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COMMERCIAL BANKS OF OMAN – A BACKBONE TO ECONOMIC DEVELOPMENT

Dr. Anitha Ravi Kumar, Teresa Manju Felex, Saranya Ramesh and Arshiya Sultana
Lecturers, Department of Business Studies, Higher College of Technology, Muscat, Sultanate of Oman

ABSTRACT

Commercial banks occupy a central and important position in the financial system of any country. Oman is one of the developing country in the GCC that focuses economic diversification in order to reduce oil dependency. Commercial banks directly and indirectly support for the economic activity in a remarkable way. They are considered as an integral part in the financial system due to its dynamic role in economy economic. In Oman, SMEs are contributing around 16% for GDP and they are one of the major sources of employment. By understanding the SMEs contribution for Oman economy, many commercial banks designed financial support and services to specially to meet the requirement of SMEs. The commercial banks financial support to industries acts as a catalyst and also supports the Oman Government's initiative to diversify the economy which is oil dependent.

Keywords: Commercial banks, economic development, functions

INTRODUCTION

Commercial banks occupy a central and important position in the financial system of any country. These banks provide financial services to industries and customers by setting up a network of branches. They provide a broader range of services like accepting of demand deposits, issuing cheques, providing loans and services to businesses and consumers, purchasing and selling foreign exchange etc. (RAO, 2017)

Oman is one of the developing country in the GCC that focuses economic diversification in order to reduce oil dependency. The government initiated National Program for Enhancing Economic Diversification (Tanfeedh) for economic diversification. The program targets tourism, agriculture and fisheries, transportation and logistics, mining and energy, and manufacturing sectors to diversify its economy as the key area for diversification. Banking and financial industry is vital sector for any economy. Particularly, commercial banks plays a major role and contributes for the economic development of any nation. An efficient financial system is essential for sustainable economic growth. Commercial banks directly and indirectly support for the economic activity in a remarkable way. They are considered as an integral part in the financial system due to its dynamic role in economy economic.

In Oman, there are 17 commercial banks. Out of which 10 are branches of foreign banks and 7 are locally incorporated. The locally incorporated commercial banks are National Bank of Oman, Bank Muscat, Oman International Bank, Al Ahli Bank, Bank Dhofar, Oman Arab Bank and Bank Sohar. Trade services and cash management is the primary objectives of Omani commercial banks. They provide financial support for larger as well as small & medium enterprises apart from individuals. In Oman, SMEs are contributing around 16% for GDP and they are one of the major source of employment. By understanding the SMEs contribution for Oman economy, many commercial banks designed financial support and services to specially to meet the requirement of SMEs. Some of the notable services are Bank Muscat's Al –Wathbah and National Bank of Oman's Tajarati SME banking.

OBJECTIVES OF THE STUDY

1. To know the functions of commercial banks in general
2. To find out how the banks in Oman function to contribute to the national economy.

REVIEW OF LITERATURE

(Dudhe, 2017) examined the contribution of commercial banks in the development of the economy. Banks being central constituents of financial system are the most effective way to produce the credit flow of finance in markets. Meanwhile, banking businesses like many other financial services face a hastily shifting market, innovative technologies, financial fears, horrible competition and particularly more demand from the customers. The fundamental aim of their study is to empirically inspect the role of Indian banks in assets creation and economic development. They recommend that monetary authorities should effectively manage the maximum lending of banks. This will result in increased investment activities which will improve the wealth formation in India required for its real sector investments and industrial development.

(Kumari, 2017) opine that the banks play a valuable role in stimulating economic growth by organizing the monetary resources of the public and by making them flow into the fruitful channels. They feel that Indian banks are at present playing a very dynamic role in promotion of economic growth of the country. In this study a comparison is made between rural areas and urban areas and is found that the urban areas are more developed due to more credit flow to these areas. So, it means that flow of credit can bring improvement and it will lead to the economic development of the country.

(Imola Driga, n.d.) Healthy operational banks promote economic growth, in the meantime poorly working banks are a hindrance to economic development and intensify poverty. Maximum experts, consider that though economic development in Romania between 2011 and 2013 has depended on exports and in 2014-2015 most perhaps will be based on underutilized business production capabilities, in medium and long term the economy desires suitable funding sources like capital market, foreign direct investment and so on. Better access to finance can benefit current businesses to develop and new businesses to enter the marketplace, which in turn facilitates progress at the comprehensive level.

According to (Bollard, 2011) banks play a significant role in helping economic development and it is worth replicating on the experiences that have been gained from the worldwide economic crisis and the experience of the New Zealand monetary system in the recent years. Any contemporary monetary system promotes economic progress and the development in standard of living by catering numerous services to the rest of the country. It includes clearance and settlement methods to simplify trade, directing monetary assets between savers and borrowers, and several products to deal with risks and uncertainties. In general, several functions can be delivered by banks or other financial institutes or right away by capital markets. Banks specialize in evaluating the credit value of borrowers and affording an enduring monitoring function to guarantee borrowers meet their debts. Further, banks provide payment and settlement facilities which are essential for households, industries and other financial organizations to discharge their day-to-day dealings.

