the market economy as it is today, the problem of poverty reduction is more complicated than before. To achieve practical effects to quickly reduce the poverty rate and improve the living standards of the people, Vietnam needs to learn from the experiences of other countries in the world, especially countries in Asia such as China and India. India has a similar starting point as our country, but it is the starting point for the implementation of poverty reduction and hunger

eradication and has achieved achievements worth learning from. From there, it is applied to the reality of Vietnam, based on the actual socio-economic conditions in each region and each locality to implement appropriate policies, to achieve the goal of a rich people, a strong country, and a strong society fair, democratic, civilized.

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FINANCIAL LITERACY AMONG VARIOUS SOCIO-ECONOMIC GROUPS AND ITS ASSOCIATION WITH FINANCIAL INCLUSION-A CASE STUDY OF TRIBAL-RURAL REGIONS IN GUJARAT

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ABSTRACT

Financial inclusion plays an important role in the development of the communities especially those living in the poor rural regions of the country. Financial inclusion to a large extent depends on the financial literacy of the individuals. Financial literacy is the ability of an individual to understand the meaning, characteristics, processes and benefits of various financial services available in the market. Financial literacy allows the individual to manage his finances, debts, savings and investments in an efficient manner. Financial inclusion on the other hand is the individual's actual participation (as against mere understanding) in financial sector. A person would be considered 'financially included' ifhe has easy access to various financial services like banking and insurance. The current study strives to understand the association between level of financial literacy and socio-economic class of the individuals. Secondly, the research aims at understanding the association between financial literacy and financial inclusion. The five parameters of financial inclusion considered in the present study are (i) holding of a bank account (ii) frequency of using the bank account (iii)availing institutional credit (iv) use of mobile and internet banking(v) having an insurance. The study found that the financial literacy was higher among males, higher income groups, general category population and youth in relation to females, low-income groups, scheduled tribes and old people. In addition, the study found a strong association between the financial literacy and financial inclusion. The financial literacy had a positive impact on the financial inclusion.

Keywords: *Financial Literacy, Financial Inclusion, Rural Regions, Socio-Economic Groups*

Introduction

Financial Literacy is the ability to use one's knowledge and skills to effectively manage financial resources, ideally for a lifetime of financial well-being (Horavi and Bokarev, World Bank, 2018). Financial literacy means possessing the right skills, knowledge and understanding of the financial system so that effective, timely and prudent financial decisions can be made (Hogarth and Hilgert, 2002). Financial literacy is a blend of awareness, attitude, knowledge, skill and behaviour needed to make the correct financial decisions so as to enhance the financial wellbeing (OECD, 2013). Financial literacy is a key factor leading to financial inclusion, financial development and financial stability (Ram Krishnan, 2011). Financial literacy enables the individual to handle his financial resources more efficiently and improves his ability to make the financial decisions (Mahdzan and Tabiani, 2013). Financial literacy also allows the individuals to recognize the cost and benefits of their financial decisions (Carpena et al., 2011).

Despite being such a crucial factor leading to financial inclusion and thereby to the economic development of the region,'financial literacy' has been very low in the poor regions, and needs to improve drastically (Lusardi and Mitchell, 2011). Individuals with poor financial literacy end up borrowing at a higher rate of interest, often finding themselves caught in debt-traps (Lusardi and Tufan, 2009).

In the context of the above facts, it seems that financial illiteracy is a major obstacle in the development of the poor communities. Poor financial literacy leads to ineffective spending, poor financial planning, bad debt management and borrowing at a high rate of interest. The current study, hence, strives to understand the impact of financial literacy on financial inclusion. It also attempts to identify the socio-economic groups in which the financial literacy is low and needs to be improved on the priority basis.

Literature Review

Lussardi Annamaria(2019) has observed that there is a lack of financial literacy, even in some of the world's most-developed financial markets which is an acute concern requiring immediate attention. According to her, on average, only about one third of the global population has familiarity with the basic concepts that underlie everyday financial decisions. Further this average concealsstark

inequalities of vulnerabilities in certain population subgroups and poor knowledge of certain specific financial topics. The study states that there is evidence of a lack of confidence, particularly among women, and this has implications for how people approach and make financial decisions. Potrich, Grigion and Heenkanda (2015) stated that financial literacy has a strong association with socio-economic traits of the individuals. According to a study conducted by OECD (2013), financial skills among the women were found to be lower than that among the males. Worthington (2006) found that besides gender; the state of education and employment also significantly influence the levels of financial literacy. Financial literacy was found to be lowest among those who were unemployed and had low education. Ansong and Gynes (2012) studied the state of financial literacy in the African country of Ghana and found that age is also a factor affecting financial literacy. As the age and experience increases, the individuals become more and more proficient in financial matters. The same was corroborated by Agarwal (2009) who found that financial literacy was higher among adults but lower among the young and old populations. Findings of Xu. L and Zia (2012) also confirm this typical relation between age and financial literacy. According to them, financial literacy has an inverted-U shape in relation to the age. Taft (2013) found that marital-status also influenced financial literacy. Besides age and education, the '*married*' status of the individual also had a positive impact on financial literacy. Monticone (2010) and Atkinson & Messy (2012) found a direct relationship between income levels and financial literacy. Those with low levels of income had a low level of financial literacy. Kumar et al (2013) found that farmers (involved in floriculture in Tamil Nādu) with a higher income and educational status had higher financial literacy. Ananth and Oncu (2013) in their study on financial literacy in Andhra Pradesh observed that financial literacy varies across the country with the level of urbanization. Financial literacy was found to be almost non-existent among the poor in rural regions. In yet another study, Lussardiet al (2009)revealed that the financial literacy level among youth is low across most part of the world and is a cause of concern. In the same study, she has observed that various socio-economic and demographic factors such as age, gender, income, marital status and educational attainment influence the financial literacy level of youth and there exists an interrelationship between financial knowledge, financial attitude and financial behaviour. Shabna (2014) in his study have identified 'lack of awareness', 'low financial literacy' and 'transaction cost' as the three main reasons for low financial inclusion.

Research Methodology

Sample: Gujarat has 33 districts in all. Since the study focuses on the state of financial literacy in the tribal-rural regions, three districts viz Dangs, Dahod and Valsad with heavy tribal (or scheduled tribe) population were selected. 94.65% of total population in Dangs, 74. 32% in Dahod and 52.93% in Valsad belongs to the scheduled-tribes category. Dang has 311 villages, Dahod has 696 villages whereas Valsad has 460 villages in all. Stratified and judgement sampling methods were used to select the sample from 50 villages. Out of these 50 villages, 11 belonged to Dangs, 24 belonged to Dahod and 15 belonged to Valsad. The number of selected villages from each district is in proportion to the actual number of villages in each of these districts. To ensure proper representation of all the various groups based on income, caste, gender, age etc; a total of 500 households (10 from each village) were selected. From these 500 households, a total of 1000 individuals above the age of 15 years were surveyed.

Terms and Parameters: Financial literacy was measured with respect to five parameters. viz. (i) awareness about Jan DhanYojna*(ii) awareness about using debit card, credit card, KCC card, Rupay card etc. (iii) awareness about the use of mobile and internet banking (iv) awareness about various government credit and finance schemes (if any) meant for them (v) awareness about the benefits and processes of life and health insurance.

Each parameter was tested on a three-point scale viz. (i) completely aware (ii) partially aware and (iii) not aware at all. Score of 0 for no awareness at all, 1 for partial awareness and 2 for complete awareness was awarded to each

participant as per his/her response regarding each decided indicator of financial literacy. 'Financial inclusion' on the other hand, was determined on the basis of person's actual bank account holding, frequent use of banking services, regular use of mobile and internet banking,credit and debit cards, actually having an insurance cover and availing of institutional credit. Since the population is not normally distributed, non-parametric tests were used for the analysis.

Hypotheses

The two main hypothesis of this study are as follows:

Ho1: There is no association between gender, age, social-class, income and financial literacy.

Ho2: There is no association between financial literacy and financial inclusion.

Sample Profile

Following is the demographic profile of the sample households and individuals

Table 1: Demographic profile of the sample households

Demographic profile	Variable	Frequency (Households)	Percent	Frequency (Individuals)	Percent
Caste	Gen	200	40	398	39.8
	OBC	16	3.2	35	3.5
	SC	40	8	63	6.3
	ST	244	48.8	504	50.4
Gender	Male	--	--	521	52
	Female	--	--	479	48
Income Status	Antyodaya	60	12	118	11.8
	BPL	225	45	417	41.7
	APL	215	43	465	46.5
Age Groups	15-24	--	--	170	17
	25-34	--	--	190	19
	35-44	--	--	175	17.5
	45-54	--	--	215	21.5
	55 and above	--	--	250	25

Source: Primary Survey May 2021

Association between financial literacy and socio-economic status

The levels of financial literacy with respect to the above four socio-economic parameters was considered. Following are the results:

i. Income Status and financial literacy

Table 2: Association between financial literacy and Income

Test Statistics[a]

	Financial Literacy
Mann-Whitney U	273542.000
Wilcoxon W	850972.000
Z	-18.660
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Income	

The research studies the association between income status and financial literacy in the selected tribal-rural regions of Gujarat. The findings show that distribution of financial literacy varies across different income groups. The mean rank of financial literacy was found to be higher among the APL and BPL households as compared to that in the Antyodaya households. Thus, the study shows that the level of financial literacy is comparatively lower in the households with lower income level.

ii. Gender and financial literacy:

Table 3: Association between financial literacy and Gender

Test Statistics[a]

	Financial Literacy
Mann-Whitney U	292633.000
Wilcoxon W	859983.000
Z	-18.500
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Gender	

The research also investigated the variation in financial literacy with respect to gender in these regions. The findings show that there is an association between financial literacy and Gender. The mean rank of financial literacy was found to be higher among males than in females.

iii. Caste status and financial literacy

Hypothesis Testing Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Financial Literacy is the same across categories of Caste	Independent Samples Kruskal Wallis Test	.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05

The study investigated the differences in financial literacy among caste-groups in the selected tribal-rural regions. The variation in the financial literacy among various caste groups was tested through Kruskal-Wallis test. Following are the results.

The results showed that the mean rank of literacy is higher among the General Category and OBC category households while it was comparatively lesser among ST and SC category households.

iv. Age and financial literacy

Hypothesis Testing Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Financial Literacy is the same across categories of Age_Group_2	Independent Samples Kruskal Wallis Test	.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is .05

The relationship between age-groups and financial literacy was again tested through the Kruskal-Wallis test. Following are the tests of the result.

The mean rank of financial literacy is lesser among the two age groups of 15 to 24 years and 55 years and above. The financial literacy was found to be relatively higher in individuals in the age group of above 24 years to 55 years.

Association between financial literacy and financial association:

This section studies the association between various dimensions of financial inclusion with the level of financial literacy of the individuals in these tribal-rural regions of Gujarat. The results of the study are as follow:

i. Financial literacy and possession of a bank account

The table below examines the association between 'financial literacy' and 'ownership of the bank account' among the selected sample households. Following are the results.

Table 4: Mean Rank for Financial literacy and Bank account

Mean Ranks				
	Bank account	N	Mean Rank	Sum of Ranks
Financial Literacy	NO	47	618.17	61199.00
	Yes	953	1058.01	2088502.00
	Total	1000		

Table 5: Association between Financial literacy and Bank account

Test Statistics[a]	
	Financial Literacy
Mann-Whitney U	56339.000
Wilcoxon W	61298.000
Z	-7.167
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Bank account	

A comparison of the mean of the distribution of parameter financial literacy was calculated for 'possession of bank-account' categories 'Yes' and 'No'. Yes-indicates holding of the bank account by the individual and No-indicates not having a bank account. Mann Whitney test was used as the data was non-normal. Having a bank account (N= 953) has a larger mean rank (1058.01) than not having the bank account (N= 47) with the mean rank (618.17) and thus tends to take larger values (see table 4). A statistically significant difference was found (U= 56339.00, $p < .005$) (see table 5). Thus, the results of the tests indicate that individuals in tribal-rural regions of Gujarat having the bank account have higher levels of financial literacy as compared to the individuals not having a bank account.

ii. Financial literacy and Frequency of Bank Account Usage

The research further investigated the association between the financial literacy of the individuals and the frequency with which they use their bank account. The test result shows that the difference in the financial literacy across the individuals using bank account at different frequency level is significant. The modal summary shows that the mean rank of financial literacy is higher in case of individuals which have the higher frequency rate of using bank account. This suggests that higher usage of the bank account is associated with higher financial literacy levels.

iii. Financial literacy and Regular Use of Mobile-Internet Banking, Credit-Debit Card

To test the association between financial literacy of an individual and usage of mobile-internet banking and Credit-Debit Card, Mann Whitney test was applied. Following are the results.

Table 6: Mean Rank for Financial Literacy and Mobile-Internet Banking and Card usage

Ranks			
	Mobile-Net Banking and Card Usage	N	Mean Rank
Financial Literacy	NO	901	964.03
	Yes	99	1766.27
	Total	1000	

Table 7 : Association between Financial Literacy and Mobile Banking

Test Statistics[a]	
	Financial Literacy
Mann-Whitney U	53513.000
Wilcoxon W	1806639.000
Z	-16.753
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Mobile-Internet Banking Use of credit and debit cards	

The test result indicates that there is a significant difference in financial literacy of individuals who use mobile-net banking and cards and those who don't use these facilities. This indicates that financial literacy and usage of mobile-net banking are associated. The modal summary further indicates that the mean rank (1766.27) of financial literacy is higher among the users of mobile banking than among the non-users (964.03) of mobile banking. This indicates that higher financial literacy leads to greater use of mobile and net banking, credit and debit card usage.

iv. Financial literacy Status and Insurance Cover

The study applies Mann Whitney test to examine the association between the financial literacy of individuals and having an insurance. Following are the results of the test.

Table 8: Mean Rank for Financial Literacy and Insurance

Ranks			
	Insurance	N	Mean Rank
Financial Literacy	NO	870	954.18
	Yes	130	1608.52
	Total	1000	

Table 9: Association between Financial Literacy and Insurance

Test Statistics[a]	
	Financial Literacy
Mann-Whitney U	87455.000
Wilcoxon W	1732746.000
Z	-16.380
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Insurance	

The test results depict that there is a significant difference in the financial literacy of individuals having insurance and not having insurance. The modal summary further shows that the mean rank of financial literacy is higher among the insurance holders which indicates that the higher financial literacy leads to availing of insurance facility in the selected regions (see table 8). The results thus indicate towards the significance of financial literacy in enhancing the level of financial inclusion in the selected tribal-rural regions of Gujarat.

v. Financial literacy and Institutional Credit

The association between financial literacy of the individuals and institutional credit beneficiaries in the selected regions of the state were also analyzed. The results of the Mann-Whitney test are as follows:

Table 10: Mean Rank between Financial literacy and Received loan

Ranks			
	Received loan	N	Mean Rank
Financial Literacy	Yes	61	1379.76
	No	939	1013.66
	Total	1000	

Table 11: Association between Financial Literacy and Received loan

Test Statistics[a]	
	Financial Literacy
Mann-Whitney U	78994.512
Wilcoxon W	19780471.501
Z	-6.720
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Received_loan	

The difference between the mean ranks suggests that financial literacy levels are relatively higher among the individuals who have availed loans from the organized money market i.e., the institutional credit facility. The test further shows that this difference in rank is significant.

(U= 78994.512, p < .005) (see table 11). Thus the results of the tests indicate that individuals in tribal-rural regions of the Gujarat who have availed credit facility have higher financial literacy than the individuals who have not availed the credit facility from institutional sources of finance.

Findings and Suggested Measures

The study reveals existence of a strong association between financial literacy and various parameters of financial inclusion. People with higher financial literacy were more likely to have a bank account, mobile and internet banking usage, insurance cover and availing of institutional credit. The findings of the current study imply that the government policies should focus more on enhancing financial literacy among the vulnerable sections of the society like women, youth, socially backward communities and low-income groups. Further, financial literacy is unevenly spread across regions with rural areas lagging far behind the urban centres. The support of financial institutions like banks, voluntary organizations and NGOs, village representatives etc can be taken to identify and train these target groups.

The spread of financial literacy through all these measures would not only help the individuals take better financial decisions but would also aid in the development of the society. With quick spread of mobile payment technology and internet banking; the financial illiteracy can aggravate the economic inequality in the society. Initiatives toward improving financial literacy can be effective only if they are large and scalable. Schools, colleges, workplaces, village communities etc provide an excellent platform to carry out financial education to a huge and often varied segments of the populations.

As suggested by Lussardi, the financial education programs should be customized and tailor-made as per the requirements of the target groups. A well-balanced financial education program accurately identifies the requirements of its targeted vulnerable groups, with clear goals and well-defined parameters. According to her, it is crucial to target students and young adults in schools and colleges to give them the necessary tools to make wise and balanced financial decisions as they graduate and take on the responsibilities. This will help them in taking more prudent purchasing decisions, borrowing decisions, debt management and retirement planning. They will also be inspired and (be) able to use the latest technology for making important financial transactions resulting in to saving of time and money. Just as the institutes of higher education provide formal courses in corporate finance, they should offer courses in personal finance. Proper management of personal finance by the individuals over their lifetime is as important as firms' management of their corporate finances. Financial education can also be provided efficiently at workplaces. It is important to recognize the socio-economic context of the employees so as to personalize the program as per the need of each employee. For targeting socially backward communities like Scheduled Tribes, the support of local community leaders is imperative. Information about various government credit facilities and schemes for farming sector and the socially & economically backward sections etc can encourage these vulnerable communities to acquire financial literacy. Patience would be a key factor in imparting financial literacy to the elderly and backward communities.

Besides the design of the program, the delivery method is also extremely crucial for its success. Many experts suggest that imparting knowledge through interesting video clips would be more effective than mere narratives. Similarly, an opportunity to practically perform

various online transactions and organizing mock finance-games wherein the participants get an opportunity to make their own financial decisions can be very effective ways of gaining financial literacy and confidence. Finally, along with making efforts for enhancing financial literacy, a systemic evaluation of their effectiveness would also be needed. This will let us know what is working and what is not.

Finally,financial literacy should be perceived as a fundamental right for each individual rather than being a privilege of a relatively few. Without intense, sincere, well-designed and well-delivered efforts in this direction; neither individuals nor societies would be able to reach their full potential.

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CREATING BUSINESS VALUE BY FOCUSING ON 'E' IN ESG: INDIAN FMCG SECTOR

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ABSTRACT

Business organizations across the world are moving beyond the short-term goal of profit maximization to long-term sustainability goals involving environmental, social and corporate governance (ESG) goals. This is due to the growing realization that ESG factors constitute a significant source of risk for the business and can affect their financial returns. The present study focusses on environment sustainability initiatives undertaken by three FMCG companies to ensure environmental compliance and align their organization with Sustainability reporting and ESG metrics. What connects the three companies is their commitment towards environment and society. The environment sustainability measures will create value for the organization by cost savings, differentiation, lower cost of capital and better employee engagement. The findings of this study have important implications for investors, corporate management as well as policymakers and regulators.

Keywords: *ESG performance, Sustainability, Risk-reduction Cost reduction.*

Introduction

Among many new paradigms established 2020, ESG stood out for both investors and corporates .ESG refers to the framework of a company to include environmentally conscious business practices, strong social responsibility and corporate governance. There is a visible rise in demand from asset managers to invest in companies with high ESG scores. ESG is an area of the investing community that focusses on highlighting risk in investor portfolio against a matrix of Environmental, Social and Governance factors.

ESG data spans an array of issues, including measures of company carbon emissions, labour and human rights policies, and corporate governance structures. Policy makers, asset owners, and the public at large are focused on ESG factors as a means to promote sustainable business practices and products. Investment professionals increasingly see its potential links to company operational strength, efficiency, and management of long-term financial risks. Broadly speaking, ESG refers to the integration of environmental, social, and governance factors in the investment process.

Terminology of ESG

The E in ESG

The environmental aspects of ESG, reflects on how an organization operates within the physical, natural environment. From an investor perspective, the E attempts to uncover risks and opportunities to investing in companies based on their management of environmental considerations and use of the natural environment. The Environmental aspect of ESG sees investor examine a company's use of natural resources, and the impact that its operations and value chain has on the environment, including through resource use and carbon emissions.

The S in ESG

The S in ESG covers social,whereby investors examine corporate considerations on impact to customers, employees where they have a presence in particular. Social requirements of businesses are much more varied than environmental ones, with businesses potentially riskingreputational damage by failing to tackle consumer protection from operations and products, human rights and labour standards, through diversity and corruption.

The G in ESG

G in ESG is the pillar that highlights whether sustainability remains a siloed aspect of a corporate strategy or if it sits at the heart of company decision. Investors will evaluate a company's management systems and how that gives them a much more transparent oversight of practices across the value chain.

Five ways E in ESG creates Value

Top-line growth*:* Having a strong environmental proposition helps companies tap new markets and expand into existing ones. McKinsey research conducted prior to the COVID-19 crisis has shown that customers say

they are willing to pay to "go green." Although there can be wide discrepancies in practice, including customers who refuse to pay even 1 percent more, they found that upwards of 70 percent of consumers surveyed on purchases in multiple industries, including the automotive, building, electronics, and packaging categories, said they would pay an additional 5 percent for a green product if it met the same performance standards as a non-green alternative.

The payoffs from meeting this kind of consumer demand are real. When Unilever developed Sunlight, a brand of dishwashing liquid that used much less water than its other brands, sales of Sunlight and Unilever's other water-saving products proceeded to outpace category growth by more than 20 percent in a number of water-scarce markets

Cost reduction. Among other advantages, executing on E well can help stall a company's rising operating expenses, including the true costs of water, carbon, and raw materials. One of our studies found a significant correlation between a company's resource efficiency and the strength of its financial performance. It also found that reducing resource costs can improve operating profits by up to 60 percent.

Consider 3M, which saved $2.2 billion since the 1975 launch of its "pollution prevention pays" (3Ps) program, which involves reformulating products, improving manufacturing processes, redesigning equipment, and recycling and reusing waste from production. FedEx aims to convert its entire 35,000-vehicle fleet to electric or hybrid engines. To date, it has converted 20 percent of vehicles, which has reduced fuel consumption by more than 50 million gallons.

Reduced regulatory interventions. Careful management of environmental issues can ease regulatory pressure on companies and reduce their risk of adverse government action, enabling them to achieve greater strategic freedom. The value at stake for your business may be higher than you think: One-third of corporate profits are typically at risk from state intervention, according to our analysis. For the automotive, aerospace, defense, and tech sectors, where government subsidies are prevalent, the value at stake can reach as much as 60 percent.

Employee productivity. A company with a record of positive environmental impact can find it easier to attract and retain quality employees, motivate them by instilling a sense of purpose, and increase productivity. Employee satisfaction is positively correlated with shareholder returns. The London Business School's Alex Edmans found that the companies that made Fortune's "100 Best Companies to Work For" list generated 2.3 percent to 3.8 percent higher stock returns per year than their peers over a greater than 25-year horizon. Moreover, it's long been observed that employees with a sense not just of satisfaction but also of connection perform better.

Investment and asset optimization. A strong environmental proposition can enhance returns by allocating capital to more promising, more sustainable opportunities (for example, renewables, waste reduction, and scrubbers). It can also help companies avoid investments that may not pay off because of longer-term environmental issues (such as write-downs in the value of oil tankers). The link from environmental issues to value creation is solid. In a world where environmental concerns are becoming more urgent, the five levers described above can make a difference.

FMCG Environmental Sustainability Trends

Customers are increasingly becoming more mindful of their purchasing habits, being attentive to the sustainability of the product, the company, and the supply chain. Gen Z are being identified as a key driver of this evolving consumer demand as the generation has acquired buying power. This key customer base is most influenced by sustainability, brand name, and company mission. Facilitated by social media, there now exists a much closer brand-consumer relationship. It has led to consumers investing more heavily in companies with strong brand narratives around climate change prevention and sustainability.

The FMCG sector is being affected substantially and is rapidly evolving, pledging a move to more sustainable practices and investments; and rightly so, with the sector responsible for over a third of global greenhouse gas emissions (Forbes.com). The

future will see the focus on sustainability crescendo as the pressures of the climate emergency lie at the forefront of global politics, driven by consumer demands.

From these evolving consumer behaviours and demands, here are the five key sustainability trends we expect to play out this year in the FMCG sector:

Sustainable packaging

Since the headline disclosing that Britain's biggest supermarkets produce 810,000 tonnes annually of throwaway packaging, there is increasing pressure on the retailers to reduce their environmental impact by cutting plastic use. Tesco has just announced they will be the first UK retailer to remove plastic-wrapped multipacks, predicting this will eliminate 350 tonnes of plastic from the environment, and encouraging brands such as Heinz to do the same. On a wider-scale, a number of supermarkets have been trialling zero waste store transformations with unwrapped fruit and veg offerings and refillable dried goods facilities with the aim of rolling this out across the country.

For products that require packaging, there is increasing noise around material sustainability and debate on the 'war on plastic'. Coca Cola made their controversial announcement last week at Davos 2020 about their commitment to recyclable plastics, choosing this over investment in alternative bottling options.

Sustainable sourcing

Products across sectors are increasingly being produced with ingredients and materials from more eco-friendly sources. Certified sustainable palm oil in food and cosmetics, UK agriculture with the Red Tractor logo, and higher animal welfare, such as the availability of cage-free eggs and eradicating animal testing, have all become industry best practice. But this year will see increased focus on sourcing alternative supplies for product ingredients and components.

Another innovative sourcing initiative is from The Body Shop who has high ambitions to source its plastics through a partnership with 'Plastics for Change'. They hope to support a group of waste-pickers in India, collecting waste plastic for recycling in what is predicted to be converted into three million shampoo and conditioner bottles. These examples within FMCG show the increasing innovation across the sector to focus on repurposing what has otherwise been discarded.

Environmental protection

Consumers are also looking beyond the products being offered by the retailers and at the ways in which the organisation conducts itself to proactively contribute to the climate emergency. Companies place sustainability at the centre of their publicly published CSR reports, showing transparency in their conduct, making them accountable for their actions and showing their investment in sustainability.

Beyond improving business as usual activity, FMCG organisations are making headway in supporting environmental charities. Leading global supermarket Tesco has partnered with WWF to be an active player in improving the global food system. This involvement in the rectification of a system contributing to environmental damage is a clear indicator to consumers of a belief in efficacy and sustainability.

Energy efficiency

Organisations are investing more in sustainable manufacturing and distributing processes. Primarily we have seen a movement towards sourcing renewable energy. Companies are using renewable energy providers, or in the case of Budweiser, they are partnering with the providers to build the renewable source necessary to power their manufacturing.

We are seeing progress for energy efficiency in other areas as well. Waitrose has committed to a zero carbon fleet of trucks for distribution, using only electric vehicles by 2045, and L'Oreal has made headway in building 'dry' factories with closed loop water systems. Sustainability in transport and manufacturing is a slow progression with challenges of technology and production disruption, but there has been increasing momentum in committing to change, setting deadlines, and laying the groundwork. We expect more organisations to announce energy efficiency plans in the next 12 months.

Sustainability is becoming the epicentre of FMCG business strategy. From innovation of the supply chain through to energy efficiency

of distribution, the sector will be taking more steps towards reducing environmental damage in the coming year.

Objectives of the study

The objective of the study is to find out how the FMCG companies in India are focussing on environmental sustainability and creating value for stakeholders. From this follows the research question andits sub-questions.

How FMCG companies are focussing on 'E' in ESG?

What steps have been taken by FMCG companies to ensure Environment Sustainability?

What are the benefits of focussing on Environment Sustainability?

Research Methodology

The study is based on secondary data by analysing Annual Reports, Business Responsibility reports and Sustainability Reports of companies. Three case studies have been selected and analysed, providing the basis for a comparative analysis ofapproaches taken.

Limitations

The current study considers only three companies from the sector.

Literature Review

Numerous studies have been undertaken to study the impact of environmental, social or governance performance of companies on their financial performance. White and Kiernan (2004) established that there is strong indication linking good environmental performance with enhanced financial performance. Orlitzky et al. (2003) concluded that good corporate social Performance leads to improved Corporate Financial Performance.Tsoutsoura's (2004) study showed positive correlation betweenCorporate Social Performance and Corporate financial Performance for S & P 500 index firms; employing ROA, ROE and ROS as a measure of financial performance, and the company's inclusion in the Domini 400Social Index or not, as a measure of CSP. While these studies examined the impact of one of the three factors—E, S or G on financial performance, many others assessed the overall impact of all three on financial performance. Manescu (2010) found that improvement in ESG scores (as measured by KLD Research and Analytics Ratings) has positive impact on firm's profitability measured using ROA and Tobin's q. Terayama's (2010) study found that over the long term, corporate ESG initiatives improve company performance. Carpenter and Wyman (2009) study stressed the need for comparable and reliable ESG reporting standards. It reviewed 16 academic studies that researched the link between ESG factors and firm performance and showed that 10 showed positive relationship, 2 showed negative relationship and 4 showed a neutral relationship. These studies were conducted in different regions, at different time periods, using different methodologies/tests and obtained varied results.

Though several studies from across the world have examined the link between ESG performance and financial performance, the literature on the above issues in India is scanty. Black and Khanna (2007) study revealed that mandatory corporate governance reforms increase firms' market value in India. Balasubramanian et al (2009) study found a positive relationship between governance measures and firm performance in India. Singh's (2010) study revealed that environmental management was significantly positively related to profitability. Tyagi's (2012) study analysed the relationship between CSP and CFP of sample Indian companies and revealed an uncertain/ inconclusive relationship between them. Ghosh's (2013) study found that superior sustainability performance results in superior financial performance of companies, which can be captured in accounting as well as market measures. While most of these studies have analysed the impact of only one of the three factors (E, S or G), even comprehensive studies that have analysed the impact of all the three.A strong environmental sustainability focus results in conservation of resources and reduces costs for the organization .Companies have to perform their obligation towards environment and society. If they fail in this, it is obvious that they are increasing the risk for business and threatening the future. Due attention and appreciation of ESG in true spirit will lead to positive impacts on non- financial parameters and can aid businesses to prepare

themselves for uncertain future and reduce risks, given the damage being caused to environment, which is posing serious challenge for survival. If negative impact of ESG factors are not attended, businesses may be subject to significant external risks which potentially can have a sizeable impact on the future profitability and stability of the business and may pose serious threat to survival itself. (ESG analysis of top 50 NSE companies)

To conclude,Realistic approaches to implant Environment sustainability into the business strategy and subsequently into marketing strategy can give benefits to the organizations.

Present study

The present study focusses on the measures taken bythree FMCG companies for environmental sustainability and how it results in cost saving for the organization and also conserves the environment. All the three companies had disclosed Sustainability report for the F.Y 2018-19 and are part of NSE 50.

All the three companies in the study made the following key disclosures:

i. Environment policy on website.
ii. Environment program initiative.
iii. Strategies to achieve global environment issues such as climate change ,global warming
iv. Information on environmental risk assessment
v. All three have projects on Clean Development Mechanism and Bio-Diversity

Hindutan Unilever Limited (HUL)

The Company's turnover for the financial year ended 31st March, 2020Rs. 39,000crores.

HUL, CSR and Environmental Sustainibilty Initiatives

By 2030, HUL wants to halve its environmental impact of the making and use of its products as it grows in its business.

Reducing Environmental Impact

HUL, has reduced CO_2 emissions by 59 % as compared to 2008.They have also increased the use of renewable energy by 43% as compared to baseline 2018.The same was achieved by usage of biofuel, usage of biomass, use of solar power at factories

Reusable, Recyclable or Compostable Plastic Packaging

In 2019, HUL arranged environment-friendly disposal of over 20,000 tons of post-consumer use plastic laminates waste in aggregate through collection and disposal partners in more than 20 cities across India.

Reduce Waste from Manufacturing

Total waste (per tonne of production) generated from HUL factories reduced by 58% in 2019 as compared to 2008. HUL maintained the status of 'zero non-hazardous waste to landfill' in all factories and offices.

Reducing Water usage

Water usage (cubic meter per tonne of production) in HUL manufacturing operations has reduced by 55% compared to the 2008 baseline. Initiatives such as reduction in freshwater abstraction, implementation of captive rainwater harvesting and use in processes & utilities make-up, increase in condensate recoveries, and maximising use of RO plants, contributed substantially to the reduction of water use in their manufacturing process..

Reducing Packaging

By 2030, HUL aim to halve the greenhouse gas impact of their products, by eliminating over 100,000 tonnes of plastic from our packaging. They have resized sachets across their hair and home care portfolio and reduced thickness of aluminium cans for deodorants, in order to save plastic.

Recycling Packaging

To increase recycling and recovery rates in packaging, they are using r-PET (80% recycled PET) in blister packs for personal care brands like Pepsodent toothbrush and Glow & Lovely. They are also using post-consumer recycled polymer in bottles. Tresemme, Sunsilk black, and Surf excel Liquid bottles are with 25% r-HDPE, while Vim bottles are 50% r-PET.

Reducing Office Waste

In 2019, they made significant changes across all offices and achieved the status of **'Zero waste to Landfill'** for non-hazardous waste. They use ceramic cups instead of paper cups, hand dryers in the washroom instead of tissue

paper, and recycled A4 sheets for printing. also replaced paper records and files with digital records.

Sustainable Sourcing
Sustainable Palm Oil

In 2019, HUL, continued the process of buying RSPO (Roundtable on Sustainable Palm Oil) certified palm oil and achieved the ambition of 100% sustainable sourcing, as per HUL Palm Policy.

Sustainable Paper and Board

Committed to protecting the natural resources that help our business grow, in 2019,they sourced and used 100% sustainable paper and board for packing our products. Their resources come from Forest Stewardship Council (FSC) certified mills, thereby supporting our efforts to utilise lower grammage paper to reduce the overall consumption of paper and board.

Becoming Carbon Positive in Manufacturing

In 2019, the CO_2 emissions from our logistics network reduced by over 14%. Our "Load More Travel Less" strategy clubbed with increased efficiency of processes, reduction in the count of trucks by using bigger truck types, and reduction in distance travelled helped us reduce CO_2 emissions.

Greenhouse Gas Emissions from Refrigeration

We have continued our drive to roll out environment-friendly freezer cabinets that use hydrocarbon (HC) refrigerants instead of Hydrofluorocarbons refrigerants. There are currently 112,826 freezers with HC technology in our fleet in India.

Managing Energy Consumption in our Offices

A net-zero carbon economy is good for the planet as well as for business. Across our offices, a significant share of electricity is sourced from clean energies such as wind and solar.

India Tobacco Company Limited (ITC)

The Company's turnover for the financial year ended 31st March, 2020 was Rs. 40,633**crores**

ITC's EHS goal is to achieve the greenest and safest operations across all its operations.

In terms of environmental performance, the aim is to minimise impact and create a positive footprint wherever possible. A rigorous system of monitoring resource usage/generation, setting targets in accordance to internal, national and international benchmarks and performance audits has enabled ITC to progressively improve water, energy and waste efficiencies.

Renewable energy and Energy Efficiency

a. ITC has adopted a low carbon growth plan as part of its multi-pronged strategy to combat climate change - maximising the use of renewable energy and sharpening energy efficiency in all units are key elements in this action plan.
b. Currently, around 41% of ITC's energy comes from renewable sources - biomass, wind and solar. Several ITC units, including a number of premium super-luxury hotels, already meet their entire energy need from self-owned wind farms.
c. ITC also constantly strives to reduce energy consumption in its operations through a variety of measures, mainly by deploying cleaner, more efficient technologies and by promoting awareness and a culture of conservation in the workplace.

Greenhouse Gas Emissions & Carbon Sequestration

a. Reducing greenhouse gas (GHG) emissions is a key action area in ITC's low-carbon growth plan which in turn, is part of its multi-pronged strategy to combat climate change. ITC computes its GHG inventory in accordance to ISO 14064:2006 - the latest international standard for quantifying and reporting GHG emissions and reductions.
b. ITC's Afforestation Programme has created green cover on a significant scale. Along with multiple other environmental benefits, these plantations sequestrate substantial quantities of carbon dioxide, mitigating the negative impact of increasing GHG levels in the atmosphere.

c. As a result of all these actions, ITC has been carbon positive for the last 15 years.

Water Security

a. Each and every ITC unit is mandated to constantly improve water efficiency performance - i.e. to minimise water consumption, maximise rainwater harvesting on-site and recycle/re-use waste water as far as possible.
b. ITC works extensively with farmers through its Watershed Development and Sustainable Agriculture Practices Programmes to increase water efficiency in agriculture. ITC promotes the use of efficient irrigation devices, e.g. sprinkler sets and drip systems.
c. As a result of all these actions, ITC has been water positive for the past 18 years.

Waste Recycling

a. ITC's action plan for waste management in its operations centres on minimising waste generation by constant monitoring and setting targets to improve resource utilisation, and maximising recycling to cut down the amount of waste going to landfills.
b. Paper and packaging waste is an important focus area for ITC as its Paperboards & Specialty Papers Division and Packaging & Printing Business are among India's largest in their respective sectors. ITC's manufacturing units are steadily increasing use of post-consumer waste paper as raw material instead of using virgin fibre.
c. ITC runs a solid waste management programme called WOW (Well-being Out of Waste) that works in partnership with citizens, municipalities and rag-pickers/waste collectors to promote source segregation and recycling.
d. As a result of these measures, ITC has been solid waste recycling positive for the last 13 years in a row.

Colgate-Palmolive

The Company's turnover for the financial year ended 31st March, 2020 was Rs. 4500**crores**

Environment Sustainability at Colgate-Palmolive India

Colgate, philosophy is be a caring, innovative growth company reimagining a healthier future for people, their pets, and planet. This purpose unites Colgate-Palmolive People all around the world and energizes our sustainability efforts.

Plastic Waste Management

Colgate-Palmolive globally, is improving the material sustainability profile of its products, working on eliminating PVC from packaging, and continuously looking for ways to enrich the environment. 98 percent of Colgate's packaging is free from hard-to-recycle plastic. Now, Colgate-Palmolive globally has raised the bar with a new commitment of 100 percent recyclability of the plastic used in packaging across all categories by 2025.

True Zero Waste Certification

Colgate-Palmolive India has received TRUE Zero Waste Platinum certification, for all its four manufacturing sites in India, from Green Business Certification Inc. (GBCI), the premier organization independently recognizing excellence in green business industry performance and practice globally. GBCI administers TRUE Zero Waste certification, a program for businesses to assess performance in reducing waste and maximizing resource efficiency.

Packaging

Colgate's 2025 packaging sustainability strategy centres on the following actions:

a. Eliminate unnecessary and problematic packaging
b. Make all our packaging recyclable, reusable or compostable
c. Reduce use of new (virgin) plastic by a third in packaging
d. Use at least 25% post-consumer recycled plastic in packaging
e. Minimize the volume and weight of packaging required to label and protect products.

Analysis and Conclusions

The three companies in the study had compliance with respect to environmental sustainability norms. All the three companies exhibited the following initiatives:

Sustainable Sourcing

a. Had a road map for sustainable supply chain

b. Supplier assessment and evaluation for ethics, being green and social focus.
c. All conducted responsible sourcing audit.

Life cycle assessment

a. All three had target set for key product life cycle assessment.
b. All three conducted lifecycle assessment on ISO 14040 and 14044.

Product Packaging

a. They had made arrangement for collecting consumer packaging waste
b. All three had set up buy back collection centres to collect plastic packaging for recycling and reuse.

Energy Consumption

d. Energy efficiency audits were conducted by all three companies.
e. All were ISO 50001 certified
f. Monitoring of energy audits of suppliers

Renewable energy

g. All three had initiatives to increase renewable energy usage
h. ITC stood out amongst three, 41% of ITC energy consumption is from renewable sources.

Water Consumption

i. ITC is water positive amongst three.
j. Common initiatives exhibited were rain water harvesting system, roof top water collection treatment of waste water -recycle and reuse.

All the above findings indicates that, the above initiative on environment sustainability will result in creating value for the organization as given in the table below:

Benefits of Environment Sustainability	Value creation for the organization
Improves operational efficiencies	Cost savings
Value chain efficiencies	Cost saving
Lowers costs and taxes	Cost saving
Improves brand image	Differentiation/Pricing
Improves customer loyalty	Market share
Improves employees productivity	Employee engagement
Lowers operational risk	Lower cost of capital

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GOOD GOVERNANCE AND ECONOMIC DEVELOPMENT: A COMPARATIVE STUDY AMONG THE DISTRICTS OF ASSAM

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ABSTRACT

Development linked governance has been an issue much debated about in the contemporary world. Good governance is considered as a key and essential ingredient of social and economic development, especially in developing countries. Good governance is critical for economic development and it is believed to be the single most important factor in eradicating poverty and promoting development. Theresearch work conducted by the international organizations such as International Monetary Fund (IMF), the United Nations and the World Bank shows that good governance leads to economic growth. It has been discovered that high-quality institutions have the power, over the long run, to raise per capita income and promote growth in all parts of the world and the "development dividend" due to good governance is large. Governance is a multi dimensional issue which has an intimate relationship with economic development. This study seeks to explore that relationship in the context of the state of Assam. In order to evaluate the governance situation in Assam a composite Governance Indicator namely Good Governance Index will be constructed. Moreover, in order to study the relationship between governance and economic development, Pearson correlation will be used to check whether there is any positive relationship between the two.

Keywords: *Governance, economic development, correlation.*

Introduction

The quality of governance plays a vital role in the economic development of a country and without good governance there will be no sustainable development (Kaufmann et al., 2008; Emara and Chiu,2016).Good governance is considered as a key and essential ingredient of social and economic development, especially in developing countries (Srinivasan, 2015).

Policy makers and academics agree that good governance is essential for economic development and it is believed to be the single most important factor in eradicating poverty and promoting development. It has been discovered that high-quality institutions have the power, over the long run, to raise per capita income and promote growth in all parts of the world and the "development dividend" due to good governance is large. In fact, the ability to measure and monitor the progress on key dimensions of governance such as rule of law, corruption and voice and accountability has enabled reformers in government and civil society to press for improvements in the quality of governance in many countries (World Bank Report, 2006).

The quality of governance can be evaluated on the basis of policies and provisions leading to enhancements in civil, cultural, economic, political and social attainments. Good governance ensures that political, social and economic priorities are based on broad consensus in society and that the voices of the poorest and the most vulnerable are heard in decision-making over the allocation of development resources (Patel, 2009). The challenge for all societies is to create a system of governance that promotes supports and sustains human development - especially for the poorest and most marginal. Inclusive governance that secures individual security and is based on the rule of law, integrity and transparency holds the key to an enhanced human security environment. In most of the studies it's seen that in many countries weak governance and slow economic development go hand in hand, while improved governance fosters development success (Kauffman et al., 1999; World Bank Report, 2006). Weak governance in the form of ineffective rule of law, inadequate protection of property rights, widespread corruption, and ill-advised policymaking serving special interests can harm the economy beyond repair. A wealth of cross-country indicators of various aspects of governance strongly suggests that governance has a major impact on development.

Good Governance and its Dimensions

Good governance is of significant importance and the necessity to measure the quality of governance led to the emphasis on the indicators or dimensions of good governance.

The World Governance Indicator Project reports six dimensions of Governance-

- Voice and Accountability
- Political Stability and Absence of Violence
- Government Effectiveness
- Regulatory Quality
- Rule of Law
- Control of Corruption

The United Nations Development Program (UNDP) came up with its own list of nine characteristics of good governance:

- Participation
- Rule of law
- Transparency
- Responsiveness
- Consensus orientation
- Equity
- Effectiveness and efficiency
- Accountability and
- Strategic vision

The World Bank's worldwide governance report aggregates individual governance indicators for over 214 regions on six dimensions namely peace and security, rule of law, control of corruption, human rights and participation, sustainable development and human development which was first published in the year 1996. Along with the World Governance Index that ranks countries according to the governance conditions existing in the respective countries, there are certain other indicators that measure the governance in countries like BASEL AML (anti money laundering) Index and Transparency International's CPI (Corruption Perception Index) that ranks countries annually based on their perceived levels of corruption.

Similarly in India, the Public Affairs Centre ranks Indian states according to Public Affairs Index (PAI) based on the governance conditions prevailing in the states. It ranks the states on the basis of 10 themes and 82 indicators. PAI ranks inter-state governance by using data available in the public domain in key areas of governance. Although, there have been studies that rank the different states according to their governance scenario there are no studies that rank the districts of Assam. Hence, an attempt has been made to construct a governance index based on certain indicators for the 27 districts of Assam for the years 2006 and 2016.

Review of Literature

The term governance can be used specifically to describe changes in the nature and role of the state following the public-sector reforms of the 1980s and 1990s. Typically, these reforms are said to have led to a shift from a hierarchic bureaucracy toward a greater use of markets, quasi-markets, and networks, especially in the delivery of public services. The effects of the reforms were intensified by global changes, including an increase in transnational economic activity and the rise of regional institutions such as the European Union (EU).Governance is defined as the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights meet their obligations and mediate their differences. Governance is a process through which authority in a country is exercised (UNDP, 1997; UNESCO, 2012). Governance is "the process of decision-making and the process by which decisions are implemented (or not implemented)". Governance is a process by which public institutions interact with one another as they manage public resources to attain the exalted objective of optimal social welfare (Barua, 2012). Development linked governance has been an issue much debated about in the contemporary world. Good institutions, good governance and good leadership are considered by many authors as necessary conditions to support the development effort of a country or region (Talmaciu et al, 2014).

Since the second half of the 1980's, growth and development studies have started to shed light on the importance of improving institutions of governance on economic growth (Emara and Chiu, 2016). Good institutions or more specifically good governance is considered as necessary condition to support the development effort of a country. The implementation of the principles of good governance has helped many countries to come out of the grasps of poverty, unemployment and inequality. The advocates of the development phenomenon have shifted their focus from the analysis of

effects of some the traditional variables such as accumulation of physical and human capital, technical and technological progress to the study of implications of some qualitative variables characteristic to the sociologic studies such as institutions, governance quality, aspects of the cultural context and social capital (Talmaciu et al, 2014).

The differences in economic performance among nations can be attributed to the difference in institutions (Acemogolu,et. al. 2000). Countries that have sound institutional policies have better growth rates compared to those which have minimum institutional set ups. This notion has been proved by studies that have done econometric analysis and have found positive relation between economic development and better governance conditions. Emara and Chiu (2016) have conducted their studies in the MENA (Middle Eastern and North African) region in which out of the nine countries of the MENA region have shown a positive correlation between governance and economic growth which includes those countries that have experience deterioration accompanied by deterioration and those countries that have experienced an enhancement accompanied by an enhancement in governance index and in economic growth, respectively.The better institutional mechanism could actually help economies to grow faster with higher level of economic well-being (Basu, 2004).

Though almost every study has focused on the positive relationship between development and governance a case study of Romania speaks otherwise. Unexpectedly, the regions having a higher development level have a very low quality of governance. Talmaciu et al., (2014) found in his study that most of the Romanian development regions are characterized by low levels of governance quality. In case of the Romanian development regions, the connection between the governance quality and economic development is quite strong and inverse one.

For better development outcomes in a country there is always a need for better governance, which shows a strong positive relationship between the two. Institutional arrangements in a better and efficient manner and the quality of governance at the national and lower levels support social well-being and economic development of people (Basu, 2002).

Conceptual Background

Governance Index

The Governance Index will be constructed to evaluate the quality of governance in the districts for the year 2006 and 2016. The governance measure is based on the dimensions, namely rule of law, public service delivery and participation. The governance index is constructed taking multiple components of governance rather than measuring the multiple aspects within a single component.