(Felicia Akujinma ANYANWU, 2017) studied the influence of commercial banks lending on economic growth of Nigeria from 1986 to 2015 by precisely determining the effect of commercial banks lending on real gross domestic product and index of industrial manufacture. The result displays that commercial banks' lending has noteworthy effect on real gross domestic product and real gross domestic product. Industrial production was not considerably affected by commercial banks' lending activities. The study shows that for attainment of long term development and expansion of the Nigerian economy, commercial banks' lending is very essential as the extraordinary interest rate charged by commercial banks' continue a hazard to the positive impact of banks' credit to the country. They consider that Central Bank of Nigeria must carry out regulation to end banks from giving loans and advances to a specific sector which is, oil and gas to increase credit flow to other important sectors, particularly agriculture and industries to improve their influences to gross domestic product of Nigeria. The fiscal policy of the Central Bank of Nigeria ought to supplement fiscal strategies of the government to decrease the level of inflation in Nigeria, with regard to its adverse influence on index of industrial production.

(Emecheta, 2014) studied the effect of bank credit on economic progress in Nigeria by using the reduced procedure of vector autoregressive (VAR) technique by means of time series statistics from 1960 to 2011. Existing gross domestic product (GDP) is the dependent variable and substitution for economic growth whereas bank credit to the private sector (CPS) to GDP ratio and broad money (M2) to GDP ratio were substitutions for monetary gauge and financial deepness correspondingly. The findings shows that there is a substantial constructive relationship between bank loans to the private sector, broad money and economic development. This finding suggests that the bank association and recapitalization implementation was a wanted growth and more steps must be taken to guarantee the consistency of the banking segment.

(Aniekan O. Akpansung, 2010) examined the correlation between banking sector credit and economic progress in Nigeria from the years 1970-2008. The causative relations between the pairs of variables of interest were proven using Granger causality test whereas a Two-Stage Least Squares (TSLS) approximation technique was used for the regression. The outcomes of the study show that private segment credit influences positively on economic progress over the period of study. But, lending rate obstructs progress. A small rate of increase of the credit size is not only a indication of feeble economic progression, but can also be one of its reasons.

(Ishioro, 2017) explored the banking sector developments and economic progression using time series data from 1970 to 2013 for the Nigerian economy. The findings indicate that the interest rate margin is more important than other variables in the model in explaining the banking sector reforms and economic development. Banking sector loans to the private sector was adverse and statistically unimportant in economic development in Nigeria. It indicates that the size of the banking sector does not augment economic progress. Meanwhile, inflation is

negatively and statistically significant in economic growth. The length of banking sector reforms should be well-defined and stringently followed to regardless of changes in the Government of the country.

(Barua, 2015) examined the association between financial growth and economic development by means of panel data for five developing South Asian countries - Bangladesh, India, Nepal, Pakistan and Sri Lanka. The diverse panel data is collected from the World Bank for the years 1974 to 2012. Economic development is denoted by GDP growth rate, and for Financial Growth, five main variables were used: (1) Domestic loans given by Financial Segment, (2) Entire Debt Services, (3) Gross Domestic Savings, (4) Broad Money, and (5) Trade Balance. The findings show that that increase of total debt services and domestic savings have substantial effect on economic progress of these nations. Remarkably, broad money, trade balance and domestic credit have no significant impact on raising economic development which is commonly bewildering.

(Demetriades, 1996) inspected the link between bank credit and economic development in Nigeria by taking into consideration the total bank credit provided to the production sector, general commerce sector and services sector. Time series data for the years 1983-2012 were fitted into the regression equation by means of various econometric methods like stationarity test by using Augmented Dickey Fuller (ADF) and Johansen Multivariate Co-Integration Test. The findings of the study reflects that the total bank credit to production, general commerce and services sectors have a positive connection with the gross domestic product. Likewise, the VEC model result displays that connection runs from bank credit to the GDP.

NATURE AND FUNCTIONS OF COMMERCIAL BANKS IN OMAN:

Financial organization and Service organizations are considered key to the success of countries. The commercial banks of Oman takes pride by offering a variety of international banking services in Oman. Banks of Oman try in narrowing the gap visible in the Standard of Living (SOL). Vision 2020 highlights the importance of regional development within Oman, by diversifying the economy by providing greater involvement of the private sector. The banking sector has soared to greater heights in terms of its services offered. (Tarawneh, 2006)

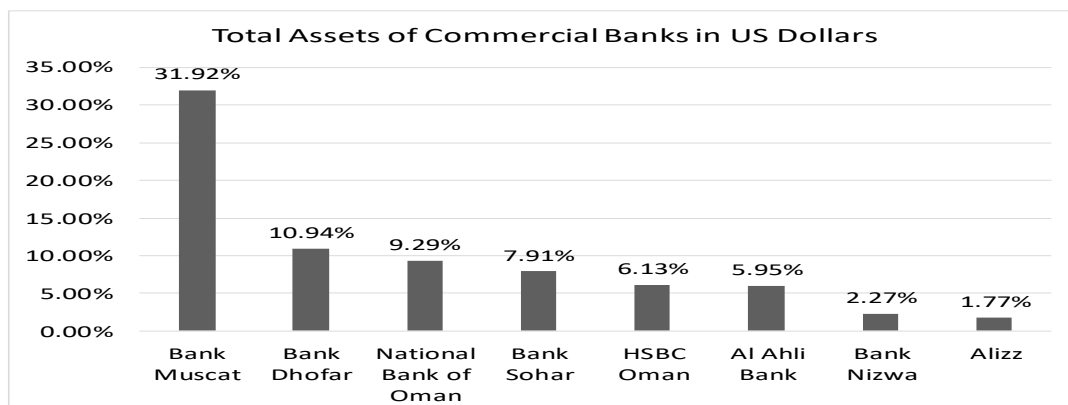
Currently as per the annual report of CBO Central Bank of Oman (December 2018) there are 7 local banks, 9 foreign banks, 2 specialized banks and 8 Islamic banks currently functioning in The Sultanate

Table no-1: Banks licensed in Oman

Local Banks	Specialized Banks	Islamic Banks	Foreign Banks (Commercial Banks)
1. Bank Dhofar SAOG 2. Bank Muscat SAOG 3. National Bank of Oman SAOG 4. Oman Arab Bank SAOC 5. Ahli Bank SAOG 6. HSBC Bank Oman SAOG 7. Bank Sohar SAOG	1. Oman Housing Bank SAOC 2. Oman Development Bank SAOC	1. Bank Nizwa 2. Al Izz Islamic Bank (S.A.O.G)	1. Bank Melli Iran 2. Bank of Baroda 3. Bank Saderat Iran 4. Habib Bank Limited 5. Standard Chartered Bank 6. State Bank of India 7. Bank of Beirut 8. Qatar National Bank

Source: Central Bank of Oman (CBO)

According to the official data it has been revealed that the top 3 financial institutions contribute around 62% of the total sector assets while leading institution (Bank Muscat) accounts for 37.26. % of the total sector assets (The Business year 2015)



CBO (Central Bank of Oman), the nation's central bank is the single integrated regulator of the banking and financial services sector in the country and supervises licenses and regulates all specialised banks and financial and leasing companies and money exchange companies in the Sultanate.

FUNCTIONS OF COMMERCIAL BANKS IN OMAN

A. Primary functions

The primary functions of commercial banks include:

1. **Accepting of deposits:** Deposits of various forms are accepted from people, businesses and other exhibits in the form of (a) Saving deposits, Time deposits and current deposits
2. **Lending of Funds:** Another important activity is lending funds to customers in the form of loans and advances, cash credit, overdraft and discounting of bills etc.

B. Secondary functions

Banks act as agents' in

- a. Collecting bills, draft, cheques
- b. Paying insurance premium, rent, loan instalments
- c. Working as representatives for a customer for purchasing or redeeming securities
- d. Acting as executors/administrators/trustees
- e. Preparing income tax returns etc.

General utility services

- a. Issuing debit and credit cards
- b. Locker facilities
- c. Transfer cheques etc.

Top commercial banks and Services in Oman:

1. **Bank Muscat** (Established in 1982): services include retail banking, treasury, investment, asset management and private banking.
2. **Bank Dhofar:** (Established in 1992) provides services on areas of retailing, treasury investment and corporate sectors.
3. **National bank of Oman** founded in 1972 offers services on areas of retail banking commercial banking, wholesale banking and acts a funding centre,
4. **Alizz Islamic Bank:** formed in the year 2012 focusses mainly on retail banking, treasury and corporate banking services.
5. **Oman Arab Bank:** Established in 1972 works with four segments Retail banking, support, Islamic banking and unallocated functions
6. **Bank Nizwa:** (founded in 2012) the focus of the bank is on three segments- retail banking, corporate banking treasury and investment banking.
7. **Ahli Bank:** (founded in the year 1983) the main functional segments of the bank includes
 - 1) Corporate banking, treasury and investments
 - 2) Retail banking
8. **Bank Sohar:** (established in 2007) the major services provided include retail banking, wholesale banking, government and project finance syndication, treasury, Islamic banking and investments.
9. **HSBC Oman:** is one of the oldest foreign banks in Oman, founded in the year 1948, works in four segments- commercial banking, retail banking, wealth management and global banking markets.
10. **Islamic Banks and Windows :(Rules of Islamic Banking in Oman :** Islamic banks in Oman offer sharia compliant products through their branches and windows.

CONCLUSION

From the study, it is evident that Bank Muscat is the major commercial bank in the country and there are nine major banks apart from Bank Muscat. These 10 major banks has more than 76% of the total bank Assets. They

provide financial support not only to large industries but also small and medium scale industries which are considered as the engines of growth of any economy. These banks by providing support to the small and medium enterprises help in the growth of the economy. The commercial banks financial support to industries acts as a catalyst and also supports the Oman Government's initiative to diversify the economy which is oil dependent.