Dimension 1: Rule of Law

Rule of law measures the extent to which the people have confidence in and abide by the rules of society, in particular the quality of contract enforcement, the police, and the courts, as well as thelikelihood of crime and violence. The rule of law enables to attract more investment by guaranteeing greater confidence among the investors and to induce economic performance (Basu, 2002). The rule of law has three indicators, crime rates as a % per 100000 population, no. of riots that took place in the particular district expressed as a % per 100000 population and the total number of police station in the districts which will be used as a proxy for the total number of police personnel per 1,00,000 population

Dimension 2: Public Service Delivery

For governance to be thriving it is important that it efficiently delivers services to the public as service delivery is closely correlated with economic development. In other words, outputs of service delivery such as education, healthcare, infrastructure, etc., are significantly correlated with per capita GDP which is taken as a proxy measure for the level of development. Hence, to capture the public service delivery dimension of governance, three indicators are considered. Immunization target achieved (%), road length per lakh population and number of electrified villages per district expressed in % has been used as the indicators of this dimension.

Dimension 3: Participation

Participation of people in the development of a nation has been considered as an important feature so that the programs can be implemented properly. However, the involvement of the people is very minimal because of the barriers caused by the bureaucrats and politicians (Zaman, 2010). In this context, people's participation in democracy is an indicator of how much the people have faith in the government. To capture the people's participation Voting Turnover (% of the population voted in the election) has been taken as an indicator as it indicates people's willingness to legitimize the ongoing economic programs of the governments (Basu,2002).

Objective

The broad objective of this paper is to study the governance scenario across the various districts of Assam and to evaluate the relationship between economic development and governance among the districts of Assam which is showed by the correlation between governance index and the Gross District Domestic Product of the districts for the year2006 and 2016.

Methodology

For the construction of the Governance Index, first the raw data need to be normalized to a common scale. This is done in order to make the raw data free from differences in the units of measurement. Normalization makes them comparable and normally lies between 0 and 1. The best and the worst values in a particular indicator are identified. In order to normalize the values, the Max-Min formula has been used.

For variables which have a positive impact on the index:

$$S.D.I = \frac{Actual\ Value - Minimum\ Value}{Maximum\ Value - Minimum\ Value}$$

For variables which have a negative impact on the index:

$$S.D.I = 1 - \frac{Actual\ value - Minimum\ Value}{Maximum\ Value - Minimum\ Value}$$

The overall governance index score is calculated by taking the geometric mean of all sub-indices. The index for each of the sub-dimensions of governance is calculated using the geometric- mean. In 2010, the geometric mean was introduced to compute the HDI. Poor performance in any dimension is directly reflected in the geometric mean. In other words, a low achievement in one dimension is not linearly compensated for by a higher achievement in another dimension. The geometric mean reduces the level of substitutability between dimensions and at the same time ensures that a 1 percent decline in the index of, say, life expectancy has the same impact on the HDI as a 1 percent decline in the education or income index. Thus, as a basis for comparisons of achievements, this method is also more respectful of the intrinsic differences across the dimensions than a simple average (UNDP, 2010).

$S.D.I_1 = \sqrt[3]{CR * RPL * PPL}$

$S.D.I_2 = \sqrt[3]{EI * RI * ITA}$

$S.D.I_3$ = normalized value of V.T since we have only one variable.

Where, CR= crime per lakh population

RPL= riots per lakh population

PPL= police station per lakh population

EI = % of villages electrified

RI= road length per lakh population

ITA= immunization target achieved

VT= Voting turnover

Therefore, the Good Governance Index is formed as:

$G.G.I = \sqrt[3]{SDI1 * SDI2 * SDI3}$

Analysis and Discussion

The Human Development Index (HDI) of Assam is 0.557 which indicates that the level of overall human development in the state is just about half of the desired level. However, it has been observed that the overall level of human development in the state has shown a steady and continuous improvement over the last 15 years (HDI Report, 2016). Improved governance that promotes robust economic growth has the potential to address some of the complexities of the region. However, the growth rate is rising and the economy of Assam has been developing at a stable rate, nevertheless the process of development has not been uniform among the entire districts. The district-wise and various diversities wise,

both overall and dimensional achievements of Assam have shown wide variations. In order to remove this disparity good governance is required. Hence, in the next section the Good Governance Index (GGI)is constructed with the help of the methodology mentioned above to look into the governance scenario in Assam.

Table: 1 GGI for the districts of Assam, 2006

Districts	SDG1	SDG2	SDG3	GGI 2006	Rank
Baksa	0.181	0.035	0.822	0.174	27
Barpeta	0.333	0.619	0.564	0.488	9
Bomgaigaon	0.442	0.355	0.690	0.476	12
Cachar	0.299	0.428	0.622	0.43	19
Chirang	0.267	0.494	0.663	0.444	16
Darrang	0.322	0.463	0.631	0.455	14
Dhemaji	0.253	0.484	0.642	0.429	20
Dhubri	0.294	0.321	0.383	0.331	25
Dibrugarh	0.357	0.610	0.666	0.525	2
DimaHasao	0.301	0.369	0.429	0.362	23
Goalpara	0.246	0.493	0.700	0.441	17
Golaghat	0.428	0.508	0.567	0.498	7
Hailaknadi	0.251	0.385	0.666	0.401	22
Jorhat	0.287	0.693	0.691	0.516	5
Kamrup (M)	0.435	0.563	0.566	0.518	4
Kamrup (R)	0.343	0.903	0.582	0.565	1
KarbiAnglong	0.287	0.355	0.360	0.332	24
Karimganj	0.322	0.615	0.349	0.41	21
Kokrajhar	0.290	0.529	0.735	0.484	11
Lakhimpur	0.279	0.412	0.699	0.432	18
Morigaon	0.291	0.410	0.751	0.447	15
Nagaon	0.411	0.634	0.544	0.521	3
Nalbari	0.225	0.669	0.660	0.463	13
Sibsagar	0.411	0.473	0.639	0.499	6
Sonitpur	0.442	0.541	0.503	0.494	8
Tinsukia	0.287	0.630	0.631	0.485	10
Udalguri	0.078	0.770	0.567	0.324	26

Source: Author's own calculation

From the above table it is seen that the best performing districts are Kamrup (Rural), Dibrugarh and Nagaon. The bottom three districts are Baksa, Udalguri and Dhubri in the index.

Table 2: Gross District Domestic Product, 2005-2006

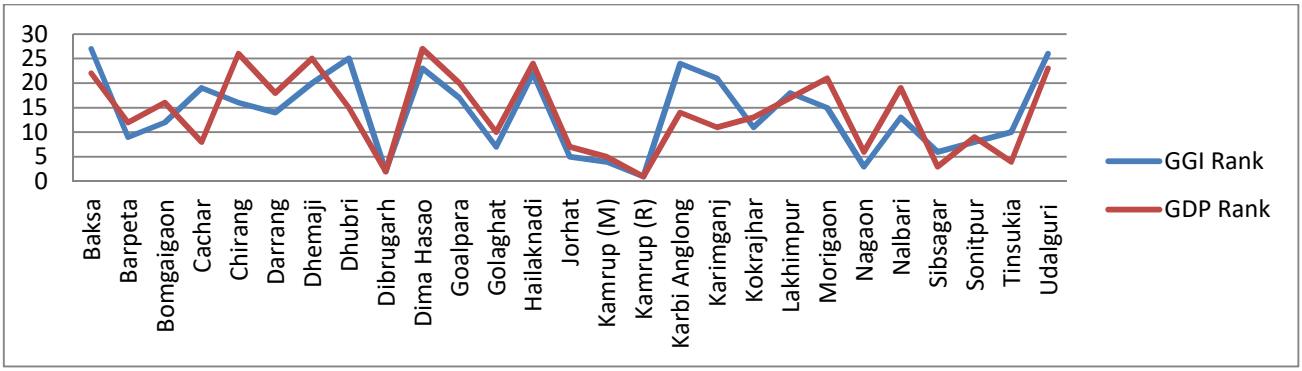
Districts	GDDP 2005-06	Rank
Baksa	105903	22
Barpeta	157127	12
Bongaigaon	130293	16
Cachar	226633	8
Chirang	57810	26
Darrang	123087	18
Dhemaji	70754	25
Dhubri	138512	15
Dibrugarh	293959	2
DimaHasao	50666	27
Goalpara	111277	20
Golaghat	168317	10
Hailakandi	86250	24
Jorhat	233668	7
Kamrup (R)	277860	5
Kamrup(M)	340766	1
KarbiAnglong	147613	14
Karimganj	163490	11
Kokrajhar	150618	13
Lakhimpur	127277	17
Morigaon	107131	21
Nagaon	255130	6
Nalbari	113021	19
Sibsagar	288989	3
Sonitpur	218638	9
Tinsukia	278414	4
Udalguri	105036	23

Note: Estimates are in lakh rupee values
Source: Directorate of Economics and Statistics.

Out of the 27 districts of Assam, Kamrup (M) had the highest Gross District Domestic Product in 2006 followed byDibrugarh and Sibsagar. The bottom three districts in this regard are Dhemaji, Chirang and DimaHasao.

The ranks of the GDDP and GGI for the districts of Assam with the help of the following graph for the year 2006.

Figure 1: GDDP and GGI, 2006



From the above figure it can be understood that the district GGI scores bear a positive relation as they have a corresponding peak in their GDDP rank. Similarly, the GGI scores have a trough with their corresponding GDDP rank and which is also supported by the literature.

Moreover, the relationship between the good governance scores and their gross district domestic product is shown with the help of the Pearson Correlation in the following table:

Table 3: Correlation between GDDP and GGI for the districts of Assam, 2006

	GDP 2006	GGI 2006
GDDP 2006 Pearson Correlation Sig. (1 tailed) N	1 27	.63 .398 27

*. Correlation is significant at the 0.05 level (1-tailed).

The table shows that governance and growth as shown by the GGI index and gross district domestic product have a high positive correlation of .630 for the year 2006 at 5% level of significance.

The following table shows the good governance index score and rank for the districts of Assam for the year 2016.

Table 4: Good Governance Index, 2016

Districts	SDG1	SDG2	SDG3	GGI 2016	Rank
Baksa	0.335	0.593	0.785	0.536	20
Barpeta	0.432	0.515	0.985	0.603	5
Bongaigaon	0.373	0.606	0.952	0.598	9
Cachar	0.273	0.542	0.700	0.47	25
Chirang	0.446	0.416	0.847	0.54	18
Darrang	0.419	0.563	0.925	0.602	7
Dhemaji	0.313	0.531	0.751	0.5	23
Dhubri	0.295	0.576	1.000	0.01	27
Dibrugarh	0.355	0.532	0.814	0.622	3
DimaHasao	0.916	0.165	0.761	0.487	24
Goalpara	0.463	0.506	0.904	0.592	11
Golaghat	0.425	0.494	0.825	0.558	14
Hailakandi	0.260	0.449	0.665	0.426	26
Jorhat	0.490	0.564	0.776	0.597	10
Kamrup (M)	0.530	0.537	0.907	0.637	2
Kamrup (R)	0.248	0.000	0.747	0.612	4

KarbiAnglong	0.741	0.429	0.758	0.554	15
Karimganj	0.304	0.650	0.674	0.511	22
Kokrajhar	0.433	0.501	0.862	0.566	13
Lakhimpur	0.364	0.535	0.850	0.549	17
Morigaon	0.410	0.469	0.864	0.55	16
Nagaon	0.385	0.668	0.889	0.602	6
Nalbari	0.426	0.545	0.895	0.572	12
Sibsagar	0.478	0.545	0.836	0.6	8
Sonitpur	0.437	0.845	0.824	0.673	1
Tinsukia	0.355	0.515	0.756	0.517	21
Udalguri	0.461	0.503	0.783	0.539	19

Source: Author's own calculation

After 10 years, the Good Governance Index for the districts of Assam for the year 2016 are calculated with the help of the same methodology. The first three districts are Sonitpur, Kamrup(M) and Dibrugarh respectively. The last three districts in this index are Hailakandi, Cachar and Dhubri.

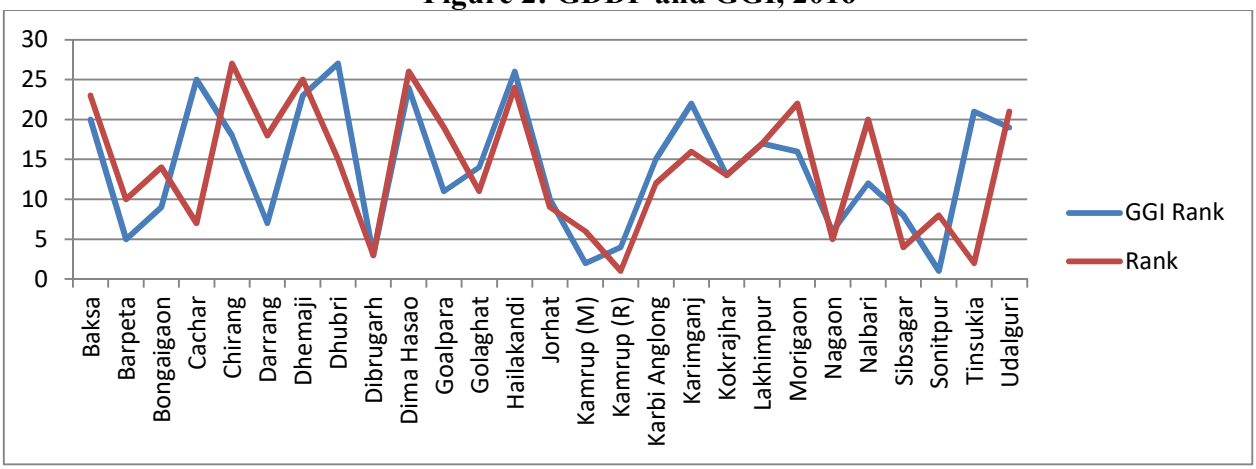
Table 5: GDDP of the districts of Assam, 2016

Districts	GDDP 2015-16	Rank
Baksa	323210	23
Barpeta	728142	10
Bongaigaon	520804	14
Cachar	940842	7
Chirang	197351	27
Darrang	422481	18
Dhemaji	241656	25
Dhubri	517516	15
Dibrugarh	1508746	3
DimaHasao	226411	26
Goalpara	419167	19
Golaghat	650347	11
Hailakandi	267754	24
Jorhat	881058	9
Kamrup (R)	971393	6
Kamrup(M)	1904928	1
KarbiAnglong	581262	12
Karimganj	492229	16
Kokrajhar	544181	13
Lakhimpur	470988	17
Morigaon	397630	22
Nagaon	1263915	5
Nalbari	411545	20
Sibsagar	1429630	4
Sonitpur	882834	8
Tinsukia	1523869	2
Udalguri	401130	21

Note: Estimates are in lakh rupee value
Source: Directorate of Economics and Statistics.

Out of the 27 districts of Assam, Kamrup (M) had the highest Gross District Domestic Product in 2006 followed byTinsukia andDibrugarh. The bottom three districts in this regard are Dhemjai, Chirang and DimaHasao. In 2006 also these three districts were at the bottom. The economic growth of these districts as shown by the GDDP is consistently low as these districts have low values in all the parameters of growth.

Figure 2: GDDP and GGI, 2016



From the above figure it can be understood that the district GGI scores bear a positive relation as they have a corresponding peak in their GDDP rank which can be seen in case of Baksa, Dhemaji, DimaHasao, Hailakandi etc. Similarly, the GGI scores have a trough with their corresponding GDDP rank and which is also supported by the literature. The districts which show the troughs are Barpeta, Darrang, Dibrugarh, Kamrup (R), Nagaon etc.

Similarly, the relationship between the good governance scores and their gross district domestic product is shown with the help of the Pearson Correlation in the following table:

Table 6: Correlation between GDDP and GGI for the districts of Assam, 2016

	GDP 2016	GGI 2016
GDDP 2016 Pearson Correlation Sig. (1 tailed) N	1 27	.567 .003 27

*. Correlation is significant at the 0.05 level (1-tailed).

The table shows that governance and growth as shown by the GGI index and gross district domestic product have a positive correlation of .567 for the year 2006 at 5% level of significance.

The following table shows the GGI scores of the districts of Assam for the year 2006 and 2016

and the respective changes in their ranks.

Table 7: GGI Scores and Ranks of the districts of Assam for 2006 and 2016

Districts	GGI 2006	Rank	GGI 2016	Rank	Change
Baksa	0.174	27	0.536	20	+7
Barpeta	0.488	9	0.603	5	+4
Bongaigaon	0.476	12	0.598	9	+3
Cachar	0.43	19	0.47	25	-6
Chirang	0.444	16	0.54	18	-2
Darrang	0.455	14	0.602	7	+7
Dhemaji	0.429	20	0.5	23	-3
Dhubri	0.331	25	0.01	27	-2
Dibrugarh	0.525	2	0.622	3	-1
DimaHasao	0.362	23	0.487	24	-1
Goalpara	0.441	17	0.592	11	+6
Golaghat	0.498	7	0.558	14	-7
Hailakandi	0.401	22	0.426	26	-4
Jorhat	0.516	5	0.597	10	-5
Kamrup (R)	0.518	4	0.637	2	+2
Kamrup(M)	0.565	1	0.612	4	-3
KarbiAnglong	0.332	24	0.554	15	+9
Karimganj	0.41	21	0.511	22	-1
Kokrajhar	0.484	11	0.566	13	-2
Lakhimpur	0.432	18	0.549	17	+1
Morigaon	0.447	15	0.55	16	-1
Nagaon	0.521	3	0.602	6	-3
Nalbari	0.463	13	0.572	12	+1
Sibsagar	0.499	6	0.6	8	-2
Sonitpur	0.494	8	0.673	1	+7
Tinsukia	0.485	10	0.517	21	-11
Udalguri	0.324	26	0.539	19	+7

The above table shows the GGI scores and the respective ranks of the districts of Assam. The highest positive change in the ranks is seen in case of KarbiAnglong with a change of +9. The district has improved significantly along all the indicators taken into account to construct the index. Sonitpur, Udalguri and Baksa all the three districts have the same change in ranks, i.e., +7. These three districts have moved seven places in the list. Conversely, the highest negative change is seen in the rank of Tinsukia district with a

change in rank of -11 followed by Golaghat that has come down by seven places with a score of -7.

Conclusion

In this paper, the good governance index for all the 27 districts of Assam for the year 2006 and 2016 had been constructed in order to comprehend the governance situation in Assam. The Gross District Domestic Product of the districts was also used as a parameter of growth. The correlation analysis shows that there is a positive relationship between governance and economic development which is represented by the GDDP in this paper which is in with the results found from the literature. Thus, governance has a very important role to play in the development of Assam. The complexity of issues, the diversity of the population and strategic location of Assam have led to a huge role to be played by the process of governance.Moreover, improved governance that promotes robust economic growth has the potential to address some of the complexities of the region. Thus, it can be concluded thatgood governance, more than policies and reforms, is the key to achieve inclusive growth.

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A STUDY ON THE EFFECTIVENESS OF CREDIT MANAGEMENT SYSTEM ON LOAN PERFORMANCE OF MICROFINANCE INSTITUTION IN SALEM DISTRICT

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ABSTRACT

The focus of the study is to assess the credit management system on loan performanceusing some micro finance institutions in salem district. Specifically we sought to determine the client appraisal on loan performance of microfinance institutions and to evaluate the effect of credit collection policies on loan performance of microfinance institutions. The researcher adopted both the qualitative and quantitative method to collect the data. The administrated questionnaire was used to collect the data from the selected MFI's.The population of the study constituted the management, non-management staff and client of Micro finance Institutions. The findings of the study showed that there was a positive relationship between the credit management practices and loan performance.

***Keywords**: Micro Finance Institutions, credit management practices, loan performance, client's appraisal*

Introduction of the study

Poverty is the main grounds to improve the economic status of developing countries. Microfinance is increasingly being considered as one of the most successful tools of reducing poverty. Microfinance has a major role in filling up the gap between the formal financial institutions and the rural poor.

Financial services could enable the poor to influence their initiative, accelerating the process of building incomes, assets and economic security. However, institutions rarely lend down-market to serve the needs of low-income families and women-headed households. They are very often deprived of access to credit for any purpose, the level of interest rate and other terms of finance.

The Micro Finance Institutions (MFIs) identifies the financial resources from the Banks and other typical Financial Institutions and provide financial support to the poor.A microfinance institution is an organization that offers financial services to low income populations. Almost provide loans to their members, insurance, deposit and other services to its customers.

MFIs are the key overseas organizations in each country that provides individual loans directly to villagers, small entrepreneurs, hard-up women and poor families. MFI is like a small bank with the same capital needs confronting any growing small venture but with the added responsibility of serving economically-marginalized populations. Many MFIs are creditworthy and efficient with established records of success, many are operationally self-sufficient.

Various types of institutions put forward microfinance are credit unions, commercial banks, NGOs (Non-governmental Organizations), cooperatives, and sectors of government banks. The commercial MFIs is growing. In India, these MFIs are referred to as Non-Banking financial Companies (NBFC). NGOs mainly work in remote rural areas thereby providing financial services to the persons with no way in to banking services.

The microfinance sector constantly focuses on understanding the needs of the poor and focusing on better ways of delivering services according to their requirements, developing the most efficient and effective way of providing finance to the poor.

The goal for MFIs should be:

- To improve the quality of life of the poor by providing financial and support services;
- To be a feasible financial institution developing sustainable communities;
- To create opportunities for self-employment for the needy;
- To train rural poor in simple skills and enable them to utilize the available resources and contribute to employment and income generation in rural areas.

Microfinance is typically availed for the section of society that is financially weak and politicallyresponsive. Microcredit as one of the many reasons for over-indebtedness.. It would directly imply that borrowers do not know

financial management and are ready to 'consume' loans tactlessly because loans are readily available and further that microfinance lenders are oblivious to the real consequences of such random lending.

Microcredit is an alternative source of finance to poor households. It is the households who use microcredit for additional consumption and do not use microcredit to substitute informal debt. Microcredit is cheaper, standardized and transparent whereas informal credit is often very costly, unreliable and riddled with coercive collection mechanisms. MFIs actively encourage clients to borrow for income generation activities including for micro-enterprises. This is further verified through loan exploitation checks. Many MFIs also pursue the complementary objective of livelihood promotion among their borrower base.

Loan performance refers to the financial soundness of a financial institution on the performance of their disbursed loan to various sectors. It also means how the loans are scheduled to act and how they are actually performing in terms of the plan payment compared to the actual payments. It is closely associated with timely and steady repayment of interest and principal of a loan. Default on borrowed funds could arise from unfavorable circumstances that may affect the ability of the borrower to repay

Effective credit management practices and loan accounting practices should be performed in a systematic way and in accordance with established policies and procedures. To be able to carefully value loans and to determine appropriate loan provisions, it is particularly important that banks have a system in place to reliably classify loans on the basis of credit risk to facilitate repayment of loans by customers

Statement of Problem

The achievement of MFIs largely depend on the effectiveness of their credit management systems because these institutions generate most of their income from interest earned on loans extended to small and medium entrepreneurs. The Central Bank Annual Supervision Report, 2010 indicated high rate of credit risk reflected in the rising levels of non- performing loans by the MFI's in the last 10 years, a situation that has badly impacted on their profitability. This trend not only threatens the feasibility and sustainability of the MFI's but also hinders the achievement of the goals for which they were intended to provide credit to the rural unbanked population and bridge the financing gap in the mainstream financial sector. A Study on microfinance credit recovery systems is a topic of considerable interest by many researchers. However, most studies undertaken in the past few years have focused mainly on credit used by MFI's and their impact on profitability .Absence of empirical studies on credit recovery systems and appreciation of the critical role that MFI's back bone of this study which sought to find out the effectiveness of credit management systems on loan performance among microfinance institutions

Objectives

The overall objective of the study was to assess the effectiveness of credit management systems on loan performance in microfinance institutions with reference to Salem.

Specific objectives

To determine the client perception towards loan performance of microfinance institutions

To evaluate the effect of credit collection policies on loan performance of microfinance institutions

Review of Literature

Pagadala Sugandadevi

This study used a descriptive research design to study the risk management practices of MFI in India. This study investigated the relationship between risk management practices and risk variables. Six MFIs were taken as sample and it used Pearson's correlation and regression to measure the hypothesis. It observed that there is a positive relationship between risk managementpractices and risk variables and further it concluded that there is no association between the number of years in operation and active borrowers and gross loan portfolio.

Evano Brako

The study focused on the assessment of relationship between credit management

practices and loan performance using some selected MFI in Ghana. It establishes the effect of credit terms and policy, lending, credit analysis and appraisal and credit risk control on loan performance. The study adopted both qualitative and quantitative methods. The data's were collected form management and non-management staffs. The study was analyzed using correlation and regression, the result of the study showed that there is a positive relationship between the credit management practices and loan performance.

Rose Mary Gatuhu (2011) Determines the effect of credit management on the financial performance of MFI in Kenya. The study adopted a descriptive survey design. The population of the study consisted of 59 MFI's.A Census was used to carry out the research. Primary data was collected using questionnaire. Descriptive statistics were used to analyze data. The study found that client appraisal, credit risk control and collection policy had effect on financial performance of MFI's in Kenya. The study established that there was strong relationship between financial performance of MFI's and client appraisal, credit risk control and collection policy. The study recommends that MFI's should enhance their collection policy by adapting a more stringent policy to a lenient policy for effective debt recovery.

Nsiah Richard (2017) assessed the effectiveness of credit risk management processes and its impact on financial performance of credit unions in Ghana. The study adopted CAMEL rating performance of the credit unions and the effects of NPL and loan portfolio on profitability of the institutions. Data was also obtained from the financial statements for 2007-2016. The study found that the credit unions do not have the capacity to relate or use its accumulated capital against credit risks. The regression analysis showed significant effects to NPL and loan portfolio on profitability of the credit unions. The study recommends that management of the credit union should put measures on place to grant more quality loans.

Scope of The Study

- In this study an attempt has been made to survey the clients of Micro finance institutions. Areas which are located within Salem district were selected for the study.
- The datas are collected from selective **E**ntrepreneurs as primary data collection with regard to the effectiveness of loan performance

Methodology

The aim of the study is to show the direction and strength of the effect of the credit management practices on the performance of the loan for this purpose the Micro finance institutions of salem district has been taken into account. The data has been gathered from 75 managers of credit departments of MFI of salem. credit terms, client appraisal, credit policies have been taken into account as the dimension of the credit management .the questionnaire regarding the dimensions of the credit management have been adopted whereas inferential techniques ,the correlation, chi-square test have been applied for achieving the objectives

Analysis And Intrepretation

Table No – 1Table Showing Number Of Officers

OFFICERS	BANKERS	PERCENTAGE
Senior	12	16%
Junior	57	76%
Administrative	6	8%
Total	75	100%

Source: Primary data

Interpretation

The above table shows that, (76%) of the respondents are junior cadre followed by the senior (16%) and the rest of (8%) are administrative.

The Majority (76%) of the respondents are junior cadre.

Tableno-2 Table Showing The Factors Affecting The Credit Appraisal

AFFECT	BANKERS	PERCENTAGE
Information sharing	29	39%
Lending	27	36%
Methodology	19	25%
Total	**75**	**100%**

Source: Primary dataINTERPRETATION

From the above table it can be found that, 39% of the respondents in the organisation said that

information sharing is the factors which affect the credit appraisal, 36% of the respondents feltthat lending the most affecting factor in the credit appraisal and remaining 25% of the respondents felt that methodology is the affecting factor in the credit appraisal.

Majority (39%) of the respondents in the organisation felt that information sharing most affecting factor in credit the appraisal.

Table No – 3 Clients Appraisal Regarding The Financial Terms And Condition Before Issuing Loans

TERMS CONDITION	STRONGLY AGREE		AGREE		DISAGREE	
	Res	Per	Res	Per	Res	Per
Terms and conditions are clear	23	31%	19	25%	33	44%
The borrowers sign of the terms and condition are before in each issue of loan realized	17	23%	13	17%	45	60%
Interest rate are clear/ clarity in interest rate in before issue	19	25%	11	15%	45	60%
Repayments and deadline segregation of repayment amount	17	23%	21	28%	37	49%

Source: Primary data

Interpretation

The above table shows that opinion of respondents regarding the terms and condition before issuing loans, 60% of them said that they have to sign the rules and conditions before realizing loans and they would be given clear idea regarding the rate of interest to be paid, 49% of them said that repayments and dead line regarding the repayment will also be clarified to the customers at the time of rising terms and condition only, 44% of them felt that terms and condition are clear.

So it can be concluded that, maximum 60% of them agree that they would sign the terms and condition before the loan in realized and clarity regarding the rate of interest will also be provided by MFI.

Table No-4 Table Showing Opinion Regarding The Role Of Loan Portfolio InLoan Performance

OPINION	STRONGLY AGREE		AGREE		DISAGREE	
We periodically assess credit quality of our loan portfolio	31	41%	39	52%	5	7%
We invest in Different Loan Products	39	52%	33	44%	3	4%
Decision to diversify our investment is only made by management	38	51%	33	44%	4	5%
The loan portfolio is invested in different sectors of theeconomy	27	36%	29	39%	19	25%
Our Loan Portfolio is fully insured	29	39%	37	49%	9	12%

Source: Primary data

Interpretation

The above table found that, opinion for the role of credit policy in loan performance, 52% of them agreed they periodically assess credit quality of their loan portfolio and they also strongly agree invest in Different Loan Products, 51% strongly agree that the decision regarding the diversification of funds are made only by them management, 39% of them agree that the loan portfolio is invested different sectors of the economy for agree and remaining of them agree that loan portfolio is fully insured

.

Table Showing CorrelationTable No: 5

$$r = \frac{}{(1{,}533.82)}$$

$$= 0.72$$

X	Y	X^2	Y^2	XY
12	29	144	841	348
21	12	441	144	252
23	21	529	441	483
19	13	361	169	32
$\sum x$ = 75	$\sum y$ = 75	$\sum x^2$ = 1,475	$\sum y^2$ = 1,595	$\sum xy$ = 1,115

The table shows the relationship between the credit risk control in MFI and guaranteeprovided to the clients

$$r = \frac{\sum XY}{\sqrt{(\sum X^2)(\sum Y^2)}}$$

$$r = \frac{1{,}115}{\sqrt{(1475)(1595)}}$$

$$1115$$

This is positive correlation. There is relationship between the credit risk control in MFIand guarantee provided to the clients

Table-6

The relationship between educational qualification of the respondents and financial institution are supportive to client's business level.

(Source: Primary Data)

Null Hypothesis

H_O: There is no significance relationship between educational qualification of the respondents and financial support to client's business level

Alternative Hypothesis

H_1: There is a significance relationship between educational qualification of the respondents and financial support to clients business level

.Degree of freedom :

(r-1) (c-1)(5-1) (5-1) 16

Level of Significance : 5% Table value : 26.296

Calculate value : 2.177

Result

Since the calculated value is less than the table value. So we accept the null hypothesis. There is relationship between educational qualification of the respondents and financial supportto client's business level

Findings

- The rate of non-performing loans increase due to pandemic situations, diversification of funds, high rate of interest ,etc
- According to the credit procedures , the applicants capabilities are scrutinised at the timeof lending loans.
- The organisation faces major problems in administrating the poor repayments.
- In credit management system the lending policies are very effective
- Clients would sign the terms and condition before the loan is realized and clarity regarding the rate of interest will also be provided by MFI.
- The barrowers perception is that the penalty provided by MFI on default or late paymentof loan are high
- The respondents felt that constant and continuous review of active borrowers files good.

Suggestion

- If microfinance is to be made a successful mass movement, the operations need to be made streamlined, cost effective and transparent.
- Loan size should be increased to meet the requirements of borrowers.
- The people should be given more opportunities for loan attainment.
- Knowledge should be provided by MFIs to interested borrowers for the better utilizationof credit.
- MFI should follow strict rules and regulations in loan performance and creditmanagement of the customers.

Conclusion

Microfinance is not just about giving micro credit to the poor rather it is an economic development tool whose objective is to assist poor to work their way out of poverty. It covers a wide range of services like credit,

savings, insurance, remittance and also non-financial services like training, counselling etc. Microfinance has the unique ability to provide sustainable development services if they are designed and implemented properly

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A STUDY ON THE PREFERENCE OF RETAIL INVESTORS TOWARDS ONLINE TRADING PLATFORMS

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ABSTRACT

Online trading systems have evolved with new age trading platforms and brokerage houses giving an array of different tools and features. This paper analyzes the consumer preferencestowards online trading platforms based on various aspects of the product itself .The study has shown that the satisfaction of customers in online transactions are influenced by the quality of services involving the factors of Brokerage charges, User Interface, Grievance redressal, Timely reports on market analysis and Margin limit.

Keywords:*Online Trading Platform, Brokerage charges, User Interface, Grievance redressal, Timely reports on market analysis , Margin limit*

Introduction

Investing is critical these days because savings alone are insufficient to meet all of our financial goals and keep up with inflation. There are a variety of investment options available, and one can select one based on specific needs and convenience. The appropriate investment option can be chosen based on one's risk tolerance and time horizon for achieving financial goals. Some financial assets aid in the achievement of short-term goals, while others aid in the achievement of long-term goals. In today's fast-paced world, technological advances have simplified the process of investing and managing investments.Even through smartphones, anyone can gain complete control of their investments. As investing in stocks necessitates constant monitoring of the stock market, one can stay connected with the market at all times. Trading platforms provide all necessary support and assistance by allowing secure real-time access to trading, research reports, stock price analysis, market news, and so on. If an investor has a trading account and an internet connection, he or she can buy or sell shares. Not only that, but they can trade currency, commodities, and so on through a single trading platform. Platforms make it possible to trade without difficulty because they allow for high-speed trading. These platforms have transformed the way people trade. These can simply be downloaded into the system or mobile device and used to begin trading.The expenses of trading have gone down as well with the online trading process.

Profitable investing necessitates the use of a brokerage service that is compatible with one's investing objectives, educational needs, and learning style. Choosing the best online stockbroker for one's needs, especially for new investors, can mean the difference between an exciting new income stream and frustrating disappointment.

Hence, we did a study to find out what factors an average retail investor looks for while choosing the broker. And overall, how satisfied the current users of the India's top 4 brokers are with services provided by brokerage houses.

The main objectives of this study were:

- To identify which Stock Brokerage House, do traders and investors prefer.
- Tounderstand therelationshipbetweenBrokerageHouse sand the demography that caters to them.
- To identify and measure the satisfaction level of the traders based on the transactional and customer services provided by the brokerage houses.
- To determine the user-friendliness of the trading platform.

Literature Review

In the study done by N. Sakthivel and SaravanakumarAnnamalaithey found that the majority of investors in the study area were extremely satisfied with the services of Sharekhan Ltd., Karvy Stock Broking Ltd., Coimbatore Capital Ltd, and MotilalOswal Securities Limited. It is suggested that all other brokerage houses in the study area design and improve their services in terms of procedures,

charges, facilities, and benefits in order to eventually overtake the aforementioned leading stockbrokers.[1]

K. Prabhakar Rajkumar, in his research done in 2015 found that Small-time investors are new entrants who want to test the waters and thus require information that brokers can provide in order to be introduced to more clients. The stock market has been steadily growing, and most share prices have remained constant or increased. With an increase in the small percentage of the middle-class investing in the stock market, the market will see an increase in investment and may not require the investments made by FDIs and FIIs in the coming years.[2]

JeelanBasha. V, (2014) in researchfound that the stock brokerage service plays a significant role in mobilizing funds due to its expertise in attracting investors to invest through appropriate guidance. It has become a profitable service in terms of earnings, provided that unfair means are not used.[3]

A comparative study done by BhavikUmakantSwadia, suggests that each brokerage firm has advantages and disadvantages. Investors like and dislike them for various reasons. Such as Religare, which is preferred by stock market participants due to its low brokerage rates, online terminal, and customized services. On the other hand, it has drawbacks such as low investor awareness, insufficient infrastructure, and a lack of coordination among its branches.[4]

The Indian stock market is highly volatile, sensitive, and reactive to unexpected shocks and news, which can have a rapid impact on market activity.According to the findings from the research study done by N.S.V.N Raju, Anita Patra in 2016, the majority of the investors in Visakhapatnam considered the average value of the top five highly influential factors, which were the Company's doings, Company Profitable, History and Outlook of the Company's Earnings, and the Company's Business Model. According to investors, there were four factors with the lowest priority or influence on stock selection decisions.[5]

A study done by KummarikuntlaSaritha, Y. Krishna Naga Lakshmi in 2019 talks how equity returns outperformed the returns on most other types of investments over the long term. Investors purchase equity shares or equity-based mutual funds because equities are thought to be the most rewarding investment option when held for a long period of time when compared to other investment options.[6]

S. Arunkumar and P. Poongodihave identified the most important retaining strategies are customer-friendly broking firms, adoption of the latest technology, availability of fund transfer facility via, online trading facility, mobile trading facility, and availability of traded information via SMS, all of which are very important for share broking firms to adopt and practice in order to create an efficient investor relationship.[7]

A research was done by P Mohanraj, P Kowsalyaandfindings of research provided a clear picture of the investor's perception of KSBL's service quality It also contributed to the factors influencing investors and provides insights for future growth.[9]

ArwinderSinghstudied the relativity between demographics and attitude dimensions. It was very good at categorizing brokers as Net brokers or non-Net brokers. In terms of demographics, ‘age (over 30 years)' was the most effective in distinguishing between Net brokers and non-Net brokers, followed by ‘trading experience (more than 10 years).' In terms of attitude dimensions, economic, convenience, and transparency played a significant role in distinguishing between Net brokers and non-Net brokers, followed by ‘variety, value-added services, and awareness.[10]

A study done by M. SadiqSohail and Majid F. Al-Otaibi has confirmed the assessment of the factors that contribute to investor satisfaction with a Saudi brokerage. However, as with many other empirical studies, there are some limitations. The study's limitation is that it did not investigate the possibility of any socio-demographic influences on the factors influencing the relationship and investor satisfaction.[11]

While talking about the features of online trading, S. Chris Robertson, in his study reported thatin the current scenario, aspects such as stock trading and investment opportunities with each investment opportunity that arises every day and has the potential to bring the investor wealth and prosperity, a new

investor is probably under tremendous pressure in today's financial world. Online stock trading creates global investment opportunities, and as a new investor, all of this can be understood with the assistance of a stockbroker, who will assist them in making investment decisions and managing his investments. As a result, for a new investor, the stockbroker can be a one-stop shop for all of their needs.[12]

J Victoris of the opinion that the stockbroker is an agent who provides a service to the investor, and the broker acts as an agent for both the buyer and seller of the security, ensuring the best investment on a commission basis. Each time, the broker will buy for the investor and sell for the seller, ensuring that the seller receives the best price.[14]

Research Framework Design

In light of the study's objectives, an exploratory (quantitative) research design was chosen. Exploratory research is one that primarily interprets previously available information, with a focus on analysis and interpretation of previously available data and the use of secondary data.

Research Methodology

The study is both descriptive and exploratory in nature. A structured questionnaire was used to collect primary data from respondents who use the selected broking firms for trading and investment activities. Secondary data was gathered from CDSL annual reports, SEBI Handbooks, other websites, and various journals.

Various statistical tools, as listed below, were used to achieve the goals of the current research. The respondents' primary data was analyzed and presented in the form of tables. The entire statistical test in this study was performed at a 5% and 1% level of significance. The following statistical tools were used:

- Kruskal-Wallis H Test
- Mann-Whitney U Test

Source for the Primary Data

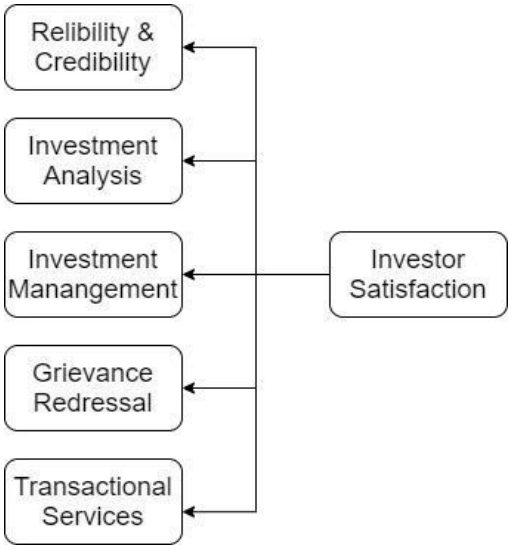
The data required for this stage was activation charges, brokerage rates, and services of the 4 brokerage houses (Zerodha, Angel broking, Upstox, ICICI Securities). And to know the behavior and perception of the customers towards the products and services provided by these service providers.

The data was collected in the form of questionnaires. Though the primary source was not enough for the study, it did give some accurate conclusions.

Source for the Secondary Data

Secondary data was gathered from various books, CDSL annual reports, regulators' handbooks, various newspapers, magazines, other websites and journals, etc. for information on the comparative analysis of various stock market players.

The secondary source did not provide any personal views of customers on the existing activation charges, brokerage rate, or services, but it was extremely helpful in completing the report and gathering information.



Developing the Research Methodology

Following the development of the model, a survey instrument was created to test the model. The first section of the instrument was designed to collect demographic data. Questions about the research framework were developed in the second part of the survey instrument.

The construct of the study was to measure, and the questionnaire items were all adapted from previous studies, which have been discussed in the literature review.

Sampling and data collection procedures

The population targeted for this study were all

adult individuals undertaking investments or trade with brokerage firms with a sample size of 70. Screening questions were included to filter out those not qualified to answer the remaining part of the questionnaire.

Due to the geographic vastness of the Indian Subcontinent and limitation of time, the population was confined to the adult individuals residing in the Indian Subcontinent and are the users of these four brokering houses (Zerodha, Angel broking, Upstox, ICICI Securities).

The non-probability technique of convenience sampling was used to collect data, by using a convenience sampling technique.During the first stage of data collection, part-time MBA students who are also dealing with brokerage firms for investment and trading were approached and their voluntary participation was sought. These respondents were from NMIMS University.

Sampling Procedure

Sampling of the population was done to maintain the following factors:

- Greater accuracy of the result
- Greater speed of data collection
- Availability of population element

The Brokerage Firms included in this study were:

- Zerodha
- Angel broking
- Upstox (RKSV Securities)
- ICICI Securities

The study was settled on the following four parameters to make sure that an adequate number of responses were received. These were:

Identification of Target population:At the start of the sampling process, the target population must be identified. Following sampling, the questionnaire was designed, the appropriate sampling method was chosen, and the survey was carried out as planned. The people who invest in stocks through brokerage houses/firms were the project's target audience. This was our target demographic, and their responses were analyzed.

Parameters: This identifies the key interpretations of the research that the researcher hopes to achieve at the conclusion of the survey. These parameters, in turn, define or guide the creation of the questionnaire. The parameters were arranged from critical to mediocre. The following parameters of interest were used in the study:

1. **Willingness to invest**: Everyone understands that stocks are high-risk investments. The difference in the ratio of their income spent on stocks versus monthly expenses revealed the investor's willingness/interest in the stock market.
2. **Experience with trading brokers:** This is a simple criterion that determined the investor's sentiment toward trading brokers based on their experience with the same.
3. **Their expectation from the brokers:** Certain expectations must be met by brokers when engaging in third-party assistance. By outlining these expectations, the broker will be able to make appropriate investments. Clients should have high expectations from whichever broker they choose to work with.
4. **Period of the investment and trading:** This factor assisted in determining whether the Investor requires third-party assistance in investing or if they are self-sufficient in handling all transactions. The occurrence that can compel a target population (new to trading) to invest. This aided in determining what event piqued investors' interest in the stock market/trading.
5. **Frequency of trading:** The number of trades executed in a given time interval is referred to as trading frequency. The holding period in high-frequency trading is typically short, ranging from milliseconds to a few minutes. This aided in determining investor interest in the stock market.
6. **Source of Information:** This is to determine where the investor gets their stock market information and how they trade accordingly.

Sampling Frame

It is a list of the elements from which the sample was derived. Ideally, it should only be a complete and correct list of population members. It is the list from which the survey samples must be drawn.

For this research, the sampling frame was the student and faculty list of the MBA students to be obtained from the admin. Depending on the responses which were received.

Sampling method

The sampling method is determined by the type of survey and the data collected. There are two types of sampling: probability sampling and non-probability sampling. A probability sample allows a researcher to make probability-based confidence estimates of various parameters that nonprobability sampling does not allow.
For this research, simple random sampling was chosen, which is the purest form of probability sampling. In this, each population element has an equal chance of selection.

Sample size

The sample size was 70 which gave us enough data to analyze and interpret and at the same time was not too time-consuming or difficult to manage.
For this research survey method was chosen and not the observation method as the survey method has an edge over the observation method and gave us accurate and quantifiable data upon which we administered some quantitative techniques to arrive at a particular outcome for the problem.

Data Analysis

Data analysis is the systematic application of logical and statistical techniques to describe, elaborate and illustrate, condense and recapitulate, and evaluate data in order to give it meaning. In other words, it is an analytic procedure that allows for the formation of inductive inferences from data while distinguishing between redundant or irrelevant noise in the data and actual signal/data points.
It is possible to identify patterns and trends for interpretation by using various data analysis tools to process and manipulate data, analyze relationships and correlations between data sets. SPSS, R, SQL, MATLAB, Python, SAS, and JAVA are some examples of data analysis tools. For this research paper, we used SPSS to analyze the data set and draw conclusions from it.

A structured questionnaire was used to collect primary data from respondents who use the selected broking firms for trading and investment activities. Secondary data was gathered from CDSL annual reports, SEBI Handbooks, other websites, and various journals. Following data collection, cleaning was performed to remove noise from actual data points, which was then analyzed, lead interpreted, and visualized.

Primary Data

In view of the objectives of the study listed above, an exploratory (Quantitative) research design was adopted. Exploratory research is one type that largely interprets previously available information, with a focus on analysis and interpretation of previously available data.
In this study, following independent variables were identified:

- Brokerage charges
- User interface
- Grievance redressal
- Market reports
- Margin limit

Secondary Data

The secondary data collected from the NSE website by Statista.com clearly indicates that Zerodha Brokering firm has the greater number of active users compared to Upstox (RKSV Securities), Angel Broking, ICICI Securities and others.[14]

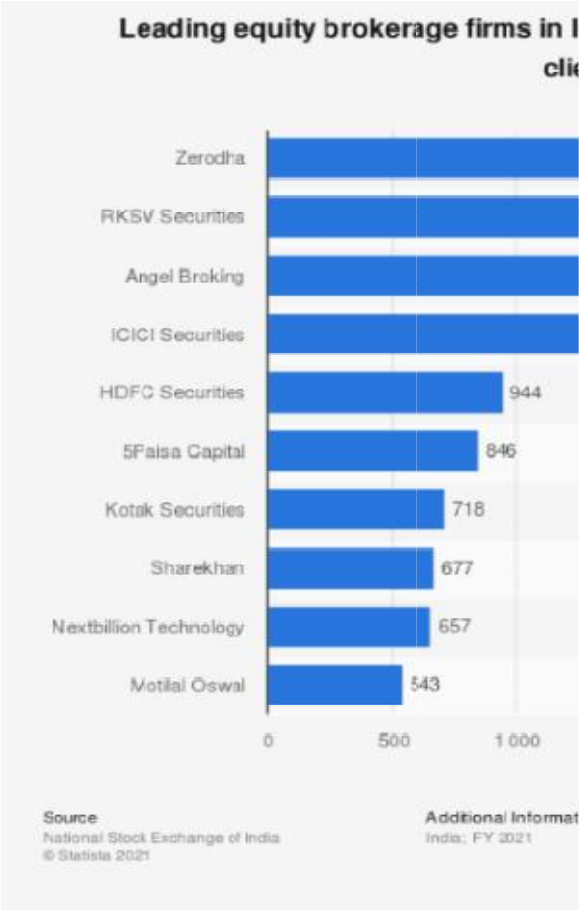


Figure 1: Leading equity brokerage firms in India, by number of active clients

Tools of Analysis

To achieve the objective of the present study various statistical tools as mentioned below were used. The primary data collected from the respondents was analyzed and presented in the form of tables. The entire statistical test in this study was carried out at a 5% and 1% level of significance. As the independent variable brokerage charges, user interface, grievance redressal, market reports and margin limit variables are Likert scale data they were classified as an ordinal type of dataset. And, one of the variables coined as "brokerage house" was classified as a nominal type of dataset. The aim was to compare the satisfaction level of the brokerage houses and determine the influence these parameters have on the satisfaction of the users. The next step was to determine which method was best suited to obtain the desired results and could interpret the results on. There were total of five variables on which the tests were carried out. These variables were brokerage charges, user interface, grievance redressal, market reports and the margin limit.