REFERENCES

- Aniekan O. Akpansung, S. J. (2010). Banking Sector Credit and Economic Growth in Nigeria: An Empirical Investigation. *CBN Journal of Applied Statistics*, 51- 62.
- Barua, R. H.-S. (2015). Financial Development and Economic Growth: Evidence From A Panel Study on South Asian Countries. *Asian Economic and Financial Review*, 1159-1173.
- Bollard, y. D. (2011, August). The role of banks in the economy- improving the performance of the New Zealand banking system after the global financial crisis. *BIS central bankers' speeches*. Tauranga, Newzealand.
- *Central Bank of oman* . (n.d.). Retrieved October 4, 2019, from Oman/<https://cbo.gov.com>
- Demetriades, P. a. (1996). Financial Development and Economic Growth: Cointegration and Causality Tests for 16 Countries. *Journal of Development Economics*, 387-411.
- Dudhe, C. (2017). Role of Indian Commercial Banks in Economy Development. *International Conference "Current Economic Trends in Emerging and Developing Countries*. Research gate.
- Emecheta, B. C. (2014). Impact of bank credit on economic growth in Nigeria: Application of reduced Vector Autoregressive (VAR) technique. . *European Journal of Accounting Auditing and Finance Researc*, 11-21.
- Felicia Akujinma ANYANWU, A. C. (2017). An Empirical Assessment of the Impact of Commercial Banks' Lending on Economic Development of Nigeria. *International Journal of Applied Economics, Finance and Accounting* , 14-29.
- <https://statistica.com>. (n.d.).
- <https://www.toppr.com>. (n.d.).
- Imola Driga, C. D. (n.d.). *The Financial Sector and the Role of Banks In Economic Development*. Retrieved from <https://www.upet.ro> › simpro › proceedings › 9.2.pdf
- Ishioro, B. O. (2017). Banking Sector Reforms and Economic Growth: Recent Evidence from a Reform-Bound Economy. *Binus Business Review*, 49-60.
- Kumari, P. J. (2017). Role of Banks in the Development of Indian Economy. *Imperial Journal of Interdisciplinary Research (IJIR)* , 740-743.
- *overview of banks in oman*. (n.d.). Retrieved october 4, 2019, from <https://www.wallstreetmojo.com/top-banks-in->
- RAO, B. K. (2017). Role of Commercial Banks In the Economic Development of India. *International Journal of Management and Applied Science*, 1-4.
- *Rules Of Islamic Banking inOman* . (n.d.). Retrieved from <https://www.reuters.com/article/islamic-finance-oman-idUSL5E8NJA9J20121219>
- Tarawneh, M. (2006). A Comparison of Financial Performance in the Banking Sector: Some evidence from Omani Commercial Banks. *International Research Journal of Finanace and Economics* (Issue 3).
- Sangeetha, J. (2012). Financial crisis and Omani commercial banks: A performance review. *European Journal of Business and Management*, 4(8), 171-176.
- Tarawneh, M. (2006). A comparison of financial performance in the banking sector: Some evidence from Omani commercial banks. *International Research Journal of Finance and Economics*, 3(3), 101-112.
- A Comparison of Financial Performance in the Banking Sector: Some Evidence from Omani Commercial Banks Medhat Tarawneh Faculty of Business Sohar University Sohar Sultanate of Oman

-
- CBO Annual Report 2018
 - The Business Year. (2015). Retrieved October 10, 2015, from The Business Year: [HYPERLINK "https://www.thebusinessyear.com/oman-2015/bank-on-oman/review"](https://www.thebusinessyear.com/oman-2015/bank-on-oman/review)
<https://www.thebusinessyear.com/oman-2015/bank-on-oman/review>
 - [HYPERLINK "https://www.statista.com/statistics/715744/oman-total-assets-of-commercial-banks/"](https://www.statista.com/statistics/715744/oman-total-assets-of-commercial-banks/)
<https://www.statista.com/statistics/715744/oman-total-assets-of-commercial-banks/>
 - [HYPERLINK "https://www.toppr.com/guides/business-economics-cs/money-and-banking/functions-of-commercial-banks/"](https://www.toppr.com/guides/business-economics-cs/money-and-banking/functions-of-commercial-banks/) <https://www.toppr.com/guides/business-economics-cs/money-and-banking/functions-of-commercial-banks/>
 - <https://www.wallstreetmojo.com/top-banks-in->
 - Oman/ [HYPERLINK "https://cbo.gov.om/Pages/AboutCBO.aspx"](https://cbo.gov.om/Pages/AboutCBO.aspx) <https://cbo.gov.om/Pages/AboutCBO.aspx>
 - [HYPERLINK "https://www.reuters.com/article/islamic-finance-oman-idUSL5E8NJA9J20121219"](https://www.reuters.com/article/islamic-finance-oman-idUSL5E8NJA9J20121219)
<https://www.reuters.com/article/islamic-finance-oman-idUSL5E8NJA9J20121219>
 - [HYPERLINK "https://ahlibank.om/en-us/commercials/Pages/SME.aspx"](https://ahlibank.om/en-us/commercials/Pages/SME.aspx) <https://ahlibank.om/en-us/commercials/Pages/SME.aspx>
 - [HYPERLINK "https://www.bankmuscat.com/en/sme/pages/about.aspx"](https://www.bankmuscat.com/en/sme/pages/about.aspx) <https://www.bankmuscat.com/en/sme/pages/about.aspx>
 - [HYPERLINK "https://ahlibank.om/en-us/commercials/Pages/SME.aspx"](https://ahlibank.om/en-us/commercials/Pages/SME.aspx) <https://ahlibank.om/en-us/commercials/Pages/SME.aspx>
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CHALLENGES OF AGRO BASED INDUSTRIES

Dr. B. Parameswara ReddyProfessor, Reah School of Business Management

INTRODUCTION

Economic development of an economy has always been an area of intense debate in academics, a challenge for planners as well as policy makers and a subject of serious research for economists. Every economy consists of several distinct sectors. Such as primary sector, secondary sector and tertiary sector that are functionally related to one another. Economic history of many nations indicates that the development of primary sector holds the key in the growth of the economy, the linkages between agricultural and non agricultural sectors be identified and recognized. This interaction facilitates the progress of both sectors. This in turn creates demand for consumer goods and services thereby providing a further stimulus to industrialization and expansion of markets. It may be further observed from the historic pattern of economic development that the planners adopted a positive approach to create employment opportunities for non-farm employment in the rural areas and thereby keeping the released surplus labour force from agriculture in the rural areas by encouraging traditional processing industries which were more labour-intensive. Thus, a programme for the development of agro-based industries was considered necessary. Traditional processing methods which were more labour intensive with limited use of capital were accepted as the Indian way. ¹The basic task of economic planning in India is to bring about a structural transformation of the economy so as to achieve a high sustained growth rate in the economy, a progressive improvement in the living standards of the masses leading to the eradication of the problems of poverty, unemployment and inequality as well as building up of self-reliant socialist economy. The objective of removal of poverty and unemployment through gainful employment opportunities can be achieved by starting and developing small – scale industries, mainly agro-based industries by doing so pressure on land will be reduced which leads to increase in the productivity of agriculture sector. ² Agro-based industries assume great significance in the developing economies like India.

Even after the completion of six decades of planning era development in agriculture still accounts for about 15 per cent of our national income, 58 per cent of our working population as well as about 70 per cent of our people residing in the rural areas. It is not only due to their being labour-intensive and capital-saving in nature but also because of the fact that these industries generate gainful employment opportunities to the surplus agricultural laborers during the lean agricultural seasons. ³ Industries, which are based on agriculture have been given high priority in India due to their significant potential for contributing to rural development. The emphasis on village and agro-based industries was initiated by Mahatma Gandhi in the 1920's as a part of India's independence movement. However, even today the development of agro-based industries is a nerve centre of the national development strategy due to their significant role in bringing value addition to agriculture output, increasing rural incomes and employment and alleviating poverty in the countryside. Mahatma Gandhi's approach of village and agro-based industries was founded on a strong economic, social as well as political ideology. However, later it failed because it was used as a blanket argument by ultra-nationalists to favor less efficient techniques of production and to oppose modern industry. ⁴ Thus agro-based industries became incompatible with market preferences. In the post independence era up to early 1980s agro-industrial policy was dominated by the thinking of Nehru-Mahalanobis model that was based on the argument that India needs large number of industries for the capital goods sector, while the consumer goods sector should be reserved for small scale ,agro-based and rural industries which were labour-intensive and require less capital. This was consistent with the objective of reducing demand on the limited available capital and savings, and expanding employment. However, the kind of agro-based industries that came up in India miserably failed because of outdated technology and poor management and inability to meet changing demand for quality goods from a rapidly growing population with rising incomes. Since 1980s there has been a more invigorated effort for the promotion of agro-based industries in India with emphasis on market demand, sophisticated technology, and efficient supply chain management there has been a substantial relaxation of Government restrictions in the import of technology import and private foreign direct investment. ⁵ However, the current trend of greater role of large private corporate sector in agro-industries development has an inherent risk of bypassing small and marginal farmers and the rural poor.

This may result in a negative impact on rural employment, and weaken the development linkage. Therefore, agro-industries were given high priority in India. In the Eleventh Plan, Indian Council of Agricultural Research (ICAR) focused on research in strategic areas which would help to evolve cropping systems suited to various agro-climatic zones. A national food security mission was launched in the first year of the Eleventh Plan which

aimed at increasing cereal production. The target of 4 per cent growth in agriculture will require much faster growth in horticulture, floriculture, dairying, poultry and fisheries and the like.⁶ The Rashtirya Krsihi Vikas Yojana was lunched to extend incentives to State governments to prepare district level agricultural plans that take into account the local conditions. No doubt, development of agriculture has raised agricultural productivity but it has not ensured a corresponding increase in employment opportunities. Therefore, agriculture alone cannot solve the economic problems and ensure rural development we need to diversify the rural economy by establishing agro-based industries in the rural areas. The establishment of these industries will provide alternative gainful employment opportunities especially to the rural landless, marginal and small farmers; it will also mitigate the forced migration of labour force from the rural to urban areas.

CHALLENGES

The different challenges at various levels generally faced by the entrepreneurs of agro-based industries during their development are:

Infrastructure Problem

For development of agro-based industries, infrastructural facilities are required without which no industrial enterprise can survive and sustain for a long. Generally many industries have been set up by the entrepreneurs as a result of their own efforts. The cost of transportation has also gone up due to lack of proper infrastructure like road facility as the rural based industries are basically in remote locations.