Initial testing was performed using basic statistical methods which included the use of tools like Descriptive statistics (Mean, Mode & Median, Standard Deviation, Correlation); Inferential statistics (Hypothesis Testing) and Simple Percentage with Range Analysis. These initial screenings were conducted on Excel; through the responses received. The "test responses" were satisfactory but to draw a comparison between the Brokerage Houses more in-depth analysis was required.

Hence for the levels present in the dataset, statistical tests like Kruskal-Wallis H-Test as a pre-test and Mann-Whitney U-Test as a post-test were employed.

Kruskal-Wallis H Test

The Kruskal-Wallis H test is a rank-based nonparametric test that can be used to see if two or more groups of an independent variable on a continuous or ordinal dependent variable have statistically significant differences. It is also known as the one-way ANOVA on ranks because the test uses the ranks of the data values rather than the actual data points.

It is a nonparametric alternative to one-way ANOVA and an extension of the Mann-Whitney U test that allows for the comparison of more than two independent groups. The term "non-parametric" refers to the fact that the test does not assume your data comes from a specific distribution.

The test determines whether two or more groups' medians differ. You compute a test statistic and compare it to a distribution cut-off point, as with most statistical tests. The H statistic is the used in this test, following are the test hypotheses:

- H0: There is an in-significant difference between the samples
- H1: There is a significant difference between the samples

Mann-Whitney U Test

When the dependent variable is ordinal or continuous but not normally distributed, the Mann-Whitney U test is used to compare differences between two independent groups. For instance, the Mann-Whitney U test could be used to determine views about pay inequality based on gender are measured on an ordinal scale.

Unlike the independent-samples t-test, the Mann-Whitney U test allows us to draw different conclusions about the data based on the assumptions made on the data's distribution. These conclusions can range from simply stating whether or not the two populations differ to determining differences in medians between groups.

Analysis of The Survey

To achieve the objective of the present study various statistical tools as mentioned below are used. The primary data collected from the respondents are analyzed and presented in the form of tables. The entire statistical test in this study will be carried out at a 5% and 1% level of significance. The statistical tools employed are:

- Kruskal-Wallis H Test
- Mann-Whitney U Test

Results / Major Findings:

The major findings of this research paper identify Stock Brokerage House that is most preferred among traders and investors among the following brokerage companies: Zerodha, Angel broking, Upstox, ICICI Securities and the most preferred were Zerodha and ICICI securities.

Another objective of this study was to find out the satisfaction level of the traders based on various transactional and customer services provided by these brokerage houses and the highest-rated brokerage house is Zerodha.

It also highlights the relationship between the demography of customers of theseBrokerage Houses and how that caters to it based on their financial income, age (highest rank 18-25 age group) and gender (mostly male).

The results were based on the following SPSS outputs:

The below output depicts the brokerage house ranking based on the dependent variables (Brokerage charges, User Interface, Grievance redressal, Timely reports on market analysis and Margin limit) analysis were in the highest rank was for Zerodha followed by ICICI securities.

Descriptive Statistics

	N	Mean	Std. Dev	Min.	Max.
Brokerage Chargers	70	4.10	0.935	2	5
User Interfaces	70	4.06	0.976	1	5
Grievance Redressal	70	3.74	0.988	2	5
Timely Market Analysis Reports	70	3.56	1.030	1	5
Margin Limit	70	3.57	0.861	2	5
Overall Satisfaction	70	3.99	0.691	2	5
Brokerage House	70	2.84	1.647	1	5

Table 1: Descriptive Statistics

Kruskal Wallis Test
Brokerage Charges

Brokerage House	N	Mean Rank
Zerodha	26	41.37
Angle Broking	6	32.33
Upstox	7	45.86
ICICI Securities	15	30.63
Others	16	27.19

Table 2: Kruskal Wallis Test – Brokerage Charges

User Interface

Brokerage House	N	Mean Rank
Zerodha	26	43.00
Angle Broking	6	27.00
Upstox	7	31.14
ICICI Securities	15	32.93
Others	16	30.81

Table 3: Kruskal Wallis Test – User Interface

Grievance Redressal

Brokerage House	N	Mean Rank
Zerodha	26	36.13
Angle Broking	6	25.92
Upstox	7	20.86
ICICI Securities	15	43.37
Others	16	37.09

Table 4: Kruskal Wallis Test – Grievance Redressal

Timely Market Analysis Reports

Brokerage House	N	Mean Rank
Zerodha	26	40.77
Angle Broking	6	23.75
Upstox	7	29.21
ICICI Securities	15	38.77
Others	16	31.03

Table 5: Kruskal Wallis Test – Timely Market Analysis Reports

Margin Limit

Brokerage House	N	Mean Rank
Zerodha	26	41.48
Angle Broking	6	21.83
Upstox	7	38.93
ICICI Securities	15	35.97
Others	16	28.97

Table 6: Kruskal Wallis Test – Margin Limit

Overall Satisfaction

Brokerage House	N	Mean Rank
Zerodha	26	43.98
Angle Broking	6	31.17
Upstox	7	27.79
ICICI Securities	15	35.53
Others	16	26.69

Table 7: Kruskal Wallis Test – Overall Satisfaction

Test Statistics

	Brokerage Charges	User Interface	Grievance Redressal	Timely Market Analysis Reports	Margin Limit	Overall Satisfaction
Kruskal Wallis	8.655	6.843	7.950	6.088	7.713	11.050
Df	4	4	4	4	4	4
Asym. Sig.	0.070	0.144	0.093	0.193	0.103	0.026

Table 8: Kruskal Wallis Test – Test Statistics

From the test statistics, it was found out that there's an in-significant difference between the brokerage houses for variables such as charges, GUI, Grievance redressal, Research Report & margin limit as the sigma value is greater than 0.05. But there's a significant difference in the overall satisfaction as the sigma value is lesser than 0.05.

Hence to find out where the difference lies in overall satisfaction Mann-Whitney U test was carried out.

The Mann-Whitney Test reflects the comparison between Zerodha and Upstox based on the rankings received via primary data collection and Zerodha has the highest overall satisfaction ranking.

Mann – Whitney Test
Overall Satisfaction

Brokerage House	N	Mean Rank	Sum of Ranks
Zerodha	26	23.15	602.00
ICICI Securities	15	17.27	259.00

Table 9: Mann Whitney Test - Results

Test Statistics

	Overall Satisfaction
Mann Wintney U	139.000
Wilcoxon W	259.000
Z	-1.907
Asym. Sig. (2-tailed)	0.057
Exact Sig. (2*(1-tailed Sig.))	0.134

Table 10: Mann Whitney Test – Test Statistics

From the results of Mann-Whitney U test, the test-statistics showed that the value of sigma is slightly lesser than 0.05 which suggests that Zerodha has ranked higher compared to Upstox in the overall satisfaction.

Now to find out if there's a significant difference in choice for selecting the broker between male & female investors again Kruskal-Wallis Test was carried out.

The following Kruskal-Wallis Tests signifies the effect of demography (age and gender) on customer satisfaction with respect to various Brokerage Houses.

The age group of the sample majorly belonged in the 18-25 age category and most of them were male respondents.

The test statistics shows that the sigma value is greater than 0.05, hence there's no significant difference between the male or female for the choice of brokerage house.

Descriptive Statistics

	N	Mean	Std. Dev	Min.	Max.
Brokerage House	70	2.84	1.647	1	5
Gender	70	1.74	0.440	1	2

Table 11: Descriptive Statistics based on gender

Kruskal Wallis Test
Brokerage House

Gender	N	Mean Rank
Female	18	36.17
Male	52	35.27

Table 12: Kruskal Wallis Test – Brokerage House

Test Statistics

	Brokerage House
Kruskal Wallis	0.28
Df	1
Asym. Sig.	0.867

Table 13: Kruskal Wallis Test – Test Statistics

The test statistics for the Kruskal-Wallis test gave sigma value more than 0.5, which suggests that there's an in-significant difference between the choice of brokerage house by investors of different ages.

Implications

To evaluate the differences across five levels of brokerage houses for preference was tested using Kruskal Wallis Test. The test revealed insignificant differences (Asymp. Sig. = .317) in the preference was evaluated using Mann-Whitney Test

The primary data collected from the respondents are analyzed and presented in the form of tables. The entire statistical test in this study will be carried out at a 5% and 1% level of significance. For this study three different statistical tools were used. As the independent variables' brokerage charges, user interface, grievance redressal, market reports and margin limit variables are Likert scale data. They were classified as an ordinal type of dataset. And one of the variables coined as brokerage house was classified as a nominal type of dataset. The aim was to compare the satisfaction level of the brokerage houses and determine the influence these parameters have on the satisfaction of the users. The next step was to determine which method was best suited to obtain the desired results and could interpret the results on. There were total of five variables on which tests were conducted. These variables were brokerage charges, user interface, grievance redressal, market reports and the margin limit.

Initial testing was performed using basic statistical methods which included the use of tools like Descriptive statistics (Mean, Mode & Median, Standard Deviation, Correlation); Inferential statistics (Hypothesis Testing) and Simple Percentage with Range Analysis. These initial screenings were conducted on Excel; through the responses received. The "test responses" were satisfactory but more in-depth analysis was required to draw a comparison between the Brokerage Houses.

Hence for the levels present in the dataset, statistical tests such as Kruskal-Wallis H-Test as a pre-test and Mann-Whitney U-Test as a post-test were employed.

Conclusion

The study has shown that the satisfaction of customers in online transactions are influenced by the quality of services involving the factors of Brokerage charges, User Interface, Grievance redressal, Timely reports on market analysis and Margin limit. Brokerage firms operating in the market should pay close attention to the findings of this study. This study makes a valuable contribution to the existing knowledge related to the brokerage firms and customer demographics of the stock market. However, as in the case of several other empirical studies, there are some limitations. First, the study has examined the possibility of any socio-demographic influences between the factors on the relationship and investor Satisfaction. A suggestion for future research is to examine the effects of demographic and psychographic variables.

For example, examining investor satisfaction in trading segmented the market into two distinct categories of investors. These were based on income level and psychographic problems. It will be interesting to undertake a similar study, given the cultural differences between India and other countries. As the brokerage firms have two kinds of products to offer, goods and service, to engage in the service, the company should maximize the relevant factors to achieve an elevated level of customer satisfaction.The results of this study also matched with the secondary data collected.

Limitations & Future Scope

It is to be noted that the Brokerage House Survey is skewed in the sense that the age group and the income of the participants all fall in a particular median. With further analysis, participants and research materials these factors will be eliminated.

Most of the age group belonged from 18 to 25 as the Survey was circulated amongst university students who were freshers and/or had very less work experience. This automatically resulted in the selection of a Brokerage House that was the most technologically stable. A Brokerage House that has the best user-friendly interface and is simpler to understand. This is because since 63.9% of the participants were below 25 years of age, their experience and understanding of the Stock Market are limited.

Since most of the participants are students and/or freshers, the income level gets affected as well. 50.3% of the participants have an income below 5 lakhs. This naturally hampers their trading limit. So, these participants are in the need of a brokerage house that does not have a high broker charge.It was found that 73.6% of the participants were male. It was a very skewed result that could not be explained.

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"MODERATING EFFECT OF ORGANIZATIONAL POLITICS AND EMPLOYEE ENGAGEMENT ON TEACHING EFFECTIVENESS"

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ABSTRACT

The teaching effectiveness of a faculty is assessed on various criteria such as professional competencies, student feedback, interpersonal relationships with students and peers, personality of the teacher and last but not least teaching capabilities. There are abundant studies on teaching effectiveness, organisational politics and employee engagement, however this research is the first of its kind to discuss about the relationship and its influence on teaching effectiveness. The researcher has collected the primary data source through structured questionnaire collected from 410 college teachers working in various private engineering colleges operating in Rayalaseema Region of Andhra Pradesh. Since the study is sought to understand the relationship and influence among the variables, the study adopts descriptive research design.The sample selected from the total population through convenience sampling method in selection of college teachers in collecting the primary data. The results revealed are as follows:

- *The study findings reveal that college teachers have mediocre perception levels towards organizational politics and employee engagement.*
- *The study finds significant association organisational politics, employee engagement and its influence on teaching effectiveness.*
- *In addition the study finds negative association of organizational politics and Teaching Effectiveness.*
- *However the study fails to prove significant moderation effect of organizational politics on the relationship between employee engagement and teaching effectiveness.*

Even though study fails to prove the moderation effect of organisational politics, it should be considered as critical variable in influencing teaching effectiveness. Consequently the study suggests management of private engineering colleges need to design appropriate policies and programmes to free the institutions from politics.

Key Words: *Employee Engagement, Organisational Politics, Teaching Effectiveness, Private Engineering Colleges.*

Introduction

Organisational politics is a quest of individual agendas and self-interest in an organization without regard to their effect on the organization's efforts to achieve its goals. Hence it is treated as a negative variable that affects environment, morale, culture and employee behavior. Private engineering colleges too cannot be exempted from Organizational politics, which can influence the overall teaching effectiveness. Hence the researchers in human resource domain are more interested in understanding the characteristics and momentous of organizational politics and its influence on performance of the institution. It is evident from the literature that organizational politics has among the various variables in negatively affecting the growth of the organization in many areas.

At the other end employee engagement is a noteworthy behavioral variable that has become essential and expected by the management. In order to enhance employee engagement the management has to think and implement those schemes pertaining to the welfare and growth of employees in the organization. However the organizational politics is one variable that has negative effects on the employee who is engaged in his work.

After the effects of prolonged recession and at the foot hills of growth of global economy, the colleges and universities are been questioned and facing greater scrutiny on their efficiency as well as concerns about teachers ability to educate a highly diverse population. The teachers in private engineering colleges in particular are been facing enquires and reports on their productivity, rigor and contributions to the economic development and intellectual vitality, at the outset coping with reduced public funding and assuming larger academic workloads. Consequently the teachers in private engineering colleges have reported professional isolation, higher levels of occupational stress and decreasing levels of job

satisfaction and retention. The present levels of economic and demographic conditions, teachers are expected to contribute higher levels of accountability pertaining to their teaching and research efforts and also to cater the needs of higher diverse and globalised society. Consequently the study is assumed to be important in understanding the various employees and organizational factors that influence teaching effectiveness. Hence the present research is sought to understand the association between Organizational Politics, Employee Engagement and Teaching Effectiveness.

Review of Literature

Massimo Garbuio, Dan Lovallo, (2017), in their paper titled "Does organizational politics kill company growth?", has discussed about the organisational politics and its negative effects on organisation growth. The basic question behind the research is that whether the organizational politics is positively associated to organisation performance. It is observed from the literature though there are ample studies on the above research question, but are limited to the elaboration in the form of case studies, apart from a niche set of studies in international business.

Hence the above research is been aimed to investigate the above said question through a survey among managers and executives working around the world and across industries. The study was successful in determining the association between politics and the ability of a company to achieve the higher heights. The study was conducted among the 382 executives from across the world. It is evident from the study that alternative explanations of slow speed to growth are explained by power centralization and decision making layers and conflicts.

It is evident from the present study that covert action of executives in influencing the internal decision has direct negative effect on a firm's ability to reach higher growth rates. That is, not only is politics time-consuming but it may also have a detrimental impact on the selection of the best growth opportunities. Hence it can be understood that politics has negative influence on growth, it slows down the ability and creates hurdle in reaching higher growth rates of market. It is also evident from the study that the reasons for slow pace to market is not only because of too many decision making layers but also because of consultative processes in resource allocation decisions and conflicts. **Zinta S. Byrne, Steven G. Manning , James W. Weston,Wayne A. Hochwarter, (2017)**, in their paper tilted "All Roads Lead to Well-Being: Unexpected Relationships Between Organizational Politics Perceptions, Employee Engagement, and Worker Well-Being" has been initiated to investigate the perceptions of organizational politics and its negative influences on detrimental outcomes of the organization and employees. The recent past demand for literature on more balanced treatment, the present study is been extended to know how the positive and negative organizational politics perceptions are reasons for stressors and affecting the employee efforts through the effect on social environment. The study assumes that employees appraise of positive and negative politics is either a challenge or hindering stressors or they respond with engagement and disengagement as problem or emotion focused coping strategies. In particular employees perceiving negative politics as hindrance use both problem and emotion focused coping strategies such as (1) decreasing their engagement, (2) narrowing the focus of their engagement, or (3) disengaging. Consequently these strategies result in negative impacts on organization, but if the employees coping with negative politics leads to their positive well being.

Conversely the employees perceiving positive politics as a challenge stressors use problem focused coping strategies such as increasing their engagement to reap the perceived benefits of a positive political environment. However positive politics perceptions may be perceived as hindrance stressors in certain situations and therefore employees resort to adopt emotion focused coping wherein they use a disengagement strategy. In disengagement process they deal with negative effects of politics perceptions and resulting in positive well being. Thus the study conceptual framework suggest that any unexpected turn to the stress process of politics can lead strain provoking component of employee work environments.

Erin M. Landells, Simon L. Albrecht, (2017),in their paper titled "Positive Politics, Negative Politics, and Engagement: Psychological Safety, Meaningfulness, and Availability as "Black BoxExplanatory Mechanisms" has been initiated to investigate on the psychological mechanisms that can explain the influence of negative organizational politics on individual employees and organisational performance. Since majority of the literature is inclined towards understanding the negative outcomes such as stress, burnout and turnover intentions. Hence the present study is sought to describe more about the positive conceptualizations of organizational politics and investigate the potential associations between both positive and negative politics and employees engagement. The outcome of the present study is to propose a model exhibiting how psychological conditions such as safety, availability and meaningfulness explain the relationship between perceptions of positive and negative politics and employee engagement. Therefore it is concluded and suggested that practical interventions that support organizations developing a more positive organisational political climate.

Aviv Kidron, HedvaVinarskiPeretz (2017), "Organizational political climate and employee engagement in political behavior in public sector organizations: a mixed methods study",The study is sought to know the association between organisational politics climate and individual engagement in political behavior. Further the moderating role of organizational commitment and trust in local government organizations. Mixed and explanatory methods design were adopted and data is collected from 217 managers and employees, in addition 16 interviews were conducted.

The findings of the study suggested that political climate is associated with political behavior, further associated with trust and affective commitment and negatively associated to political climate. The moderating role of trust between political climate and political behaviors is evident from the study results. In addition it is observed that the moderation effect of affective commitment moderated by political climate and political behavior in the case of women. It is also evident that men perceive more positive than women regarding the organizational politics.

Usman Aslam, FarwaMuqadas, Muhammad Kashif Imran, Ubaid Ur Rahman, (2018) in their paper titled "Investigating the antecedents of work disengagement in the workplace" has proposed that organizations are anxious in knowing the causes of work disengagement and effecting the desired level of performance. The predictors and levels of work disengagement differ among organizations and sectors, the reason could be the differences in organisationalcultureGalitMeisler, EranVigoda-Gadot,AmosDrory, (2017). Hence the aim of the present study is to determine the predictors of work disengagement. The study is conducted among 303 employees of the public sector organizations through self administered questionnaires and cluster sampling technique. Hayes's (2013) moderation model and regressions statistical techniques reveal that work disengagement is increasing because of manager's personal preferences, unfairness,over the rule practices, negative political influence, work overload, and a lack of accountability in the workplace. It is also evident that there is positive relation among organizational injustice, organizational politics, work overload, and work disengagement. In addition it is also observed that organizational injustice is a strongest antecedent of work disengagement. Bureaucratic culture of the public sector organizations has a strong strengthening effect on above-stated relationships. The mixed methods design for studying the contextual-organizational antecedent (perception of political climate) for politicking and individual engagement in political behavior may serve to expand the theory of organizational politics Mohammed Y.A. Rawwas, BasharatJaved, Muhammad Naveed Iqbal, (2018).

Objectives

The following are the objectives of the study:

1. To investigate the demographic profile of faculties working in private engineering colleges in Andhra Pradesh
2. To determine the negative effects and moderations of organisational politics on

relationship between employee engagement and teaching effectiveness.

Hypothesis Development

H1:*There is significant association between employee engagementand Teaching Effectiveness*

H2: *There is negative association of Organisational Politics on Teaching Effectiveness*

H3: *Organisational Politics negatively moderates the relationship between employee engagement and Teaching Effectiveness.*

Research Design

The aim of the present study is determine the perception levels of engineering colleges teachers and direction of relationship between Employee Engagement, Organizational Politics and Teaching Effectiveness. Consequently the study assumes employee engagement, organisational politics and teaching effectiveness as independent, moderating and dependent variables. The engineering college teachers are the respondents of the study. Hence the study is sought to describe the levels and relationships between the study variable, descriptive research design is adopted.

Sample Design and size

Andhra Pradesh is a geographically dispersed state, classified with two regions – Rayalaseema and Coastal with 13 districts. Convenience sampling techniques is followed to select the respondents among the populations. Since the faculty members working in private engineering colleges working are geographically dispersed, it is difficult to get access, because of their availability during the visit to the colleges; hence the study adopts convenience sampling method.

Even though convenience sampling method is adopted at most care is taken in selecting the colleges and faculty members for collection of the primary data. The study in the first stage divides Andhra Pradesh into Rayalaseema region comprising of four districts and Coastal region comprising of nine districts, then among the two regions Rayalaseema Region is selected for the study. Rayalaseema region is selected since the density of private engineering colleges to area is high comparatively to Coastal region. In Rayalaseema region, i) Kadapa (21 colleges), ii) Chittor (32 Colleges) iii) Kurnool (21 colleges) and iv) Anantapur (15 Colleges) have 89 private engineering colleges are selected as sample in first stage.

The researcher has visited the above engineering colleges as stated in the above towns randomly, before visiting the colleges the faculty members and principals of the respective colleges are been requested for permission to conduct the survey. Hence the survey is conducted only in those colleges where the permission is granted.

The sample size of the study is calculated using www.raosoft.com website. The inputs to be given for calculating sample size are i) Margin of error accepted ii) Confidence level iii) Population size and iv) Response distribution.

The study considered a Margin of error equal to standard of 5%, Confidence level 95%, Population size of 20,000 (Assumed value, since the exact number of faculty members is not known) engineering faculty members in Andhra Pradesh and Response distribution of 50%. Finally the calculated value of sample size is 377. Hence the study collected primary data from 400 engineering college faculty to the nearest value. The 400 sample is been distributed equally among the four districts of Rayalaseema Region, Hence from each district the study has collected the primary data from 100 engineering college faculty members. The details are as follows.

Table 1: Sample Distribution

SL.No	District	Sample Size
1	Kadapa	110
2	Chittor	100
3	Anantapur	100
4	Kurnool	100
Total Sample Size		**410**

Data Collection

The present study has collected the primary data by distributing structured questionnaire among engineering college faculty members working in Andhra Pradesh. Enough care has been taken so that the data collected is not biased. We have distributed questionnaires to each and every faculty and the opinions given by them are truly confidential.

Statistical Tools

Data is analyzed by using SPSS 16.0 version. Statistical tools like correlation and regression analysis were employed for this study.

Data Analysis

The study states Organizational Politics negatively moderates the relationship between Employee Engagement and Teaching Effectiveness. The hypothesis is tested by conducting regression analysis, Teaching Effectiveness is considered as dependent variable, Organizational Politics as moderating variable and Employee Engagement as independent variable. Results are summarized in the following **Table 2**.

Table 2: Moderation Effect of Organizational Politics on Employee Engagement and Teaching Effectiveness

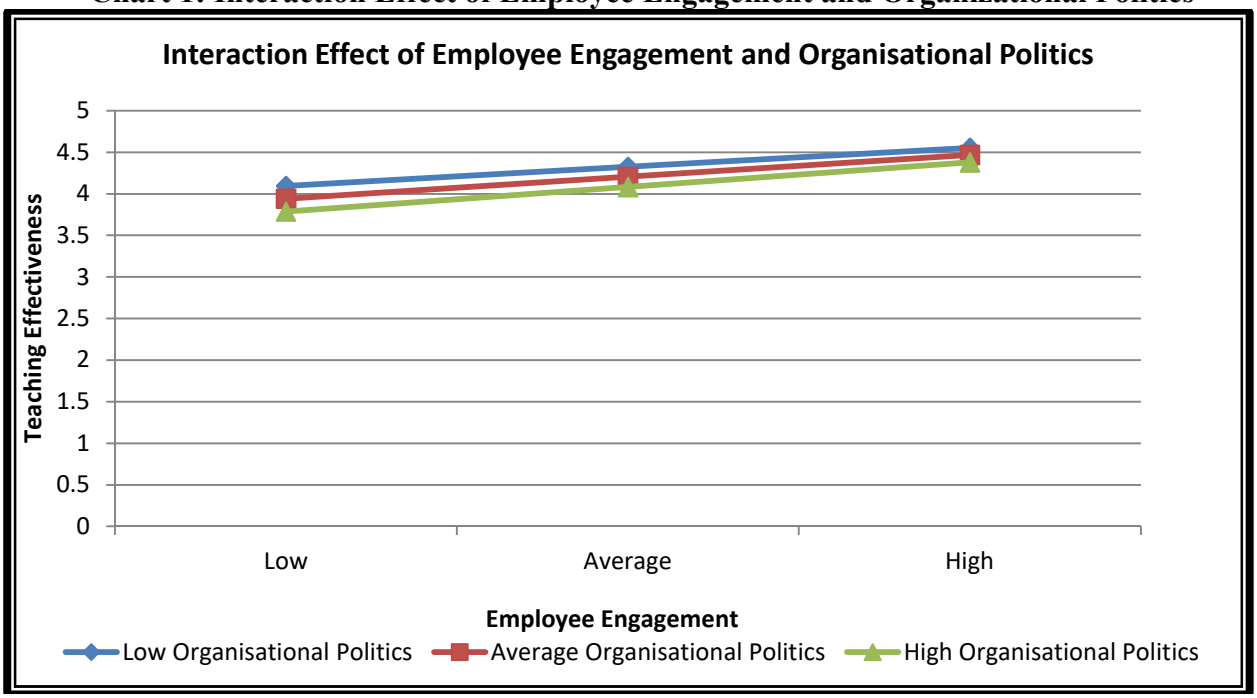
Regression Parameters	EmployeeEngagement(EE)	Organisational Politics(OP)	EE*OP	Model Summary
R^2			.0017	.119
Df			406	406
F			.791	18.44
P			.374	.000**
B	.459	-.203	.0989	4.204 (Constant)
T	6.407	-2.947	.889	103.129
P	.000**	.003**	.374	.000**

**Significance at P < 0.01.
* Significance at P < 0.05.

Model: Employee Engagement (Predictor), Organisational politics (Moderating Variable) and Teaching Effectiveness (Dependent Variable).

The regression of Organizational Politics on teaching effectiveness is significant at β = -.203, t (406) =-2.947, p = .003. The regression of Employee Engagement on Teaching effectiveness is significant in presence of Organisational Politics at β = .459, t (406) = 6.407, p = .000. The total model summary is significant at R^2 = .119, F (406) = 18.44, p = .000. Interaction effect of Organisational Politics and Employee Engagement is insignificant at R^2= .0017, F (406) = .791, p = .374, β = .0989, t (406) = .889, p = .374.

Chart 1: Interaction Effect of Employee Engagement and Organizational Politics



It is observed from the above interaction plot chart 1, Teaching Effectiveness is low at High Organisational politics and Low Employee Engagement. Further, it is inferred that Teaching Effectiveness is high in the conditions of Low Organisational Politics and High Employee Engagement. However, study fails to prove statistically the moderation effect of Organizational Politics on relationship between Employee Engagement and Teaching Effectiveness. Hence **H1 and H2 are accepted and H3** is rejected.

Discussion

The study find faculty has neutral opinions regarding organizational politics. Politics is a constraint for organisational development. In the context of private engineering college the study opines Organisational Politics being neutral as a positive setting. In the opinion of faculty and personal observation, Organisation rewards people working hard; favoritism is less in the organization. Conversely the faculty opine, they fear to speak due to retaliation of others; there are some influential group in organisation on which no one crosses.

The study finds relatively positive levels of Employee Engagement among faculty in engineering colleges. The faculty opines that they are fascinated being a member of their organisation; highly engaged in their job and they feel concern regarding the activities happening in their organization. Hence the study opines faculties are engaged in their job and organisational activities.

The study examines relationship between organisational politics, employee engagement and teaching effectiveness, finds that there is significant relationship. However the study fails to proves significant moderation effect of Organisational politics.

The study finding shows that Organisational Politics and Employee Engagement have significant variance in Teaching Effectiveness in isolation. Conversely interaction plot reveal unresponsive lines indicating Organisational Politics have insignificant moderation effect on Employee Engagement and Teaching Effectiveness. Additionally the statistical results reveal Organisational Politics have insignificant moderation effect. Hence the study opines Organisational Politics has no influence on the relationship between Employee Engagement and Teaching Effectiveness.

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ARECA LEAF TABLEWARE: CAN IT BE AN ECOFRIENDLY SOLUTION TO DISPOSABLES?

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ABSTRACT

Everyone moans about pollution, loss of ecology and destruction of environment, and yet each one of us, contribute daily towards it either intentionally or unintentionally. In search for a better quality of we have started adopted numerous destructive and unsustainable practices. One such practice is the rising use of non-biodegradable plastic disposables. Such tableware are convenient and inexpensive in terms of money. However, they are devastating for the environment. Inorder to tackle this problem, scientists and entrepreneurs have been coming up with environment friendly alternatives over the years but none of them seem to have caught up as a replacement for plastic disposables. One such innovation is the use of Areca Leaves to make biodegradable tableware which can be used in a variety of situations such as house parties, picnics, office spaces, meetings, conferences and the like. Areca trees grow in abundance in the State of Assam. The leaves of Areca can be used to manufacture various kinds of commodities including biodegradable tableware. Guwahati being the gateway to North East India and the Capital of Assam, is not only the most populated city but also is a hub for consumerism in this part of the country. An article published in The Sentinel Assam stated that the City produces 3 lakh kgs of plastic waste per day. Keeping all this in perspective, the current study attempts to analyse the perception and willingness of small and large retailers to sell and promote biodegradable disposables such as areca leaves tableware in Guwahati City of Assam. The paper also studies the consumer awareness and willingness to buy such biodegradable disposables in the City.

Keywords: *Sustainability, biodegradable, plastic waste, eco-friendly, and areca leaves tableware, dinnerware.*

Introduction

The advent of plastic products has not only revolutionised the packaging industry but also has had a profound impact on the use of utensils and tableware around the globe. Globally plastic waste is creating havoc not only in the cities but also in the soil, rivers and ocean. The areca leaves tableware possesses a number of advantages including itsdurability, high range of options to choose from, no use of toxic chemical whilemanufacturing, 100 per cent natural and most importantly eco-friendly. This paper attempts to study the availability as well as acceptability of such areca leaves tableware in Guwahati City

Review of Literature

In the present years the academicians, economists, non-government agencies have conducted various research studies on different aspects of biodegradable plates and areca nut sheaths plates.

Kalita, Dixit, Mahanta and Saha (2008), studied a novel energy efficient machine for plate manufacturing from areca leaf sheath and found that the new machine is very effective in regard of cost of production, quality, versatility, space required and ease of operation for normal as well as physically handicapped people with leg deficiency.

Lavanya, Rahman and Santhosh (2018), studied green marketing orientation and role ofSmall Medium Enterprises- areca plate manufacturing in Karnataka and examined thatmanufacturing of green products provides wide employment opportunities for theunemployed rural population.

Kora (2019), in her study found that leaf plates and cups offer many advantagessuch as renewability, non-toxicity, socio-economic importance in Indian culture.

Chowdhury and Kirti (2020),found that Areca leaf-made utensils have very highenvironmental and aesthetic value. However, in spite of having multiple benefits of areca leafmade dinnerware it does not occupy a satisfying market position.

Thus, the review of literature shows that manystudies have been done on the use and benefits of Areca Leaves Dinnerware however, no study has been done on the availability and acceptability of such dinnerware in Assam or Guwahati City. For that reason, this study has been undertaken.

Objectives of the Study

The study has been undertaken with the following objectives:

1. To study the level of awareness and perception regarding the availability and useof areca leaves products among customers in Guwahati city.
2. To study the consumer preference and satisfaction level of biodegradable overnon-biodegradable disposable tableware in Guwahati city.
3. To put forward suggestions to the retailers andmanufacturers inorder to boost availability and acceptability of such tableware.

Research Methodology

The research design is **descriptive research and analytical in nature**.The study has been conducted among thecustomers purchasing disposable tableware in **Guwahati City of Assam**. An interview has beenconducted and a structured questionnaire was prepared to collect information regardingawareness, choice of biodegradable over non-biodegradable tableware,perception regarding availability of arecaleaf dinnerware etc of the customer.The sampling technique used for selection of respondents is **convenience sampling technique** and **snowball sampling technique**. The total **sample size is 60** which is conveniently selected by the researcher based on the **geographic location** of the consumers covering the entire Guwahati City. The collected data and information have been analysed on the basis of gender and occupation of the respondents. Percentage method has been used in the study.

Analysis and Interpretation

The analysis and interpretation on the basis of the data provided by the various respondentsare as follows.

Preference of Bio-Degradable over non-Biodegradable Tableware

The following tables shows the level of preference of consumers in Guwahati City regarding the use of bio-degradable tableware as a replacement for non-biodegradable tableware.

Table 1
Gender wise preference of biodegradable tableware

LEVEL OF PREFERENCE	No of respondents		
	Male	Female	TOTAL
Highly preferred	13 (52%)	15 (43%)	28 (47%)
Preferred	7 (28%)	12 (34%)	19 (31%)
Neither preferred nor not preferred	5 (20%)	7 (20%)	12 (20%)
Not preferred	0	0	0
Highly not preferred	0	1 (3%)	1 (2%)
TOTAL	25 (100%)	35 (100%)	60 (100%)

Source: field survey

Table 2
Occupation wise preference of biodegradable tableware

LEVEL OF PREFERENCE	No of respondents			
	Service	Business	Others	TOTAL
Highly preferred	14 (50%)	08 (47%)	6 (40%)	28 (47%)
Preferred	11 (39%)	5 (29%)	3 (20%)	19 (31%)
Neither preferred nor not preferred	3 (11%)	4 (24%)	5 (33%)	12 (20%)
Not preferred	0	0	0	0
Highly not preferred	0	0	1 (7%)	1 (2%)
TOTAL	28(100 %)	17(100 %)	15(100 %)	60(100 %)

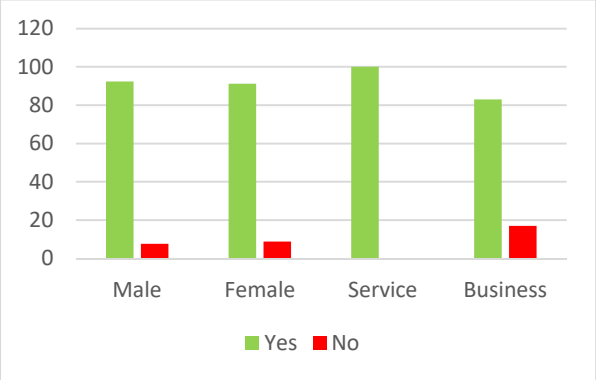
Source: field survey

Table 1 and table 2 show that, there is very high preference for biodegradable tableware in Guwahati City. Male population is seen to have a marginally higher preference compared to female population. Occupation wise it is observed that service people prefer biodegradable tableware more compared to businesspeople.

Awareness Regarding availability of Areca Leaves disposable TablewarE

The following figure shows the awareness of the respondents regarding the availability of biodegradable tableware manufactured using areca leaves.

Figure 1Awareness of areca leaf tableware



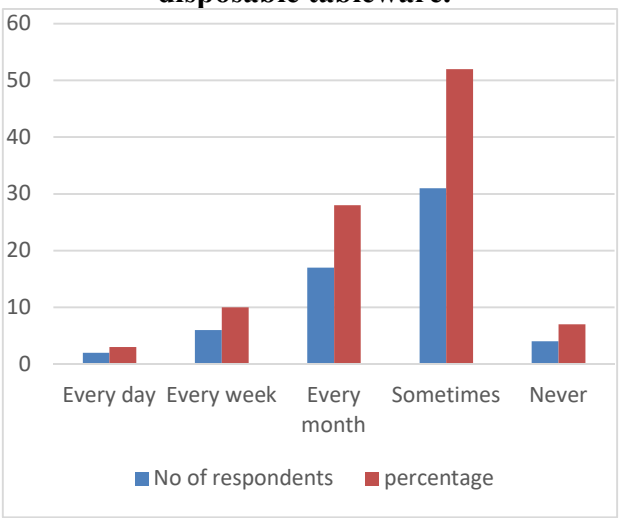
Source: field survey

91.67 percent of respondents has been found to be aware regarding the availability of areca leaf tableware in the market. The level of awareness is found to be marginally higher in case of male respondents compared to female respondents. While comparing the service people and businesspeople it is found that the level of awareness is significantly higher in case of service people.

Frequency and use of Areca Leaves Disposable Products.

Through the questionnaire the researcher wanted to know the frequency of use of areca leaf tableware by consumers.

Figure 2 Frequency of using areca leaf disposable tableware.



Source: field survey

The frequency of people using areca leaf disposable tableware has been found to be low.

Table 3 Time since using areca leaf disposable tableware.

Time	Number of Residents	Percentage
Less than 2 years	22	37
2 – 3 years	20	33
3 – 5 years	12	20
More than 5 years	6	10

Source: field survey

It is found that majority of the residents of Guwahati have started using areca leaf disposables fairly recently.

Factors Affecting choice of Areca leaves products over Styrofoam/ plastic disposables.

Table 4 Factors affecting choice of areca leaves products.

SL No.	Factors	No of respondents	Percentage
1	100 percent natural and eco friendly	17	28
2	Easy Handling	0	0
3	Different design and sizes	0	0
4	Microwavable and freeze safe	8	13
5	Hygienic and odourless	0	0
	All of the above	35	58

Source: field survey

It is found that a variety of factors affect the choice of people to buy areca leaf disposables and being 100 percent natural and eco-friendly is the main reason.

Table 5 Use of Areca Leaf Disposable Tableware

USE	No. of respondents	Percentage
Home use	5	10
Home parties	15	25
Picnics	10	17
Outdoor Catering functions	29	48
Others	1	2
TOTAL	**60**	**100**

Source: field survey

Majority use of areca leaf disposable tableware has been found to be for the purpose of outdoor catering functions and functions.

Source of Knowledge about Areca Leaf Disposable Products

Table 6 Knowledge about areca leaves disposable products.

Source	No of respondents	Percentage
Internet	24	40
Retail Outlets	37	62
Friends and Family	21	35
Others	0	0

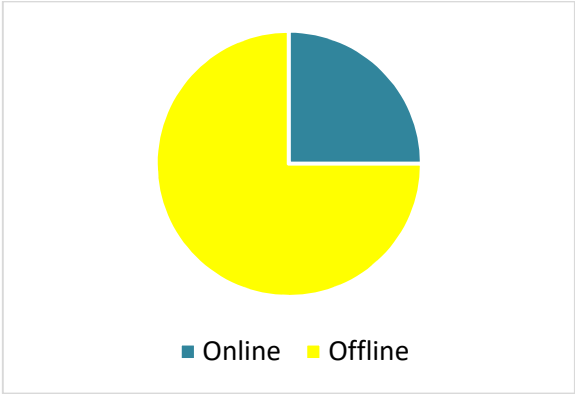
Source: field survey

It can be observed that internet and retail outlets play the highest role in informing people regarding disposable tableware (area leaf disposables).

Online vs Offline Purchase of Areca Leaf Disposables

Whether the respondents prefer to purchase the products online or offline was asked and the responses are shown in the following diagram.

Figure 3Mode of purchase of areca leaf disposable tableware.



Source: field survey

It is found that the customers mostly prefer to buy the areca leaf disposable tableware in offline retail stores and not from online shopping platforms.

Level of Satisfaction with Acera Leaf Disposables

The level of satisfaction of the respondents while using areca leaf disposable items are shown with the help of the following table.

Table 7 Level of satisfaction for areca leaves disposable items

Level of satisfaction	No. of respondents	Percentage
Highly satisfied	11	18
Moderately satisfied	37	62
Dissatisfied	2	3
Moderately dissatisfied	10	17
Highly dissatisfied	0	0

Source: field survey

It is found that 80 percent of the respondents lie in the moderately satisfied and highly satisfied category.

Problems/Issues regarding the use of Area leaf disposable tableware

The respondents were asked to state their biggest issue regarding areca leaf disposable tableware.

Table 8 Problem in purchasing areca leaves disposable tableware locally

Response	Number of respondents	Percentage
Yes	39	65
No	21	35
Total	60	100

Source: field survey

Table 9 Type of problem while purchasing areca leaves product

Problem	Number of respondents	Percentage
Non-Availability	37	62
Price	19	32
Awareness	4	7

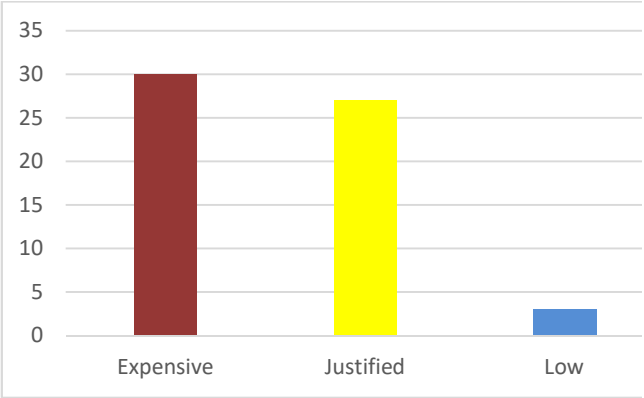
Source: field survey

From the table 8 and table 9, it is clear that majority of the people face problem while purchasing areca leaf products and availability is cited as the most significant problem.

Opinion of Customers regarding Price of Areca leaf disposables

The opinion of the respondents regarding the price of areca leaf disposables have been highlighted in the following figure.

Figure 4 Opinion of customers regarding Price



Source: field survey

From the above figure it can be concluded that majority of the customers regard areca leaf disposable tableware as expensive.

Comparision of Areca leaves Disposable tableware withother Biodegradable disposables

Customers have been asked to rate areca leaf disposables against other biodegradable disposables available in the market. The responses are shown below.

Table 10 Areca leaves disposable tableware vs biodegradable disposables.

Particulars	No of respondents	Percentage
Better	34	57
At par	24	40
Worse	2	3

Source: field survey

Table 11 Recommend areca leaf tableware to others

Recommend	No. of respondents	Percentage
Yes	59	98
No	1	1

Source: field survey

The table show that majority customer feel that areca leaf disposables are better than other biodegradable disposables and 98 percent recommend the same to others.

Findings of the Study

1. It is found that there is a **very high preference for biodegradable tableware** in Guwahati City.
2. Male population is seen to have a marginally higher preference compared to female population.
3. Occupation wise it is observed that **service people prefer biodegradable tableware more compared to businesspeople**.
4. 91.67 percent of respondents has been found to be **aware regarding the availability of areca leaf tableware** in the market.
5. The level of awareness is found to be **marginally higher in case of male respondents** compared to female respondents.
6. While comparing the service people and businesspeople it is found that the **level of awareness is significantly higher in case of service people.**
7. The **frequency of people using areca leaf disposable** tableware has been found to be low.
8. It is found that majority of the residents of Guwahati **have started using areca leaf disposables fairly recently**.
9. Being **100 percent natural and eco-friendly is the main reason** is found to be the major factor affecting the people to buy areca leaf disposables.
10. Majority use of areca leaf disposable tableware has been found to be for the **purpose of outdoor catering functions and functions.**
11. **Internet and retail outlets** play the highest role in informing people regarding disposable tableware (area leaf disposables).
12. It is found that the customers mostly **prefer** to buy the areca leaf disposable tableware in **offline retail stores** and not from online shopping platforms.
13. **High level of satisfaction** has been found regarding the use of areca leaf products by the respondents.
14. **People face problem** while purchasing areca leaf products and **non-availability** is cited as the most significant problem.
15. The customers regard areca **leaf disposable tableware as expensive**.

16. Customers feel that areca leaf disposables are better than other biodegradable disposables and **98 percent recommend** the same to others.

Recommendations

1. Inorder to sustain the practice of using leaf plates in our daily life and discourage the use of plastic plate, the retailers and producers of areca leaf tableware should ensure **adequate availability of the products** in the market.
2. Cities like Guwahati have **a high knowledge and demand for areca leaf tableware** and other biodegradable products therefore, retailers and producers should concentrate on them before the rural areas.
3. **Businessmen and other professionals** should be encouraged to use more areca leaf tableware as their level of preference has been found to be low.
4. **E-commerce** has been found to be major source of adoption of eco-friendly and biodegradable tableware hence, the use of **internet-based services and digital adoption** should be further encouraged.
5. Non-biodegradable disposable tableware in picnic and riverside celebrations areas, should be bannedinorder to **curb the plastic problem**which is life threatening.
6. After analysis of data the younger group of people are found to be more aware aboutbiodegradability. For this reason, educational and promotional activities should beconducted by the producers, retailers, government and non-government organisations so as to attract andeducate the **older generation about the importance** and use of biodegradable itemsand tableware.
7. Areca leaf plates and other tableware items should beshowcased in **state-based exhibition and fairs** tocreate more awareness among the public regarding its use and versatility.
8. Law should be imposed to **ban single use plastics** to meet the Indian governmentgoals of Swachh Bharat and Swasth Bharat missions.
9. The use of areca disposable plates at restaurants, hotels,roadside eateries, food joint, religious feasts etc. should be **encouraged by creating more environment** conscious behaviour from people.

Conclusion

Majority ofthe customers are conscious about their responsibility towards safeguarding the environmentfrom unwanted waste and not polluting the same. But a very few of the customers actually purchase biodegradable. The level of awareness among customers is high regarding the availability of biodegradable dinnerware in the market however, their use is found to be only limited. One reason for this attitude of the customers is high price of areca leaf and other biodegradable tableware.

The occupations of the customers have a great impact on the purchase ofthese disposables. The customers from service sector opt for areca leaf plates more thanpeople from business sector or other sectors. This shows that people from service sector aremore knowledgeable and responsible towards the environment. It is in the context thatpeople's own consciousness towards healthy living and clean environment is the only way toencourage and motivate the people for purchase of biodegradable disposable wares rather

Moreover, the internet and retailers have been found to be the major source for information about the availability of biodegradable tableware like areca leaf tableware. Thereis very less mass-market promotion of any kind by either the manufacturer or thegovernment.

Lastly, in order to motivate the present generation to make positive choices withregard to disposables ware, it is strongly felt that a feeling of responsibility and consciousness

towards our environment should be inculcated in the minds of the people. There is atremendous potential for Areca leaf products to substitute conventional disposable tablewareas well as promote the use of biodegradable tableware.