Financial Problem

It has been observed that agro based industries are facing numerous financial problems such as non-availability of adequate finance on timely basis, non-availability of finance at reasonable rates of interest with the financial institutions instance of production collectoral securely with the financial institutions and the like .

Marketing Problem

Generally the newly set up agro based industries face the problem of proper marketing to sell their products in the nearby areas and have to remain dependent upon supply to government/other agencies like food Supply Corporation of India or any private organizations. Besides this, high cost of manufacturing also comes due to transportation cost incurred as the product needs to be carried to an appropriate market.

Technological Problem

New technology and modern thinking need to be incorporated with the existing one help the agro based industries in getting more liquid money. Due to shortage of capital there is a huge gap between the improved technologies integration and the accessible ones.

Labour Availability

The main asset of any enterprise is its manpower or human resource. If any of the industries including agro based industries get right number of skilled labour the profitability and productivity will enhance to a manifold level. Generally agro based industries of any rural area depend on local labour to produce the food material; the wage becomes high due to scarcity of labour. Sometimes the labour needs to undergo training which enhances the cost of the unit as well.

Research and Development Problem

Research and Development occupies an important place for developing of any industrial culture. To test the final product or for developing new one, well equipped lab facility is very essential. Generally rural based agro industries have to move for testing their products in different parts of the country as a result the cost of production increases to a great extent.²³

Constraints affecting the growth of agro-food processing

Constraints affecting the growth of agro-food processing including volume of crops available, costs of production, low productivity, quality and quantity of supplies, access to appropriate technologies and/or plant, access to services, support from the public sector, availability of sufficient investors and the like. It is here that the public sector as a promoter of the agro-based industries has responsibilities. Viability comes from pre-investment surveys and findings, which are then shared within the public domain – that everyone is involved and informed.

Exporting goods

Export opportunities are only tenable when manufacturers have sufficient experience to produce goods of the quality required for exporting. Export markets are best exploited with a knowledge of market demand, competition within the market for the same goods and, importantly, the production of high quality goods that meet the requirements and/or restrictions of the importing country. In spite of an abundant and varied

production base in many developing countries and there is a substantial international demand that exists for many fresh and processed foods, the export performance of these countries (and their industries) is marginal. Collectively, these developing countries contribute 1-2 percent of total international export trade. Globally, these countries remain on the fringe of markets that exist. Limited export trade is due to a variety of reasons, the most common of which include:

- Inadequate post harvest management practices.
- Lack of sophisticated equipment for ensuring uniform high quality products for export.
- Lack of cold storage facilities, which make the grower increasingly dependent upon external market traders (and thus market forces over which others have control).
- Constraints of air cargo space, high air freight rates and lack of facilities at ports of exit.
- Over-dependence on a few selected export products (for example from India - onions, okra and mangoes; and from Sri Lanka - coir, desiccated coconut and spices).
- Over-dependence on a limited number of conventional markets in West Asia, Western Europe or North America catering mainly to ethnic populations; making these exports vulnerable to fluctuations in international trade.
- Absence of clear policies with which to ensure a sustained presence in the main export markets over a reasonable period of time.
- Lack of adequate quality control facilities either on-site at point of production or as common facilities within a district or an industrial estate.
- Inadequate information about potential markets and the competitiveness of the raw materials or manufactured goods involved.

Support to Producers

A number of opportunities exist for providing the best varieties of crops and crop care required for processing, but the technical assistance required is normally beyond the immediate responsibility of the food processor. Partnership arrangements are possible with the intervention of the public sector.

Given the importance of links between producer and processor, contracting is a valuable means of providing an outlet for sales of fresh crop, and for delivering known quantities and quality materials at the factory gate. Contracting is a means of linking producers and processors, but difficult to apply where alternative markets for food crops, and the like, sometimes exist.

Technical assistance between the producer and processor is a two-way network, but with the processor normally in the dominant position. The provision of planting materials, crop inputs, equipment and technical information, for example, is essential for the production of high quality farm materials. Joint public sector (government) and private sector (park companies) arrangements are required.²⁴

CONSTRAINTS FACING AGRO-BASED INDUSTRIES

The first constraint is inadequate supply of raw materials from agriculture. The Indian literature has emphasized that agro-based industrial growth in India has historically been constrained by both supply of raw material and slow growth in consumer demand for agro-based industrial products.

The second constraint is the poor quality of much raw material. Available raw material is often of unsuitable quality, processing varieties are frequently not available, and the period of availability of the raw material is too short and unreliable. Show that only about 0.5 percent of the fruits and vegetables grown in India are commercially processed, partly for quality reasons.

The third constraint is the obsolete technology often used in processing, resulting in low efficiency and poor quality of the output. A major problem in improving technology is the very small size of the average agro-processing unit, suggesting the need to integrate to achieve larger scale to be able to remain competitive.

The fourth constraint is regulations that work against agro-based industry. The government typically considers processed and packaged goods as luxury items, and as a result their production is heavily taxed. There are myriad special regulations and licensing requirements for specific agro-based industries, such as the Milk Product Order for the dairy industry. These policies create disincentives for investment in higher value-added agro-processing.