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SUCCESS FACTORS OF RAISING START-UP CAPITAL IN THE RETAIL INDUSTRY OF BRAAMFONTEIN

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ABSTRACT

Objective. *The objective of research was to identify determinants of the ability of entrepreneurs working in the retail industry of Braamfontein in the City of Johannesburg to raise start-up capital from commercial banks and microfinance institutions.* ***Methods.*** *Data was gathered from 409 SMMEs in the retail industry of Braamfontein. Linear discriminant analysis was used for performing multivariate analysis.* ***Results.*** *The study found that 164 of the 409 businesses in the study (40.10%) managed to raise start-up capital from commercial banks and microfinance institutions, whereas the remaining 245 businesses in the study (59.90%) were unable to raise start-up capital from informal money-lending associations. About 32% of retailers used money borrowed from stockvel associations for funding new retail ventures and for expanding existing business operations. The results showed that the ability to raise start-up capital was influenced by the ability of entrepreneurs to raise start-up capital from family and friends, the culture of saving money, and networking skills of entrepreneurs. The fitted linear discriminant function could classify 83.19% of randomly identified retailers accurately based on the 3 influential predictor variables of success in raising money needed by retailers.*

Keywords*: Braamfontein, Retail sector, Start-up capital, Linear discriminant function*

Introduction and background to study

De Klerk (2020) and Garidziarai and Takudzwa (2020) have highlighted various obstacles to securing business loans that are needed by South African retailers for starting up new business ventures and expansions. The authors have shown the immense difficulty experienced by emerging and novice retailers in Braamfontein, Johannesburg to secure business loans that are required for new business ventures and expansion. De Jongh, Ferreira, Dickason-Koekemoer and Sunde (2020) have shown that emerging retailers often struggle to meet the demand for fixed assets, collateral and a track record of bank statements. The aim of research was to identify determinants of the ability of retailers in the suburb of Braamfontein, Johannesburg to raise business loans required for new ventures and expansion.

The study was aimed at determining the extent to which start-up loans were accessible to SMMEs operating in the retail industry of Braamfontein from commercial banks and microfinance agencies. The retail sector is a key contributor to Gross Domestic Product (GDP), job creation, export production, industrial and commercial innovation, and tax revenue (Berejena, Kleynhans & Vibetti, 2020). Dlamini, Tesfamichael, Shiferaw and Mokhele (2020) have highlighted the need to address the lack of access to finance by emerging and novice retailers. Garidziarai and Takudzwa (2020) have shown the need to consider alternative sources of finance such as crowdfunding in order to address the need for finance by emerging SMMEs in the retail industry of Gauteng Province. Studies conducted by Moeletsi and Tongwane (2020) have shown that it is still difficult for emerging SMMEs in the retail industry to raise money needed for business operation and expansion. The study conducted by Swartz, Ivancheva, Czerniewicz and Morris (2019) has shown that there were 2.3 million SMMEs operating in South Africa in 2015 out of which 65% were operating in the informal sector. Bushe (2019) has shown that about 34% of SMMEs operating in the retail industry of Gauteng Province struggle to raise enough capital for new business ventures in the retail industry.

Hurley, Morris and Portelance (2019) have shown that SMMEs operating in the retail industry struggle to raise finance from commercial banks. Ramnanun, Pillay and Rajaram (2020) have made a similar assessment about difficulty in raising start-up business loans in South African provinces such as Gauteng, the Western Cape and KwaZulu-Natal. The retail industry is a key sector of the South African economy, and needs to grow on

a sustainable basis. The study explores potential sources of funding that could be used by emerging entrepreneurs operating in the retail industry of Braamfontein in the City of Johannesburg.

Literature review

Pillay, Rajaram and Ramnanun (2020) have suggested raising loan money from sources such as stockvels in order to make finance available to SMMEs operating in the crowdfunding for renewable and sustainable energy projects in industry, including the retail industry. The authors have highlighted the difficulty in raising enough money and human resources in the retail industry, with a particular reference to emerging entrepreneurs. Moos and Sambo (2018) have shown the worsening plight of operators working in the retail industry. The authors have called for a tailor-made solution in terms of mentoring, skills-based training, financial education, and assistance in developmental and operational loans. Fleming and Sorenson (2016: 5-19) have argued that stockvels and crowdfunding are valuable sources of finance to struggling SMMEs. Frydrych, Bock, Kinder and Koeck (2014: 247-269) have shown the benefits of raising venture capital for emerging South African SMMEs from stockvels. About half of all newly established South African SMMEs fail before operating for three years (Marivate, 2014: 53-72) due to lack of access to finance and entrepreneurial skills. Comoglio and Botta (2012: 92-102) have recommended the use of high technology and innovative methods for ensuring adequate performance and compliance with environmental regulations in the South African retail industry. According to the authors, emerging SMMEs in the retail sector lack the capacity for procuring high technology and innovative systems. Studies conducted by Hutchison (2020), Nnaeme, Patel and Plagerson (2020) and Siziba (2020) have shown that stockvel associations are commonly used by retailers for raising start-up capital required for new business ventures and expansion.

Worku and Muchie (2011: 357-366) and Cholakova and Clarysse (2015: 145-172) have argued that stockvels are suitable for raising venture capital in the South African retail industry because they require no collateral requirements. Bhaumik, Driffield and Pal (2010: 437-450) have shown the benefits of assisting emerging SMMEs in the retail sector by way of attracting foreign direct investment. The authors have argued that the provision of incentives is a key factor that helps national governments. Bi, Liu and Usman (2017: 10-18) have pointed out that stockvels and stock exchange markets are vital for raising funds needed for operation by SMMEs. The authors have pointed out the need for demonstrating economic stability and suitable macroeconomic policy to foreign investors. Charles and Chucks (2012: 12-21) have shown the benefits of using stock exchanges for ensuring sustained growth in SMMEs.

The study conducted by Barnes (2013: 236-259) has found that there is a need for improving the current degree of access to finance by emerging companies in the South African retail sector. According to the author, there is a need for enhancing the current capital structure of the South African retail industry. According to the author, the South African retail industry vision for the year 2035 needs to be vigorously supported by the South African Government so that the South African retail industry grows on a sustainable basis. One of the key transformation agenda items is the plan to increase the number of jobs among black South Africans from 112, 000 (contribution of 6.9% to South Africa's GDP) to 224, 000 by the year 2035. The plan entails to promote ownership of retail companies by black South Africans to 25% by the year 2035.

3. Problem Statement

De Jongh, Ferreira, Dickason-Koekemoer and Sunde (2020) and Mafini, Dhurup and Madzimure (2020) have found that the growth rate among emerging SMMEs in the South African retail industry is low due to inability to raise loan needed for business operations and new business ventures. There is a need for an alternative method of raising loan money for emerging retailers working in the retail industry of Braamfontein, Johannesburg. Hutchison (2020), Nnaeme, Patel and Plagerson (2020) and Siziba (2020) have shown how valuable stockvel associations are for raising start-up capital required by South

African retail businesses for new business ventures and expansion. The research attempts to test the veracity of these findings by gathering fresh data from Braamfontein based retailers.

4. Objectives of Study

The overall objective of study is to assess the degree to which stockvels could be used as a source of funding by emerging retailers working in the retail industry of Braamfontein, Johannesburg. The study places a special emphasis on poorly resourced retailers in Braamfontein, Johannesburg. The study will assess the extent to which stockvels alleviate the demand for collateral imposed by commercial banks on retail operators who need loans. The specific objectives of research are the following:

- To determine factors that undermine the ability of emerging retailers in Braamfontein to raise business loans that are required for new ventures and expansion; and
- To determine the extent to which stockvels could be used for alleviating the demand for collateral imposed on emerging retailers by commercial banks.

Research questions

The study aims to provide adequate answers to the following research questions:

- What are the key factors that undermine the ability of retail operators in Gauteng Province to secure loans from commercial banks?
- To what extent can stockvels be used for alleviating the demand for collateral in the retail industry of Gauteng Province?

Methods and materials of study

The research was based on a design that was exploratory, descriptive and cross-sectional (Chandrasekaran & Nagavinothini, 2020). The research was based on data gathered from 409 retail businesses working in the Braamfontein suburb of Johannesburg. Data was collected by using a structured, pretested and validated questionnaire of study from a stratified random sample of size 409 retail businesses in Braamfontein. Linear discriminant analysis (Gyamfi, Brusey, Hunt and Gaura, 2017) was used for identifying important determinants of success in securing business loans needed for new retail ventures and expansion in the retail sector of Braamfontein. Measures of success in raising money for business ventures defined by Adhami and Guegan (2020) were used for classifying respondents into 2 categories in terms of their ability to raise money from various sources. Content validity was ensured by administering the questionnaire of study to 32 eligible retailers. Internal consistency and validity were ensured by estimating Cronbach Alpha coefficients (Jeno, Vandvik, Eliassen & Grytnes, 2019). All variables used for data analyses had Cronbach Alpha coefficients with magnitudes of 0.75 or above.

Results of study

Table 1 shows the personal profile of the 409 retailers who were chosen for the survey. The table shows that since they started working as retailers, only about 40% of retailers have been able to raise loans needed for business venture or expansion. About 3% of retailers got started with their own savings. About 8% of them started retail business with a loan taken from a commercial bank. About 11% of them started retail business with a loan taken from a microfinance agency. About 32% of them started retail business with a loan taken from a stockvel association. About 46% of retailers started retail business by using a loan from friends and family. About 57% of the 409 retailers in the study have been working for 3 to 5 years (37 to 60 months) at the time of data collection. About 66% of retailers were employed managers. About 52% of retailers were black Africans. The results show that stockvel associations play a significant role as a source of start-up capital in the retail industry of Braamfontein.

Table 1: Personal profile of retailers chosen for the survey (n=409)

Variable of study	**Percentage**
At least one success in raising loan required for new venture or expansion in the past	Yes: 164 (40.10%) No: 245 (59.90%)
Source of initial capital of retail business	Own savings: 13 (3.18%) Loan from commercial bank: 32 (7.82%) Loan from microfinance agency: 43 (10.51%) Loan from stockvel associations: 131 (32.03%) Loan from family and friends: 190 (46.45%)
Culture of saving money on a regular basis	Yes: 171 (41.81%) No: 238 (58.19%)
Networking skills based on criteria defined by Adhami and Guegan (2020)	Adequate: 169 (41.32%) Inadequate: 240 (58.68%)
Duration of operation of retail business in months	12 months or less: 34 (8.31%) 13 to 36 months: 55 (13.45%) 37 to 60 months: 235 (57.46%) 61 to 120 months: 52 (12.71%) 121 months or longer: 33 (8.07%)
Age of retailer in years	20 or less: 8 (1.96%) 21 to 30: 39 (9.54%) 31 to 35: 47 (11.49%) 36 to 40: 183 (44.74%) 41 to 45: 52 (12.71%) 46 to 50: 48 (11.74%)
Status of retailer in business	Owner of business: 102 (24.94%) Employed manager: 268 (65.53%) Relative of owner: 39 (9.54%)
Racial group of retailer	African: 211 (51.59%) White: 79 (19.32%) Coloured: 31 (7.58%) Asian: 88 (21.52%)

A composite index defined by Adhami and Guegan (2020) was used for measuring the ease of raising money by effectively networking and working with valuable sources of loan money for retailers. Measurement was made by using a 5-point ordinal scale in which the number 1 represents strong disagreement, and the number 5 reprsents strong agreement. Responses obtaiend based on a 5-point ordinal scale were later transformed into dichtomous (Yes, No) responses for simplifying the task of interpretation. A summary of the measurement of perceptions from the 409 retailers in the study is shown below in Table 2.

Table 2: Past expereince of retailers on the task of raising loan money (n=409)

Past experience of retailers	Yes	No
I have applied for a business loan from at least one commercial bank in the past.	66%	34%
I have applied for a business loan from at least one commercial bank in the past, and my loan application was approved.	11%	89%
I have applied for a business loan from at least one microfinance agency in the past.	87%	13%
I have applied for a business loan from at least one microfinance agency in the past, and my loan application was approved.	38%	62%
I have borrowed a business loan from at least one stockvel association in the past.	32%	68%
Borrowing money from a stockvel association is relatively easier than borrowing money from a commercial bank.	32%	68%
Borrowing money from a stockvel association is relatively easier than borrowing money from a microfinance agency.	32%	68%
My failure to produce adequate collateral is the reason why I failed to borrow money from a commercial bank at least once in the past.	42%	58%
The interest rate imposed on me by microfinance institutions is affordable to me.	37%	63%
Loan repayment conditions imposed on me by microfinance institutions are fair enough.	34%	66%

Pearson's statistical tests of association (Denis, 2021) were used for identifying signficant interaction effects of order 2. Table 3 shows 5 signficant predictors of success in the ability of retailers to raise loan money for starting up new business ventures or for expanding existing retail operations.

Table 3: Significant associations obtained from Pearson's crosstab tests (n=409)

Factors significantly associated with success in raising start-up capital	**Observed chi-square value**	**P-value**
Ability to raise money from family and friends	8.0308	0.000
A deeply entrenched culture of saving money	7.8826	0.000
Ability to network effectively with valuable sources of capital	6.4171	0.000
Source of initial capital	5.2181	0.000
Duration of operation of retail business	4.6427	0.000

Table 3 shows 5 predictors of the ability of retailers to raise money successfully. These 5 predictor variables were the ability to raise money from family and friends, a deeply entrenched culture of saving money, the ability to network effectively with valuable sources of capital, source of initial capital, and the duration of operation of retail businesses. Discriminant analysis was performed by using these 5 predictors.

Table 4 shows standardised mean scores for the 3 influential predictors of perception held by the 409 retail business operators about the ease of raising money required for new retail ventures and expansion. Estimates are shown for 3 categories of retailers (164 retailers who succeeded in raising money, 245 retailers who failed to raise money, and all 409 retailers who were selected for the survey). It can be seen from the table that the mean scores of the 3 predictor variables vary significantly with regards to the 3 influential predictor variables.

Table 4: Standardised mean scores of predictor variables (n=409)

Predictors of success in raising start-up capital for retail business	Positive perception (n=164)	Negative perception (n=245)	All respondents (n=409)
Ability to raise money from family and friends	62.09	37.93	53.97
A deeply entrenched culture of saving money	54.81	38.96	49.06
Ability to network effectively with valuable sources of capital	57.76	38.12	50.49

The reliability of the fitted linear discriminant function was tested and confirmed by using standard goodness-of-fit tests. The estimated canonical correlation coefficient was equal to 0.8319 = 83.19%. This figure is a measure of percentage variation that has been explained successfully by the fitted linear discriminant function. The Eigen value was equal to 2.2497 (significantly larger than the number 1). The F-test gave a P-value of 0.0000. These estimates indicate that the fitted linear discriminant function is credible enough for classifying randomly identified retailers from the Braamfontein suburb of Johannesburg according to their chances of success in raising money based on the 3 influential predictor variables (ability to raise money from family and friends, a deeply entrenched culture of saving money, and ability to network effectively with valuable sources of capital).

Discussion of results

The research was aimed at identifying influential determinants of the ability of entrepreneurs working in the retail industry of Braamfontein in the City of Johannesburg to raise start-up capital from commercial banks and microfinance institutions. Data was gathered from 409 SMMEs in the retail industry of Braamfontein. Discriminant analysis was used for performing multivariate analysis. Results. The study found that 164 of the 409 businesses in the study (40.10%) managed to raise start-up capital from commercial banks and microfinance institutions, whereas the remaining 245 businesses in the study (59.90%) were unable to raise start-up capital from informal money-lending associations. The results showed that the ability to raise start-up capital was influenced by the ability of entrepreneurs to raise start-up capital from family and friends, the culture of saving money, and networking skills of entrepreneurs. About 32% of retailers used money borrowed from stockvel associations for funding new retail ventures and for expanding existing business operations. The research has shown the relative importance of stockvel associations as a fairly well reliable source of working capital for entrepreneurs operating in the retail sector of Braamfontein in Johannesburg, South Africa.

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STUDY ON MALNUTRITION IN SOME INDIAN STATES THROUGH SPATIAL STATISTICS

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ABSTRACT

Malnutrition among under-five children is an important concern for the health and government planners.This study is an attempt to find the high-risk zones of child malnutrition (under age 5 of children) i.e., stunting, wasting and underweight in Uttar Pradesh, Delhi and Bihar using spatial approaches. These zones might help the government to cover wide area to implement the programs related to child malnourishment. The approaches have been applied using the fourth round of National Family Health Survey (2015-16) data for Uttar Pradesh, Delhi and Bihar.

Keyword: *Scan Statistics, Poisson distribution, Spatial Clusters*

Introduction

Malnutrition in simple terms can be defined as faulty nutrition due to inadequate or unbalanced intake of nutrients or their impaired assimilation or utilization.According to WHO, Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. Malnutrition among under-five children is an important concern for the health authorities in India. Early studies suggest that malnutrition is not only the cause of irreversible damages to the brain but is consideredas a result from the complex interaction between environmental deprivation and malnutrition (Grantham-McGregor, 1995). Studies indicate that adequate nutrition can help prevent some of these undesirable outcomes. However, past studies do not confirm a causal association between malnutrition and mental development that could facilitate more direct action (Behrman, 1996).The World Bank estimates that India is one of the highest ranking countries in the world for the number of children suffering from malnutrition. The prevalence of underweight children in India is among the highest in the world, and is nearly double that of Sub Saharan Africa with direct consequences for mobility, mortality, productivity and economic growth.

Definition of Basic terms of malnutrition is given as: -

Stunting (height-for-age)meansa child who is too short in respect of his or her age. These children can suffer severe irreversible physical and cognitive damage that accompanies stunted growth. The devastating effects of stunting can last a lifetime and even affect the next generation.Stunting is also known as Chronic Malnutrition.

Wasting (weight-for-height)implies a child who is very thin in respect of his or her height. Wasting is the result of recent rapid weight loss or the failure to gain weight. A child who is moderately or severely wasted has an increased risk of death, but treatment is possible. Wasting is also known as Acute Malnutrition.

Underweight (weight-for-age) is a cumulative index of height-for-age and weight-for-height. It considers both acute and chronic malnutrition. Children whose weight-for-age is below minus two standard deviations from the median of the reference population are classified as underweight.

Children nutritional status is a major concern in most of the underdeveloped and undeveloped countries. Childhood nutrition refers to the dietary needs of healthy children. In developing countries, children are more vulnerable to malnutrition because of low dietary intakes, infectious diseases and lack of appropriate care. Height and weight are the most commonly used indicators of the nutritional status of a child. According to a WHO Working Group (WHO 1986), appropriate height-for-age of a child reflects linear growth and can measure long- term growth faltering or stunting. Stunting, or being too short for one's age, is defined as a height that is more than two standard deviations below the World Health Organization (WHO) Child Growth Standards median (WHO 2014). Stunting is the outcome of chronic deficiency in nutrition during the first 1000 days of a child's life-from conception, through pregnancy, to the age of two. A stunted child will never reach his or her full cognitive

capacity, never able to learn as much nor earn as much throughout life. Stunting and other forms of under-nutrition are thought to be responsible for nearly half of all child deaths globally. Stunting and other forms of under-nutrition are thought to be responsible for nearly half of all child deaths globally. In India, almost half (48 per cent) of children under five years of age are stunted (WHO et al 2006, IIPS 2005).

Many studies in past have suggested that breastfeeding in developing countries is associated with a greater risk of under nutrition as defined by height-for-age (stunting), weight-for-age underweight) and weight-for-height (wasting). Malnutrition has been responsible directly or indirectly for 60 percent of 10.9 million deaths annually among children under 5 years. Over two third of these deaths are associated with inappropriate feeding practices that occur during the first year of life. The single most cost-effective intervention to reduce infant mortality in developing countries would be the promotion of exclusive breastfeeding. Yet 90 percent of universal practices of exclusive breastfeeding for 6 months continued for 6-11 months could save 13-15 percent of deaths in children below 5 years in India, which means 3, 00,000 child deaths could be prevented in one year. Non-exclusive breastfeeding rather than exclusive breastfeeding can increase the risk of dying due to diarrhea and pneumonia among 0-5 month old infants by more than two-fold. Benefits of exclusive breastfeeding up to six months duration have been studied all over the world and there is enormous amount of evidence to support this.(Kumar and Singh, 2015)

In 1965 Naus proposed the study of an event with the help of recognition of space-time hot spots by locating them on the map and defining with the connected states according to the cluster many extensions have been made by Kulldroff (1995-2000) where he proposed to study on the basis of clusters of regular shape or on the basis which expands it to a large extent in a study of epidemic, health and several endemic scenarios. Kulldroff (1997) discussed the formation of cluster in spatial-temporal zone. In his study he explained that the points patterns in the cluster are homogeneous which may be applied through Poisson or Binomial structure, but the patterns in between clusters may be in homogeneous. Several studies have been made with the help of space-time for infant mortality in several countries. Alam et al. (2010) used that study to find the patterns of under-five mortality in rural Bangladesh with the help of MATLAB and given a logistic approach to study the effect of several explanatory variables on under-fivemortality. Ayle et al. (2013-2016)made the study on childhood mortality study on the basis of spatial distribution in Ethiopia, and several studies have been madeon the several parametric and semi parametric models with the help of spatial cluster. Gupta et al. (2016) studied the spatial cluster and risk detection for infant mortality in high focus states of India with the help of Annual Health Survey (2013), and District Level Health Survey-III (2007-08) Data(Singh et al., 2018).

Present study consists with the scenario of malnutrition in three central states of India as Uttar Pradesh, Bihar and Delhi through spatial scan statistics with the help of Poisson model. This study also shows that is there any relevance effect of region on malnutrition or not.

Data and Methodology

Data Source

The Fourth round of National Family Health Survey (NFHS-IV) was carried out in 2015-2016. NFHS-4 funding was provided by the Government of India, the United States Agency for International Development (USAID), the Department for International Development (DFID), the Bill and Melinda Gates Foundation, UNICEF, the United Nations Population Fund (UNFPA), and the MacArthur Foundation. NFHS-4 is the first of the NFHS series that collects data in each of India's 29 States and all 7 Union Territories. Also, NFHS-4, for the first time, provided estimates of most indicators at the district level for all 640 districts of the country included in the 2011 Census. In NFHS-IV, women aged 15-49 years and men aged 15-54 years are interviewed. A total of 601,509 households were interviewed.

Study area

Uttar Pradesh and Bihar are highly resourceful states of India consisting around 25%

population of India(Census 2011) which are also the least performing states of India in case of malnutrition. So, the study goes for the exploration of the situation of malnutrition in the two states with the capital territory of India where the plans for population are highly focused. Child Malnutrition below age 5 year of child had been studied for the states Uttar Pradesh, Delhi and Bihar from NFHS-IV.

Method

Method of spatial Poisson probability is used to study the clusters and risk scenario of malnutrition among children below age 5 in Uttar Pradesh, Bihar and Delhi. For study purpose the likelihood of Poisson has been described as below.

The dependent variable in our data is the integer number of trips made in a time period. We can regress on socio economic attributes of the individual X. the most logical model for this is a Poisson or negative binomial count model,

$$P\left(y = \frac{h}{X}\right) = \frac{e^{-\lambda}\lambda^{h}}{h!}$$

Where the mean of the Poisson distribution is $\lambda = e^{X\beta}$, or an exponentiated latent regression. The likelihood function for this model is

$$\mathcal{L}(\beta) = \sum_{i=1}^{n} (y_i \log(\lambda_i) - \exp(\lambda_i))$$

Now consider that instead, we have a spatial regression that we use for the latent mean estimation. If we consider that the mean follows a spatial dependence process $\lambda = e^{(I-\rho W)^{-1}X\beta}$, would this imply that the likelihood function is simply

$$\mathcal{L}(\beta) = \sum_{i=1}^{n} (y_i (I - \rho W)^{-1} X_i \beta - \exp((I - \rho W)^{-1} X_i \beta))$$

Results

Uttar Pradesh

Stunting

When we consider the case of stunting among the children of below age five in Uttar Pradesh, we found 3 clusters of districts is given below: -

Cluster 1

Cluster 1 consists of 38 districts which includes Sitapur having 34.05% children stunted, Mahrajganj consisting of 25% children stunted ,Siddharth Nagar consisting of 28.13%, SantKabir Nagar consisiting of 22.72%, Balrampur consisting of 38.42% , Deoria consisting of 16.41%, Basti 24.33%, Ambedkar Nagar 15.38%, Bahraich 36%, Lucknow 16.22%, Aligarh 20.43% , Azamgarh 15.63%, Mau 17.18%, Gonda 30.2%, Ballia18.08%, Ghazipur 16.05%, Sultanpur 20.35%, Jaunpur 19.54%, Varanasi 19.45%, Pratapgarh 19.78%, Bara Banki 23.43%, Kushinagar 22.71%, Mirzapur 24.45%, Rae Bareli 16.47%,Shrawasti 32.54%, SantRavidas Nagar (Bhadohi) 23.93%, Sonbhadra 25.48%, Unnao 18.71%, Kheri 26.43%, Kaushambi 24.71%, Fatehpur 26.11%, Hardoi 20.74%, Kanpur Nagar 17.26%, Chitrakoot 27.53%, Kannauj 19.91%, Shahjahanpur 23.26%, Banda 23.32% and Farrukhabad consisting of 22.24% children stunted. In this cluster most of the districts are from eastern Uttar Pradesh and border area of Nepal. This area lacks industrialization and is also have lower literacy rate.

Cluster 2

Cluster 2 consists of 4 districts which includes Chitrakoot having 27.53% children stunted, Banda consisting of 23.32% children stunted, Kaushambi consisting of 24.71% and Fatehpur having 26.11% children stunted. This cluster is mainly drought effected and because of lower rainfall and lack of irrigation facilities, agricultural activities are badly affected in this region.

Cluster 3

Cluster 3 consists of 3 districts which includes SantRavidas Nagar (Bhadohi) consisting of 23.93% children stunted, Sonbhadra having 25.48% and Mirzapur having 24.45% children stunted. Although these 3 districts have some industrial activity but the majority of population is near to poverty line.

Wasting

When we study the case of wasting, we found 2 clusters of districts in Uttar Pradesh as given below

Cluster -1

Cluster 1 consists of 11 districts which includes Mahoba comprising 6.42% of children wasted, Banda comprising of 6.32% of children wasted, Chitrakoot 13.9%, Jalaun 13.9%, Fatehpur 5.49%, Kanpur Nagar 10.69%, Jhansi 10.69%, Auraiya 11.28%, Kaushambi 13.04%, Rae Bareli 13.92% and Lalitpur consisting of 16.29% children wasted.

Cluster -2

Cluster 2 consists of 6 districts includes Varanasi comprising of 7.73% of children wasted, Mirzapur 6.33%, Jaunpur 8.31%, Ghazipur 7.56%, SantRavidas Nagar (Bhadohi) 7.69% and Sonbhadra comprising of 6.69% children wasted.

Underweight

Scenario of underweight can be covered through 5 clusters in Uttar Pradesh.

Cluster 1

Cluster 1 consists of 9 districts comprising of Aligarh which includes 11.16% of children who are underweight, Mirzapur having 16.15% underweight, Kaushambi 19.9%, SantRavidas Nagar (Bhadohi) 18.63%, Sonbhadra 13.82%, Pratapgarh 12.83%, Chitrakoot 21.65%, Varanas15.46%and Jaunpur comprising of 15.59% children who are underweight.

Cluster 2

Cluster 2 consists of 5 districts comprising of Mirzapur having 16.15% of children underweight, Varanasi 15.46%, Jaunpur comprising of 15.59%, SantRavidasNagar(Bhadohi) 18.63% andSonbhadra consisting of 13.82%who are underweight.

Cluster 3

Cluster 3 consists of 5 districts comprising of Pilibhit having 17.16% children who are underweight, Bareilly Comprising of 11.79%, Rampur 13.76%, Shahjahanpur 17.34% and Budaun consisting of 18.82% children who are underweight.

Cluster 4

Cluster 4 consists of 4 districts which includes Balrampur comprising of 16.49% children who are underweight, Mahrajganj with 11.55%, Sitapur 16.3% and Siddharth Nagar having 13.72% children who are underweight.

Cluster 5

Cluster 5 consists of 3 districts includes Bahraich comprising of 14.95% children who are underweight, Gonda 11.97% and Shrawasti which includes 14.33% of children who are underweight.

Delhi
Stunting

When study regarding stunting in Delhi done we get one cluster as given below:-

Cluster 1

Cluster 1 consists of 4 districts which includes West Delhi comprising of 10.76% children stunted, North West Delhi having 10% children stunted, North Delhi comprising of 10.06% and Central Delhi comprising of 14.42% children stunted.

Wasting

When study regarding wasting in Delhi done we get one cluster as given below:-

Cluster 1

Cluster 1 consists of 4 districts which includes New Delhi comprising of 9.47% children wasted, Central Delhi having 11.53% children wasted, North Delhi comprising of 7.54% and EastDelhi comprising of 7.93% children wasted.

Underweight

When study regarding underweight in Delhi done we get one cluster as given below:-

Cluster 1

Cluster 1 consists of 5 districts which includes West Delhi comprising of 9.23% children underweight, North West Delhi having 7.27% children underweight, North Delhi comprising of 6.91%, Central Delhi comprising of 11.53% children and New Delhi comprising of 8.42% children underweight.

Bihar
Stunting

When study regarding stunting in Bihar had done we get one cluster as given below:-

Cluster 1

Cluster 1 consists of 6 districts which includes Nawada comprising of 24.76% children stunted, Kaimur (Bhabua) 24.05%, Sheikhpura 23.42%, Nalanda 25.04%, Gaya 24.65% and Lakhisarai comprising of 25.23% children stunted.

Wasting

When study regarding wasting in Bihar had done we get one cluster as given below:-

Cluster 1

Cluster 1 consists of 5 districts which includes Arwal comprising of 14.79% children wasted, Bhojpur 12.28%, Jehanabad 7.72%, Gaya 7.26% and Patna comprising of 10.9% children wasted.

Underweight

When study regarding underweight in Bihar had done we get one cluster as given below:-

Cluster 1

Cluster 1 consists of 12 districts which includes Gaya comprising of 19.72% children who are underweight, Jehanabad 14.65%, Nawada 16.51%, Arwal 20.81%, Aurangabad 15.95%, Kaimur (Bhabua) 19.75%, Nalanda 17.59%, Bhojpur 15.87%, Patna 15.11%, Sheikhpura 17.11%, Rohtas 15.02% and Lakhisarai comprising of 16.34 % children who are underweight.

Conclusion

Analytical approach of results shows that there is proper effect of malnutrition on regions in all the states.To tackle the problem of malnutrition, Government of India has launched many programmes such as Integrated Child Development Services (ICDS), National Health Mission (NHM), Mid-Day Meal Scheme, Rajiv Gandhi Schemes for Empowerment of Adolescent Girls (RGSEAG) etc. Government should primarily focus on areas having high rates of malnutrition suchasSitapur, Gonda, Balrampur, Chitrakoot, SantRavidas Nagar (Bhadohi), Bahraich and Shrawasti in Uttar Pradesh. West Delhi and Central Delhi in the capital territory,Gaya, Arwal, Nalanda and Bhojpur in Bihar.

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TABLE 1.1.1:

CLUSTER 1 Uttar Pradesh Stunting

DISTRICT	NOT STUNTED	STUNTED	POPULATION	DISTRICT	NOT STUNTED	STUNTED	POPULATION
Sitapur	275	142	417	Pratapgarh	300	74	374
Mahrajganj	396	132	528	Bara Banki	294	90	384
Siddharth Nagar	424	166	590	Kushinagar	432	127	559
SantKabir Nagar	425	125	550	Mirzapur	346	112	458
Balrampur	351	219	570	Rae Bareli	294	58	352
Deoria	382	75	457	Shrawasti	400	193	593
Basti	401	129	530	SantRavidas Nagar (Bhadohi)	445	140	585
Ambedkar Nagar	385	70	455	Sonbhadra	345	118	463
Bahraich	368	207	575	Unnao	330	76	406
Lucknow	382	74	456	Kheri	359	129	488
Aligarh	798	205	1003	Kaushambi	329	108	437
Azamgarh	367	68	435	Fatehpur	215	76	291
Mau	400	83	483	Hardoi	321	84	405
Gonda	379	164	543	Kanpur Nagar	441	92	533
Ballia	403	89	492	Chitrakoot	358	136	494
Ghazipur	366	70	436	Kannauj	382	95	477
Sultanpur	317	81	398	Shahjahanpur	376	114	490
Jaunpur	387	94	481	Banda	217	66	283
Varanasi	646	156	802	Farrukhabad	381	109	490

TABLE1.1.2:

CLUSTER 2 **Uttar Pradesh Stunting**

DISTRICT	NOT STUNTED	STUNTED	POPULATION
Chitrakoot	358	136	494
Banda	217	66	283
Kaushambi	329	108	437
Fatehpur	215	76	291

TABLE1.1.3:

CLUSTER 3**Uttar Pradesh Stunting**

DISTRICT	NOT STUNTED	STUNTED	POPULATION
SantRavidas Nagar (Bhadohi)	445	140	585
Sonbhadra	345	118	463
Mirzapur	346	112	458

TABLE1.2.1:

CLUSTER 1 **Uttar Pradesh Wasting**

DISTRICT	NOT WASTED	WASTED	POPULATION
Mahoba	320	22	342
Banda	265	18	283
Chitrakoot	425	69	494
Jalaun	229	37	266
Fatehpur	275	16	291
Kanpur Nagar	476	57	533
Jhansi	501	60	561
Auraiya	338	43	381
Kaushambi	380	57	437
Rae Bareli	303	49	352
Lalitpur	262	51	313

TABLE1.2.2:

CLUSTER 2 **Uttar Pradesh Wasting**

DISTRICT	NOT WASTED	WASTED	POPULATION
Varanasi	740	62	802
Mirzapur	429	29	458
Jaunpur	441	40	481
Ghazipur	403	33	436
SantRavidas Nagar (Bhadohi)	540	45	585

TABLE1.3.1:

CLUSTER 1 **Uttar Pradesh Underweight**

DISTRICT	NOT UNDERWEIGHT	UNDERWEIGHT	POPULATION
Aligarh	891	112	1003
Mirzapur	384	74	458
Kaushambi	350	87	437
SantRavidas Nagar (Bhadohi)	476	109	585
Sonbhadra	399	64	463
Pratapgarh	326	48	374
Chitrakoot	387	107	494
Varanasi	678	124	802
Jaunpur	406	75	481

TABLE1.3.2:

CLUSTER 2**Uttar Pradesh Underweight**

DISTRICT	NOT UNDERWEIGHT	UNDERWEIGHT	POPULATION
Mirzapur	384	74	458
Varanasi	678	124	802
Jaunpur	406	75	481
SantRavidas Nagar (Bhadohi)	476	109	585
Sonbhadra	399	64	463

TABLE1.3.3:

CLUSTER 3 **Uttar Pradesh Underweight**

DISTRICT	NOT UNDERWEIGHT	UNDERWEIGHT	POPULATION
Pilibhit	386	80	466
Bareilly	763	102	865
Rampur	426	68	494
Shahjahanpur	405	85	490
Budaun	470	109	579

TABLE1.3.4:

CLUSTER 3**Uttar Pradesh Underweight**

DISTRICT	NOT UNDERWEIGHT	UNDERWEIGHT	POPULATION
Balrampur	476	94	570
Mahrajganj	467	61	528
Sitapur	349	68	417
Siddharth Nagar	509	81	590

TABLE1.3.5:

CLUSTER 4 **Uttar Pradesh Underweight**

DISTRICT	NOT UNDERWEIGHT	UNDERWEIGHT	POPULATION
Bahraich	489	86	575
Gonda	478	65	543
Shrawasti	508	85	593

TABLE2.1.1

CLUSTER 1**Delhi Stunting**

DISTRICT	NOT STUNTED	STUNTED	POPULATION
West	116	14	130
North West	99	11	110
North	143	16	159
Central	89	15	104

TABLE2.2.1:

CLUSTER 1 **Delhi Wasting**

DISTRICT	NOT WASTED	WASTED	POPULATION
New Delhi	86	9	95
Central	92	12	104
North	147	12	159
East	116	10	126

TABLE2.3.1:

CLUSTER 1 Delhi Underweight

DISTRICT	NOT UNDERWEIGHT	UNDERWEIGHT	POPULATION
West	118	12	130
North West	102	8	110
North	148	11	159
Central	92	12	104
New Delhi	87	8	95

TABLE3.1.1:

CLUSTER 1**Bihar Stunted**

DISTRICT	NOT STUNTED	STUNTED	POPULATION
Nawada	424	133	557
Kaimur (Bhabua)	442	140	582
Sheikhpura	510	156	666
Nalanda	392	131	523
Gaya	550	180	730
Lakhisarai	471	159	630

TABLE3.2.1:

CLUSTER 1**Bihar Wasting**

DISTRICT	NOT WASTED	WASTED	POPULATION
Arwal	524	91	615
Bhojpur	514	72	586
Jehanabad	466	39	505
Gaya	677	53	730
Patna	931	114	1045

TABLE3.3.1:

CLUSTER 1**Bihar Underweight**

DISTRICT	NOT UNDERWEIGHT	UNDERWEIGHT	POPULATION
Gaya	586	144	730
Jehanabad	431	74	505
Nawada	465	92	557
Arwal	487	128	615
Aurangabad	411	78	489
Kaimur (Bhabua)	467	115	582
Nalanda	431	92	523
Bhojpur	493	93	586
Patna	887	158	1045
Sheikhpura	552	114	666
Rohtas	492	87	579
Lakhisarai	527	103	630

"ORGANIZATIONAL CHALLENGES TOWARDS FEMALE JOB SATISFACTION IN INDIAN HOTEL INDUSTRY"

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ABSTRACT

With the changing trends in business and most recent challenges observed in the competitive world organizations have become more responsive towards their resources. In hotel industry human workforce is the major resource that converts the non-valuable assets to valuable products. They are the key components of hotel business. Female employees in this regard plays significant role in overall performance, guest loyalty and brand imaging of any hotel organization. Having natural attributes of soft skills in hospitality procedures they are the leading participants of the industry. Hence it is important for the industry to acknowledge their job needs and special requirements .In this regard Human Resource Department and the hotel management could work together to develop female friendly practices within the organization that could offer them the higher level of job satisfaction. The aim of the paper is to investigate the effect of HRM practices that occurs as organizational challengesfor female employees' job satisfaction with special reference to selected five star hotels in India. It is a descriptive study and data has been collected from 238 female employees of various five star hotels in India on the basis of HR Practices adopted in hotel organizations. The variables taken for the study are Working Conditions, Compensation, growth opportunities and gender equality. Data has been collected through questionnaire from 25 five star and above category hotels. The study found that job satisfaction of female employees is significantly affected by all the variables selected for study. The highest association was found with growth opportunities and the least with working conditions.

Keywords: *Female employees, Hotel, Human Resource Department, HRM Practices*

Introduction

Hotel organizations are complex in their functioning .Several departments and people work in close coordination 24x7x365 days .Due to the nature of versatility in jobs the work force just not needs to have higher level of job skills and expertise but also essentially to have a balance of mind and behavior all the time.Dealing with variety of guests with differentkind of needs and requirements an employee in hotel job has to be emotionally and mentally strong. Then only one can offer total commitment and loyalty to his/her job. Female in this regard has edge over their male counterparts as they usually hold intrinsic behavior to handle complicatedwork conditions easily.However, due to the multiple roles performed by women in the family and society, organizations should focus to fulfill their job needs and requirements. Effective HR Practices and HR management could play an important role in this. In general hotel industry observes hard and difficult work conditions which lead to high rate of turnover in the industry (Osman and Ronate, 2012.). Bakotic and Babic, (2013) also declared that employees who observe hard working conditions remains dissatisfied with their jobs which leads to quitting of job.Moreover, scholars noted that job satisfaction and employee performance are associated very closely.Budur&Poturak,(2020) explains employee performance as the way an employee perform his job effectively. Job satisfaction is identified as a vital factor on the employee's commitment towards the organization. Following these further, HRM policies are major features of the job that determines employees'positiveresults.Human resource policies can affect employee inspiration and job satisfaction either in positive or negative manner. If employees are happy with the human resource policies and practices in their organization, then they tend to be dedicated and motivated sufficiently to attain organizational goals and objectives. Hence it is correct to state that Human Resource Practices directly affects the Job Satisfaction of employees. However, it is also important to know that females are more concerned with the human resource practices of the organization as they are the most, who gets affected by them (Chadwick, 2010). This complies suitably with the hotel organizations.Patwardhan et al. (2016) found that HR Practices related to work, growth, glass ceiling and gender inequality are the

major causes affecting female career enhancement in Indian hotels.

Literature Review

Job Satisfaction of Employees- Since early times scholars have extensively identified satisfaction in job, as an important career feature.. Different researchers defined job satisfaction in their own manner. However, everyone in one or another way explained job satisfaction as the matter of overall life satisfaction. Hoppock (1935) elaborated the multidimensional aspects of job satisfaction and defined it as a combination of psychological, physiological and environmental factors that causes an individual to say "I am satisfied with my job". Later several others scholars associated employees' job satisfaction with their well being and organizational growth .An employee's job satisfaction can also be associated with the fulfillment of his/her needs and demands (Finn, 2001).Furthermore, Wolnaik et al., (2005) established a positive involvementamong the job satisfaction and employee performance. Enhanced Performance leads to the growth of organization and employees'. Similarly, Hanif and Kamal (2009) identified the advantages of satisfied employees and concluded satisfied employees as to be happy employees who offer warm and welcoming behavior to their customers. Besides the benefits of job satisfactions scholars also studied the factors that impacts the job satisfaction of an employees. Saeed et al., (2014) identified that working conditions, salary, equality and promotion opportunities are the major parameters of job satisfaction among employees at various designations.Later, Laskarin(2017) closely related employee satisfaction with organizational performance in relation to hospitality organizations. The results concluded that a higher level of job satisfaction can have a direct impact on increasing the financial performance of the hotel Similarly, Siddiq and Acharya, (2018) in context of hospitality organizations connectedconstructivejob conditions and appropriate rewards with betterjob performance and employee job satisfaction.

HRM Practices in Hotels

Human Resource Management (HRM) is defined as "the practice of dealing with the nature of employment relationships along with various decisions, actions and issues that relate to that relationship.Human resource management in the organizations provides the prospects for the efficientutilization of available skilled human resources(Bayiz Ahmad et al., 2019) It is also important for creating positive organizational culture, crises management during work and progressive environment for the employees. Human Resource department thus plays essential roles in employee management. The policies and practices adopted by HR departments actually reflect the vision and approach of any organization. Demir (2019) identified strategies related to employee motivation, training, communication, rewards, and empowerment as themajor policies of HRM departments. Hospitality organizations are unique in their functioning wherein women workforce plays an important role. The HR issues typically in hotels are of varied nature. According to Mooney and Ryan, (2009) job satisfaction of female employees in hospitality industry is majorly exaggerated by long and irregular work hours. These in turn causes health issues and further develops feel of dissatisfaction among them. Similarly, Okumus et al., (2010) identified insufficient time for friends and family, low compensation and the difficulty of getting a promotion as few of the obstacles faced by females while working in the hospitality industry. Baum (2013) also highlighted the organizational factors that determine the roles of women workforce in hotel industry. Effective human resource practices in this regard could have positive influence on valuable and quality delivering of service to guests in hospitality organizations (Chand, 2010) .Likewise, Jawaad et al., (2019) related effectiveness of HR practices with employee performance, job satisfaction and quality of guest services offered.

Methodology

.Sampling – A total of 250 questionnaires were distributed to the female employees working in the five star hotels. Out of the distributed questionnaires, 241 questionnaires were

received back and a total of 238 questionnaires were found complete and usable in all manners for analysis..The data was collected by simple random sampling method. The responses were measured on a 5-point Likert scale (1= Highly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Highly Agree).

Research instruments -The questionnaire consists of two parts. The first part involves items related to socio-demographic characteristics of respondents.(Table 1). Second part consists of the list of HR variables about the job satisfaction of female respondents. (Table2) .Job satisfaction is dependent variable whiles others are independent variables. The HR variables about job satisfaction of female employees in hotels were adopted from review of literature from previous studies.

Research hypothesis

Based on the literature review, following hypothesis was formulated:

H1: Working Conditions has significant impact on female job satisfaction

H2: Compensation has significant impact on female job satisfaction

H3: Growth Opportunities has significant impact on female job satisfaction

H4: Gender Equality has significant impact on female job satisfaction

Research Findings

Demographic Table

Table 1 shows the demographic classification of the respondents. Based on the results it was observed that

Table 1: Demographic Distribution of Respondents (N=238)

Department	**Frequency**	**Percentage**
Front Office	84	35.29%
Housekeeping	79	33.19%
Food & Beverage Service	54	22.68%
Food Production	21	8.82%
Total	**238**	**100%**
Position	**Frequency**	
Entry Level	127	53.36%
Supervisory level	72	30.25%
Managerial Level	39	16.38%
Total	**238**	**100%**
Age (In Years)	**Frequency**	
Below 25	96	40.33%
25 to 35	100	42.01%
36 to 45	30	12.60%
46 and above	12	5.04%
Total	**238**	**100%**
Marital status	**Frequency**	
Single	121	50.84%
Married	107	44.95%
Others	10	4.20%
Total	**238**	**100%**

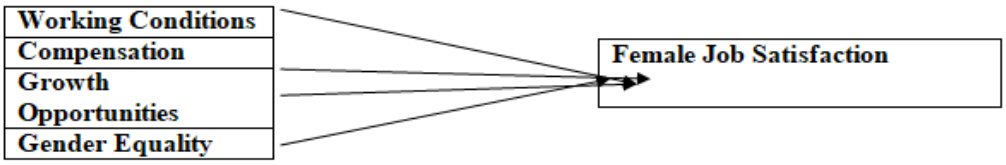
Instrument Validity and Reliability

Table 2: List of Variables for female Job Satisfaction

	Cronbach's Alpha	**Composite Reliability (CR)**	**Average Variance Extracted (AVE)**
Working Conditions	0.924	0.912	0.744
Compensation	0.831	0.816	0.652
Growth Opportunities	0.906	0.926	0.731
Gender equality	0.901	0.918	0.711

From Table 2, it is clear that all the variables have AVE greater than 0.5 and CR greater than 0.7, thus this satisfies the criteria of convergent validity as per Hair et al. (2014, 2017) In addition, the questionnaire was found reliable as the Cronbach's Alpha value for the variables is greater than 0.7 (Hair et al., 2014).

Figure 1: Conceptual Model of Female job satisfaction In Hotels



Hypotheses Testing

In this part analysis between covariance and correlation among the independent variable (working conditions, compensation, growth opportunities and Gender equality) and the dependent variable job satisfaction. "Covariance" explains the significance of relationship between two variable whether it is positive, negative or neutral in nature. But, it is unable to identify the strength of relationship. "Correlations" measure both the quality and the strength of relationship.

Table 3: Correlation and Covariance among Variables

Independent Variable	Dependent variable
Covariance	Correlation
Working Conditions	Job satisfaction
1.24	0.45
Compensation	Job satisfaction
1.40	0.52
Growth opportunities	Job satisfaction
1.42	0.59
Gender Equality	Job Satisfaction
1.32	0.50

From Table 3 it is evident that all the four selected variables are positively associated with job satisfaction of female employees in hotel industry. The results further indicated highest correlation with growth opportunities followed by Compensation, gender equality and least with the working conditions of the hotel.

Table 4: Results of Hypotheses

Independent Variable	Dependent Variable	R Square	Adjusted R square	T Stat	Coefficient	Hypothesis No	Result
Working Conditions	Job Satisfaction	0.21	0.20	6.90	0.48	H1	Accepted
Compensation	Job Satisfaction	0.35	0.34	8.08	0.53	H2	Accepted
Growth opportunities	Job Satisfaction	0.36	0.36	8.18	0.61	H3	Accepted
Gender Equality	Job Satisfaction	0.29	0.28	7.06	0.43	H4	Accepted

The Hypotheses are further tested using regression analysis. It is a technique to examine the relationship of at least two premium variables. Analysis of regression examines the effect of an independent variable with that to a dependent variable.

Based on Table 4 and the adjusted R Squares .it was revealed that growth opportunities with value 0.36is the main indicator which effected female job satisfaction stronger than compensation, gender equality and working conditions. Secondly, compensation held 0.34 adjusted R square had stronger impact on the job satisfaction of female hoteliers than gender quality and working conditions.Lastly though the impact of gender equality and working condition was significant, gender equality held 0.28 and working conditions held the least impact with 0.20 adjusted R square values. The results have shown that t values of all hypotheses were above 1.98 hence impact of working conditions, compensation, growth opportunities and gender equality on female job satisfaction was significant. Therefore, all hypotheses were found significant and accepted

Conclusion and Suggestions

From the data collected it can be clearly concluded thatvery few number of female employees are holding higher positions and also they tend to leave hotel industry at their high age. Further, front office department appears to be the most preferred department and food production as the least opted department by females in hotel industry. As the results have revealed that growth opportunities are the most significant challenge of female job satisfaction in hotel industry .Therefore, it is suggested to hotel organizations to:

It has been observed that the most important factors affecting attrition are "Low salaries" &

"Long working hours". The industry should concentrate on these areas to reduce employee dissatisfaction.

- To acknowledge female workforce as an integral part of the industry. While planning HR policies and practice hotels it should be essential to keep in consideration the needs and requirements of female employees.
- Formulate mechanism for enhanced female participation, retention and growth in the industry.
- Provide development opportunities at your hotel by devising transparent and well stated policies regardingdevelopment and promotions.
- Assessment of employees' job must be non biased and should purely be prepared on performance criterions.
- Promote fairness and gender equality while offering leadership roles to employees.
- Fulfill work life balance training demands of female employees in order to hold experienced employees especially during their increased life responsibilities.
- Hotels should focus to build female centric work environment equally in all departments so as to encourage more females to choose departments other then considered as female oriented ones.
- Compensations and incentives much be as competitive as to other similar industries .It would definitely encourage female retention in the industry.

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BEHAVIOURAL FINANCE DIMENSIONS OF INVESTORS OF TINSUKIA TOWN

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ABSTRACT

Behavioural finance studies the psychology of financial decision-making. Behavioural finance attempts to understand and explain observed investor and market behaviours. The paper makes an attempt to study the various psychological baises present among the investors of Tinsukia town with the view to assess the level of behavioural bias among the investors of Tinsukia town, to examine the presence of association between various demographic variables among the investors of Tinsukia town and to find out the factors influencing the investment decision making process on the perspective of Behavioural Finance. The data has been collected from primary as well as secondary sources of data. Primary data has been collected from 100 investors of Tinsukia as sample. Secondary sources has been collected from various journals, books and thesis.The methodological approach of this research is based on the Univariate analysis, Binary Regression (Logit) and Hosmer–Lemeshow test. The data collected with the help of questionnaires were segregating in respective bias categories and evaluated using SPSS 21.0 in order to extract some relationship amongst them. The study found that around 48% of the investors were influenced by overall biases. More than half of the respondents were influenced by Loss of aversion biases, Herd behaviour bias, Overconfidence bias, Cognitive dissonance bias and Representative bias. Whereas, half of the investors were influenced by Regret aversion bias respectively.

Introduction

Behavioural finance studies the psychology of financial decision-making.[1]Behavioural finance attempts to understand and explain observed investor and market behaviours. This differs from traditional (standard) finance, which is based on hypotheses about how investors and markets should behave.[2]Behavioural finance, with its roots in the psychological study of human decision-making, is a relatively new and evolving subject in the field of finance. In brief, behavioural finance is the study of investors' psychology while making investment decisions.[3]Behavioral finance is a famous field of finance that suggests theories based on human psychology (financial psychology or behavioural economics) in order to explain the concept of stock market anomalies, which includes extreme rise and fall in the prices of stocks.[4]Behavioural finance is a new academic discipline which seeks to apply the insights of the psychologists to understand the behaviour of both investors and financial markets. It helps us to avoid emotion-driven speculation leading to losses, and thus devises an appropriate wealth management strategy.[5]

Theories of Behavioural finance

Prospect theory

Based on Expected Utility Theory (EUT), investors are risk averse so the slope of curve of wealth utility by its increasing decrease. Prospect theory in 1980 by other scientists like Thaler, Shiller and Johnson completed and now this theory states four important behaviour aspects of investors

Loss Aversion: *Loss aversion* is a cognitive bias that describes why, for individuals, the pain of losing is psychologically twice as powerful as the pleasure of gaining.[6] Loss

[1]https://www.vanguard.co.uk/documents/portal/literature/behavourial-finance-guide.pdf accessed on 20/11/2020 at 12:10PM.

[2]https://www.cfainstitute.org/en/membership/professional-development/refresherreadings/2020/behavioral-finance-perspective accessed on 20/11/2020 at 02:10PM.

[3] https://www.businessmanagementideas.com/financial-management/behavioral-finance/behavioural-finance-meaning-and-applications-financial-management/16569 accessed on 20/11/2020 at 12:10PM.

[4] https://en.samt.ag/behavioral-finance-theory accessed on 20/11/2020 at 01:20PM.

[5] https://www.businessmanagementideas.com/financial-management/behavioral-finance/behavioural-finance-meaning-and-applications-financial-management/16569#:~:text=Behavioural%20finance%20is%20a%20new,an%20appropriate%20wealth%20management%20strategy. accessed on 22/11/2020 at 02:20PM.

[6] https://thedecisionlab.com/biases/loss-aversion/ accessed on 23/11/2020 at 11:10AM.

aversion was first convincingly demonstrated by Amos Tversky and Daniel Kahneman (1979).

Mental Accounting:Mental accounting refers to the different values a person places on the same amount of money, based on subjective criteria, often with detrimental results. Mental accounting is a concept in the field of behavioral economics, developed by economist Richard H. Thaler, it contends that individuals classify funds differently and therefore are prone to irrational decision-making in their spending and investment behavior[7].

Self-Control Bias : This theory states that investor like invests on securities that have more control on investments for this reason investor select stocks that pay dividend versus capital gain.

Regret Aversion:*Regret aversion* occurs when a decision is made to avoid regretting an alternative decision in the future. Regret can be a powerless and discomforting state and people sometimes make decisions in order to avoid this outcome.[8]

Heuristics: Heuristic is derived from the Greek word meaning "to discover". The word Heuristic means behavior and making decision based on experienced and past documents, these kinds of behaviors are categorized into some groups:

Herd Behavior: Herd behaviour, which is the tendency for individuals to mimic the actions (rational or irrational) of a larger group. Individually, however, most people would not necessarily make the same choice. There are a couple of reasons why herd behaviour happens. The first is the social pressure of conformity.

Over and under reaction: According to market efficiency, new information should more or less be reflected instantly in a security's price.

Anchoring: Anchoring is a behavioral bias in which the use of a psychological benchmark carries a disproportionately high weight in a market participant's decision-making process. The concept is part of the field of behavioral finance, which studies how emotions and other extraneous factors influence economic choices.[9]

Over Confidence:Overconfidence bias is a tendency to hold a false and misleading assessment of our skills, intellect, or talent. In short, it's an egotistical belief that we're better than we actually are. It can be a dangerous bias and is very prolific in behavioural finance and capital markets.[10]

Representativeness: The representativeness heuristic is used when making judgments about the probability of an event under uncertainty.[11]

Profile of Tinsukia

Tinsukia is an industrial town. It is situated 480 kilometres (298 mi) north-east of Guwahati and 84 kilometres (52 mi) away from the border with Arunachal Pradesh.[12] It is the administrative headquarters of Tinsukia District of Assam, India. Tinsukia is located at 27.5°N 95.37°E.It has an average elevation of 116 metres (380 feet).

According to the 2011 census, Tinsukiahad a population of 126,389. Males constituted 55% of the population and females 45%. Tinsukia had an average literacy rate of 70.15%, higher than the national average of 64.84%; male literacy was 77.89%, and female literacy 63.54%. 13.29% of the population was under 6 years of age.

Statement of the problem

Financial literacy is emerging and gradually markets are becoming more capital oriented. People tend to take risk these days and so is the capital market rising. With the increase

[7] https://www.investopedia.com/terms/m/mentalaccounting.asp accessed on 24/11/2020 at 02:30PM.

[8] https://thedecisionlab.com/biases/regret-aversion/ accessed on 24/11/2020 at 02:10PM.

[9] https://www.investopedia.com/terms/a/anchoring.asp accessed on 20/11/2020 at 12:10PM.

[10] Overconfidence Bias - Definition, Overview and Examples in Finance (corporatefinanceinstitute.com) accessed on 20/11/2020 at 12:10PM.

[11] Representativeness heuristic - Wikipedia accessed on 20/11/2020 at 12:20PM.

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investment opportunities, People are now investing intensively and thus Behavioural finance is rising which defines the rationality or irrationality of the investors which generates market sentiments. This paper makes an attempt to find out the various behavioural biases present among the investors of Tinsukia town. It also made an attempt to examine whether the individual investor's trading from are rational or irrational and its extent.

Review of Literature

Paul(2015)[13] did a research work in the form of doctoral thesis on State of Mental Accounting and Retail Investors of Mutual Fund to ascertain the gap between the level of 'the customers' solution expected' and the level of 'the customers' solution experienced', between the level of 'the customers' cost expected' and the level of 'the customers' cost experienced, the level of 'the customers' communication expected' and the level of 'the customers' communication experienced' with respect to mutual fund as perceived by the retail investors and to find the relationship between the 'state of mental accounting' of retail investors, in one hand, and the level of the gaps in respect of 4Cs , on the other hand, with respect to mutual fund. He followed a mixed model Research Design i.e., a combination of Qualitative Research and Quantitative Research. Qualitative analysis was followed by quantitative research. He used snowball-sampling method to collect sample. KahnemanandRiepe,Doviak(2015)[14] approached behavioural finance from the point of view of a financial planner. In her paper, Doviak attempts to honein on the advisor side and provide readers with strategies for applying behavioural finance to one's practice. Benzion, Krupalnik, Shavit(2013)[15] added to Benartzi and Thaler's piece to show that the addition of a high-risk stock fund option to the original experiment reduced the effect of myopic loss aversion because of the subject's tendencies to diversify equally to all investment options. Barberis and Thaler (2001)[16] confirmed that the data does indeed show anomalous corrective activity following earnings announcements from these companies. Barberisetal. Provide a comprehensive review of behavioural finance literature. Chan(2001)[17] illustrated the price trend reversals of ten occur when a majority of market agents follow the same investing strategy (buying or selling), unsupported by new information. Evidence of investor herding is presented. Annalien DeVries, PierreD. Erasmus, Charlene Gerbe(2017)[18] made a study to investigate the existence of familiarity bias amongst individual investors in the South African stock market. Using quantitative approach, an online survey was used to show images of familiar and unfamiliar company brands to respondents, where after respondents were asked to indicate whether they will invest in the shares of the identified companies. Goyal, Nisha, Kumar Satish(2015)[19] investigated review the

[13] Paul, Tarak (2015) : INFLUENCE OF MARKETING MIX ON INVESTORS MENTAL ACCOUNTING WITH RESPECT TO POSITIONING OF MUTUAL FUND PRODUCTS Doctoral Thesis, Assam University. Silchar

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literature systematically published in past 33 years on behavioural biases in investment decision-making through selecting 117 articles published in peer- review journals between 1980 and 2013 to highlights the major gaps in the existing studies on behavioural biases and found tha the focus on equity in home bias. Trehanand Sinha (2016)[20] identified overconfidence variables with extensive literature review asself-attribution, optimism, better than average effect, miscalibration, and illusion of control, trading frequency and trading experience. They used structured questionnaire based on 5 point Likert Scale to identify the influence of these variables in investor's decision making with relevant statistical tools and found that investors are over confident about their investment decisions, skills, knowledge, ability to choose stocks, control of portfolio, future investment plans and views about the stock market and require the multiple approach.

Research Gap

After going through extensive Review of Literature it has been found that no studies have been conducted so far to study the behavioural bias of the investors of Tinsukia town of Assam and no studies have been conducted to find out the level of association between various demographic variables and the factors influencing the investment decision making process of the individual investors of Tinsukia.

Objective of the Study

The objectives of the study are as follows:

1) To assess the level of behavioural bias among the investors of Tinsukia town.
2) To examine the presence of association between various demographic variables among the investors of Tinsukia town.
3) To find out the factors influencing the investment decision making process on the perspective of Behavioural Finance.

Hypothesis of the study

The hypothesis of the study are as follows:

H_{01}: Behavioral biases do not exist among individual investor of Tinsukia town.

H_{11}:Behavioralbiases exist among individual investor of Tinsukia town.

H_{02}: There is no presence of association between various demographic variables among the investors of Tinsukia town.

H_{12}: There is presence of association between various demographic variables among the investors of Tinsukia town.

Data and Methods

Methodology, Time Frame and Data

The methodological approach of this research is based on the Univariate analysis, Binary Regression (Logit)andHosmer–Leme show test.Univariate analysis is the technique of comparing and analyzing the dependency of a single predictor and a response variable.[21]Logistic regression is a statistical model that in its basic form uses a logistic function to model a binary dependent variable, although many more complex extensions exist. In regression analysis, logistic regression.[22] Logistic regression is the appropriate regression analysis to conduct when the dependent variable is dichotomous (binary)[23]

108,https://doi.org/10.1108/QRFM-07-2014-0022

[20]Trehan, Bhoomika, Sinha, Amit Kumar(2016): A STUDY OF EXISTENCE OF OVERCONFIDENCE BIASES AMONG INVESTORS AND ITS IMPACT ON INVESTMENT DECISION , ELK Asia Pacific Journals – Special Issue https://www.elkjournals.com/microadmin/UploadFolder/8565A%20STUDY%20OF%20EXISTENCE%20OF%20OVERCONFIDENCE%20BIASES%20AMONG%20INVESTORS%20AND%20ITS%20IMPACT%20ON%20INVESTMENT%20DECISION.pdf accessed on 20/11/2020 at 12:10PM.

[21] https://deepai.org/machine-learning-glossary-and-terms/univariate-analysis accessed on 20/11/2020 at 02:30PM.

[22]https://en.wikipedia.org/wiki/Logistic_regression#:~:text=Logistic%20regression%20is%20a%20statistical,a%20form%20of%20binary%20regression). https://en.wikipedia.org/wiki/Logistic_regression#:~:text=Logistic%20regression%20is%20a%20statistical,a%20form%20of%20binary%20regression) accessed on 22/11/2020 at 02:40PM.

[23] https://www.statisticssolutions.com/what-is-logistic-regression/?__cf_chl_jschl_tk__=74151d16a7715d825ce63a7a22300053c72a16b8-1606659983-0AfF9Ti8TfZYWEB1i_1nCsAURnBBjEn5RLHHF

Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables.[24]**Logistic regression** is a statistical method for analyzing a dataset in which there are one or more independent variables that determine an outcome. The outcome is measured with a dichotomous variable (in which there are only two possible outcomes).[25]The Hosmer–Lemeshow test is a statistical test for goodness of fit for logistic regression models.The test assesses whether or not the observed event rates match expected event rates in subgroups of the model population. The Hosmer–Lemeshow test specifically identifies subgroups as the deciles of fitted risk values. Models for which expected and observed event rates in subgroups are similar are called well calibrated.[26]The Pearson chi-squared goodness of fit test cannot be readily applied if there are only one or a few observations for each possible value of an x variable, or for each possible combination of values of x variables. The Hosmer-Lemeshow statistic was developed to address this problem.[27]For the current research, primary data has been collected using structured questionnaire were distributed in person to investors engaged in trading through brokerage houses and also as an online survey to those who choose to trade online. For this purpose, the data of 100 investors was collected from individual investors.

Questionnaires which were completely filled in all aspects were only taken for analysis purpose. 100 investors were picked randomly to ensure that sample size truly represents the whole population. The present research aims to collect data from diversified investors of distinct age, educational qualification, years of investment experience with differing attitudes in different market scenarios. Further, the questionnaire was prepared and made accessible to respondents in July 2020 to November 2020 .

The data collected with the help of questionnaires were segregating in respective bias categories and evaluated using SPSS 21.0 in order to extract some relationship amongst them. Chi-square test for independence was also used to test the various hypotheses and various charts and tables were made using Microsoft excel to present the demographic characteristics of the respondents like their age, gender, educational qualification, risk taking capacity, etc.

Statistical Analysis

Firstly, univariate analysis is carried out to describe the profile of the variables under study. The dependent variable here is dichotomous, so, binary logistic regression has been applied for the multivariate analysis. The dependent variable has been categorized as “1 = Yes (influenced by bias)” and “0 = No (not influenced by bias)".

1pZBhhkEJgULHMPjWMU7I4tOg3F_v_Qbky2J5dt_bCEHxq0DQ1LrmH1oE7PMZk_HtsL11Kd4A3RUmtIifPTC9CcpdPxzsGqWkb7zRMIum98652L7d36b1McQ25Fobtu97oErylteDK4zMTYrsonZAGMuPyaazO6cqhhk9DC4mnKJNHe3Q7JGMEwI1o9A7Z9SmAr_uqWAwh9ICjeK6FV7h8R0vXtJ894Zft5DZfMbCKPknEDReBM_LNd4g4MJU22VFnV-Wwh8FCi6S11EnudMDB-dxGyNlvsQreloCdAgJ5z3R4GE accessed on 23/11/2020 at 02:40PM.

[24]https://www.statisticssolutions.com/what-is-logistic regression/?__cf_chl_jschl_tk__=74151d16a7715d825ce63a7a22300053c72a16b8-1606659983-0-AfF9Ti8TfZYWEB1i_1nCs-AURnBBjEn5RLHHF1pZBhhkEJgULHMPj-WMU7I4tOg3F_v_Qbky2J5dt_bCEHxq0DQ1LrmH1oE7PMZk_HtsL11Kd4A-3RUmtIifPTC9CcpdPxzsGqWkb7zRMIum98652L7d36b1McQ25Fobtu97oErylteDK4zMTYrsonZAGMuPyaazO6cqhhk9DC4mnKJNHe3Q7JGMEwI1o9A7Z9SmAr_uqWAwh9ICjeK6FV7h8R0vXtJ894Zft5DZfMbCKPknEDReBM_LNd4g4MJU22VFnV-Wwh8FCi6S11EnudMDB-dxGyNlvsQreloCdAgJ5z3R4GE accessed on 20/11/2020 at 01:10PM.

[25] https://www.medcalc.org/manual/logistic_regression.php accessed on 20/11/2020 at 12:10PM.

[26] https://en.wikipedia.org/wiki/Hosmer%E2%80%93Lemeshow_test accessed on 25/11/2020 at 03:10PM.

[27] https://en.wikipedia.org/wiki/Hosmer%E2%80%93Lemeshow_test accessed on 25/11/2020 at 03:20PM.

The age of the investors, gender, occupation, family size, investor types, investment years, source, mode of trading, investment preference, objective of investment and downfall have been included as the predictors. We then used a logistic regression model, given by

$$logit(p) = ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n$$

Where X_i's are independent variables and β_i's are regression coefficients. To interpret logistic regression, we use the odds ratio. It is a measure of association, as it proximate how much more likely (or unlikely) it is for the outcome to be present among those with X=0 than among those with X=1. All the analysis has been carried out with the help of STATA (Version 14).

Results and Interpretation

Table 1: Profile of the background characteristics of the study population or predictor variables under study

Predictors (n=100)	Percentage share	Predictors (n=100)	Percentage share
Gender		**Investment years**	
Male	65%	Less than or equal to 5 years	44%
Female	35%	More than 5 years	56%
Age (in years)		**Source of investment**	
Less Than 25	37%	Borrowed funds	55%
25-40	25%	Both own and borrowed	45%
41 and above	38%	**Preferred mode of trading**	
Education		Online	15%
Bachelors	75%	Offline	54%
Masters and above	25%	Both	31%
Marital Status		**Investment preferences**	
Single	62%	Others (FMCH/Banking /IT)	17%
Married	38%	Energy sector	24%
Occupation		Pharmaceutical sector	39%
Job	22%	Capital goods sector	20%
Businessman	39%	Investment preference	
Others	39%	**Objective of investment**	
Family size		Regular return	17%
Two	26%	Safety of principal amount	25%
Three	38%	Income tax benefits	16%
Four and above	36%	Diversification	17%
Type of Investor		Liquidity	25%
Hereditary	63%	**Downfall experience**	
New investor	37%	Yes	53%
		No	47%

Table 1 depicts the percentage distribution of background characteristics of the population under study. Out of the total sampling units under study, 65% of them were males whereas rest were females. Most of the people sampled were either less than 25 years of age or more than 41 years. One-fourth of the population under study had qualification of master's degree and above. Around 62% of the population sampled were single. 39% of the study subjects were businessperson. More than 75% of the sampled individuals had family of size more than three. Almost 60% of the investors were hereditary. More than half of the investors had experience of more than 5 years. Around 55% of the investors used borrowed funds. More than half of the investors preferred offline mode of trading. Highest percentage of the study subjects preferred pharmaceutical sector for investment, followed by energy sector. For one-fourth of the investors the objective of investment was safety of principal amount and for another one fourth it was liquidity. More than 50% of the investors has experienced downfall in the market that resulted into heavy loses.

Table 2: Percentage of respondents influenced by various behavioural biases

Biases	Respondents influenced by biases	Respondents not influenced by biases
Overall	48%	52%
Loss of aversion	51%	49%
Regret aversion	50%	50%
Herd behaviour	52%	48%
Overconfidence	57%	43%

Anchoring bias	45%	55%
Cognitive Dissonance	54%	46%
Representative bias	55%	45%

Table 2 represented the percentage share of respondents (investors) who were influenced by various behavioural biases. Around 48% of the investors were influenced by overall biases. More than half of the respondents were influenced by Loss of aversion biases, Herd behaviour bias, Overconfidence bias, Cognitive dissonance bias and Representative bias. Whereas, half of the investors were influenced by Regret aversion bias respectively.

Table 3: Binary logistic regression table (overall bias)

Influenced by bias	Odds ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Gender (male®)				
Female	.634	.784	.024	16.645
Age (less than 25 ®)				
25-40 years	.839	.854	.130	5.434
41 and above	0.517**	.040	.056	0.456
Occupation (job ®)				
Businessman	2.256	.528	.181	28.187
Others	3.011	.338	.316	28.652
Family (two ®)				
Three	0.288**	.001	.000	.028
Four and above	0.022**	.004	.002	.306
Investor type (hereditary ®)				
New investor	.915	.936	.104	0.930
Investment years (less than/equal to 5 years ®)				
More than 5 years	.801**	.056	.947	3.670
Source (borrowed®)				
Both own & borrowed fund	10.091	.189	.321	317.478
Mode of trading (online®)				
Offline	3.2**	.031	1.370	7.560
Both	4.5**	.006	3.063	6.890
Investment preference (others®)				
Energy sector	2.16**	.009	6.731	9.760
Pharmaceutical sector	8.97**	.030	1.561	3.180
Capital goods sector	2.98**	.040	.148	5.330
Objectives (regular return®)				
Safety of principal amount	30.964	.226	.120	8011.580
Income tax benefits	0.04**	.026	.001	0.240
Diversification	.360	.536	.014	9.154
Liquidity	0.21**	.048	.000	1.401
Downfall (yes®)				
No	0.90**	.034	.083	0.430
Constant	.181	.395		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 3.1 Hosmer and Lemeshow Test (overall bias)

Step	Chi-square	Df	Sig.
1	4.896	8	.428

Table 3 depicted the findings from binary logistic regression model. This model represented the relationship between different predictor variables under study with the investors influenced by overall bias. Findings from this table suggested that, investors aged 41 and above were statistically and significantly 49% less likely to get influenced by overall bias, when compared to the one who were less than 25 years of age. Investors with family members of three or more had lesser chance of getting influenced by overall bias as compared to the one with family size of two or less. Respondents with investment experience of more than 5 years were 20% less likely to get influenced by overall bias, as compared to the counterpart. Investors using offline or both mode of trading had higher chance of being influenced by overall bias as compared to the one using online mode. Investors whose investment preference were either energy sector, pharmaceutical sector or energy goods sector had higher odds of getting influenced by overall bias as compared to the one from IT/FNCH/Banking sector respectively. Investors with objective related to liquidity or income tax benefit acquired lesser chance of being influenced by overall bias as compared to the one with objective of regular return. Investors who haven't experienced any downfall had 10% lesser chance of being influenced by overall bias as compared to the counterpart. However, the remaining predictor variables remained statistically insignificant in the model, showing no association with the dependent variable under study (influenced by bias).

Table 3.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance value is 0.428 which confirms that the model adequately fits the data.

Table 4: Binary logistic regression table (Loss Aversion Bias)

Influenced by bias	odds ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Gender (male®)				
Female	.576	.650	.053	6.231
Age (less than 25 ®)				
25-40 years	1.456**	0.03	.206	0.899
41 and above	1.427	.776	.124	16.464
Occupation (job ®)				
Businessman	3.979**	0.03	1.609	6.240
Others	2.443**	0.007	6.810	3.220
Family (two ®)				
Three	26.723	0.820	1.657	3.902
Four and above	.057	0.333	.004	.797
Investor type (hereditary ®)				
New investor	1.108	.935	.094	13.097
Investment years (less than/equal to 5 years ®)				
More than 5 years	4.358**	0.01	.597	1.821
Source (borrowed®)				
Both own & borrowed fund	125.667	0.791	3.735	4227.848
Mode of trading (online®)				
Offline	.598	.761	.022	16.486
Both	.444	.476	.048	4.146
Investment preference (others®)				
Energy sector	.220**	0.002	.000	.096
Pharmaceutical sector	3.984	.564	.036	438.055

Capital goods sector	.120	.244	.003	4.261
Objectives (regular return®)				
Safety of principal amount	5.900**	0.009	.459	1.650
Income tax benefits	10.127	.163	.392	261.329
Diversification	6.200**	0.004	14.891	29.890
Liquidity	1.294	.883	.041	40.547
Downfall (yes®)				
No	.593**	0.04	.632	4.700
Constant	.000	.042		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 4.1 Hosmer and Lemeshow Test (Loss Aversion Bias)

Step	Chi-square	Df	Sig.
1	9.432	8	.152

Table 4 depicted the findings from binary logistic regression model. This model represented the relationship between different predictor variables under study with the investors influenced by loss aversion bias. Findings from this table suggested that, investors belonging to the age group of 25-40 years, were statistically and significantly 45% more likely to get influenced by loss aversion bias, compared to those who were less than 25 years of age. Investors who were businessperson, had three times higher odds of getting influenced by loss aversion bias, compared to the one who were service person. Respondents with investment experience of more than 5 years were 4.3 times more likely to be influenced by loss aversion bias, as compared to the counterpart. Investors with investment preference of energy sector were 78% less likely of being influenced by loss aversion bias as compared to that of IT/FNCH/Banking sector respectively. Investors with objectives related to safety of principal amount or income tax benefit acquired higher chance of being influenced by loss aversion bias as compared to the one with objective of regular return. Investors who haven't experienced any downfall were 41% less likely of being influenced by loss aversion bias as compared to the counterpart.

Table 4.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance value is 0.152 which confirms that the model adequately fits the data.

Table 5: Binary logistic regression table (Regret Aversion Bias)

Influenced by bias	odds ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Gender (male®)				
Female	1.191**	0.045	.298	4.752
Age (less than 25 ®)				
25-40 years	.986	.982	.297	3.271
41 and above	1.518	.549	.388	5.946
Family (two ®)				
Three	.073	0.18	.015	.364
Four and above	.518	.305	.147	1.821
Investor type (hereditary ®)				
New investor	.279**	0.04	.069	1.134
Investment years (less than/equal to 5 years ®)				

More than 5 years	2.118**	0.023	.629	7.160
Source (borrowed®)				
Both own & borrowed fund	.336	.155	.075	1.510
Mode of trading (online®)				
Offline	4.019**	0.045	.833	9.386
Both	2.376	.144	.745	7.573
Investment preference (others®)				
Energy sector	3.129	.245	.458	21.388
Pharmaceutical sector	3.417	.178	.572	20.420
Capital goods sector	14.899**	0.008	1.965	112.980
Objectives (regular return®)				
Safety of principal amount	.104**	0.033	.011	1.034
Income tax benefits	.130**	0.045	.018	.957
Diversification	1.974	.505	.267	14.582
Liquidity	.103**	0.023	.014	.736
Downfall (yes®)				
No	1.164**	0.037	.285	4.755
Constant	2.008	.559		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 5.1 Hosmer and Lemeshow Test (Regret Aversion Bias)

Step	Chi-square	Df	Sig.
1	19.55	8	.569

Table 5 represented the findings from binary logistic regression model. This model showed the relationship between different predictor variables under study with the investors influenced by regret aversion bias. Findings from this table suggested that, female investors were 19% more likely to get influenced by regret aversion bias as compared to males. New investors were 73% less likely to get influenced by the same as compared to the counterpart. Respondents with investment experience of more than 5 years had 2.1 times higher chance of getting influenced by regret aversion bias, as compared to the one with less than 5 years of experience. Investors using offline mode of trading had higher chance of being influenced by regret aversion bias as compared to the one using online or both the modes. Investors with investment preference of capital goods sector had higher odds of getting influenced by regret aversion bias as compared to the one from IT/FNCH/Banking sector respectively. Investors with objective related to safety of principal amount, income tax benefit, liquidity acquired lesser chance of being influenced by regret aversion bias as compared to the one with objective of regular return. Investors who haven't experienced any downfall had 84% higher chance of being influenced by regret aversion bias as compared to the counterpart.

Table 5.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance value is 0.569 which confirms that the model adequately fits the data.

Table 6: Binary logistic regression table (Herd Behaviour Bias)

Influenced by bias	odds ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Gender (male®)				
Female	9.369**	0.013	1.597	54.979
Age (less than 25 ®)				
25-40 years	.632	.577	.126	3.179
41 and above	.749	.753	.124	4.519
Occupation (job ®)				
Businessman	14.505**	0.007	2.012	10.586
Others	7.996**	0.034	.889	71.950
Family (two ®)				
Three	20.75	0.56	2.392	18.047
four and above	.026**	0.014	.001	.479
Investor type (hereditary ®)				
New investor	.401**	0.0024	.077	1.087
Investment years (less than/equal to 5 years ®)				
More than 5 years	.456	.365	.084	2.494
Source (borrowed®)				
Both own & borrowed fund	.365	.357	.043	3.126
Mode of trading (online®)				
Offline	.256	.276	.022	2.969
Both	.419	.294	.082	2.130
Investment preference (others®)				
Energy sector	5.234**	0.004	4.758	6.150
Pharmaceutical sector	.266**	0.034	.022	3.252
Capital goods sector	.841	.882	.087	8.181
Objectives (regular return®)				
Safety of principal amount	1.762	.736	.065	47.453
Income tax benefits	.021**	0.014	.001	.467
Diversification	1.416	.797	.101	19.917
Liquidity	.508	.661	.025	10.483
Downfall (yes®)				
No	.606**	0.006	.089	1.136
Constant	.016	.051		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 6.1 Hosmer and Lemeshow Test (Herd Behaviour Bias)

Step	Chi-square	Df	Sig.
1	15.960	8	.439

Table 6 represented the findings from binary logistic regression model. This model showed the relationship between different predictor variables under study with the investors influenced by herd behaviour bias. Findings from this table suggested that, female investors were 9.3 times more likely to get influenced by herd behaviour bias as compared to males. Businesspersons had higher chance of getting influenced by herd behaviour bias when compared to the service person. Investors with

family members of three or more had lesser chance of being influenced by herd behaviour bias as compared to the one with family size of two or less. New investors were 60% less likely to be influenced by the same as compared to the counterpart. Investors with investment preference of energy sector had higher odds of getting influenced by herd behaviour bias, whereas the one preferring pharmaceutical sector had lesser chance for the same, as compared to the investors with preference of IT/FNCH/Banking sector respectively. Investors with objective related to income tax benefit acquired lesser chance of being influenced by herd behaviour bias as compared to the one with objective of regular return. Investors who haven't experienced any downfall had 40% lesser chance of being influenced by herd behaviour bias as compared to the counterpart.

Table 6.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance value is 0.439 which confirms that the model adequately fits the data.

Table 7: Binary logistic regression table (Overconfidence Bias)

Influenced by bias	Odds Ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Age (less than 25 ®)				
25-40 years	1.290**	0.045	0.371	2.580
41 and above	2.340	.679	.371	71.950
Investment preference (others®)				
Energy sector	1.670**	0.033	0.097	1.876
Pharmaceutical sector	2.870**	0.047	0.456	5.053
Capital goods sector	0.780	8.990	1.896	91.080
Downfall (yes®)				
No	.741**	0.029	.556	3.281
Constant	.970	.160		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 7.1 Hosmer and Lemeshow Test (Overconfidence Bias)

Step	Chi-square	Df	Sig.
1	0.193	5	.895

Table 7 represented the findings from binary logistic regression model. This model showed the relationship between different predictor variables under study with the investors influenced by overconfidence bias. Findings from this table suggested that,investors belonging to the age group of 25-40 years, were statistically and significantly 29% more likely to get influenced by overconfidence bias, as compared to those who were less than 25 value is 0.895 which confirms that the model adequately fits the data.

years of age.Investors with investment preference of energy sector and pharmaceutical sector had higher odds of getting influenced by overconfidence bias, as compared to the one preferring IT/FNCH/Banking sector respectively. Investors who haven'texperienced any downfall had 66% lesser chance of being influenced by overconfidence bias as compared to the counterpart.

Table 7.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance

Table 8: Binary logistic regression table (Anchoring Bias)

Influenced by bias	Odds Ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Gender (male®)				
Female	4.832**	0.047	.894	6.110
Age (less than 25 ®)				
25-40 years	1.046	.951	.254	4.303
41 and above	.750	.727	.150	3.753
Occupation (job ®)				
Businessman	.065**	0.008	.008	.497
Others	.460	.434	.066	3.218
Family (two ®)				
Three	.287	.152	.052	1.584
Four and above	.475	.436	.073	3.095
Investor type (hereditary ®)				
New investor	.471	.359	.094	2.354
Investment years (less than/equal to 5 years ®)				
More than 5 years	1.909	.399	.424	8.591
Source (borrowed®)				
Both own & borrowed fund	.551**	0.021	.073	4.175
Mode of trading (online®)				
Offline	3.097	.241	.468	20.496
Both	2.789	.154	.681	11.419
Investment preference (others®)				
Energy sector	5.955**	0.001	7.211	4293.271
Pharmaceutical sector	.551	.571	.070	4.315
Capital goods sector	8.635**	0.037	.791	94.296
Objectives (regular return®)				
Safety of principal amount	1.176	.916	.058	23.839
Income tax benefits	1.097**	0.009	.085	4.075
Diversification	3.702	.265	.370	37.019
Liquidity	24.088	.015	1.862	311.624
Downfall (yes®)				
No	2.752**	0.025	.484	5.648
Constant	.579	.742		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 8.1 Hosmer and Lemeshow Test (Anchoring Bias)

Step	Chi-square	Df	Sig.
1	13.45	8	.729

Table 8 represented the findings from binary logistic regression model. This model showed the relationship between different predictor variables under study with the investors influenced by anchoring bias. Findings from this table suggested that, female investors were 4.8 times more likely to get influenced by anchoring bias as compared to males. Businesspersons were 94% less likely to get influenced by anchoring bias when compared to the service person. Investors who used both own and borrowed fund had lesser chance of being influenced by anchoring bias as compared to the one using only borrowed funds. Investors with investment preference of energy sector and capital good sector had more than 5 times higher odds of getting influenced by anchoring bias, as compared to the investors preferring IT/FNCH/Banking sector respectively. Investors with objective related to income tax benefit acquired lesser chance of

being influenced by anchoring bias as compared to the one with objective of regular return. Investors who haven't experienced any downfall had 40% lesser chance of being influenced by anchoring bias as compared to the counterpart.

Table 8.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance value is 0.729 which confirms that the model adequately fits the data.

Table 9: Binary logistic regression table (Cognitive Dissonance Bias)

Influenced by bias	Odds Ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Gender (male®)				
Female	.382	.297	.062	2.335
Age (less than 25 ®)				
25-40 years	.398	0.025	.082	1.936
41 and above	.946	.960	.111	8.071
Occupation (job ®)				
Businessman	.333	.231	.055	2.017
Others	10.938	0.137	1.153	10.807
Family (two ®)				
Three				
Four and above	1.038	.971	.140	7.705
Investor type (hereditary ®)	.819	.820	.147	4.571
New investor	1.154	.908	.103	12.981
Investment years (less than/equal to 5 years ®)				
More than 5 years	.033**	0.002	.004	.296
Source (borrowed®)				
Both own & borrowed fund	5.829	.111	.666	51.054
Mode of trading (online®)				
Offline	.414	.465	.039	4.404
Both	.488	.402	.091	2.613
Investment preference (others®)				
Energy sector	8.377	.172	.398	176.315
Pharmaceutical sector	1.017**	0.003	.001	.274
Capital goods sector	.916	.944	.079	10.677
Objectives (regular return®)				
Safety of principal amount	2.364**	0.000	25.727	29.103
Income tax benefits	9.756**	0.031	1.390	16.763
Diversification	2.553**	0.013	.787	2.335
Liquidity	8.093**	0.01	2.280	14.400
Downfall (yes®)				
No	3.355**	0.022	1.405	19.778
Constant	.110	.326		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 9.1 Hosmer and Lemeshow Test (Anchoring Bias)

Step	Chi-square	Df	Sig.
1	3.808	8	.539

Table 9 represented the findings from binary logistic regression model. This model showed the relationship between different predictor variables under study with the investors influenced by cognitive dissonance bias. Findings from this table suggested that, respondents with investment experience of more than 5 years had 97% lesser chance of being influenced by cognitive dissonance bias, as compared to the one with less than 5 years of experience. Investors with investment preference of pharmaceutical sector and capital good sector had higher odds of getting influenced by cognitive dissonance bias, as compared to the investors preferring IT/FNCH/Banking sector respectively. Investors with objective related to safety of principal amount, income tax benefit, diversification and liquidity acquired higher odds of being influenced by cognitive dissonance bias as compared to the one with objective of regular return. Investors who haven't experienced any downfall were 3 times more likely to get influenced by cognitive dissonance bias as compared to the counterpart.

Table 9.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance value is 0.539 which confirms that the model adequately fits the data.

Table 10: Binary logistic regression table (Representative Bias)

Influenced by bias	Odds Ratio	Sig.	95% C.I. for odds ratio	
			Lower	Upper
Occupation (job ®)				
Businessman	1.780**	0.042	.173	3.400
Others	2.800**	0.03	.219	1.100
Investment preference (others®)				
Energy sector	4.400**	0.048	.016	0.180
Pharmaceutical sector	3.980	.190	.193	1.980
Capital goods sector	.200**	0.047	.000	5.113
Downfall (yes®)				
No	3.600**	0.012	.495	0.045
Constant	.000	.046		

*Note: ® indicates reference category. ** indicates 5% significance level (p-value less than 0.05).**Sig** indicates p-value.*

Table 10.1 Hosmer and Lemeshow Test (Reptresentative Bias)

Step	Chi-square	Df	Sig.
1	2.74	8	.687

Table 10 represented the findings from binary logistic regression model. This model showed the relationship between different predictor variables under study with the investors influenced by overconfidence bias. Findings from this table suggested that, investors who were businesspersons or others were statistically and significantly more likely to get influenced by representative bias, as compared to those who were involved in any job. Investors with investment preference of energy sector had higher odds of being influenced by representative bias, whereas the one preferring capital goods sector had lesser chance for the same, as compared to the investors with preference of IT/FNCH/Banking sector

respectively. Investors who haven't experienced any downfall had 3.6 times higher odds of being influenced by representative bias as compared to the counterpart.

Table 10.1 depicted the result from HosmerLemeshow test, which showed the goodness of fit of the binary logistic regression model. The Hosmer and Lemeshow statistic here indicates that the model is a good fit, because significance value is 0.687 which confirms that the model adequately fits the data.

Conclusion

It is therefore evident that there exists different biases among different levels of people among the individual investors of Tinsukia town. Many studies suggested that there is a strong neeed to do research about Behavioural finance which is also known as Modern Finance Theories. Traditional finance theories only studies about forms of market but do not pay any heed about the rationality of the investor, which the behavioural finance does. It is an very useful tool to prevent decision makers from irrational decisions or applying any shortcut or taking any decsions out of wrong implulse from the brain. There is a growing need for awareness about behavioural finance among the investors so that they can be careful about making wrong investment decisions and avoid any kind of mental shortcut.

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TALENT ACQUISITION: A STUDY ON TECHNOLOGIES AND STRATEGIES ADOPTED IN THE IT SECTOR

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ABSTRACT

Talent acquisition is perceived differently by different individuals based on the culture. In a certain culture, managers screen suitable candidates and inspect their capabilities on different grounds like their ability to perform and handle the technical requirements of the job. While others may examine them on technical competence and whether they will fit with the existing workforce. Moreover, there might be managers that will judge them based on results gained from psychometric tests which basically rely on intelligence and personality tests. In contrast to the above, some may just seldom make use of such tests or what even consider them inappropriate. The current study is an attempt to find whether the current talent acquisition practices in the IT sector are in alignment with the changing dynamics of the Talent Acquisition practices adopted elsewhere. For this purpose, the study conducted a survey using the questionnaire instrument to gain insight into the practices adopted and the challenges faced in the same with special reference to the IT sector.

Keywords: *talent, management, critical, IT sector, employer branding, recruitment, selection.*

introduction

Importance of Talent Acquisition

The process of Talent acquisition must be conducted in a procedural manner. Talent acquisition is a vital process for any organization. It is defined as a critical process of *scrutinizing* among the best people available in the labor market, *sourcing and attracting* the people with such competencies,*analyzing*them in an efficient manner to *choose* the *finest*among them, *recruiting* them and *socializing* with them to cut the time required for mingling in the new environment and enhancing their *productivity,* and lastly, *retaining* the best one for the potential growth of the company (Ployhart et. al, 2018). Thus, it can be clearly stated that the talent acquisition process does not just revolve around the recruitment of potential employees but also involves changing the environment and making it suitable for enhancing their product to reach the ultimate goals of an organization (Lorincova, 2015). Many top organizations consider their employees as human assets of the business and therefore classify as their most profitable capital investment (Hooi, 2019). In this purview, employees are considered as precious and vital factors that drive a company's production and the resulting profits (Gallardo-Gallardo et. al, 2013). Thereby, identifying and selecting such talented human assets from the pool of labor market for any given business counts as a critical challenge to Human Resource Management globally.

Techniques of Talent Acquisition

IT firms prefer to pay higher salaries to attract engineering freshers. It was found that Foreign-owned firms offer higher salary packages to new entrants than Indian Service firms (Van Riemsdijk, 2013). Employee poaching is also one of the strategies to recruit an employee previously employed in a competing firm due to the requirement of good experience and skills (Budhwar et. al., 2007). The hiring of ex-employees is another rare but potential strategic techniques adopted by HR management in many organizations. They keep track of their performance in varied companies after they resign and then based on requirements are again screened and given preference over other candidates (Sengupta et. al., 2018). Many organizations neither use active recruiting process nor employ recruiting professionals and instead rely on the age-old strategy of "post and pray". Moreover, the medium for posting is changed from the traditional newspapers ad posting to social networks and job boards (Parthasarthy et. al., 2014).

Changing Dynamics in Talent Acquisition

With the advancement of technology, acquiring and managing talent has emerged as a collaborative approach wherein HR's have

resorted to e-recruitment and web functionalities. It is termed as a collaborative approach due to the participation of both the HR team and the candidate through websites, applications, interactive platforms, or social networking sites. The Internet has bridged the communication gap between employers and potential employees (Roberts et. al., 2016). It is found that web platforms are conducive to strengthening corporate image which further helps them in attracting skilled candidates at a lower cost (Kumar and Moller, 2018). Since users are spending a significant amount of their time on social media and job boards browsing suitable jobs for themselves, it becomes relatively convenient for the organizations to screen a good no. of job seekers in a shorter period of time (Adler, 2014).

Challenges for the Adoption of Talent Acquisition

Employer Branding poses a major obstacle in recruiting employees and retaining them after recruitment. Initially resorting to providing higher salaries to new entrants from campus-based interviews was instrumental in recruiting them (Patra et. al., 2019). However, after a certain period of time, they seek to shift in better organizations with higher employer brand value and environment. Despite the various benefits, social media, and other web recruiting platforms offer, there are various challenges faced by the Talent Acquisition teams. One of the probing challenges faced in recruiting through internet platforms is wasting time analyzing the incompetent or unskilled candidates and recruiting them (Krishna and Mohan, 2016). While on the other hand, the candidate's perspective depicts that they are sometimes unaware of certain credible organizations and thereby, refrain from applying in them (El Samra et. al., 2018). Excessively relying on web platforms could thereby, lead to overlook or deter leading seekers and job providers which is detrimental to the business (Funk, 2014).

Research Objectives

- To identify the current talent acquisition process in the IT sector.
- To identify the major areas of concern with the current talent acquisition process.
- To determine the extent of adoption of best practices in talent acquisition process-job analysis, recruitment strategies, and selection technique, for branding in the IT sector.
- To understand the changing dynamics of talent acquisition.

Hypothesis

a. H_{01}: The prevailing talent acquisition process in the IT sector is not in alignment with the best practices followed in the Talent Acquisition process.

H_{11}: The prevailing talent acquisition process in the IT sector is in alignment with the best practices followed in the Talent Acquisition process.

b. H_{02}: Recruitment and selection process is not a major area of concern in the case of best practices followed in Talent Acquisition.

H_{12}: Recruitment and selection process is a major area of concern in the case of best practices followed in Talent Acquisition.

c. H_{03}: There is no significant relationship between the changing dynamics of talent acquisition and best practices followed in the Talent Acquisition process.

H_{03}: There is a significant relationship between the changing dynamics of talent acquisition and best practices followed in the Talent Acquisition process.

d. H_{04}: There is no significant relationship between the measures to improve the current process and current talent acquisition process in the IT sector.

H_{14}: There is no significant relationship between the measures to improve the current process and current talent acquisition process in the IT sector.

Methodology

Research Approach

The research will undergo a mixed approach covering both qualitative and quantitative approaches.

Research Design

The research design is descriptive and explanatory.

Data Collection

The primary data will be collected through a survey method. The instrument used for data collection is the questionnaire and interview.

Sampling

The sampling technique will judgmental non-probability sampling. Around 60 employees working in the IT companies be surveyed through a questionnaire. For the interview, the total respondents chosen will be around 10.The respondents for an interview will be HR of IT companies.

Data Analysis

The statistical analysis of the data collected through the questionnaire will be analyzed through SPSS. The qualitative analysis of data obtained through interviews will be analyzed through Thematic analysis.

Findings and Discussion

Out of the total of 60 respondents, 32 were males i.e. 53.3% and 28 were females i.e. 46.7%. In concern to the age group of the respondents, the age group targeted was 21-60 years of age. Among them, 40% of the respondents which depicted the maximum followed by 38.3% belonged to the age-group 31-40 years and 41-50 years respectively. All the participants' education level was Masters and above. The majority of the respondents had an income level of 3,00,001 to 5,00,000 which accounted for 33.3%. With regard to the marital status of the respondents, 73.3% of respondents were married.