The final constraint is lack of finance. The financial institutions in India are mainly geared to lending for fixed capital requirements, while agro-based industry, have a large requirement of working capital. Banks lend working capital, if at all, at higher interest rates than other capital loans.²⁵

PROSPECTS OF SMALL SCALE AGRO BASED INDUSTRIES IN RURAL AREAS

India is rich in her natural resources. But these resources have not been fully and adequately utilized till today. There are great opportunities for the development of small scale rural industrial units for the development of rural area in this country. India is the 2nd largest arable land (184 million hectares) occupied country in the world. The country is the largest producer of wheat (92 million tones), pulses (18 million tones), milk, spices, tea and live stock and it is the 2nd largest producer in rice (104 million tones), fruits, and vegetables in the world. By utilizing this agro based material, rural industrial set up is not so unbelievable.

- Encouraging the rural youth with possible financial support from the government sector to establish agro-based industries.
- Development of systematic marketing network for selling of industrial products.
- Opening of global markets may lead to export of new technologies and facilitate generation of additional income and employment opportunities.
- The institute may initiate establishing agro-based industry development cell for providing modular training to the students and farmers.
- Research and extension on different models of agro based industries.
- Strategic advertising by using print, electronic and web media for marketing and export of agro based industrial products.
- Strengthening of effective linkage between State Government and State Agriculture University, ICAR along with NGOs, National Horticultural Board, NABARD and other funding agencies.
- Integration of developments in contemporary technologies such as electronics, material science, computer, bio-technology and the like. Offer vast scope for rapid improvement and progress.²⁶

CONCLUSION

Economic development of an economy has always been an area of intense debate in academics, a challenge for planners as well as policy makers and a subject of serious research for economists. Every economy consists of several distinct sectors. Such as primary sector, secondary sector and territory sector that are functionally related to one another. The objective of removal of poverty and unemployment through gainful employment opportunities can be achieved by starting and developing small – scale industries, mainly agro-based industries .by doing so pressure on land will be reduced which leads to increase in the productivity of agriculture sector. The agro-based industries bridges a gap between agriculture and industry, enriches rural and urban culture extend benefit to each and every one. It helps open up the economy to the exploitation of its vast potential of growth and development. Agro-based industries can be broadly defined as those industries that are dependent upon agriculture for their raw material and other basic inputs. Agro-based industries are the industries which not only depends on the output of agriculture and but also depend on the inputs that go in to the agriculture like agricultural machinery and implements, fertilizers, and the like. Much of the recent literature on economic development has emphasized the rural-led employment oriented strategy of growth, especially for developing countries with a labour surplus. Agro-based industries help to improve the level of income and its equitable distribution among the different sectors, regions and sections of the society. Agro-based industries create opportunities to absorb surplus labour in agriculture and thereby help break the vicious circle of rural poverty. By increasing agricultural income, they make farmers go for innovation and modern techniques of production to raise farm productivity.

REFERENCES

1. B.S. Syngal, “ Success of Agro industrial enterprises through training of cadres”, Khadigramodyag, Vol. 52, No.78, 1986, p 435.
2. M. Nirmal Reddy,“The Production and performance of Agro-Based Industries in Nalgonda District”, Paper submitted at National Seminar on “Role of Indian Agro-Industry in Rural Economic Development – A Perspective” at Sri Venkateswara college, suryapet, Nalgonda, Andhra Pradesh, 2006.
3. M. Soundariya Preetha, “More Agro-Based Units planned”, The Hindu, Sunday, 2004.P.6

4. Niels Fold, "Globalization, State Regulation and Industrial Upgrading of the oil seed Industries in Malaysia and Brazil, Singapore", *Journal of Tropical Geography*, 2000, pp.263-278.,
5. Foriyo Segan and A.D. Berau, "Role of Agro-Based Industries in increasing Food Production in Nigeria", *Agriculture Administration*, vol. 2 Issue 1,1982.P.132-148
6. Badar A. Iqbal , "Agro-Based industries performance and prospects" print well publications, Aligarh, 1987, pp 4-5.
7. Michael Boehlje, "structural changes in the Agriculture Industries: How do we measure, analyse and understand them?", *American Journal of Agriculture Economics*, Vol.7, No.5 , 1999, pp.1058-1041.
8. S.Arunajatesan and S.Balaji, "Centre's Move for Agro-Industry Hailed", *The Business Line*, 2005,September, 16th, p-5.
9. Deepthi Singh. "Technical Modeling of Employment Potential and Economic Viability of Agro-based industries", *Banaras Hindu University*, Vol.No.06, Issue No.06, 2014, p.1
10. Vasant Gandhi, Gauri Kumar and Robin Marsh, " Agro industry for Rural and Small farmer Development: Issues and Lessons from India", *International Food and Agribusiness Management Review*, Vol. No. 2, Issue No.3, 2001, pp 331-344
11. India international trade fair, "Agro-Based Industries", New Delhi, 2004.P.52
12. R.C Goal and A.C. Gangway,"Economic Analysis of parboiled vs Raw Rice Processing", *Financing Agriculture*, 1996, pp.75-78.
13. P. Purushotham "Appropriate Technology for Employment Generation in Agro-Industries",Vol.53, No. 10,*Kurushetra*, 2005, p. 10.
14. B. Mistra, G.C. kar, S.N. Mistra, "Agro-Based Industries and Economic Development: A vision for the 21st century", *Deep and Deep Publications Pvt. Ltd.*, New Delhi, 2003, p.229.
15. Deepthi Singh. "Technical Modeling of Employment Potential and Economic Viability of Agro-based industries", *Banaras Hindu University*, Vol.No.06, Issue No.06, 2014, p.1
16. Sandip Sarkar, "Growth of Agro-Industry and Its Relationship with Agriculture", *Arthavijnana*, Vol XXXIXNO.2, 1997, pp.166-184.
17. Staff Reporter, "Rice milling industry in doldrums", 2004,*The Hindu*,
18. *Ibid*, Deepthi Singh, p.1.
19. Somnath Sharma, "Socio-Economic Study of Agro-Based Industries", *Mittal Publications*, New Dehil, 1992, pp.135-139.
20. Denis Requier – Dejardins, Fransisboucher and Cheire Cerdon, "Globalization, Competitive advantages and the evolution of production systems; rural food processing and localized agro-food systems in Latin American Countries", *Entrepreneurship of Regional Development*, Issue 15; 2003, pp.49-67.
21. *Ibid*, K. Lakshminarayana, p.49.
22. *Ibid*, Vasant Gandhi, Gauri Kumar and Robin Marsh,pp336-338.
23. *Ibid*, Ratneswar Poddar, pp 8-9.