Current Talent Acquisition Process in the IT Sector

Reliability Test: The Cronbach alpha value is found to be 0.864 which is higher than 0.7, which depicts the high reliability of the questionnaire.

Table 1

Communalities

	Initial	Extraction
Q1. Recruitment plans are strategically associated with the goals of the organization.	1.000	.986
Q2. Conventional Job analysis approach is being used.	1.000	.970
Q3. The companies following strategies like Internal recruitment, employee referrals, and other practices increase the no. of quality applicants attracted and estimating the recruitment source helps in finding the most instrumental medium.	1.000	.968
Q4. The company makes use of current testing methods such filling application forms, taking written technical tests, virtual technical tests, aptitude test, telephonic interview, WAF and BIB tests.	1.000	.967
Q5. The company adheres to examining candidates by taking their cognitive tests, personality tests through questionnaires and interviews, etc.	1.000	.985

Extraction Method: Principal Component Analysis

The values above 0.7 and closer to 1.00 indicate that respondents are in a strong agreement with the statement. While values ranging from 0.5 to 0.7 indicate that respondents moderately agree with the statement. Lastly, the values lesser than 0.5 indicate that respondents disagree with the given statement. In the current case, all the values are more than 0.9 and closer to one which indicates that the current talent acquisition process is in the IT sector is in alignment with the needs of the sector.

Best Practices followed in Talent Acquisition

Recruitment Process

Reliability Test: The Cronbach alpha value is found to be 0.813 which is higher than 0.7, which depicts the high reliability of the questionnaire.

Table 2

Communalities		
	Initial	**Extraction**
Q1.The company conducts a formal recruitment analysis so as to identify the most appropriate source of employing potential employees.	1.000	.807
Q2. Companies that follow internal recruitment or sourcing procedures have greater organizational commitment and high employee retention rates.	1.000	.949

Q3.Informal recruiting procedures like employee referrals complement to the quality of the applicants.	1.000	.761
Q4. Referral Engine's like Linkedin enhance the no. of quality referrals and candidates.	1.000	.644
Q5. Senior executives get leverage due to employee referral systems in acquiring new employees.	1.000	.685
Q6. Creation of a global team that is solely directed to pull and monitor referrals on a daily basis is conductive to the company.	1.000	.940
Extraction Method: Principal Component Analysis.		

The values above 0.7 and closer to 1.00 indicate that respondents are in a strong agreement with the statement. While values ranging from 0.5 to 0.7 indicate that respondents moderately agree with the statement. Lastly, the values lesser than 0.5 indicate that respondents disagree with the given statement. In the present case, the recruitment process has been evaluated. Most of the values are closer to 0.7 or 1.00. This depicts that the recruitment process is more than moderate and needs little changes to make it perfect.

Selection Process

Reliability Test: TheCronbach alpha value is found to be 0.663 which is close to 0.7, which depicts the high reliability of the questionnaire.

Table 3

Communalities		
	Initial	**Extraction**
Q1. Integrating a multiple technique approach and usage of selection practices that are more sophisticated, reliable and valid such as psychological tests that measure cognitive ability, questionnaires that estimate personality, interview and examining centers are regarded as the most suitable practices.	1.000	.647
Q2.Validation of the selection techniques for providing feedback of the system is required to assess the reliability and validity of the process.	1.000	.338
Q3. While conducting interviews, questions that test candidates' behavior are more flexible than questions that test candidates' reactions in a particular situation. This is because it allows candidates to explain and elaborate about them and their skills from their past experiences.	1.000	.831
Extraction Method: Principal Component Analysis.		

The values above 0.7 and closer to 1.00 indicate that respondents are in a strong agreement with the statement. While values ranging from 0.5 to 0.7 indicate that respondents moderately agree with the statement. Lastly, the values lesser than 0.5 indicate that respondents disagree with the given statement. The second statement has a value of 0.338 which indicates that there is a strong need to improve the validation techniques.

Employer Branding

Reliability Test*:* The Cronbach alpha value is found to be 0.926 which is higher than 0.7, which depicts very high reliability of the questionnaire.

Table 4

Communalities		
	Initial	**Extraction**
Q1. To ensure success in this competitive labor market. Companies resort to incorporate recruitment efforts along with overall marketing campaigns and strategies.	1.000	1.000
Q2. Candidates' perception of company's corporate and recruitment image has a significant correlation with the job applicants' intentions to be in further contact with the company.	1.000	.756
3.Social Consideration	1.000	.767
4.Visibility and First Impression	1.000	.794
Extraction Method: Principal Component Analysis.		

The values above 0.7 and closer to 1.00 indicate that respondents are in a strong agreement with the statement. While values ranging from 0.5 to 0.7 indicate that respondents moderately agree with the statement. Lastly, the values lesser than 0.5 indicate that respondents disagree with the given statement. In the current section, that estimates whether employer branding

techniques are in cue with the talent acquisition process. It can be stated that they are in complete alignment with the talent acquisition process.

5.3. Changing Dynamics of Talent Acquisition

Reliability Test: The Cronbach alpha value is found to be 0.905 which is higher than 0.7, which depicts the high reliability of the questionnaire.

Table 5

Communalities		
	Initial	**Extraction**
Q1. Mobile-enabled assessments to analyze and anticipate competencies, job fit, and cultural alignment enhance the candidate experience and speed up the hiring process.	1.000	.902
Q2. Digital interview platforms offer convenience, are cost effective, and more optimistic experiences for managers involved in recruitment and candidates as well.	1.000	.783
Q3. The recruitment management tool offers full transparency to the managers responsible for hiring as they gain an instant and dashboard view of various activities.	1.000	.758
Q4. 360 Degree Approach in Talent Acquisition:	1.000	.658
Q5. Employee Career Architecture platforms allow candidates to navigate through various career alternatives with an interactive "build your own career path" facilitated by mapping tool	1.000	.647
Q6. Diversity hiring	1.000	.665
Q7. The social media today has become an integral part of talent acquisition	1.000	.955
Q8. Boomerang rehiring in which organizations are using a high return on investments and low-cost recruiting approach.	1.000	.816
Q9. Organizations are trying to attract and hire those who can be passive job seekers	1.000	.749
Q10. The increasing focus being made on recruitments being done by way of references made by the existing employees	1.000	.932
Q11. Internal promotion	1.000	.577
Q12. Focus on employer branding	1.000	.425
Extraction Method: Principal Component Analysis.		

The values above 0.7 and closer to 1.00 indicate that respondents are in a strong agreement with the statement. While values ranging from 0.5 to 0.7 indicate that respondents moderately agree with the statement. Lastly, the values lesser than 0.5 indicate that respondents disagree with the given statement. In the present case, it can be attributed to the above table that Talent Acquisition is inefficient in focusing on employer branding. While on the other hand, it can be attributed that social media has become an integral part of the Talent Acquisition Process.

Measures to Improve the Current Process

Reliability Test: The Cronbach alpha value is found to be 0.823 which is higher than 0.7, which depicts the high reliability of the questionnaire.

Table 6

Communalities		
	Initial	**Extraction**
Q1. Reducing the lead time for Recruitment & Selection process.	1.000	.936
Q2. Lead time to be reduced to 45 days from the current average of 82 days. To achieve this, the recommended process accountability matrix with timelines can be drawn	1.000	.891
Q3. More effective metrics need to be deployed	1.000	.889
Q4. The candidate background verification process needs to be improved.	1.000	.919
Q5. More consistency needs to be ensured in all processes	1.000	.697
Extraction Method: Principal Component Analysis.		

The values above 0.7 and closer to 1.00 indicate that respondents are in a strong agreement with the statement. While values ranging from 0.5 to 0.7 indicate that respondents moderately agree with the statement. Lastly, the values lesser than 0.5 indicate that respondents disagree with the given statement. The above table represents the

measures that need to be taken to improve and enhance the current talent acquisition process and practices adopted in the IT sector. Most respondents depict a strong agreement with the above measures that portray that they need to be implemented.

Hypothesis Testing

a. H_{01}: The prevailing talent acquisition process in the IT sector is not in alignment with the best practices followed in the Talent Acquisition process

H_{11}: The prevailing talent acquisition process in the IT sector is in alignment with the best practices followed in the Talent Acquisition process.

The significance value of the F-test was found to be 168.2 with a p-value = 0.00 which is less than the 0.05 level of significance. This indicated the model is statistically significant. As a result, the study rejects the null hypothesis based on this evidence. Therefore, the prevailing talent acquisition process in the IT sector is in complete alignment with the best practices followed in the Talent Acquisition process.

b. H_{02}: Recruitment and selection process is not a major area of concern in the case of best practices followed in Talent Acquisition.

H_{12}: Recruitment and selection process is a major area of concern in the case of best practices followed in Talent Acquisition.

The significance value of the F-test was found to be 456.16 with a p-value = 0.00 which is less than the 0.05 level of significance. This indicated the model is statistically significant. As a result, the study rejects the null hypothesis based on this evidence. Therefore, the recruitment and selection process is a major area of concern in the case of best practices followed in Talent Acquisition.

c. H_{03}: There is no significant relationship between the changing dynamics of talent acquisition and best practices followed in the Talent Acquisition process.

H_{13}: There is a significant relationship between the changing dynamics of talent acquisition and best practices followed in the Talent Acquisition process.

The significance value of the F-test was found to be 83.94 with a p-value = 0.00 which is less than the 0.05 level of significance. This indicated the model is statistically significant. As a result, the study rejects the null hypothesis based on this evidence. Therefore, there is a significant relationship between the changing dynamics of talent acquisition and best practices followed in the Talent Acquisition process.

d. H_{04}: There is no significant relationship between the measures to improve the current process and current talent acquisition process in the IT sector.

H_{14}: There is a significant relationship between the measures to improve the current process and current talent acquisition process in the IT sector.

The significance value of the F-test was found to be 78.55 with a p-value = 0.00 which is less than the 0.05 level of significance. This indicated the model is statistically significant. As a result, the study rejects the null hypothesis based on this evidence. Therefore, there is a significant relationship between the measures to improve the current process and current talent acquisition process in the IT sector.

Conclusion and Recommendation

In an increasingly competitive global market, organizations have realized the worth of their employees. Talent acquisition is the process of not only acquiring but retaining talented employees in the organization. This is because talent acquisition is a crucial and time-consuming process of finding the best employees from the market. Therefore, along with acquiring, retaining the employees is another major task as it saves the cost and time of the organization in pooling another potential employee from the industry and then providing them training all over again. The findings of the study significantly elucidate that the current process and dynamics of the talent acquisition process is already in place with the best practices followed. However, the major shortcoming faced by HRM in the Talent Acquisition process is the recruitment and selection process. Recruiting and Selecting pertinent employees from a heap of talent available is not an easy task. It may happen so that the managers may be unaware or negligent of the appropriate candidate and may recruit

another. Further, a study must be conducted to analyze whether the employees acquired through the talent acquisition process display higher productivity and retention levels in comparison to employees recruited using primitive methods.

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TOWARDS A FEMALE HEROISM: DEBUNKING THE SOCIAL CONSTRUCT OF HERO THROUGH SELECT KASHMIRI FOLKTALES

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ABSTRACT

Heroism is typically tied to gender in the sociology of heroism that views male as the bearer of physical prowess. The female gender is excluded from the debate of heroism and is regarded as belonging to the domestic world. A similarorientation is visible in classical literature where the public sphere is masculine, and a private, domestic sphere is feminine. Scholars have perceived the conventional focus on men's heroism as a hurdle to be overcome in academic discourse. The present paper is an attempt to address this problem through the medium of Kashmiri folktales. The paper adopts an interdisciplinary approach and performs content analyses of three Kashmiri folktales, The Tale of a Princess, All for a Pansa, and The Tale of a Goldsmith,to deconstruct the social construct of a hero and move towards female heroism where female performs heroic actions and portrays endurance. This study introduces us to a new kind of female character who breaks the gendered patterns of heroism and acts autonomously.

***Keywords*:** Classical Social Theory, Female Hero,Folktales, Gender, Heroism, Kashmiri folktales

Introduction

Heroes are generally defined in terms of the willingnessto put others first while risking one's own life, whereas, heroism is a conduct of the hero involving certain actions that serve a social goal. Due to the social purpose behind the heroic deeds, heroism is closely linked to society whichis composed of social structures and social facts that remain stable due to social solidarity and collective conscience. (Durkheim, 1938) Frisk (2016) links heroism to the conventional social theory and contends that sociologists have increased our understanding of heroism by clarifying the social structure of heroic figures, heroic activities, and hero worship. Sociologists have a variety of viewpoints on the hero, who they define as someone who "returns from a journey with the power to bestow boons on his fellow men." (Campbell, 2004, p. 28) or as "Great Men who have impacted the course of history". (Carlyle, 2001. p. 5)

Heroic deeds are not limited to larger-than-life individuals; they can also be performed by ordinary people who are motivated by a desire to serve others. A variety of events evoke heroic actions, which are often located outside of the person in societal forms, and these situations result in bravery and self-sacrifice. As a result, society has a crucial role to play in motivating people to take heroic actions. In the literature of sociology, sociologists view a hero as a man whose heroism is linked to his physical prowess. Women, on the other hand, are confined to the domestic realm, where they are thought to be primarily inert. (Featherstone, 1992. P.161) Becausewomen are not addressed when the concept of a hero is discussed in classical literature of sociology, it can be considered that heroism is tightly associated with masculinity in the sociology of heroism.Studies in gender stereotypes have shown that male gender roles include attributes such as daring, adventurous, and courageous more than the female gender. (Williams & Best, 1990) Similar to this, in English literature, as Rose says,

"The stress on movement and adventure, on rescue, rule, exploration, and conquest is… distinctively masculine…the public sphere becomes…masculine. Women…are excluded from the questing, striving, and conquering that both form the heroic subjects and characterizes his actions…what is female becomes increasingly confined to a domestic…private world". (Rose,2004. p. xi)

However, the forms of folklore, particularly certain folktales, being a product of a society have the capacity to debunk the gendered patterns of heroic opportunities if the influence of patriarchal sensibilities doesn't shape the scholarships of folktales, as it happened in the 19th Century (Mbele, 2006, p.62).

Folktale in its simplest form is a customary story that individuals of a specific locale or group rehash among themselves and is considered to be anonymous, timeless, and placeless. A folktale is full of action, usually involving a hero who is honourable,

courageous, selfless, and kind. The heroic actions in a folktale is also influenced by the social surrounding of the hero. A folktale doesn't evolve from a void rather it is a product of a society wherein it performs various functions that involve education, validation of social behaviour, conformation, and escape. These functions can be grouped into a single function of imparting stability to society. (Bascom, 1954) Hence, a hero in a folktale serves as a vehicle for society's stability as he fosters a sense of comradeship and solidarity.There are numerous folktales where the hero is a female in the form of courageous mothers, clever young girls, and warrior women who save villages from monsters, rule wisely over kingdoms, and outwit judges, kings, and tigers. (Ragan, 1998) Thus, a hero and it's heroic behavior in folktales can be described as androgynous. But this aspect is missing in the study of folktales, as Mbele (2006) points out the fact that, in the history of folktale scholarship, a tradition has evolved of downplaying or ignoring the heroic deeds of female characters. (63)The magnum opus in folktale collection, the Grimm's folktales, does not contain as strong heroines like the ones Stone (1975) found through her analysis of other collectionswhere she located strong, autonomous female protagonists different from the ones found in popular collections and Disney productions. The fact that the heroine in many type of tales is the active leader of events, is even frequently overlooked by the prestigious scientific research instruments as Aarne and Thompsons's *The Types of the Folktale* and *Motif Index of Folk Literature*. (Lundell, 1983, p.240)In a similar context, Lundell notes:

A reader of unabridged collections of folktales, and fairy tales, soon realizes, however, that the model for female conduct reflected in such tales over a wide geographical area is far from confined to a submissive beauty of popular selections and Walt Disney's dramatizations. Furthermore, folktale scholar soon finds that a similar tendency to present an image of passive and subordinate heroine exists in such scholarly research tools long considered fundamental as AnttiAarne and Stith Thompson's *The Types of the Folktale* and Thompson's *Motif Index of Folk Literature.* (Lundell, 1989, p.149)

Similar biases exist in the study of Kashmiri folktales and the scholars have not envisaged the possibility of the existence of what we call female heroism in these tales. The present paper is an attempt to remove this void in folktale scholarship and for this, it analyses threeKashmiri folktales,*The Tale of a Princess*, *All for a Pansa*, and *The Tale of a Goldsmith*. Throughthe medium of these tales,it is hypothesized that female characters in folktaleshave much more than the traditional female virtues ascribed to them such as giving care and having concern for others and that heroism is not gender centric but rather androgynous, and these folktales must be read afresh from a new perspective where a female is a hero.

'Female Heroism' in Selected Folktales

The Tale of a Princess is an odyssey of a female who through the virtue of her heroic actions controverts the sociology of heroism that places men at the apex of performing heroic deeds and women at domestic spheres as Featherstone claims that everyday life, reproduction, and care is the sphere of women whereas the sphere of danger, violence, and courting of risk is for men. (Featherstone, 1992, p.165) The tale opens with a certain nameless king defeated in a battle who flees with his family to a distant yet safer place, but in a haste, forgets money at his prior abode. Without money, the king and his family would've died of hunger had not his daughter-in-law- the princess of the title-came to their rescue. The princess being a wise woman had made sure to carry some rubies with her to be utilized in the hour of need and since there was an exigency in her family, she did not think twice before handing over a ruby to her father-in-law to sell in exchange for money and buy them food. The selflessness of the princess and her motivation to help her family marks her first heroic action.

The king, however, is duped by a clever merchant who takes him to the latter's house and traps him in a pit. The same fate is met by the prince and his mother, the queen, who couldn't detect the trickery behind the merchant's words and actions. The princess being the only one left behind at the house set out to search for her missing family members

and landed at the merchant's shop who planned to deceive her in the same manner and confine her in the pit. The princess was sagacious enough to sense the merchant's dishonesty and didn't agree to go inside his house and in the meantime heard the voices of her husband, father-in-law, and mother-in-law coming from inside. She threatened the merchant to take him to the king if he doesn't set them free and the merchant out of the fear of punishment let them out at once. The bravery she showed while dealing with the merchant and her charisma to handle the situation fearlessly marks her second heroic action.

The princess from here took a detour and set out on another unknown journey. She kept walking until she reached some other country where she disguised herself as GanpatRai, the son of a merchant. In that country, a merchant was grief-stricken as his family was afflicted by an ogresswho devoured the merchant's new born sons the same night they were birthed. GanpatRai (the princess) resolved to save the merchant's child from the ogress as his wife was expecting a baby at midnight. The princess was a brave woman who not only prevented the ogress from opening the door but also seized her by the hair and threw her down showcasing her strength and valour. In this manner, she saved the merchant's child and his family from the ogress risking her own life which is a path of heroism described as an extreme form of selflessness characterized by the commitment to serve others despite the significant danger of personal damage or death. (Frisk, p.92)

The princess was determined to restore her lost kingdom and return to her country for which she gathered all the troops of her father-in-law and stirred them up to fight for the recovery of their kingdom. In the end, a battle took place where the princesses' father-in-law and his troops were victorious. In this manner, the princess through her perseverance, courage, and spirit of a warrior retrieved their kingdom. Bolen in *Goddesses in Everywoman* states that:

There is a potential heroine in everywoman. She is the leading lady in her own life story on a journey that begins at her birth and continues through her lifetime. (Bolen, 1985, p.283)

The journey of the princess is that of discovery and development, of merging aspects of herself into a full, yet complex identity. (Frontgia, 1991, p.17) She did what neither the king nor the prince –both man-- resolved to do, exhibiting the true description of female heroism.

All for a Pansa is another account of a female who portrays what Rose calls "heroism of marriage" which is a blend of heroic action and endurance. (Rose, 2004) The tale unfurls with a disappointed merchant whose source of discontent was his only son who was a stupid fellow. But the merchant's wife, like all the mothers, turned a blind eye towards her son's ignorance and wished for him to get married. The merchant, however, before agreeing to this demand of his wife wanted to test his son's intelligence again. For this, he devised a task for his son to be fulfilled through the medium of solving a riddle. He handed over three pansas (Indian currency) to him and asked him "to go to the bazar, and with one pansa to buy something for himself, to throw another pansa into the river, and with the remaining pansa to get at least five things-something to eat, something to drink, something to gnaw, something to sow in the garden, and some food for the cow."(Knowles, p.145) The son went to the market but because of his foolishness could not understand the significance of his father's command and was perturbed. At this point, a hero came to the rescue of the man but there is a twist in the preconceived notion of a hero as this saviour was not a male but a female.

This woman was the daughter of an ironsmith who came forward selflessly to help the merchant's son when she saw him in distress. She heard about the merchant's command and at once understood the riddle. She then asked the man to buy a watermelon and take it to his father as this was the answer to his riddle. The merchant was surprised at his son's venture and was sure enough that he has taken someone's help to which his son confessed. The merchant agreed to get him married but on the condition of marrying him to the ironsmith's daughter only. They were then married but the man being stupid fell into the trap of his friends who advised him to beat his wife every day to keep her in spirits. The ironsmith's daughter even after having knowledge of his to-be husband's plan didn't change her decision to marry him as she

believed there was a difference between what a man says and what he does. Here, she portrays heroism of marriage which while demanding courage equal to the heroic action …requires not direct aggression but self-sacrifice and endurance". (Rose, 2004, p.xv) She, however, was proven wrong as on the very first night after their marriage, the merchant's son came to beat her. She used her wits and saved herself from her husband's beating for seven days and on the eighth day went to her father's house.

Back at home, the merchant's wife asked her husband to give a chance to their lone son in business. The merchant even though hesitant could not turn away his wife and so invested some of his money into his son's business. But the son being true to his nature fell into the trap of a clever gambler who was a professional at duping people and to her, the merchant's son lost all the money and belongings in a game of gambling. He was then locked in a prison by this woman and again, as a knight in the armour, came forward the ironsmith's daughter, now his wife. She was the one who at once set out to save her husband without thinking about the risks that she may have to endure in the process, thus manifesting her heroism.

The ironsmith's daughter, a shrewd woman, defeated the clever gambler not just once but multiple times until she rescued her husband and abstained the money and belongings. The couple went back to their home but there again instead of being thankful to his wife, the merchant's son being ignorant and foolish was reminded of the pending beating he had to lash out on his wife. The ironsmith's daughter had a moment of realization and she could not take any more of her husband's cruelty and stupidity. She comprehends from her fallacy of the past and for the first time got vocal against her husband and declared him stupid that he was since the beginning. The merchant too at the end handed over all the jewels and the belongings to his daughter-in-law who he considered to be too good for his son.

According to Carlyle and Weber, a hero is exclusively a man who takes action. Heroism has been tied to physical strength…the hero has typically shown traditionally masculine virtues, including competitiveness, power of will, and risk-taking. (Frisk, p.96)

Neumann, however, holds a view that is in contrast to the views held by Carlyle, Weber, and Frisk, as he clearly states that:

> heroism involves both doing and knowing, that the pattern of action that characterizes heroism exists to support an underlying development and growth of consciousness. The action then exists not for its own sake but as support or more accurately as a symbolic expression of underlying psychic structures. This perception is absolutely crucial to the postulation of the existence of a female hero. For if we define heroism by action alone and limit those actions we call heroic to those marked by unusual physical strength, military prowess, or even social or political power, then the physiology, or culture, which limits women's capacities in these areas also, by definition, denies women the possibilities of heroism. (Edwards, 1979, p.39)

In *All for a Pansa*, it is not a man but a woman who through her sharp wit, presence of mind, selfless character, and courage not only salvaged her stupid husband (a man) but also retrieved the merchant's (a man) hard-earned money. Moreover, she saves herself too from the clutches of her husband by raising her voice which again is heroic as a woman with a voice is, by definition, a strong woman. Her strength and valor are not physical but mental and through this psychic strength, she provides a new tangent to heroism that is not determined by physical prowess solely.

The Tale of the Goldsmith again introduces us to a new kind of female hero who through her sharp wits and clever mind takes revenge on her husband and his lover. In this Kashmiri folktale, a goldsmith who is already married has fallen in love with a princess who reciprocates his love but due to the social class difference, they cannot get married. The wife of the goldsmith, a clever woman understands the cause of her husband's pain and quite selflessly is motivated to help him get united with his beloved, thereby risking her own married life. In the events that follow, it is the goldsmith's wife who directs the acts of her husband and his beloved, the princess. She is the one who asks him to toss two gold balls into the princess's chamber so that she is aware of his presence. It is once again up to her to comprehend the underlying importance of the

princess's acts, and she requests her husband to go to the princess's garden to meet her. She protects the princess and her husband from the king's wrath by swapping places with the princess in the prison where they were held together after being captured in the garden. In the end, it is her plot that forces the king to give his daughter- the princess- to the goldsmith's wife as restitution for the loss of the dancing girl, who was actually the goldsmith in disguise.

However, there are instances where it appears like she is punishing her husband and seeking vengeance from him for his betrayal under the guise of providing assistance. She initially gashes his nail and urges him to treat it with red pepper and salt. Second, she has him strip down to his underwear, rub ashes all over his body, and transform into a mendicant. Third, she humiliates him by dressing him up as a dancing girl and handing him over to the king. Her vindictive psyche is revealed when, while handing over the princess to the goldsmith, she says, "You must learn, and she must learn". (Stein, p.31) This statement, constructed by the goldsmith's wife, foreshadows the fact that their lives would not be as easy and pleasant as they had hoped, as neither her smart deeds nor her wiles will cease very soon, for she has a lesson for both of them to learn. This was her underlying objective beneath her altruistic and helpful behavior throughout the tale, which she achieved through her cunning as she maneuvered events to fulfill her own selfish ends. She is not a weak woman who weeps or breaks down after learning of her husband's treachery. Rather, she depicts a strong lady who does not easily relinquish her position but seeks revenge from her husband, refusing to forgive him and vowing to continue to teach him a lesson. She may appear to some as a classic hero, and others as an anti-hero, but, she falls perfectly under the category of a vengeful hero, a hero who acts on the basis of vengeance (also known as retribution or revenge), whether for a wrong done to them or their people/race. (*Fandom*)

Conclusion

The world, and particularly the third world, has had a difficult time recognizing autonomous and aspirational women who are capable of processing information, acting courageously, having the urge to help others selflessly, and making their own independent judgments. Because of the social system established by classical literature and social theorists, this is the scenario. The sociology of heroism has clung to the idea of women as decision acceptors and chore doers while men as the performers of heroic actions. Changes in the structure of heroism can sometimes lead to denial and refutation in society. This sociology of heroism was challenged by Kashmiri folktales long before the concept of female heroism came into existence. *The Tale of a Princess, All for a Pansa*, and *The Tale of a Goldsmith* introduce us to a new type of female character, a physically and cognitively powerful female hero, who breaks the gendered patterns of heroism and acts autonomously. This female hero pursues all the heroic characteristics thereby deconstructing the societal construct of heroism and shattering the gendered preconceptions associated with it. She not only demonstrates heroic actions but also perseverance. Her heroic actions are not necessarily physical, as she relies on her intellect to deal with tough situations, overcome her enemies, and save herself and others selflessly. She is a brave and charismatic figure who has the motivation of performing heroic actions and portraying endurance which is influenced by the surrounding social order and pattern.

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AN INVESTIGATION ON MIX DESIGN & STRENGTH ISSUE OF GEOPOLYMER CONCRETE

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ABSTRACT

The production of Ordinary Portland Cement results in large amount of CO2 emissions. Also, the raw materials needed for the production of OPC are scarce in nature and hence possesses environmental threats, and also danger to climate. Hence need for a viable replacement of OPC is seen being a major topic in recent studies. The industrial and agricultural by-products such as fly ash, slag, rice hush ash is available in ample amount. Hence the discovery of Geopolymer concrete was made where these by-products are used in place of OPC, and studies are being made in this subject. The study in the research paper presented gives an investigation regarding Geopolymer concrete. Class F fly ash was used for the GPC for its pozzolanic properties. In the presence of alkaline activators, an aluminosilicate network is initiated and oven curing of 24 hours forms the Geopolymer Concrete. The alkaline activators used in the study are sodium hydroxide and sodium silicate in the ratio of 1:1, since a single alkaline activator is not effective. The strength of GPC depends on variety of factors such as quality and quantity of fly ash, solution to fly ash ratio and Molarity of solutions. In the study carried out, variation in the molarity of the solutions is made. However, the study was greatly affected by the pandemic situation, and due to the restrictions imposed the study was unable to be executed as pre planned. However, the study gives detailed idea regarding the procedure of mix design and the method adopted. The mix design proposed in the paper gives the information regarding various aspects in the procedure of GPC. The paper presented may be found resourceful for many other further studies.

Introduction

In recent years, the popularity of geopolymer concrete in concrete sector has increased due to the fact that it is significantly more environment friendly than standard concrete. Flyash based geopolymer concrete is a new technology which reduces the consumption of ordinary Portland cement (OPC) and also environmental pollution. Geopolymer concrete, based on fly ash, finds its application in construction as a prestress concrete (Zhang et al.,2016). Fly ash based geopolymer concrete, an inorganic polymer is a greener substitute for PC-based concrete as it has viable low cost and good properties such as high compressive strength, little creep, higher acid resistance, and low shrinkage (Wang et al., 2015; Yadollahi et al., 2015).

Geopolymer concrete is a kind of concrete that is made by chemically react with aluminate & silicate bearing materials with an alkaline activatoror caustic activator. This results in the formation of aluminosilicate gel that acts as a binding material for the concrete. Material such as GGBS, met kaolin (calcined kaolin) which are of geological origin or by product materials in industry such as Fly ash and rice husk ash are used as source of silicon and aluminum.

Fly ash, mine waste, GGBS, red mud, etc. is being disposed in large areas of useful land, impacting the environment. This level damage of pollution to the atmosphere is unsustainable and hence motivated the research for environment friendly concrete. Geopolymer concrete is one such concrete which reduces the CO2 emission up to 26 to 45%. After municipal solid wastes, coal combustion production (CCP) constitutes the second largest waste stream, as per reports. In 2011, 130 megations (MT) of CP were produced out of which 56.57 MT (43.50%)were utilized. Flue gas desulfurization material, bottom ash, boiler slag and fly ash are the main type of CCPs. Near about 60.0 MTs of total CCP were considered as class C fly ash. About 22 MT (38.35%) of fly ash were used, and the rest was disposed of in landfills or surface impoundment, which are lined with compacted clay soil, a plastic sheet, or both. Replacement of PC and assistance in producing a green construction material are the main outcomes of utilizing fly ash in Geopolymer concrete (Alyamac et al., 2017; Kuenzel and Vandeperre, 2016; Mehta and Siddique, 2016, Liew et al 2014.

Many GPC materials perform better than Portland cement concrete (PCC) because having chemical resistance, high temperature strength, resistance to chloride penetration and freeze thaw resistance, excellent mechanical properties, high early strength, fire resistance

can be achieved (Fang and Kayali, 2013; Kuenzel et al., 2013; Liew et al., 2016).

Geopolymer concrete materials are more resistance to acid attack than Portland cement-based material as they have low calcium content. Also, reduction in the energy requirement in their manufacturing makes geopolymer concrete based material of great interest (Bani Ardalan et al., 2017; Committee, 2008; Liew et al., 2016).

The replacement of traditional Portland concrete may make geopolymer concrete appear as a super concrete. However, it has its limitation as:

- Difficulty in its creation: Special handling needs are required forGeopolymer Concrete and its creation is extremely difficult. It requires the use of chemicals, such as sodium hydroxide, that can be harmful to humans (Khatib, 2008; Perná et al., 2014).
- Only Pre-mix because of the dangers associates with its creation, geopolymer concrete is sold only as a pre-cast material. (Papa et al., 2015).
- The process of Geopolimerization is sensitive.An inconclusive and extremely volatile result has been obtained in this field of study. Lack of consistency.

Geopolymer concrete may seem to be best thing to come along after Portland concrete and may appear as an absolute idea. However, there are still a lot many unstable issues with geopolymer concrete that may possess greater challenges in its mixing and process of application of concrete (Nikolić et al., 2015; Ogundiran and Kumar, 2015).

Historical Development of Geopolymer Concrete:

In the late 1970s, the term geopolymer was first introduced by professor Joseph Davidovits. And the first geopolymer concrete developed in the 1980s resulted from the research developments carried out by joseph davidovits and J. L. Sawyer.

From the reaction of alkaline liquid with aluminum and silicon from source material like Fly ash and rice husk ash, we can produce geopolymer. Aggregate And fly ash are mixed with alkaline activator like combination of sodium hydroxide with sodium silicate in geopolymer concrete. (G. Saravanan.et.al... (2014)).

The chemical composition of geopolymer is of same characteristics as that of zeolite fly ash are based in geopolymer binders show excellent short- and long-term mechanical characteristics of concrete. The development of geopolymer concrete includes the chemical reaction, source and the manufacturing process. (D. Hardjito...et.al. (2016)). Geopolymer concrete is constructed using common technology which we usually used in construction of ordinary Portland cement concrete. Geopolymeric material made from coal ash can had more compressive strength, and better chemical and mechanical properties.

Trial mix :1

Specific gravity of fly ash =2.2
Specific gravity of fine aggregates=2.74
Specific gravity of coarse aggregates= 2.74
Molarity of NAOH =16M
Specific gravity of NAOH =1.316
Solid content of NAOH = 41.558 %
Specific gravity of $NA_2\ SIO_3$ = 1.193
Solid content of Na_2SiO_3 = 40.506%
$NaOH/\ Na_2SiO_3$ = 1
Workability=50mm

Sr No. (1)	Grade of concrete (2)	Assumed Standard Deviation N/mm^2 (3)
i)	M 10	3.5
ii)	M 15	
iii)	M 20	4.0
iv)	M 25	
v)	M 30	5.0
vi)	M 35	
vii)	M 40	
viii)	M 45	
ix)	M 50	
x)	M 55	

Table 1- Assumed Standard Deviation (IS-10262-2009) *(Clauses 3.2.1.2, A-3 and B-3)*

1)Fck'=Fck +1.65*S

From table 1, IS10262:2009
S= 5
Fck'= 30+1.65*5
=38.25 N/mm^2

Table 5, IS456:2000

Sr	Exposure	Plain Concrete	Reinforced Concrete

No. (1)	(2)	Minimum Cement Content kg/m^3 (3)	Maximum Free Water-Cement Ratio (4)	Minimum Grade of Concrete (5)	Minimum Cement Content kg/m^3 (6)	Maximum Free Water-Cement Ratio (7)	Minimum Grade of Concrete (8)
i)	Mild	220	0.60	-	300	0.55	M 20
ii)	Moderate	240	0.60	M 15	300	0.50	M 25
iii)	Severe	250	0.50	M 20	320	0.45	M 30
iv)	Very severe	260	0.45	M 20	340	0.45	M 35
v)	Extreme	280	0.40	M 25	360	0.40	M 40

Maximum water to cement ratio= 0.45
Maximum water to fly ash ratio = 0.45
Based on experience, we adopt 0.4
Table 2 Maximum Water Content per Cubic Meter of Concrete for Nominal Maximum Size of Aggregate
(clauses 4.2, A-5and B-5), IS10262:2009

Sr No. (1)	Nominal Maximum Size of Aggregate mm (2)	Maximum Water Content kg (3)
i)	10	208
ii)	20	186
iii)	40	165

Maximum water content for 20 mm aggregates=186lit

1) <u>Calculation of fly ash content:</u>
Water to fly ash ratio= 0.4
Fly ash content = $\frac{186}{0.4} = 465\,\frac{Kg}{m3}$
From table no. 5, IS456:2000
Cement or fly ash content =320 kg/m3
465 >320, hence ok

2) <u>Volume of course and fine aggregates:</u>
Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate

(Clauses 4.4, A-7 and B-7)

Sr No. (1)	Nominal Maximum Size of Aggregate mm (2)	Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate			
		Zone IV (3)	Zone III (4)	Zone II (5)	Zone I (6)
i)	10	0.50	0.48	0.46	0.44
ii)	20	0.66	0.64	0.62	0.60
iii)	40	0.75	0.73	0.71	0.69

From table No. 3, IS10262:2009
Volume of coarse aggregates corresponding to 20mm size coarse aggregates and fine aggregates of water to cement ratio e.g., 0.5 =0.6
In present case, water to cement ratio =0.4
For this, volume of coarse aggregates =0.62
Volume of fine aggregates = 1-0.62 = 0.38

3) <u>Solution requirements:</u>
Water content in NaOH = 100 – 41.558
= 58.442%
Water content in Na_2SiO_3 = 100 – 40.506
= 59.494%
Solution / fly ash = 0.35
Solution = 0.35*465 =162.75 kg
NaOH + Na_2SiO_3 = 162.75 kg as NaOH /Na_2SiO_3 = 1
Mass of NaOH =81.375 kg
Water content in NaOH = $((58.442) * (81.375))/(100) = 47.55kg$
Mass of Na_2SiO_3 = 81.375 kg
Water content in Na_2SiO_3 = $\frac{59.494}{100} * 81.375 =$ 48.413
Total water content in solution = 48.413 +47.55 = 95.963 kg
Extra water = 186 -95.963 = 90.036 kg/m3

5)<u>Mix proportion:</u>
a) volume of concrete = 1m3
b) Volume of fly ash = $\frac{465}{2.2} * \frac{1}{1000} = 0.2113m3$
c) Volume of water = $\frac{90.036}{1} * \frac{1}{1000} = 0.09m3$
d) volume of NaOH = $\frac{81.375}{1.316} * \frac{1}{1000} = 0.0618\,m3$
e) volume of Na_2SiO_3 = $\frac{81.375}{1.193} * \frac{1}{1000} = 0.0682$
f) Volume of all aggregates = 1-(0.2113+0.09+0.0618+0.0682) = 0.5687m3
g) Mass of coarse aggregates = 0.5687*0.62*2.74*1000 = 966.10kg
h) Mass of fine aggregates = 0.5687*0.38*2.74*1000 = 592.130kg

Mix proportion values:

Fly ash	465 kg /m3
Water	90.036 kg/m3
NaOH	81.375 Kg/m3
Na_2SiO_3	81.375 kg/m3
Fine aggregates	592.130 kg /m3
Coarse aggregates	966.10 kg/m

Results

Trial Mix 1

Period (in days)	Sr. No.	Load (in N)	Area (in mm^2)	Compressive strength (in N/mm^2)	Average Compressive strength (in N/mm^2)
After 1 day	1.	$40x10^3$	150x150	1.78	1.69
	2.	$36x10^3$	150x150	1.6	
After 5 day's	1.	$70x10^3$	150x150	3.11	3.11
	2.	$70x10^3$	150x150	3.11	
After 7 day's	1.	$64x10^3$	150x150	2.84	2.84
	2.	$64x10^3$	150x150	2.84	
After 14 day's	1.	$98x10^3$	150x150	4.36	4.36
After 28 day's	1.	$93x10^3$	150x150	4.13	4.13

Trial Mix 2

Period (in days)	Sr. No.	Load (in N)	Area (in mm^2)	Compressive strength (in N/mm^2)	Average Compressive strength (in N/mm^2)
After 1 day	1.	$222x10^3$	150x150	9.867	10.3585
	2.	$244x10^3$	150x150	10.85	
After 5 day's	1.	$314x10^3$	150x150	13.95	14.75
	2.	$350x10^3$	150x150	15.55	
After 7 day's	1.	$310x10^3$	150x150	13.78	14.78
	2.	$355x10^3$	150x150	15.78	
After 14 day's	1.	$450x10^3$	150x150	20	15.445
	2.	$245x10^3$	150x150	10.89	
After 21 day's	1.	$365x10^3$	150x150	16.23	19.23
	2.	$500x10^3$	150x150	22.23	
After 28 day's	1.	$438x10^3$	150x150	19.47	20.355
	2.	478x103	150x150	21.24	

Trial Mix 3

Period (in days)	Sr. No.	Load (in N)	Area (in mm^2)	Compressive strength (in N/mm^2)	Average Compressive strength (in N/mm^2)
After 1 day	1.	$230x10^3$	150x150	10.23	10.895
	2.	$260x10^3$	150x150	11.56	
After 7 day's	1.	$290x10^3$	150x150	12.89	14.445
	2.	$360x10^3$	150x150	16	
After 14 day's	1.	$270x10^3$	150x150	13.12	15.675
	2.	$410x10^3$	150x150	18.23	
After 28 day's	1.	$335x10^3$	150x150	14.88	15.77
	2.	$370x10^3$	150x150	16.66	

Conclusion

1.The strength of GPC is highly affected by the method of curing adopted. Strict oven curing yielded better results than the curing provided by Blast furnace.
2.The Molarity of the solution plays a major role in the strength of the Geopolymer Concrete. Greater the molarity of the solution, higher is the strength obtained. However, solutions with higher molarity have lesser reactivity time and also are very costly.
3.The optimum molarity found from the study carried is 16M. At this molarity of the solution, a balance between economy and effectiveness was found.
4.The solution to fly ash ratio was maintained as 0.35, which is optimal for the mix, as found from the past studies.
5.The Geopolymer concrete's major limitation is that it needs skilled labor for its handling.
6.Chemicals used are to be preserved in a place where no other reactive materials are present.
7.As the curing provided is oven curing and hence has its limitations. And therefore, may not be able to be provided at all the construction aspects.
8.The applications of GPC can be found in various other aspects and can be subject of an entire study.
9.The setting time for GPC is very less as it starts to gain hardness very quickly. In order to bring desirable changes in the concrete mix, admixtures can be used.

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ECONOMICS OF INTEGRATED FARMING IN KERALA

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ABSTRACT

The present research article unfurlsthe research findings of the work on economics of Integrated farming in Kerala.The findings were extracted from the primary survey conducted in six agro-ecological zones of Kerala namely, Onattukara, Southern-midlands, Northern-midlands, Malayoram, Riverbank alluvium and High ranges.The important findings state that the integrated farmers in Kerala gain considerable amount of income and that the losses in other systems of farming are compensated from integrated farming.The farmers were generally categorized into three based on stratified random sampling,the stratum being the size of land holdings and they were small, medium and large. The category of 'medium farmers' were found to be more advantageous than other categories of farmers. The size of landholdings in the state of Kerala compared to other states in India are less.With the limited availability of land and high density of population in Kerala,the system of integrated farming has empirically proved the best system of agricultural practice in Kerala.Though the system of integrated farming has gained momentum in Kerala,it has not become popular among the farming community of Kerala.The agricultural offices of all fourteen districts have to make initiative for such a venture.

Keywords *- Integrated farming,sources of water,methods of irrigation,size of land,agro-ecological zones,primary occupation and income*

Introduction

Integrated farming was practiced in India and in the state of Kerala from time immemorial. It gained a distinct gesticulation from 1968 onwards as integrated farming was commenced to practise under the auspices of the Integrated Farming Systems Research Station (IFSRS) located at Nedumcaud in the district of Thiruvananthapuram, which was established in 1955. The station has an area of 7.65 hectares of which 7.25 hectares is double cropped wet land and 0.4 hectare garden land. The centre, formerly known as the Model Agronomic Research Station and was established in 1955. New schemes and projects were started from 1968 onwards under the All India Co-ordinated Agronomic Research Project (AICARP) of the Indian Council of Agriculture Research (hereafter, ICAR). From October, 1983 onwards, the station was upgraded as the headquarters (HQ) of the AICARP in Kerala. Lead functions are rice-based cropping system and verification functions are agro techniques (rice), integrated farming systems with rice, fish, poultry and cattle. From 1986, a unit of All India Co-ordinated Agronomic project is functioning here. Integrated farming is practiced in Kerala in the districts of Thiruvananthapuram, Kollam, Alappuzha, Idukki, Ernakulam, Malapuram, Trissur and Kannur. In 1986, a pioneer study was done in Kerala on integrated farming and found out that it was a profitable venture for an economy like Kerala. From then various studies undertaken in this area have brought out the result that integrated farming was conducive even in the coastal districts of Kerala, namely Thiruvananthapuram, Alappuzha, Ernakulam, Trissur, Malapuram , Kozhikode and Kannur. Nevertheless, integrated farming has not become the best agriculture practice in Kerala. However, integrated farming is gaining ground in the agricultural community of Kerala. It is in this backdrop the present article was developed.

Concept of Integrated Farming

Integrated Farming System camouflages the idea of integrated agriculture where the elements interact each other in order to make farming more productive and environmentally sustainable by cutting down the chemicals or unhealthy artificial content. The studies in this field identified Integrated Farming System as a natural way of farming, which suited the constrained conditions of agriculture. The complex and compatible integration helped farmers, especially those with small land holdings to use their off-farm resources to upsurge the farm output at a reduced cost. Research works around the world support this

argument of integrated farming and space for trial and error experiments with different crops and farm practices are high in this system of farming. Various works had mentioned about the significance of integrated farming in controlling the environmental losses incurred due to bad agricultural practices. In defining the basic concept of integrated farming system many researchers had made their contribution. Integrated Farming System (IFS) was defined as a complex interrelated matrix of soil, plants, animals, implements, power, labour, capital and other inputs controlled in part by farming families and influenced, to varying degree, by political, economic, institutional and rest factors that operated at the level of the farm (Mahapatra, 1992). The definition disclosed the interrelation of the factors in a more effective way within the level of the farm. Unlike the traditional farming system, integrated farming system had more correlation among the inputs of the farm, both internal and external. The natural interrelations framed in a systematic way helped to maintain the sustainable conditions of the environment. The waste recycling and re-composting techniques like aerobic and vermi-composting involved in the integrated farming system was found to be more effective in their study than the use of chemicals and pesticides. Their study made an effort to learn about the environmental and sociological impact of existing farming system, which had high use of chemicals and pesticides, and integrated farming system, which was a fusion of traditional and modern farm techniques with limited chemicals. Interrelation and interaction of agro elements in the farming system was also discussed by Sharma et al. (1991) in their work in farming systems. For increasing productivity and profitability of the farm the families allocated their resources in its best way so that it could be efficiently utilized in the existing farm enterprises. These farm enterprises included crops, livestock, aggro-horticulture and agroforestry. In the integrated farming process this enterprises interacted each other and efficient utilization of resources happened with these interaction and interdependence. This integration was extended to other elements like aquaculture and energy management Lightfoot C. (1990) defined integrated framing on this basis. His definition was reflected in the article 'Integration of aquaculture and agriculture: a route to sustainable farming system'. In the article he explained about the conditions of African and Asian countries to explain the relevance of integrated farming and the researches done on farming systems. He explained that researching on individual crops and individual fish would not be enough to feed the needs of food availability of the 21st century. Instead, studies about combined agricultural patterns and systems would be adopted. Integrated farming systems are considered to be less risky, if managed efficiently. They benefit from synergism among enterprises, diversity in produce, and environmental soundness. He also added that researches were worth when they were able to produce outcome.

Integration results in better income and healthy environment, which also lead to multiple results influenced by Socio- economic and geographical elements. The geographical significance of farming system was mentioned by Gangwar (1993). In this work, farming system was considered as a highly location oriented research. The most effective combinations of farm enterprises and the available means to the individual farmers derive the profitability of the farm systems. The author added that integrated farming involved a multidisciplinary intervention as it revolved around social, economic and geographical factors. Technological innovation in agriculture developed as a consideration of farming system as a whole rather than considering individual crops or techniques. The sustainability both in economic and environmental cases needed to be mentioned while explaining about the significance of integrated farming system. Chandakavate and Shivaramu (2008)in their work 'Sustainable rural livelihood through integrated farming system' has mentioned about the important components of Integrated Farming System. They had tried to define Integrated farming system in Indian context, by marking it as a mixed animal crop system where animal is raised by using the crop or farm byproducts and animal waste is used for farm activities. Considering the components of integrated farming system, they have included

crop diversification+ fodder+ diary+ biogas+ vermi-compost, crop diversification +sheep/goat,crop diversification+ seed production+ livestock, SWC (Soil Water Conservation) + crop diversification+ livestock. These components were selected by the farmers based on the biophysical resources available for them. As the elements were selected on the basis of both affordability and environmental factors, the balance between both environment and agricultural trade-off could be maintained. Extending the Concept of farming system and farming system research defined farming system as a set of agricultural professions avowed on a farm unit. The choice of farm enterprises were mainly guided by factors like the agro-ecological limits, the farm resources, availability of market, extent of mechanization, technology level of farmers, infrastructure back-up and managerial skill and acumen of the farm entrepreneur. Further explaining farming system he mentioned farming system as an art and science of realizing the most suited combination of enterprises to achieve two goals: maximum profit, maximization of net worth of the farming unit.The activities should also be given consideration to the environmental factors. The integrated farming took the principles from economics, natural biology, geography and management. Their study mainly revolved around the regions of Bangladesh, where sustainability of Integrated farming models showed good results.

The concept of integrated farming system could be extended to different dimensions that incorporated methods, practices and strategies involved in the broader farming system. The concept of Intensive Integrated farming was used by Swaminathan (1996) in which the factors or elements like soil health care, water harvesting and management, crop and pest management, energy management, post-harvest management, choice of crops, farm animals were considered as the seven pillars of Intensive Integrated Farming System. The other components of the farming like information, skill, organization and management empowerment also played important role in deriving the benefit and viability of Farming systems. Similarly, the technique of participatory rural appraisal considered in Integrated Farming System was used by Neela Mukherjee (1997) in her book Participatory Rural Appraisal: Methodology and Application. The work had devoted a section for recognizing the importance of PRA approach in Integrated Farming System. During 1970s, Indian farming system had a tremendous shift in the practices, methods and strategies. In this scenario her attempt was to make assessment of the PRA approach in farming system in India. In her study she also mentioned about the conditions that existed in the South Asian countries, who were trying to adopt a new or alternative farming technique, during that period. Japan had their studies in the integration of paddy-fish-duck-azolla cultivation model. Similarly countries like India, Bangladesh, Cambodia, Philippines conducted their own research with the help of innovative farmers and developmental organizations. All of them had the conclusion that this kind of intra-subsystem linkage is required to solve the existing issues in agricultural sector. She also added the issues existing in implementing integrated farming and elaborated how Participatory Rural Appraisal can act as a solution for it. The issues quoted by Neela included the social and organizational issues like distance from farm, sense of security issue, inefficient government mechanism to monitor farming systems. The Food and Agriculture Organization (FAO, 1977) had made their effort to define Integrated Farming system. They mentioned about the necessity of introducing integrated farming in Asian Regions as the adoption of integrated farming would help the small and marginal farmers to find solutions for their existing issues, such as low production and high poverty level. Integrated Farming facilitated to reduce the cost incurred in production for the purchase of raw material and other waste by reusing the waste generated from other components. FAO report had quoted the concept of integrated farming system as “there is no waste” and “waste is only misplaced resource which could be a valuable resource for another product”. IFS depends on this principle for its interactions and inter-relations for bringing better output thereby improving the productivity and efficiency.

Result and Discussions of the Research Finding

Profile of Selected Agro-ecological Zones

The state of Kerala is located in the South-West corner of India, with a geographical area of 38863 Square Kilometre (hereafter, Km).It lies along the Arabian coastline, to the extreme south west of Indian Peninsula, bordered by Lakshadweep Sea on the west and the mountains of the Western Ghats on the east. The land size of Kerala stretches north-south along a coastline of 580 Km with a varying width of 35 to 120 Km (Profile, Kerala State, 2019). Kerala is one of the smaller states of India and possesses only 1.18 per cent of the total area of the state. The agro-ecological zones of Kerala are classified into 13 different types based on four parameters which are: altitude, soil type, rainfall pattern and topography (*ENVIS, Kerala 2019*). There are different levels for each parameters, with the variations in the parameters, there will be changes in the temperature, water availability, climatic conditions and cropping pattern. The parameters are divided into different levels based on the profile of various agro-ecological zones. Agro-ecological Zone (AEZ) methodology is a common approach used to measure the productivity and capability of different regions on agriculture and farming. Thus, the parameters distinguishing the agro-ecological zones facilitated to understand the variations in agricultural patterns of different zones. Out of the total agro-ecological zones, six zones, giving importance to their locations, are selected for conducting the study.

Table 1.1Parameters for IdentifyingAgro-EcologicalZones

Parameter	Level	Description		
I Altitude	Type I	Altitude Up to 500 m above MSL (Low altitude zone- hot humid tropics, spread over the entire state)		
	Type II	More than 500 m above MSL		
II Rainfall	Pattern I	Both the southwest and northeast monsoons are active and moderately distributed. Southwest monsoon with June maximum (South of 11ºN latitude)		
	Pattern II	Poorly distributed rainfall; southwest monsoon with July maximum and concentrated in 3-4 months. Northeast monsoon relatively weak (North of 110 N Latitude).		
III Soil Type	1	Alluvial soil (Spread over river banks)		
	2	Sandy soil (Coastal areas)		
	3	Sandy loam soil (Coastal areas)		
	4	Late-rite soil with well-defined B horizon (Natural midlands)		
	5	Late-rite soil without B-horizon (Natural highlands).		
	6	Red soil (Southern-most Kerala)		
	7	Black soil (ChitturTaluk of Palakkad district)		
	8	Peat (kari) soil (Kuttanad)		
	9	Acid-saline soil (Pokkali and Kaipad areas)		
IV Topology		Valleys	Hill Tops	Slopes
	Model I	Extensive valleys with level but raised garden lands		
	Model II a	Valleys less extensive	Hills with moderate gradients	Slopes having mild gradients
	Model II b	Valleys less extensive	Hills with moderate gradients and top with egg shaped hump	Steep slopes
	Model II c	Valleys less extensive	Hills with table tops	Steep slopes
	Model III	Narrow valleys	Hills with steep gradients	Steep slopes

Source: ENVIS centre: Kerala

Table 1.2Profile of the Selected Agro-ecological zones

No	Zones	Altitude type	Rainfall Pattern	Topography	Soil Type

I	Onattukara	I	I	I	Sandy loam
II	Southern midlands	I	I	III	Laterite without B-horizon
III	Northern midlands	I	II	II b	Laterite
IV	Malayoram	I	I	III	Laterite without B
V	Riverbank alluvium	I	I	I	Alluvium
VI	High ranges	II	I&II	III	Red loam

Source: ENVIS centre: Kerala

The six agro-ecological zones selected were Onattukara, Southern midlands, Northern midlands, Malayoram, Riverbank Alluvium and High ranges. Each agro-ecological zones have different characteristics based on the parameters such as altitude type, rainfall pattern, topography and soil type. Considering the altitude type, Onattukara, southern midlands, northern midlands, Malayoram, and riverbank alluvium have type I altitude condition, that is, altitude up to 500 m above MSL (Low altitude zone- hot humid tropics), whereas, high ranges have type II condition of more than 500 m above MSL.

When it comes to the rainfall pattern, Onattukara, southern midlands, Malayoram and riverbank alluvium have type I condition of active southwest and northeast monsoons which are moderately distributed and blessed with southwest monsoon at maximum during the month of June. In northern midlands the rainfall condition is type II, where the rainfall is poorly distributed and southwest monsoon is maximum during July and concentrated in 3-4 months and the northeast monsoon is also relatively weak. The high ranges experience both type I and type II rainfall conditions.

The topology is different among the selected six agro-ecological zones. The topology was analyzed based on the nature of the valleys, hill tops and slopes. Onattukara and riverbank alluvium have a similar topology of extensive valleys but with raised garden lands. Malayoram, High ranges and Southern midlands have a similar topology of narrow valleys, hill with steep gradients and steep slopes. Finally, the northern midlands have a topology of less extensive valleys, hills with moderate gradients and top with egg shaped hump and steep slopes.

The six agro-ecological zones have six different types of soil. Onattukara possesses sandy loam type of soil and southern midlands have late-rite without B-horizon type of soil, and northern midlands are blessed with late-rite soils, Malayoram with late-rite without B soil type, riverbank alluvium has alluvium soil and high ranges have red loam soil.

The agro-ecological zones based on the above mentioned parameters are located in different regions of Kerala. The locations of them are mentioned in table 1.3.

Table 1.3Distribution of agro-ecological zones of Kerala

No	Zones	Description
I	Onattukara	Quilon, Chavara, Karunagappally, Ochira, Kayamkulam, Mavelikkara, Mavelikkara,

		Muthukulam, Haripad.
II	Southern midlands	Trivandrum, Trivandrum Rural, Kazhakkuttam, Chirayinkeezh, Attingal, Varkala, Kilimannoor, Ethikkara, Mukhathala, Anchalummude, Chadayamangalam, Kottarakkara, Vettikkavala, Chittumala, Sasthamkotta, Elanthur, Pandalam, Kulanada, Bharanikkavu, Madappally, Pallom, Kottayam, Ettumannur.
III	Northern midlands	Pandalayani, Balusseri, Perambra, Meladi, Vadakara, Thodannur, Kunnummel, Tuneri, Badagara, Thalassery, Thalassery, Kuthuparamba, Edakkad, Cannanore, Irikkur, Cannanore, Taliparamba, Payyannur.
IV	Malayoram	Perumkadavila, Vellanad, Nedumangad, Vamanapuram, Anchal, Pathanapuram, Parakode, Konni, Ranni, Vazhoor, Kanjirappally, Pampady, Erattupetta, Lalam, Pala, Uzhavoor, Thodupuzha, Elamdesam, Muvattupuzha, Muvattupuzha, Kothamangalam, Chalakudy, Kodakara, Ollukkara, Pazhayannur, Mannarkkad.
V	Riverbank alluvium	Distributed as narrow stretches in the river banks all over Kerala. For Sample collection places like Chegannur, mallappilly, koippuram, pulikeezhu, thiruvalla were visited.
VI	High ranges	Arudai, Devikulam, Attapadi, Kalpetta, Sultan Battery, Mananthavady.

Source: Kissan Kerala (2020)

Primary Survey Analysis

The sample of the present study formed 390 farmers from 6 different agro-ecological zones in order to give representation to different types of Integrated Farming Systems (IFS) based on multi stage random sampling, across Kerala. Based on the Integrated Simulation Model of IFS different components related to the sustainability of the farm fields were studied. The Integrated Simulation principle used in this study comprised of two parts, i.e., Socio- Economic factors and Bio-Physical Factors. The Social Economic factors included: conditions of the farm, basic profile of the farmers, labour supply, land availability and market accessibility. Bio-physical factors included; farm components and interactions, main crops, farming technique, use of technology and climatic conditions. This chapter is categorized into four parts: (I) Socio-Economic Factors, (II) Bio-physical Factors, (III) Economic Variables, (IV) Benefit - Cost analysis and (V) Regression Analysis.

Socio- Economic Profile of the Farmers

The Socio--demographic profile of the farmers give a basic understanding about their background which has an important role in determining the nature of their farming. It is a critical element in determining the behaviour of the farmers and is relevant for explaining the economic relations and helps to suggest necessary policy changes. The main aspects of the socio-economic profile of the respondents include: Condition of farm and land availability, basic-profile of the farmer, labour supply and market accessibility.

Condition of Farm and Land Availability

The condition of farm and land availability are explained using the size of landholding, average land size, ownership of land, nature of agricultural activity, income share of farming, water resource, and method of irrigation.

Size of Land Holding

The size of the landholdings categorized were hooked on to three categories based on stratified random sampling as small, medium and large, the stratum being the size of landholdings. Here, the small landholdings constitute, landholdings which were less than 2 acres, landholdings more than 2 acres and less than 4 acres and above 4 acres were respectively termed as medium and large. These categorizations of the landholdings were distributed among the six different aggro-ecological zones. The cross tabulation of zones and category of landholding are given in table 1.4

Table 1.4 Size of land holdings.

Type of land	Place	Total

area	High ranges	Malayoram	Northern midlands	Onattukara	Riverbank alluvium	Southern Midlands	
Large	12	3	20	7	31	16	89
Medium	35	45	32	48	26	30	216
Small	18	17	13	10	8	19	85
Total	65	65	65	65	65	65	390

Source: primary Survey

The size of the landholdings selected for the study were distributed in such a way that 22 per cent were large farmers, 55 per cent of the farmers were medium and rest of the farmers held small landholdings (i.e. Less than 2 acres) . In the High ranges, 53 per cent of the respondents had medium landholdings, 27 per cent with small landholdings and 20 per cent with large landholdings. At this juncture it could be observed that the general trend of the size of landholdings of the state of Kerala was reflected here. In Kerala the size of large landholding is less compared to other states. At the outset it should also be inferred that the farmers engaged in integrated farming cluster more around the medium size of landholdings. In Malayoram, 69 per cent of the respondents possessed medium landholdings, 26 per cent had small landholdings and the rest were large landholdings. In Northern midlands, 49 per cent of the respondents had medium landholdings and 30 per cent were large landholdings and rest had small landholdings. In Onattukara, 74 per cent of the respondents had medium landholdings, 15 per cent of the respondents had small landholdings and 11 per cent of them had large holdings. Among riverbank alluvium, 48 per cent of the landholdings were large, 40 per cent of the landholdings were medium and the rest belonged to small farmers. In southern midlands, 46 per cent of the landholdings belonged to medium farmers, 29 per cent of the landholdings were small and 25 per cent of the holdings were large. At this junction it is to be approved that majority of farmers engaged in integrated farming in gist belonged to the category of medium farmers. That was why 74 per cent belonged to the category of medium farmers. In Kerala, the average size of the cultivable land was only 0.22 whereas it was 1.67at all India level (Monitoring and Evaluation Division, Directorate of Agriculture, (Agricultural statistics, Govt.of Kerala 2020).

However, the overall average land area was 4.53 acres. In the case of large farmers the average landholdings was 10.25 acres and for the medium farmers the average land area was 3.41 acres and for the small farmers the average land area was 1.64 acres. For the High ranges, the average land area was 4.45 acres and the average land area of the larger farmers was 12.75 acres, for medium farmers, it was 3.39 and for the small farmers the average land area was 1.72. It was observed here that the density of population in high ranges was less as compared to other areas under the consideration of the study. In the northern midlands, the average land area was highest with 5.88 acres and among them, the large farmers were having an average land area of 12.83 acres. The average land area was lowest in Malayoram (low land of the high ranges) with 3.02 acres. In the case of average size of land in Kerala, the small category of farmers (i.e. below 2 hectares of land) constituted the highest. As explained in table 1.4, the average size of land available for cultivation in Kerala was lower than the all India level.

Table 1.5 Average Land Area (in acres)

Type of Place	Tota

land area	High ranges	Malayoram	Northern midlands	Onattukara	Riverbank alluvium	Southern Midlands	l
Large	12.75	7	12.83	10.5	8.15	10.8	10.25
Medium	3.39	3	3.6	3.5	3.56	3.57	3.41
Small	1.72	1.67	1.875	1.23	2	1.47	1.64
Total	4.45	3.02	5.88	3.83	5.59	4.74	4.53

Source: primary Survey

Ownership of Landholding

Out of the 390 farmers considered, around 75 per cent of the landholdings were self-owned, 9 per cent of them were using purely rented land or leased and 16 per cent of them were both self-owned and rented or leased. In riverbank alluvium, 85 per cent of them had own land and 15 per cent of them had both self-owned and leased or rented. In Northern midlands, 15 per cent of the landholdings were rented or leased, 74 per cent of them were self-owned and 11 per cent both self-owned and rented or leased. In High ranges, 24 per cent of them were both self-owned and rented or leased, 14 per cent of them were rented or leased and 62 per cent of them were self-owned.

Table 1.6 Ownership of land

Place	Self-owned	Rented/Leased	Both A and B	Total
High ranges	40	9	16	65
Malayoram	49	7	9	65
Northern midlands	48	10	7	65
Onattukara	53	3	9	65
Riverbank alluvial	55	-	10	65
Southern Midlands	47	6	12	65
Total	292	35	63	390

Source: primary Survey

Agriculture as Primary Occupation

Integrated farmers engage in farming considering it as primary or subsidiary bustle or occupation, as there was no organizational structure or norms. Nature is the determining factor of the time involved in farming. This made some of the farmers to consider farming as a subsidiary activity. Primary farmers engage in farming for the whole day and had no other occupation for their livelihood whereas in the case of subsidiary farmers, they were engaged in other occupations such as government job, part time work, casual labour, auto drivers, teachers in aided sector, government sector and unaided sector and self-employed people. It was observed during the primary survey that the farmers who considered farming as primary occupation, had no other means to supplement their family income and were likely to make a living from integrated farming. Thus they depended too much on integrated farming. Their concentration was entirely given to the integrated farming system that made them to invent and experiment different ways to make it viable and appealing for them to sustain in it.

Table 1.7Agricultural Activity-as Occupation

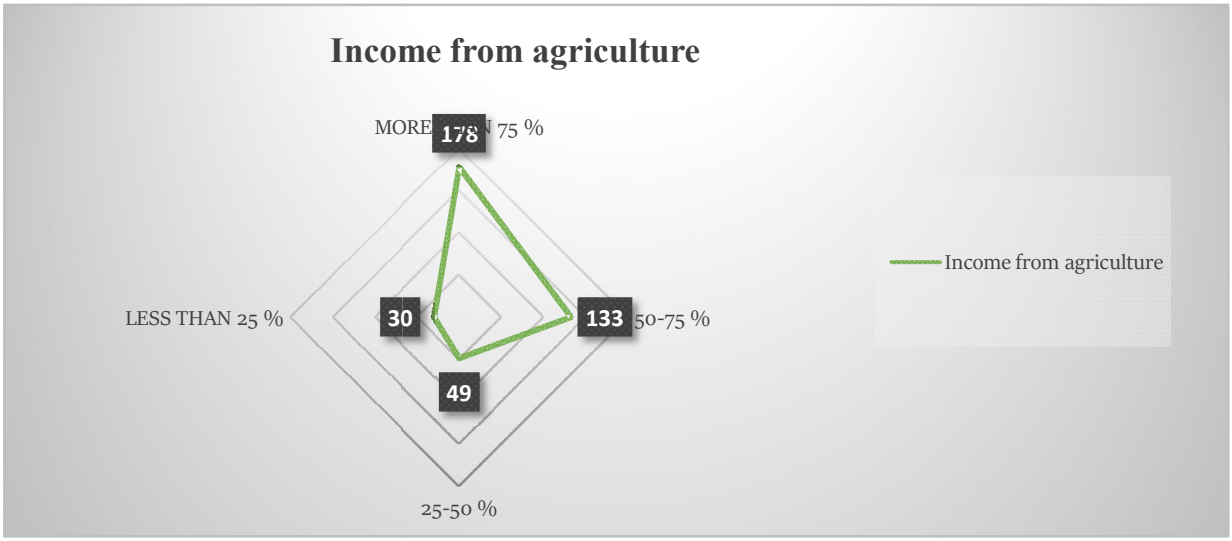
Place	Agricultural activity- as occupation		Total
	Primary	Subsidiary	
High ranges	65	0	65
Malayoram	65	0	65
Northern midlands	55	10	65
Onattukara	65	0	65
Riverbank alluvial	65	0	65
Southern Midlands	45	20	65
Total	360	30	390

Source: primary Survey

The distribution of farmers in the agricultural activity as primary and secondary, are explicated in table 1.7. It could be inferred that 92 per cent of the farmers considered farming as a primary activity and 8 per cent of the farmers considered it as a subsidiary activity. In northern midlands and southern midlands, 15 and 30 per cent respectively deliberatedfarming as a subsidiary activity, rest of the farmers in the entire agro- ecological zones ruminated farming as primary activity. Thus for majority of the farmers integrated farming was a way of living and means of livelihood. They earned income, made a living and acquired profit for the economic sustainability of the IFS.

1.5.5 Income from Agriculture

The share of income from agriculture in the entire income of the family varied from household to household. Around 46 per cent of the farmers had income of more than 75 per cent imminent from agriculture and around 34 per cent of the farmers had 50-75 per cent of their income upcoming from agriculture. 12 per cent of the farmers had income of around 25-50 per cent from farming and 8 per cent of the farmers had less than 25 per cent of their income from farming. 80 per cent of the farmers had more than 50 per cent of their household income looming from agriculture. This brought out an interesting fact for researchers that integrated farming sector had generated considerable portion of the income of the farmers.From the primary survey it was understood that framers engaged in integrated farming had compensated their shortages in income in other agricultural activities from the high earnings they gained from integrated farming. It was also observed that in integrated farming farmers could earn income one area if not from the other and the entire process went on in harmonized and synchronized style. Integrated farmers especially the medium category farmers shared that they were blessed because they had opted for this type of farming.



Source: primary Survey

Figure 5.1Percentage of Income from Agriculture

Source of Water

The major sources of water for farmers were well, pond or tank, canal, river and bore well. Kerala is renowned for its water resources. There are 44 rivers in Kerala and ensures its water supply through south-west and north-east monsoons. There were possibilities of water shortage during the season of summer and the farmers were effected typically due to the dependence of farming on water resource availability.

Table 1.8Source of Water

Place	Well	Pond/Tank	Canal	River	Bore well	Total
High ranges	42	11	5	4	3	65
Onattukara	38	12	4	3	8	65
Southern midlands	52	5	2	0	6	65
Northern midlands	36	11	6	3	9	65
Malayoram	37	7	3	6	12	65
Riverbank alluvium	41	8	0	13	3	65
Total	246	54	20	29	41	390

Source: Primary data

Kerala as understood in general parlance, is blessed with abundance of natural water and common people depend on natural sources for their need of water. From table 1.8, it could be anecdotal that 63 per cent of the farmers depended on wells and 13 per cent of them on ponds or tanks, 10 per cent on bore wells and the rest of them on canals and rivers. Among those who use well as their major resource, Southern midlands had highest with 21 per cent and northern midlands had the lowest position with just 9 per cent. Among the farmers who used pond or tank 22 per cent of them were from Onattukara and 9 per cent of them were from southern midlands making them the highest and lowest category respectively. Among the canal water users 30 per cent of them were from northern midlands and there was no one who used canal water among the respondents in riverbank alluvium. Among the

river water category 44 per cent of them were from riverbank alluvium and none of them from southern midlands used river water directly for farming. Finally, in the category of those using well, majority of them were from Malayoram with 29 per cent and lowest per cent shared in the riverbank alluvium and high ranges.

The major methods of irrigation were supported by diesel or electric motor, traditional motor, solar or wind motors. The farmers who had more than one type of motors and farmers who had modern irrigation techniques like splinters, drip irrigation and sprayers are well expressed in table 1.9.

1.5.7Methods of Irrigation

Table 1.9Method of Irrigation in the Cultivated Land

Place	Diesel/ electric motor	Traditional motor	Solar/ Wind motor	More than one type of motor	Modern irrigation technique	Total
High ranges	19	28	2	10	6	65
Onattukara	21	26	-	6	12	65
Southern midlands	8	32	4	16	5	65
Northern midlands	10	35	-	9	11	65
Malayoram	14	24	1	12	14	65
Riverbank alluvium	17	28	2	13	5	65
Total	89	173	9	66	53	390

Source: Primary data

Out of the major methods, 44 per cent of the farmers used traditional motors and 23 per cent of them used diesel or electric motor. Only 2 per cent of them used solar or wind motor, around 17 per cent of them used more than one type of motor and the rest of the 14 per cent used modern irrigation techniques. Only 4 farmers in southern midlands, 2 each from high ranges and riverbank alluvium castoff solar or wind powered motors. Malayoram steered in those who used modern irrigation techniques and Southern midlands headed in those who used more than one motors. Onattukara had the highest number of diesel or electric motors and the least in southern midlands. In the case of using the traditional motors northern midlands lead in number of users and Malayoram with least number of users.

Conclusion

The present research article brought out the income and other variables such as availability of land ,size of land holding, ownership of land, source of water and methods of irrigation of the integrated farming in Kerala.The study had found out that the farmers earned an income for a decent living from the integrated farming.Integrated farming in Kerala had proved that it was one of convenient, suitable and comfortable methods of farming in Kerala in all the six selected agro-ecological zones of the state.The integrated farming has roots in all the districts of the state but it has not become a common practice of agriculture in Kerala. It is a viable method of farming. It has to be promoted and encouraged by Krishibhavans (agricultural Offices) in all the districts of Kerala.It has to be encouraged to make a common practice among the farmers.The advantage is that if the farmers make losses in one area of cultivation they are likely to gain from other segments of cultivation and other combinations.There are varieties combinations in this farming.The farmers have to select the most convenient and profitable combination.

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AN INVESTIGATION ON MIX DESIGN & STRENGTH ISSUE OF GEOPOLYMER CONCRETE

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ABSTRACT

The production of Ordinary Portland Cement results in large amount of CO2 emissions. Also, the raw materials needed for the production of OPC are scarce in nature and hence possesses environmental threats, and also danger to climate. Hence need for a viable replacement of OPC is seen being a major topic in recent studies. The industrial and agricultural by-products such as fly ash, slag, rice hush ash is available in ample amount. Hence the discovery of Geopolymer concrete was made where these by-products are used in place of OPC, and studies are being made in this subject. The study in the research paper presented gives an investigation regarding Geopolymer concrete. Class F fly ash was used for the GPC for its pozzolanic properties. In the presence of alkaline activators, an aluminosilicate network is initiated and oven curing of 24 hours forms the Geopolymer Concrete. The alkaline activators used in the study are sodium hydroxide and sodium silicate in the ratio of 1:1, since a single alkaline activator is not effective. The strength of GPC depends on variety of factors such as quality and quantity of fly ash, solution to fly ash ratio and Molarity of solutions. In the study carried out, variation in the molarity of the solutions is made. However, the study was greatly affected by the pandemic situation, and due to the restrictions imposed the study was unable to be executed as pre planned. However, the study gives detailed idea regarding the procedure of mix design and the method adopted. The mix design proposed in the paper gives the information regarding various aspects in the procedure of GPC. The paper presented may be found resourceful for many other further studies.

Keywords: *Geopolymer Concrete.*

Introduction

In recent years, the popularity of geopolymer concrete in concrete sector has increased due to the fact that it is significantly more environment friendly than standard concrete. Flyash based geopolymer concrete is a new technology which reduces the consumption of ordinary Portland cement (OPC) and also environmental pollution. Geopolymer concrete, based on fly ash, finds its application in construction as a pre stress concrete (Zhang et al., 2016). Fly ash based geopolymer concrete, an inorganic polymer is a greener substitute for PC-based concrete as it has viable low cost and good properties such as high compressive strength, little creep, higher acid resistance, and low shrinkage (Wang et al., 2015; Yadollahi et al., 2015).

Geopolymer concrete is a kind of concrete that is made by chemically react with aluminate & silicate bearing materials with an alkaline activatoror caustic activator. This results in the formation of aluminosilicate gel that acts as a binding material for the concrete. Material such as GGBS, met kaolin (calcined kaolin) which are of geological origin or by product materials in industry such as Fly ash and rice husk ash are used as source of silicon and aluminum.

Fly ash, mine waste, GGBS, red mud, etc. is being disposed in large areas of useful land, impacting the environment. This level damage of pollution to the atmosphere is unsustainable and hence motivated the research for environment friendly concrete. Geopolymer concrete is one such concrete which reduces the CO2 emission up to 26 to 45%. After municipal solid wastes, coal combustion production (CCP) constitutes the second largest waste stream, as per reports. In 2011, 130 megations (MT) of CP were produced out of which 56.57 MT (43.50%)were utilized. Flue gas desulfurization material, bottom ash, boiler slag and fly ash are the main type of CCPs. Near about 60.0 MTs of total CCP were considered as class C fly ash. About 22 MT (38.35%) of fly ash were used, and the rest was disposed of in landfills or surface impoundment, which are lined with compacted clay soil, a plastic sheet, or both. Replacement of PC and assistance in producing a green construction material are the main outcomes of utilizing fly ash in Geopolymer concrete (Alyamac et al., 2017; Kuenzel and Vandeperre, 2016; Mehta and Siddique, 2016, Liew et al2014.

Many GPC materials perform better than Portland cement concrete (PCC) because having chemical resistance, high temperature

strength, resistance to chloride penetration and freeze thaw resistance, excellent mechanical properties, high early strength, fire resistance can be achieved (Fang and Kayali, 2013; Kuenzel et al., 2013; Liew et al., 2016).

Geopolymer concrete materials are more resistance to acid attack than Portland cement-based material as they have low calcium content. Also, reduction in the energy requirement in their manufacturing makes geopolymer concrete based material of great interest (Bani Ardalan et al., 2017; Committee, 2008; Liew et al., 2016).

The replacement of traditional Portland concrete may make geopolymer concrete appear as a super concrete. However, it has its limitation as:

- Difficulty in its creation: Special handling needs are required forGeopolymer Concrete and its creation is extremely difficult. It requires the use of chemicals, such as sodium hydroxide, that can be harmful to humans (Khatib, 2008; Perná et al., 2014).
- Only Pre-mix because of the dangers associates with its creation, geopolymer concrete is sold only as a pre-cast material. (Papa et al., 2015).
- The process of Geopolimerization is sensitive.An inconclusive and extremely volatile result has been obtained in this field of study. Lack of consistency.

Geopolymer concrete may seem to be best thing to come along after Portland concrete and may appear as an absolute idea. However, there are still a lot many unstable issues with geopolymer concrete that may possess greater challenges in its mixing and process of application of concrete (Nikolić et al., 2015; Ogundiran and Kumar, 2015).

Historical Development of Geopolymer Concrete

In the late 1970s, the term geopolymer was first introduced by professor Joseph Davidovits. And the first geopolymer concrete developed in the 1980s resulted from the research developments carried out by joseph davidovits and J. L. Sawyer.

From the reaction of alkaline liquid with aluminum and silicon from source material like Fly ash and rice husk ash, we can produce geopolymer. Aggregate And fly ash are mixed with alkaline activator like combination of sodium hydroxide with sodium silicate in geopolymer concrete. (G. Saravanan.et.al... (2014)).

The chemical composition of geopolymer is of same characteristics as that of zeolite fly ash are based in geopolymer binders show excellent short- and long-term mechanical characteristics of concrete. The development of geopolymer concrete includes the chemical reaction, source and the manufacturing process. (D. Hardjito...et.al. (2016)). Geopolymer concrete is constructed using common technology which we usually used in construction of ordinary Portland cement concrete. Geopolymeric material made from coal ash can had more compressive strength, and better chemical and mechanical properties.

Trial Mix: 1

Specific gravity of fly ash =2.2
Specific gravity of fine aggregates=2.74
Specific gravity of coarse aggregates= 2.74
Molarity of NAOH =16M
Specific gravity of NAOH =1.316
Solid content of NAOH = 41.558 %
Specific gravity of $NA_2\ SIO_3$ = 1.193
Solid content of Na_2SiO_3 = 40.506%
$NaOH/\ Na_2SiO_3$ = 1
Workability=50mm

Table 1: Assumed Standard Deviation (IS-10262-2009) (Clauses 3.2.1.2, A-3 and B-3)

Sr No. (1)	Grade of Concrete (2)	Assumed Standard Deviation N/mm^2 (3)
i)	M 10	3.5
ii)	M 15	
iii)	M 20	4.0
iv)	M 25	
v)	M 30	5.0
vi)	M 35	
vii)	M 40	
viii)	M 45	
ix)	M 50	
x)	M 55	

1)Fck'=Fck +1.65*S
From table 1, IS10262:2009
S= 5

Fck'= 30+1.65*5
=38.25 N/mm^2
Table 5, IS456:2000

Table 2: Maximum Water Content per Cubic Meter of Concrete for Nominal Maximum Size of Aggregate

Sr No. (1)	Exposure (2)	Plain Concrete			Reinforced Concrete		
		Minimum Cement Content kg/m^3 (3)	Maximum Free Water-Cement Ratio (4)	Minimum Grade of Concrete (5)	Minimum Cement Content kg/m^3 (6)	Maximum Free Water-Cement Ratio (7)	Minimum Grade of Concrete (8)
i)	Mild	220	0.60	-	300	0.55	M 20
ii)	Moderate	240	0.60	M 15	300	0.50	M 25
iii)	Severe	250	0.50	M 20	320	0.45	M 30
iv)	Very severe	260	0.45	M 20	340	0.45	M 35
v)	Extreme	280	0.40	M 25	360	0.40	M 40

Maximum water to cement ratio= 0.45
Maximum water to fly ash ratio = 0.45

Based on experience, we adopt 0.4
(clauses 4.2, A-5and B-5), IS10262:2009

Table 3

Sr No. (1)	Nominal Maximum Size of Aggregate mm (2)	Maximum Water Content kg (3)
i)	10	208
ii)	20	186
iii)	40	165

Maximum water content for 20 mm aggregates=186lit

1) Calculation of Fly Ash Content

Water to fly ash ratio= 0.4
Fly ash content = $\frac{186}{0.4} = 465 \frac{Kg}{m3}$
From table no. 5, IS456:2000
Cement or fly ash content =320 kg/m3
465 >320, hence ok

2) Volume of Course and Fine Aggregates

Table 3 Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate
(Clauses 4.4, A-7 and B-7)

Table 4

Sr No. (1)	Nominal Maximum Size of Aggregate mm (2)	Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate			
		Zone IV (3)	Zone III (4)	Zone II (5)	Zone I (6)
i)	10	0.50	0.48	0.46	0.44
ii)	20	0.66	0.64	0.62	0.60
iii)	40	0.75	0.73	0.71	0.69

From table No. 3, IS10262:2009
Volume of coarse aggregates corresponding to 20mm size coarse aggregates and fine aggregates of water to cement ratio e.g., 0.5 =0.6
In present case, water to cement ratio =0.4
For this, volume of coarse aggregates =0.62
Volume of fine aggregates = 1-0.62 = 0.38

3) Solution Requirements

Water content in NaOH = 100 – 41.558
= 58.442%
Water content in Na_2SiO_3 = 100 – 40.506
= 59.494%
Solution / fly ash = 0.35
Solution = 0.35*465 =162.75 kg

$NaOH + Na_2SiO_3$ = 162.75 kg as NaOH /Na_2SiO_3 = 1
Mass of NaOH =81.375 kg
Water content in NaOH = $((58.442) * (81.375))/(100) = 47.55kg$
Mass of Na_2SiO_3 = 81.375 kg
Water content in Na_2SiO_3 = $\frac{59.494}{100} * 81.375 =$ 48.413
Total water content in solution = 48.413 +47.55 = 95.963 kg
Extra water = 186 -95.963 = 90.036 kg/m3

4) Mix Proportion

- Volume of concrete = 1m3
- Volume of fly ash = $\frac{465}{2.2} * \frac{1}{1000} = 0.2113m3$
- Volume of water = $\frac{90.036}{1} * \frac{1}{1000} = 0.09m3$
- Volume of NaOH = $\frac{81.375}{1.316} * \frac{1}{1000} =$ 0.0618 $m3$
- Volume of Na_2SiO_3 = $\frac{81.375}{1.193} * \frac{1}{1000} =$ 0.0682
- Volume of all aggregates = 1-(0.2113+0.09+0.0618+0.0682) = 0.5687m3
- Mass of coarse aggregates = 0.5687*0.62*2.74*1000 = 966.10kg
- Mass of fine aggregates = 0.5687*0.38*2.74*1000 = 592.130kg

Table 5: Mix Proportion Values

Fly Ash	465 kg /m3
Water	90.036 kg/m3
NaOH	81.375 Kg/m3
Na_2SiO_3	81.375 kg/m3
Fine Aggregates	592.130 kg /m3
Coarse Aggregates	966.10 kg/m

Results

Table 6: Trial Mix 1

Period (in days)	Sr. No.	Load (in N)	Area (in mm^2)	Compressive strength (in N/mm^2)	Average Compressive strength (in N/mm^2)
After 1 day	1.	$40x10^3$	150x150	1.78	1.69
	2.	$36x10^3$	150x150	1.6	
After 5 day's	1.	$70x10^3$	150x150	3.11	3.11
	2.	$70x10^3$	150x150	3.11	
After 7 day's	1.	$64x10^3$	150x150	2.84	2.84
	2.	$64x10^3$	150x150	2.84	
After 14 day's	1.	$98x10^3$	150x150	4.36	4.36
After 28 day's	1.	$93x10^3$	150x150	4.13	4.13

Table 7: Trial Mix 2

Period (in days)	Sr. No.	Load (in N)	Area (in mm^2)	Compressive strength (in N/mm^2)	Average Compressive strength (in N/mm^2)
After 1 day	1.	$222x10^3$	150x150	9.867	10.3585
	2.	$244x10^3$	150x150	10.85	
After 5 day's	1.	$314x10^3$	150x150	13.95	14.75
	2.	$350x10^3$	150x150	15.55	
After 7 day's	1.	$310x10^3$	150x150	13.78	14.78
	2.	$355x10^3$	150x150	15.78	
After 14 day's	1.	$450x10^3$	150x150	20	15.445
	2.	$245x10^3$	150x150	10.89	
After 21 day's	1.	$365x10^3$	150x150	16.23	19.23
	2.	$500x10^3$	150x150	22.23	
After 28 day's	1.	$438x10^3$	150x150	19.47	20.355
	2.	478x103	150x150	21.24	

Table 8:Trial Mix 3

Period (in days)	Sr. No.	Load (in N)	Area (in mm^2)	Compressive strength (in N/mm^2)	Average Compressive strength (in N/mm^2)
After 1 day	1.	$230x10^3$	150x150	10.23	10.895
	2.	$260x10^3$	150x150	11.56	
After 7 day's	1.	$290x10^3$	150x150	12.89	14.445
	2.	$360x10^3$	150x150	16	
After 14 day's	1.	$270x10^3$	150x150	13.12	15.675
	2.	$410x10^3$	150x150	18.23	
After 28 day's	1.	$335x10^3$	150x150	14.88	15.77
	2.	$370x10^3$	150x150	16.66	

Conclusion

- The strength of GPC is highly affected by the method of curing adopted. Strict oven curing yielded better results than the curing provided by Blast furnace.
- The Molarity of the solution plays a major role in the strength of the Geopolymer Concrete. Greater the molarity of the solution, higher is the strength obtained. However, solutions with higher molarity have lesser reactivity time and also are very costly.
- The optimum molarity found from the study carried is 16M. At this molarity of the solution, a balance between economy and effectiveness was found.
- The solution to fly ash ratio was maintained as 0.35, which is optimal for the mix, as found from the past studies.
- The Geopolymer concrete's major limitation is that it needs skilled labor for its handling.
- Chemicals used are to be preserved in a place where no other reactive materials are present.
- As the curing provided is oven curing and hence has its limitations. And therefore, may not be able to be provided at all the construction aspects.
- The applications of GPC can be found in various other aspects and can be subject of an entire study.
- The setting time for GPC is very less as it starts to gain hardness very quickly. In order to bring desirable changes in the concrete mix, admixtures can be used.

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THE STUDY OF RELATIONSHIP BETWEEN FDI AND STOCK MARKET AND THE REAL ESTATE SECTOR

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ABSTRACT

The diversity and complexity of Property Market, its linkages with economy and investment sphere has necessitated a closer study on its dynamics and movement. This paper attempts to find out the role of real estate in a multi-asset portfolio and need of its securitization in order to be investible in Indian context. Johansen cointegration test and Granger's Causality Test in the VAR block exogeneity on Quarterly data (Q 2009-10 to Q3 2016-2017) for HPI (Real estate index) and NSE 50(Stock market index) shows that there is no long run as well as no short run relationship between these markets. Segmentation exists between the stock market and the real estate market, and so these two assets can be held in a portfolio for diversification purpose. Descriptive statistics prove it as desirable asset class for investment. It further proves that Direct real estate investment is sufficient to be defined as an asset class and does not require standardization through securitization in order to be investible. Findings are relevant for policymakers as well as for market traders. This study contributes to the alternative investment literature for emerging markets.

Keywords: *Direct Real Estate Investment, Cointegration, Granger causality, Securitization.*

INTRODUCTION

Foreign Direct Investment (FDI), apart from being a significant engine of global growth, has become a major non-debt financial resource for India's economic progress. Global businesses invest in India to benefit from lower salaries, exclusive investment benefits such as tax waivers and so on. For a nation where foreign investment is made, it often means technological know-how and work creation.

The favorable policies and the robust business climate of the Indian Government have ensured that foreign capital continues to flow into the region. Over recent years the Government has taken many steps such as relaxation of FDI standards through fields such as security, refineries, telecoms, energy exchanges and stock exchanges among others. The variety and sophistication of the property market and its ties with economy and investment also demanded a closer analysis of its dynamics and movement (RBI, 2008, 2010). Posts have become explosive about the complexities with respect to the United States and the United Kingdom (McDonald, 2002; Barras, 2009; Brooks & Tsolacos, 2010). In the developing markets the character of the property sector has not been extensively studied (Ciarlone, 2015). Very few studies are conducted in Indian sense, e.g. Halbert and Rouanet (2014) and Newell and Kamineni (2007). Since the advantages of including real estate in a portfolio differ across countries (Hoesli, Lekander, and Witkiewicz, 2004), the position of the property in the Indian sense must be understood.

The purpose of the present analysis is to examine the long-term and short-term relationship between the real estate and the stock market. The presence and segmentation of an association between the financial market and the real estate market. This thesis explores the interaction of the equity market with the real estate market using the co-integration examination suggested by Johansen (1988) and Johansen and Juselius (1990). In dismissing the null hypothesis that no co-integration takes place, it assumes that these two economies will maintain a long-term equilibrium and suggests that the financial market is merged into the real estate market. It may also be inferred that the fund portfolio replaces these two investments well. Conversely, if the null hypothesis of no cointegration is acknowledged, there is a dividing line between the investment market and the real property market, which may be kept in a fund for diversification. Toda and Yamamoto (1995) Granger causality in the erogeneity of the VAR block is used to diagnosis long-term equilibrium.

We are looking at a massive amount of US$ 90 billion. This is what Merrill Lynch anticipates the

growth of the Indian real estate market by 2015. Because industry is excited about this number, RBI has expressed its concern. It is justified that the portfolio inflows could affirm the FDI standards in the market. In analysts' opinion, rather than curbing portfolio inflows, the central bank should examine FDI criteria.

Like they say, you will have two ends, no matter how small you slice. An increasing market has its own responsibility generating infrastructure and real estate demands. When we glance at the following figures, the relevance of real estate also increases:

1) It is India's second largest employer (including construction and facilities management)

2) It is related to about 250 auxiliary industries such as cement, brick and steel through reverse and forward linkages.

3) The multiplier benefit of a unit rise in spending in this field and the potential to produce revenue up to five times.

Therefore, numerous concessions and incentives have been provided to the sector to promote expansion. This will lead to changing the present allocation of housing and immovables to India's GDP at 1% against 3-6% for developed countries.

Money can be obtained by interest, equity or a combination of the two. Debt finance may be collected from outlets like banks, NBFC or foreign commercial borrowing (ECB). Participation of equity would require participation at the level of the business or at the project level. FDI is one way to fund the ventures of a business. Immobiliary FDI is allowed under some project requirements in building and project creation pertaining to both residential and industrial development in housing cities and commercial offices. Investing in India definitely is a strong choice, with rates of about 11.0% for offices that hit 20-25% in greenfield ventures. A research by ASSOCHAM in November 2006 reports that the share of property in FDI is rising to 26% by the end of 2007 from some 16% last year. Table 1 displays the spending rate in the first quarter of 2007.

Many investors are seeking to look west since listing on local markets (BSE/NSE) is challenging. The Goal with its simplified criteria was one of the easiest international shores where different players raised cash (Table 2). These funds are used in FDI (Foreign Direct Investment) compliant mega-projects spanning from suburban townships across the world.

There have recently been several flags and issues posed in this sense. As assets have soared, values and the strong concern of a real estate bubble. No clear methodology or guidelines on valuations have been developed, but the imperative fear of bulls hunting bears and shattering many dreams has been generated.

Some of the questions posed or fixed are –

1) In terms of pre-IPO placements, the Ministry of Finance noticed that the transaction can be listed as a foreign direct investment or FDI subject to a protracted duration of lockout, so that the uncertainty on these assets would be avoided if FIIs desired to invest in pre-IPO placement of real property firms.

2) SEBI issued guidelines on valuations which suggest that real estate valuations should be focused on their development plans, not on their land banks. There is also a plan for the registry of valuers with the SEBI.

This industry offers its participants great opportunities – be it developers, companies, FII's or institutional investors – with the introduction of Real Estate Mutual Funds (REMFs), corporate governance problems, tighter enforcement by players, sophisticated transactions and improved accountability. The Tier III towns, with less access obstacles in the form of affordable land rates and the availability of land banks, will also be a new place for the developers.

The launch of Commercial Real Estate Assets under the type of REIT in India is a significant move towards securitizing the Indian immobiliary industry. It is therefore necessary to decide if direct real estate investment is adequate to be identified as an asset class, and does not involve standardization by means of securities to be invested. The statistical properties in the sample log return sequence (Brooks & Tsolacos, 2010) are used to assess if direct immovable property counts as an alternate asset class with respect to its risk-return characteristics.

It is essential to recognize such relationships for both investors and policymakers. It indicates future benefits of long-term diversification as buyers own direct real estate and stocks concurrently. Their total income, usage, aggregate demand and jobs could all be impacted. Local municipalities are seeking to deliver effective tax and development policies in response to this possible chain reaction (Lin & Fuerst, 2014; Kiohos, Babalos, & Koulakiotis, 2017).

LITERATURE REVIEW

Many researches have analyzed the connection between stock and the real estate industry, but the findings which vary because of variations in sampling, data quality or economic conditions (Ambrose, Ancel, & Griffiths, 1992; Chaudhry, Myer, & Webb, 1999; Liow & Yang, 2005 and Lin & Fuerst, 2014).

The presence and segmentation of an association between the financial market and the real estate market. Geltner studies (1990); Wilson and Okunev (1996), Ling and Naranjo (1999), Quan and Titman (1999), and Lu, Chang and Wei (2007) demonstrate proof in support of two consumer segmentation. Knight, Lizieri, and Satchell (2005), Hoesli and Lizieri (2007) and Adcock, Hua and Huang (2016), on the other side show that there is a relationship of convergence within the two asset markets under investigation.

Baum (2009, p. 5) notes that The direct implication of property being different is its diversification potential, and hence the justification for holding it within a multi-asset portfolio." Direct property assets have proven to provide valuable advantages in terms of diversification of a portfolio comprising stocks (Hoesli et al., 2004 and MacKinnon & Al Zaman, 2009). However, relatively few research have explored the impact of direct real estate markets on alternate conventional capital markets.

International diversification has been found to be much more effective in the Asian real estate industry than in the European real estate sector (Bond, Karolyi & Sanders, 2003) and there are long-term prospects for diversification through investing in property in many Asian countries (Garvey, Santry & Stevenson, 2001) (2007).

The launch in India of Commercial Real Estate Properties in the form of REIT is a significant move towards securitising the Indian Immobilien Sector (Das & Thomas Jr, 2016). Pai and Geltner (2007) have demonstrated that less systematic risk indirect real estate continues to give better returns. The Swenson Model defines immaturity and non-transparency as he desirable aspects of an asset class. According to Hoesli and Oikarinen (2012), Indirect Immobilien provides liquidity and clarity of knowledge, yet is strongly interrelated with a broader stock sector. In this scenario, it cannot function as a fund mix diversifier. It is therefore necessary to decide if direct immovable investment is appropriate to be described as an asset class and does not need standardization through securitization to be investible.

DATA AND METHODOLOGY

Research Objectives

I. To find out whether direct real estate investment in terms of their risk-return characteristics qualify as an alternative asset class.

II. To examine the relationship (long run as well as short run) between equities and real estate in India.

a) To test whether there is cointegration relationship between stock and real estate markets.

b) To examine whether a causality relationship exists between the stock and real estate markets.

c) To find the impact of FDI in real estate on employment, income inflation and interest rate and thus affordability of real estate (SEM)

RESEARCH APPROACH

The effects of an asset, which an individual would like to hear about before contemplating investment in securities, are stated in four stylised facts, i.e., return (average specimen), uncertainties (standard deviation), whether or not severe returns are over predicted value (positive skewness) and the relative likelihood of extreme returns (kurtosis). These statistical predictive properties of the survey log returns sequence are used to evaluate if direct real estate counts as an alternate asset class in terms of its risk-return characteristics.

ADF (Increased Dickey Fuller) test controls the stationarity of results. The methods used to analyze a long-term association between capital markets and immobilization markets is Johansen Cointegration. Although Granger causality was used for VAR block erogeneity for short-haul diagnosis for long-haul equilibrium relationships by Toda and Yamamoto (1995).

SOURCES OF INFORMATION:

In India, the CPI(UNME) and CPI(IW) rental data were historically only the source of data on housing prices1. There are currently three separate methods for monitoring house prices, i.e. NHB's RESIDEX, Indian Reserve Bank Housing Price Index (HPI), and residential property prices index (RPPI). This analysis uses HPI details, as the coverage of registry data is more comprehensive than that obtained from the banks/HFCs (for RESIDEX and RPPI) since all domestic transactions are not supported by banks/HFCs.

The secondary details was obtained from inventory and real estate indexes (NSE 50 Index) (HPI). Quarterly statistics was obtained for both Q 1 2009-10 and Q3 2016-2017 indexes, and 31 data points are thus available. But from Q 9 2008-09 to Q 3, the HPI series is usable. 2016 – 17, although two base years results, viz. 2008-09 and 2010-11, are available. The time series developed with the Laspeyres formula as the base year for 2008-2009 would not agree with the time series built with the base year for 2010-2011. The current research then uses Splicing (Hill & Fox, 1997) to merge these two time sequences. Eviews are used for methodological purposes.

RESULTS AND DISCUSSION

Continuously compounded returns (log returns) are used for study. Log returns of the NSE and HPI series are denoted respectively by LNRNSE/lnrnse and LNRHPI/lnrhpi. Initial delay four was used for model formulation as a quarterly data and data frequency may be used according to Brooks and Tsolacos (2010, p. 380) to assess delay.

Table 1 reveals that the mean the predicted return is higher for immovable return, the normal risk variance for real estate return is smaller, Kurtosis (relative likelihood).

Table 1: Descriptive statistics of log return series of real estate market and stock market

	LNRHPI	LNRNSE
Mean	0.037280	0.017662
Median	0.040711	0.022772

Maximum	0.077338	0.350972
Minimum	-0.011797	-0.281496
Std. Dev.	0.021689	0.116715
Skewness	-0.224946	-0.220334
Kurtosis	2.489109	5.358695

Extreme returns occur) are poor for a desirable return on immovable assets, as investors favor returns similar to projected returns. For all asset groups, skewness is detrimental, which is unwanted. Beside skewing, other metrics are beneficial for immovables, which show that they are a suitable investment asset type. It demonstrates further that direct real estate investment is necessary to be described as an asset class, and that securitisation does not need standardization to be investmentable. This is compatible with the Swenson Paradigm, which defines immaturity and openness as the desirable characteristics of an asset class. Here the illiquidity premium and underlying inefficiency result in the desirability of direct real estate investment. The premium liquidity and the actual portion of immovables are adding to portfolio performance (Ang, Nabar, & Wald, 2013). Direct real estate investing provides liquidity and clarity of knowledge but is still closely connected to a larger financial markets (Hoesli & Oikarinen, 2012).

The ADF (Augmented Dickey Fuller) test mentioned in table 2 shall be used to study the root of variables before performing statistical studies. The findings reveal that the two variables are non-static at their respective stage and stationary at their first difference..

Table 2: Augmented Dickey-Fuller test statistic

	CNX NIFTY		**RESIDEX**	
	t-Statistic	**Prob.***	**t-Statistic**	**Prob.***
Unit root estimation at level	2.70533	0.0867	1.41763	0.5581
Unit root estimation at first difference I	4.45191	0.0018	5.24906	0.0002

Table 3: Result of Johansen Cointegration Test

Series: LNRHPI LNRNSE

Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.274799	12.07211	15.49471	0.1535
At most 1	0.133251	3.718161	3.841466	0.0538

Trace test indicates no cointegration at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.274799	8.353950	14.26460	0.3439
At most 1	0.133251	3.718161	3.841466	0.0538

Max-eigenvalue test indicates no cointegration at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values

Again the long-term partnership was tested using Johansen Cointegration Technique. Table 3 shows the findings for the Johansen Cointegration Exam. The trace and max test is done to evaluate the maximum number of cointegrating vectors. Both the trace test likelihood value and the overall self-equivalence test are greater than the 5% statistical significance essential value, which indicates that there is no mixture of HPI and CNX NIFTY. Thus there is no long-term association between real estate and the equity market, which also confirms the diversifiers of both.

There are no long-term partnerships, so it is possible that the Toda Yamamoto Granger's Causality Test would test a short-term dynamic relationship.

Exogeneity of the VAR block. The result is reported in table 4.

Table 4: VAR Granger Causality/

Block Exogeneity Wald Tests

Excluded	**Chi-sq**	**Df**	**Prob.**
LNRNSE	4.033758	4	0.4015
All	4.033758	4	0.4015
Dependent variable: LNRNSE			
Excluded	**Chi-sq**	**Df**	**Prob.**
LNRHPI	4.420597	4	0.3521
All	4.420597	4	0.3521

As the p value is more than 5%, it is concluded that there is no causal relationship between Real Estate Market and Stock Market.

DATA ANALYSIS USING SPSS

Introduction

This chapter presents the results of data analysis of the collected data from the field. Data for the study was exclusively gathered from secondary sources and the analysis was done with the aid of Statistical Package for Social Sciences (SPSS). The findings were presented using Figures, Tables, Means and standard deviations.

Data analysis and presentation

The gathered data covered the period 2005-2015. Secondary data was presented in excel spreadsheet and analyzed with the aid of SPSS version 2.0.

Descriptive Statistics

The study sought to investigate the effect of Foreign Direct investment on the performance of the real estate sector in India. The findings were presented with the help of standard deviation and means.

Table 4.1: Descriptive Statistics

	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Performance of the real estate sector	44	.00	9.40	2.5068	2.02558
FDI	44	4.46	9.60	6.5412	1.09947
Inflation rates	44	3.33	29.13	10.5495	6.79438
Interest Rates	44	12.22	20.21	15.2643	2.08404

From Table 4.1, the maximum value of performance of real estate sector in India was 9.40% while the minimum value was 0.00% with a mean of 2.5068% and standard deviation of 2.02558%. The findings indicated that real estate sector in India is still growing. Foreign direct investment on the other hand had a minimum value of 4.46% while the maximum was 9.6% with a mean of 6.5412% and standard deviation of 1.09947%. The inflation rate had a minimum value of 3.33%, a maximum value of 29.13% with a mean of 10.5495% and standard deviation of 6.7943%. The interest rate on the other hand had a minimum value of 12.22% with a maximum value of 20.21% while the mean was 15.2643%and standard deviation was 2.084%.

Trend Analysis

The study adopted trend analysis so as to analyze the trend of real estate performance, Foreign Direct investment, inflation and interest rate in the period 2005 to 2015. The findings are summarized in subsequent sections.

Foreign Direct Investment FDI

The study sought to determine the trend of foreign direct investment expressed as a percentage of GDP in India over the period of study. The findings are summarized byfigure.4.1

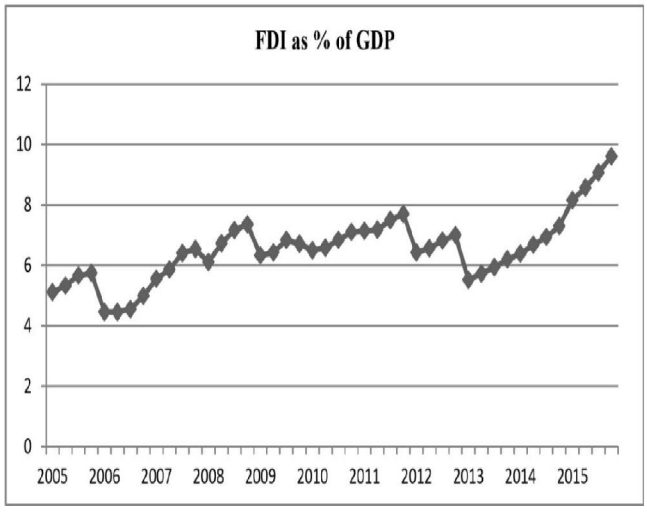

Figure 4.1: Foreign Direct Investment FDI

The findings from Figure 4.1 indicate the trend in the growth in Foreign Direct investment. The findings indicate that Foreign Direct investment growth has generally been fluctuating over the period under consideration. The year 2006 had the least value of Foreign Direct investment as determined by % of GDP of 4.995%. This was followed by a sharp consistent increase in value of Foreign Direct investment reaching a peak in 2007.Between 2010 and 2012 and between 2013 and 2015 there was a consistent growth in FDI stock with FDI stock reporting the highest value in 2015.

Interest Rate

The study further sought to determine the behavior of interest rate during the period of study. The findings were presented in Figure 4.2

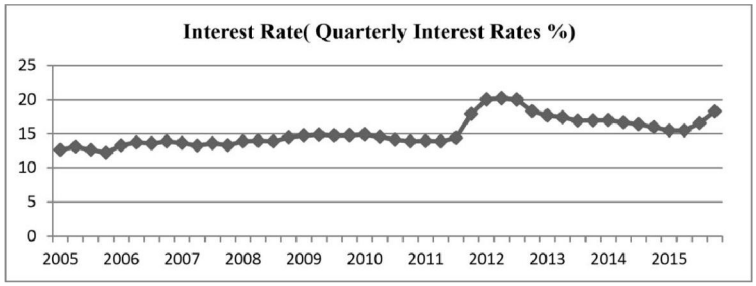

Figure 4.2: Interest Rate

From Figure 4.2, the interest rate has been increasing from 2005 reporting a slight dip during the last quarters of 2005 and 2007. Between 2010 and 2012 and between 2013 and 2015 there was a pronounced decrease in interest rate presenting a suitable environment for borrowing. The decrease can partly be explained by the introduction of Credit reference bureau in 2010 that enhanced credit sharing mechanisms and therefore reducing the cost of credit represented by interest rates. The highest increase in interest occurred between 2011 and 2012.

Inflation Rate

The study sought to investigate the change in inflation rate during the period under study in India. The findings of trend analysis were presented in Figure 4.3

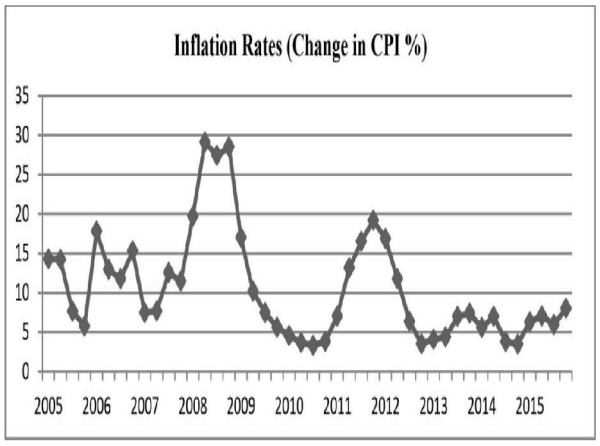

Figure 4.3: Inflation Rate

From figure 4.3 Inflation rates have been fluctuating within the period under review. However, between 2009 and 2011 and between 2012 and 2013 a pronounced dip in inflation rates was witnessed. These were conducive operating environment for businesses. The year 2008 and 2011 on the other hand witnessed the highest rise in inflation rates with 2008 reporting a rise from 19.70% in quarter one to 28.50% in quarter four and 2011 reporting a rise from 7.05% in quarter one to 19.19% in quarter four. This could partly be explained by the effect of the post-election violence that was witnessed in India after the 2007 disputed elections and uncertainties in relation to 2012 elections outcome.

Performance of Real Estate Sector

Finally, the study sought to establish the trend in the performance of real estate sector in India as measured by growth in real estate investment. The findings of the trend analysis were generalized in Figure 4.4.

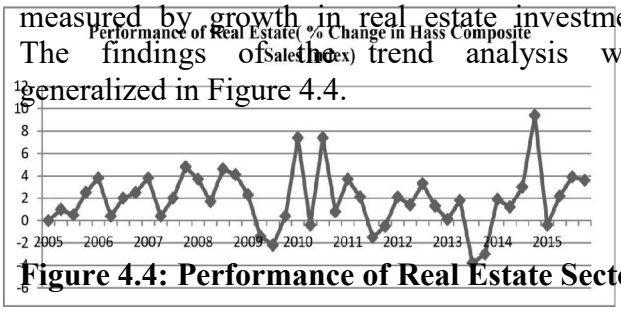

Figure 4.4: Performance of Real Estate Sector

According to figure 4.4, the efficiency of the property fluctuated from 2005 until 2015. The fastest increase was recorded between the 2005 three and 2006 three thirds, the 2006 three and the 2007 one the 2007 two and the 2007 fourth and quarters, the 2010 two, and the 2010 two and the 2009 fourth quarters, the 2013 three and 2014 one the 2014 two and 2014 fourth quarters, and the 2015 one and fourth quarters. The largest drop in output has been recorded between 2007 quarters 4 and 2009 quarters 3,2010 quarters 1 and 2010 quart 3 and 4,2011 quarters 1 and 2013 quarters 3,2012 quarters 1 and 2013 quarters 1 and 2013 quarters 3 and 2014 quarter 4 and 2015 quarter 1. The decrease in immovable sector results between the first and fourth quarters of 2008 and between the third and fourth quarters of 2012 can be due to the violence and uncertainty of the 2012 elections of 2008. The immovable industry's output was the strongest in the fourth quarter of 2014, and its lowest in the third quarter of 2013.

Regression Analysis

The dependent variable performance in real estate sector was examined against three variables namely Foreign Direct investment, inflation and interest rates. The analysis was carried out at 5% confidence level. The significance of the three variables in the model was examined by comparing the probability value obtained against the confidence level of 0.05. The variables were considered significant if the probability value was less than confidence level. Additionally, F-table value was compared with the F-value of regression analysis. Variables were considered to be significantly associated with any change on the dependent variable if the F-table value was less than the regression analysis value.

Model summary

To ascertain the level of performance in real estate sector that is attributable to Foreign Direct investment, inflation and interest rate, coefficient of determination arising from regression as depicted by table 4.2 was used. Coefficient of determination presents the degree by which changes in dependent variable can be explained

by change in the independent variables under study.

The findings of multiple regression analysis conducted to ascertain relationship between Foreign Direct Investment and Performance of real estate sector in India was summarized in subsequent Tables.

Table 4.2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.740[a]	.549	.450	0.04791

From Table 4.2, the value of R is 0.70, R square is 0.49 and adjusted R square is 0.45. These findings indicated that the three variables contributed to 49% change in the performance of real estate sector in India. Further, a strong relationship between the variables was revealed by the coefficient of determination (R) of 0.70.

Regression coefficient

Analysis results resulted into a model coefficient and statistics depicted in the table 4.4 below

Table 4.3: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.379	2.754		.501	.619
FDI	.427	.305	.232	1.400	.169
inflation rates	-.014	.047	-.048	-.306	.761
Interest Rates	-.099	.164	-.102	-.604	.549

The results of the regression analysis presented the below equation to explain the relationship between performance of real estate sector and Foreign direct investment, inflation, interest:

$$Y=1.379 + 0.437X_1 - 0.014X_2 - 0.099X_3 + \varepsilon$$

Y is an Equity Supply Sector Output X1 X2 X3 is respectively the foreign direct investment, interest rate and inflation rate whereas ε is an error word. The above model will reflect 1,379 real estate results if all other variables remain unchanged. The improvement in the output of the real estate market, as a function of the adjustments in any independent variable is equal to the coefficient of each independent change, implying that the rise in unit performance by FDI, keeping other variables unchanged, will increase the performance of the real estate by 0.437. The positive value of the investment coefficients for Foreign Direct indicates a clear positive correlation between the real estate results and foreign direct investment. Both p values were higher than 0.05, suggesting that the three variables were not statistically important. These results are compatible with Moronge's findings & Loyford (2014) concluding that the efficiency of the real estate business declines whether there is a shift in acquisition prices, interest rates or the unit of inflation in their analysis of economic indicators such as the housing market, interest rate, transaction costs, inflation and the performance of the real estate sector.

Test of Regression Model Significance

Analysis of variance was undertaken to test the significance of the model.**Table 4.4: ANOVA**

Model	Sum of Squares	df	Mean Square	F	Sig.

Regression	86.71	3	28.90	6.89	.004[b]
Residual	167.757	40	4.194		
Total	**176.428**	**43**			

for more comparative analysis between Direct and Indirect Immobilien Investment.

The findings of the ANOVA revealed a probability value of 0.004 making it a significant model in predicting the relationship between the variables under study as it was less than the confidence level of 0.05. This was further echoed by F-test statistic calculated value of 6.89 which was more than the F-critical (from table) value of 2.32. Since F calculated was greater than F critical (6.89>2.32), this was a clear indication that the overall multiple regression model was statistically significant.

The analytical results show that there is no short and long-term association between the investment market and the real estate market. There is segmentation between the equity market and the immovable market and all of these securities should be retained for diversification in a fund. The explanation for this segmentation is that the systemic danger of the immovable economy is regulated by rules that vary from equity markets. It gives a real advantage of diversification by serving as an inflation shield.

CONCLUSION

This paper seeks to decide the position of immovable in a multi-asset portfolio and the need to securitize them for investment in the Indian context. Direct real estate investment is sufficient to be classified as an asset type, and does not need securitisation standardization to be investable. This is in keeping with the endowment model (Swenson, 2000). In this respect, the desirability of direct investment in immovables derives from its premium liquidity and intrinsic inefficiency. The premium for illiquidity and the actual portion of immovables as a contributor to portfolio performance (Ang et al., 2013). The launch of REITs in India, however, opens the way

The results are relevant both for policy makers and for market traders. It is essential to recognize such relationships for both investors and policymakers. It reveals that there are future benefits from long-term diversification if buyers own direct property and inventories at the same time. Their total income, usage, aggregate demand and jobs could all be impacted. Local municipalities are trying to propose effective tax and development policies in response to such an imminent chain reaction. While investigating relationships is vital, it remains important to find the underlying forces that drive. Further study should also be carried out in this area.

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LUNG CANCER CLASSIFICATION USING IMPROVED SPARSE AUTO ENCODER WITH NEURAL NETWORK

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ABSTRACT

Analysation and the processing of pictures with the assist of the computer are increased in today's world. A picture is stated as a variation of brightness from point to point. Pictures are digitized before applying any kind of processing techniques. The most promising strategy to improve a patient's chances of survival is to discover cancer early. Using an enhanced sparse auto encoder, this research proposes a computer-aided classification method for computed tomography (CT) images of the lungs. From the CT pictures, the complete lung is segmented, and the parameters are determined from the segmented image. Feed forward and feed forward back propagation neural networks are used in the classification process. When compared to feed forward networks, the feed forward back propagation network performs better in terms of categorization and accuracy. The results demonstrate that the proposed training function has a 99% accuracy, sensitivity of 92.3% and a specificity of 90%.

Keywords: *Lung cancer, classification, auto encoder, neural network, image processing and accuracy.*

Introduction

Digital Image Processing (DIP) incorporates computer algorithms to process the digital images. Analog image processing permits to use wider range of approaches to process the image and avoids the issues of distortion as well as noise construction in the image. Analog image processing is a sub field of image processing [1]. The significant information from the images are retrieved using the analysis and denotes varied techniques to improve the information yield from the image. From the images 3D parametric maps are generated and values for the calculation is ultimately user-independent and replicable. Image processing techniques are sophisticated and it has the tendency to establish automation as feasible [2].

The advancement of imaging modalities has raised the amount CT images and the identification of disease is a complicated process. The extraction of needed biological region from the background of CT image is accomplished by segmentation. The segmentation process the image to segment the different regions in relevance to the pathologies, organs and other biological structure [3]. Low contrast value and the incidence of noise values are considered in the segmentation process of image processing.

The automated process of segmentation is a significant role in the analysis of image [4]. Segmentation's accuracy determines the success or failure rate of disease diagnosis system. Implementation of physical approaches and modern mathematical techniques namely, illumination, Principal Component Analysis (PCA), convex property, partial differential equation, thresholding and the significant material properties of images has improved the accuracy of the process of segmentation [5]. Robust segmentation techniques facilitate the assessment of diseases related to lung [6].

Neural Network is an interesting method. Because of its high potential, it is used in the process of classification and prediction approaches [7]. It is a famous and prominent tool for modelling the data. Neural Network is a self-adaptive and non-linear approach. Correlation among the input and target patterns are identified [8]. Neural Network is modelled with the learning behaviour of brain. It is used in training the complex data and the fields that generate complex data [9].

Literature Review

Demir & Yılmaz Çamurcu [10] proposed a CAD system for detecting the lung nodules in CT images. This system has four major steps with 2D and 3D preprocessing steps. In the preprocessing step, ROI was identified by removing the unwanted artifacts from the CT

images. Then, the feature extraction step was applied for extracting the different features such as morphological, statistical, histogram and texture features of outer surface. Moreover, the Support Vector Machine (SVM) algorithm was optimized by using Particle Swarm Optimization (PSO) for classifying the extracted features and identifying the nodule candidates. But, the accuracy was still not effective.

Shen et al. [11] proposed a Multi-Crop CNN (MC-CNN) algorithm for automatically extracting the nodule salient information. In this algorithm, a MC pooling function was proposed for generating multi-scale features for replacing the traditional max-pooling function. By using this new mechanism, various regions were cropped from convolutional feature maps and then max-pooling was applied at different times. But, the accuracy and precision of this algorithm were not effective.

Dou et al. [12] proposed a novel technique using 3D CNN for reducing false positive in automated pulmonary nodule detection from volumetric CT scans. In this technique, more affluent spatial details were encoded and more representative features were extracted through their hierarchical architecture trained with 3D samples. Moreover, a simple effective strategy was proposed for encoding the multilevel contextual details. At last, the final classification outcomes were acquired by combining the likelihood prediction outputs of these networks. However, the conflicts between the large variants of pulmonary nodules and the limited training dataset were not solved.

Kang et al. [13] suggested an automated classification of lung nodules using the 3D Multi-View CNN (MV-CNN) framework with two classification processes such as binary classification and ternary classification. In binary classification, the nodules were split into benign and malignant whereas in ternary classification, the nodules were split into benign, primary malignant and metastatic malignant. However, error rate was high.

Improved Sparse Auto Encoder-Image Classification

Initially, the significant location is spotted with the most influential spatio-temporal relationship to the objective location and then forecast the target location on the basis of features. To retrieve the significant feature for disease forecasting, the needed geometric features are determined. Suppose set of locations $Lt=\{lt_1,lt_2,\ldots,lt_n\}$ and set of relevant features $Ft=\{f_1,f_2,\ldots,f_m\}$. To identify the correlated locations in the spatial region and sequence of relationship (SRS) is equated as, where the elements in the matrix is estimated, the count of the pixel location is signified as n, the elements in the diagonal is denoted as $D_{si,i}$ are assigned as zero. The feature sequence interval (FSI) for a definite pixel location is determined as, where the lt_i has some feature ft_i that diverse from the start str to the finish fini, the time constraint is str<fini and $e(lt_i,ft_i,t_k)$ denote the measure value of ft_i to t_k. The distance among the feature sequences for any desired two pixel location is equated as, to acquire the most related locations in the temporal region. The target sequence prediction f_{tar} and the necessary parameters are passed into this. The most related locations are related strongly and the spatial temporal relation is determined as, During the process of intersection the candidate items may loss some of the necessary target features and the spatial temporal sequency as, to construct a model Md to forecast the target sequence of features, the sequence of set is returned by Md and target feature by Se between the duration of t'_{str} to $t'f_{ini}$. The most relevant time series is generated from the Se and it is with t_{lbc} to t_r. Where the lbc is the look back time. The forecasting of air quality and the proposed model is discusses in the subsequent phase.

To discover interaction among the location and sequence delay, the spatial-temporal investigation is used and most appropriate relationship among the location identified. Identical temporal patterns and adjacent locations are used because they are having major correlation with the target location. The corresponding location to the target location is determined by the relationship extractors namely kNN-ED (k-Nearest Neighbor by Euclidian Distance) and kNN DTWD whereas the top h relevant locations are generated from the training dataset. The Euclidian distance among the location by utilizing the geographical coordinate is estimated and the

predictive model training is attained by the Algorithm kNN-ED.

The errors in scaling and shifting among the sequence is minimized by the two sequence among the distance is estimated by the DTW algorithm. The sequence distortion is occurred by the Euclidian distance, which is rectified by the DTW and it maps the data points to the relevant intervals. The robust temporal time series are identified by kNN-DTWD and their distances are sorted whereas the top h is elected as a candidate to spot the sequence of target location. These approaches cannot estimate similarity degree among the time series with the missing information. This issue is tackled by filter short method that uses shortest threshold of interval lt_{min} and these values are converted as meaningful unit DTW. Finally, the candidate item for the predictive model is established by the Algorithm kNN-DTWD. The current data is utilized by the Artificial Neural Network (ANN) and it is highly sensitive to quick alterations. Thus, the low frequency of data is attained by the LSTM and high frequency of data is attained by the ANN. The relevancy of the feature is diverse with respect to the quality of air is learned via previous studies. By considering the impact of the neighborhood data the sensitivity is improved by introducing the ANN SRE approach. The noise information is effectively handled by the improved sparse auto encoder, which uses the feed forward neural network (FFNN). The correlation among the particulate matter and target pixel is determined whereby the elevation of every point was normalized as,

and the transformation to the relevant elevation is given as, where the elevation of standardization is denoted as El_s and it minimizes the higher altitudes impact whereas the distribution is highly related to the elevation. The TE, SRE and TRE outcomes are concatenated and transmitted to the improved sparse autoencoder based FFNN. The process of merging of layers and the detection of anomaly is attained by the improved sparse autoencoder. The input data is effectively handled as an incremental approach.

With the assistance of autoencoder complex shaped are formulated from the simpler shapes. The autoencoders are proficient and effective detectors of significant features. The continuous and discrete forms are data is fused for the learning process. In this approach, feed forward artificial neural network based perceptron is used and the weight value is multiplied with the input data. The bias value a is added to the total inputs and weights, the process is initiated by the linear function, log-sigmoid, hard limit, hyperbolic tangent with possible saturation. The resultant value is estimated by,

Typically, perceptron uses general function for the process of estimation and the common elected function is given by,

The proper estimation of the weight reduces the error among the output and the presumed value is determined in the training set of data. The presence of numerous perceptron is arranged as multiple layers and the output data of a layer is transmitted to the subsequent layers input. This multilayer network permit the solving of complex linear separable classification. The input data is broadcasted via by applying the initial weights. The error value is estimated from the expected output that is the difference of output of feed forward propagation.

The algorithm is attained as a batch wise process and every test is progressed before the updation of weight. The mean of the value of gradient is utilized for the updation of weight and every input is investigated by the updated weights whereas the output data is classified accordingly.

Result and Discussion

The prediction accuracy and the classification performance of the proposed ISAE-IC and the existing MV-CNN is compared and the outcomes are evaluated [14-18].

Accuracy

Accuracy is defined as the closeness of a given value from a set of classified examples. The accuracy shows systematic flaws and statistical bias. It is the calculation of the true value as well as the identification (both TP and TN values) of the predicted classes amongst count. Variation between the resultant and genuine resultant values occurs when the lowest accuracy occurs. It's the proportion of accurate disease detection to the total number of cases examined. It's calculated as follows:

Precision

The closeness of the measurement and the importance among the values identified are indicated by the positive analytical value or precision. Random errors are expressed as precision, which is calculated using statistical factors. Precision and accuracy are phrases that are interchangeable. Precision is directly proportional to the percentage of positive values in the whole population. The count of true positive values is the precision value for a particular problem in the classification process (i.e. the count of the item correctly labelled as positive classes). The algorithm with maximum precision achieves more necessary information than extraneous data as a consequent value. It is calculated as,

Table 1. Comparison of ISAE-IC Accuracy and Precision with MV-CNN

Iteration	Accuracy		Precision	
	MV-CNN	ISAE-IC	MV-CNN	ISAE-IC
50	0.901	0.933	0.887	0.913
100	0.9101	0.964	0.881	0.915
150	0.952	0.973	0.883	0.918
200	0.971	0.991	0.885	0.923

In Table 1, the outcomes of the proposed approach ISAE-IC and existing approach MV-CNN is given. In this comparison, the accuracy and the precision values of the algorithms are given.

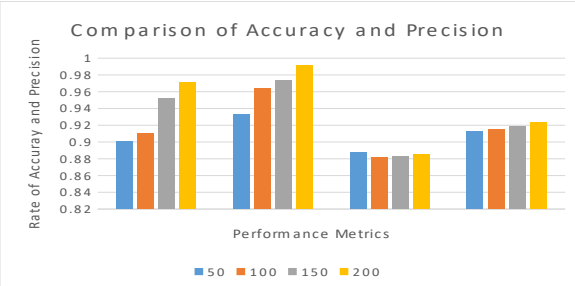

Figure 1. Comparison of Accuracy and Precision

From the Figure 1, it is identified that the prediction accuracy of the proposed approach ISAE-IC is high when compared to the existing approach.

Sensitivity

The ratio of genuine negative values in all samples is known as specificity, and it has no defined condition. The accurate detection of real positive test readings is referred to as sensitivity. It aids in the determination of sample categorization accuracy. The sensitivity is equated as,

Specificity

The ratio of genuine negative values in all samples is known as specificity, and it has no defined condition. The accurate detection of real positive test readings is referred to as sensitivity. It aids in the determination of sample categorization accuracy. The specificity is equated as,

Table 2. Comparison of ISAE-IC Sensitivity and Specificity with MV-CNN

Iteration	Sensitivity		Specificity	
	MV-CNN	ISAE-IC	MV-CNN	ISAE-IC
50	0.781	0.823	0.793	0.814
100	0.813	0.874	0.835	0.833
150	0.862	0.916	0.882	0.875
200	0.91	0.923	0.894	0.901

In Table 2, the outcomes of the proposed approach ISAE-IC and existing approach MV-CNN is given. In this comparison, the sensitivity and the specificity values of the algorithms are given.

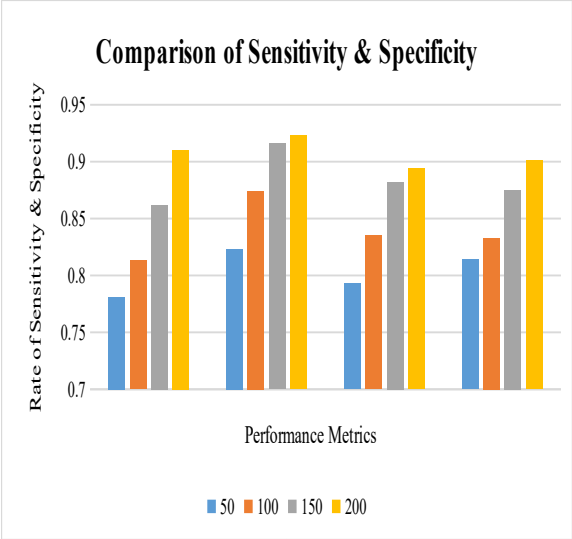

Figure 2. Comparison of Sensitivity and Specificity

From the Figure 2, it is identified that the prediction accuracy of the proposed approach ISAE-IC is improved with the acquired high sensitivity when compared to the existing approach. In the ISAE-IC, the sensitivity is

high and specificity is low, which shows effective prediction of accuracy. In the MV-CNN, the sensitivity is low and specificity is high that shows the contrast among the accuracy of prediction.

Area under Curve (AUC)

The area under the curve value (AUC) is the arithmetic average of accuracy, F-measure, precision-recall curve, and precision [24]. AUC is the better classification indication for an unbalanced dataset and is dependent of the classes with scattered examples. The value of AUC is estimated by,

Matthew's correlation coefficient (MCC)

MCC is used in machine learning as a metric for estimating classification quality. It's the coefficient of correlation between expected and observed categorization values. It is calculated as,

Table 3. Comparison of ISAE-IC AUC and MCC with MV-CNN

Iteration	AUC		MCC	
	MV-CNN	ISAE-IC	MV-CNN	ISAE-IC
50	0.882	0.8891	0.9349	0.9404
100	0.884	0.8889	0.9351	0.9403
150	0.885	0.8891	0.9357	0.9402
200	0.887	0.8892	0.935	0.9423

In Table 3, the outcomes of the proposed approach ISAE-IC and existing approach MV-CNN is given. In this comparison, the AUC and the MCC values of the algorithms are given.

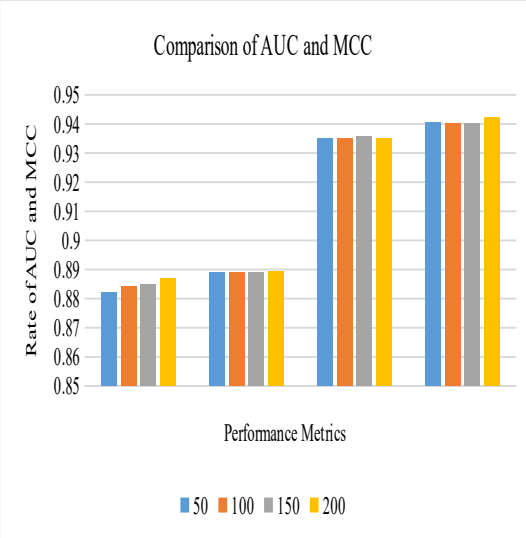

Figure 3. Comparison of AUC and MCC

From the Figure 3, it is identified that the rate of AUC and MCC of the proposed approach ISAE-IC is high when compared to the existing approach.

Mean Absolute Error Rate

The incidence of error in the digital transformation is due to different variables such as noise, distortion, and disturbance in the data transformation. It's a performance rate ratio. The error rate is the percentage of patterns classified wrongly by the decision-making model. The error rate is calculated by multiplying the sum of the FP and FN values by the sum of the TP,TN, FP, and FN values. It is measured as:

Table 4. Comparison of ISAE-IC mean absolute error rate with MV-CNN

Training Epochs	MV-CNN	ISAE-IC
100	4.1	3.7
200	3.3	3.1
300	3.2	3.1
400	2.8	2.3
500	2.6	2.2

In Table 4, the outcomes of the proposed approach ISAE-IC and existing approach MV-CNN is given. In this comparison, the mean absolute error rate of the algorithms are given.

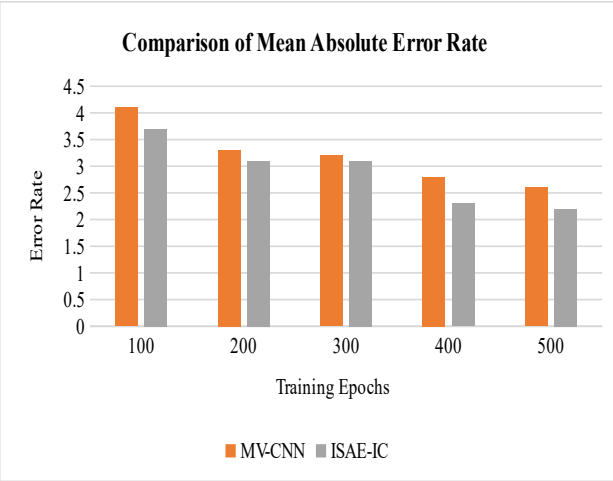

Figure 4. Comparison of incidence of error rate

In Figure 4, the error rate values for ISAE-IC and MV-CNN models are shown. In this graph, x-axis denotes the number of training epochs and y-axis denotes the error rate values.

Conclusion

In the proposed approach, an improved sparse autoencoder with deep learning (ISA-IC) is a proposed approach that uses the feed forward neural network as a sparse auto encoder. The CT images of lung may comprise noise and anomaly related data. The kNN-ED and kNN-DTWD is applied to acquire significant data. Additionally, ANN and LSTM are used to acquire the relative information and the classification model is generated with training data. To handle the noisy information an improved sparse auto encoder is introduced, which is feed forward neural network. It effectively handles the noisy information and forecast the occurrence of cancer accurately. Through the performance metrics the performance of the proposed approach is investigated and it is compared with the existing MV-CNN approach. The proposed ISA-IC outperforms the existing MV-CNN. Typically, the proposed ISA-IC is applicable to other images and it devise proficient solution to minimize the risk. In future, the approach can be improved to handle the huge data accumulation and generation.

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PERSPECTIVES ON THE IMPACT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING ON MATERIAL AND ENGINEERING PROCESS

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ABSTRACT

The field of artificial intelligence (AI) and machine learning (ML) are rapidly growing, and impacting every technological aspect of society. Advancement of technology has been slowly engaged by the material and engineering process. New materials can bring incredible development in the innovative application and technology. Furthermore, generally utilising the trial-and-error technique cannot meet the available necessity for new materials. The paradigm of ML and AI is utilised in the exploration of new materials. Perhaps the latest progression that are driving other technical fields are not adequately differentiated from long known informatics techniques of materials, thus masking them to influence materials and process engineering. In this article, numerous ML and AI techniques for the materials and engineering process is discussed. Additionally, significance of the existing ML and AI techniques in the materials and engineering process is summarized.

Keywords: *Machine learning, artificial intelligence, modelling, material, digital and process engineering.*

Introduction

The term ML is derived from the computational model of complex patterns or non-linear corelationships within the data. The perspective of ML is beyond the ability of human or progressed physics to determine. AI is a machine-based framework for accomplishing the necessary actions and decision by utilizing the ML and AI tools and investigations. Both the technologies are sufficient and necessary for accomplsing the independent or autonomous system. ML is a subfield of AI, which mainly focuses on the optimized computer programs to enrich the algorithms via researching data and experience [1, 2].

ML is a significant and efficient tool for investigating the available material in the field of new material identification [3]. The ancient trial-and-error technique depend on the experience of the individual.Experimental progression and ancient method for the discovery of material is considered to adhere the demand of large-scale for the new high-performance materials [4]. The issues in the materials is solved by the ML technique, the datasets are necessary to assist in the identification of target values, properties, unknown materials or features. The data or information inside the system is termed as input and the necessary target value is termed as output [5].

The support of AI and ML technique is determined as utilising the inputs and suitable computational algorithms to construct a numerical forecasting model and identifies the indefinite output by the forecasting capability of this model [6]. The output information are fitted as inputs that is reasonable with the outputs and it can have identical chemical structure. The information reside in the system are investigated and with these technology the comprehension of the properties of the materials are enhanced, which is utilised in forecasting the necessary material [7, 8]. The overall outline of AI and ML in material processing is illustrated in Figure 1 [9].

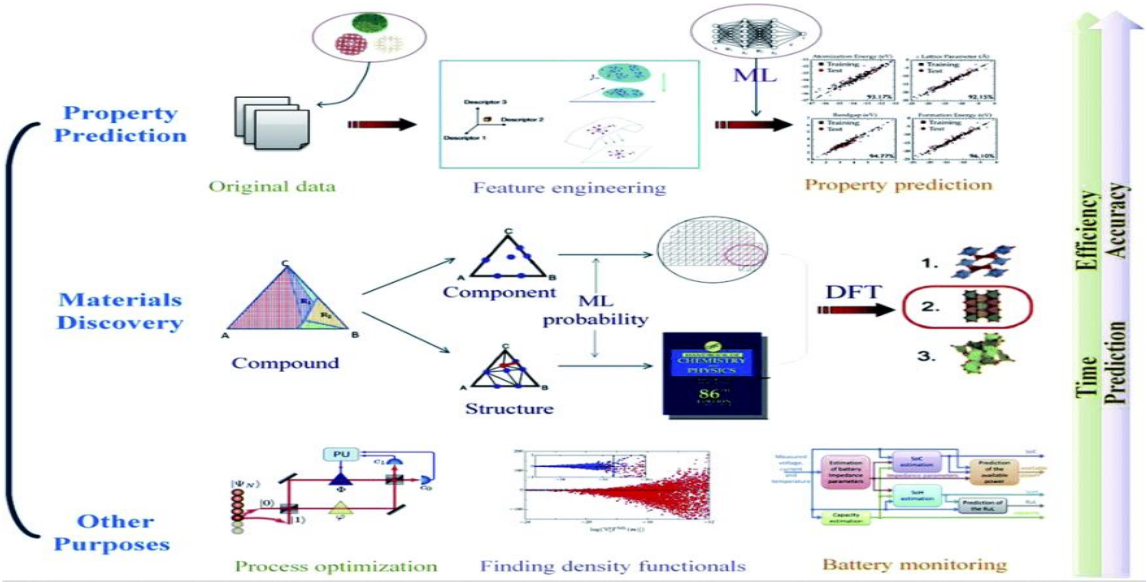

Figure 1. Outline of ML and AI in Material and Process Engineering

The remaining of the article organized as follows: the overview of machine learning and its impact on material processing is given in Section 2, the artificial intelligence support system for materials and engineering process is detailed in Section 3, and the article is concluded in Section 4.

Overview of machine learning techniques

Machine Learning algorithms plays a prominent role in discovery of new material. It builds the classifier automatically by learning the features of the classes from the predefinedcollection of training documents. Initially, data mining is utilized for the extraction of the valuable insights from the large datasets and the machine learning serves as techniques for solving complex problems. ML algorithms can learn by analysing or examining the training data and to find out what type of relationships exist among the information for the discovery of materials.

New or innovative material identification system based on machine learning algorithms are especially more precise than the rule based system. Some of the prominent machine learning algorithms are Naive Bayes, Deep Learning, Support Vector Machine and Neural Networks. To automate this system, machine learning, artificial intelligence and other techniques have been introduced. Machine learning rely on the past insights, more training is not necessary,easy to maintain and accurate in predictions [10].

Classification can be done by the machine learning algorithms based on the feature sets. Feature selection refers to selection of subsets of features that represent data. The data generated from material and engineering process contains several high dimensional features, some of them are useful and some other features are non-informative. These are noisy, unevenly distributed, redundant and irrelevant. Feature selection aids in enriching the predictor performance, minimizing the impact of dimensionality, minimizing the computation requirements and understanding the information [11, 12].

ML algorithms is categorized into four varieties namely unsupervised, reinforcement, supervised, and semi-supervised learning. Generally, reinforcement learning emphases on the interrelations among techniques and the environment but not on identifying definite patterns from datasets that is not suitable for discovery of material. Every algorithm has their own advantages and disadvantages. Here, generally utilized numerousML techniques are listed for reference in Table 1.

Table 1. Summary of ML Techniques

ML Techniques	**Inference**	**Advantages**	**Disadvantages**	**Application**
Naïve Bayes [13]	It can categorize the information into numerous varieties that follows the highest possibility.	Small quantity of information is necessary for acquiring the desirable parameters.	The hypothesis generated from the feature independence is not accurate.	Utilized in the identification of impairment in the material engineering.
Regression Analysis [14]	It can identify the regression based equation and dependent variables are predicted.	It is progressed deeply and widely utilised in numerous occasions.	In practical application, over fitting will arise and huge amount data is necessary.	ML technique with density-functional theory estimation is utilized in the applications of melting temperature of binary and single solid components.
Decision Tree and Random Forest [15, 16]	Numerous subsets are generated by splitting the source data that information will be classified and judged.	The estimation process is simple to comprehend and also it has the ability to handle huge quantity of information.	In practical application, over fitting will arise and complicated to acquire high-performance.	ML-driven with high throughput synthesis of full-heusler compounds.
Support Vector Machine [17]	SVM can identify a hyperplane to categorize them into group of information into two categories.	The capability of is great and the huge dimensional information are controlled appropriately.	It is not suitable for the issues like multiple classification.	Sequence based identification of phase virion proteins utilising SVM.
Deep Learning [18]	It is originated from the ANN technique and it aims to construct NN for investigating the data by imitating the performance of the human brain.	It poses the self-improving and self-adjusting capabilities compared with other ML techniques.	Many deficiencies are unclear in new trend of ML.	In neuropathology and tauopathy assessment.
Artificial Neural Network [19]	The activities of neurons are imitated and the automatic identification essential patterns in the inputs.	ANN is highly robust, tolerance to fault and improves the capability.	Inner estimation process is very complicate to understand.	The utilization of NN to accelerate the detection process of materials.

Artificial intelligence based supported system for material processing

Artificial intelligence is a field of computer science that is evolved from the simulation of human intelligence. Due to the progression of computer technology and big data, theoretical framework of AI is highly progressed. It has numerous subfields namely data mining, ML and computer vision. Furthermore, it has depicted great capability and high potential in material science. AI is widely utilised in the mechanism of material design, screening, detection of corrosion and some other fields of material science [20, 21].

Artificial Intelligence has investigated in the context of material processing for about fifty years and it is initiated into the process engineering for the identification of new materials as well as processing the material. AI driven system is deliberate with personalized instructions and process in order to facilitate the researcher for the development of material. An expert system is employed is analysing the engineering process based on the data and recommends an appropriate material identification. Expert system provides complete guidance to the developer across various learning stages of the material and the data set about the materials are also improved [22].

The main intent of inverse design is to identify the materials with functionalities or preferred particulars, which is prominently diverse from the forward progression. The traditional forward progression is acquires the target material via viable experiments and then it judge the material's functionalities [23]. Inverse design poses goal-oriented characteristics that initiates from the preferred properties and concludes in a chemical space. The main intent of inverse design is the identification of appropriate material with the assistance of the material's functionalities [24].

Computer vision is determined as an AI-based system that can mine data from multidimensional or images data. The technology of computer vision is widely utilised in numerous correlated domains, and it has also been incorporated in numerous subfields of material science. In the material science, computer vision can investigate unknown or unclear properties of material from massive quantity of figures that will greatly assist the scientists to comprehend the chemical/ physical properties and inner associations of identical materials.

By utilising this approach, scientists can construct and design a novel target materials. Furthermore, computer vision plays a significant role in the classification of material [25].In addition to ML, other AI algorithms are extensively utilised in the field of novel discovery of material, and there are abundant cases presenting the significance, growth and effects of prospects of AI. In summary, AI has robust effects and an optimistic prospect in materials science; though, it still necessitates subsequent progression.

Conclusion

In the current era, identification of material has emerged and it is due to the context of data-driven method. The progression of computation technologies namely AI and ML in science and due to the growth of huge experimental outcome, this innovative material identification technique become a fascinating research paradigm. With the deep research, it gives numerous advancing capabilities namely minimum experimental utilization, minimum time utilization, huge generalizing capability and huge analysis of density. Presently, it is utilised in pharmaceutical science, general chemistry, material science, recognition of material, forecasting of binary compound's melting temperature, complex reaction and spectral investigation of terahertz. These approaches has definite defects and the accuracy highly rely on the algorithm quality. Combination of ML and AI approaches with other material theories explores new designs and material methods.

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