WHY ORGANIZATIONS NEED ENGAGED EMPLOYEES

BACKGROUND

Not too long ago, many business consultants, management schools and organizations started speaking about Employee Engagement. It had become the buzzword and everybody claimed that they know what engagement means and they implement employee engagement strategies in their organizations. However, these strategies did not get translated into employee productivity and as a result it had no or hardly any impact on overall organizational performance. These companies had got it wrong, many leaders and managers responsible for engaging employees were focusing on increasing employee satisfactions, employee happiness or employee feel good factor. The assumption was that a satisfied employee is motivated and engaged employee. Therefore, all the efforts and energy was directed towards employee satisfaction as –

- Organizational health surveys were focused on employee satisfaction.
- Post survey interventions were to improve the satisfaction levels, feel good factors of employee.
- HR would take up assignments related to benefits, employee wellbeing and happiness.
- Taskforce teams would spend time and efforts on enhancing the satisfaction levels.
- Management would assign budget and invest for these initiatives.

In spite of all the efforts, investments of time and money the organizations as a whole did not perform well in terms of bottom line. There was no direct correlation between the satisfaction and business outcome.

Hence, it was clear that not all the satisfied employees are productive employees. However, in most of the cases it can be a necessary condition but not sufficient. It is possible that the employee is happy, enjoying the comfort zone, status quo and all the benefits without bothering much about the performance of the organization. Employee satisfaction is transactional and contractual. An organization promises to provide employees with compensations, tools, and resources, physical safety, dignity, and respect in return for their work. There is a contract between the employer and the employee. The satisfied employees will put out as much effort as they are compensated for, and nothing more. They deliver what is asked of them, as long as you deliver on your part of the deal. There is no ownership, no going extra mile, no attachment to the organization and no creativity., just do the bare minimum to avoid failure. Hence, the realization that employee satisfaction is not a true measure. What matters most is the employee productivity and performance of the organization while taking care of the implicit and explicit needs of the employees. Employee engagement is a better measure of satisfaction and performance of the employees.

DEFINING EMPLOYEE ENGAGEMENT

You will come across various definitions of Employee Engagement from management consultants, research companies and leaders. Here are some of the selected definitions -

- **Gallup** defines “engaged employees as those who are involved in, enthusiastic about and committed to their work and workplace.”
- **Mercer** defines “Employee engagement – also called ‘commitment’ or ‘motivation’ – refers to a psychological state where employees feel a vested interest in the company’s success and perform to a high standard that may exceed the stated requirements of the job” (www.mercerHR.com).
- **Hewitt** - states that “Engaged employees consistently demonstrate three general behaviors. They: (1) Say – consistently speak positively about the organization to coworkers, potential employees, and customers; (2) Stay – have an intense desire to be a member of the organization despite opportunities to work elsewhere; (3) Strive – exert extra time, effort, and initiative to contribute to business success”(www.hewittassociates.com).
- **Towers Perrin** engagement reflects employees’ “personal satisfaction and a sense of inspiration and affirmation they get from work and being a part of the organization” (www.towersperrin.com).
- “The emotional commitment the employee has to the organization and its goals.” **Kevin Kruse**, Forbes Contributor and NY Times Best Selling Author

- “Emotional connection an employee feels toward his/her employment organization, which tends to influence his/her behaviors and level of effort in work related activities.” **Business Dictionary**
- “A business management concept that describes the level of enthusiasm and dedication a worker feels toward his/her job. Engaged employees care about their work and about the performance of the company, and feel that their efforts make a difference.”¹
- “An emergent and working condition as a positive cognitive, emotional, and behavioral state directed toward organizational outcomes.” **Michael Shuck and Karen Wallard**
- Employee engagement is the extent to which employees feel passionate about their jobs, are committed to the organization, and put discretionary effort into their work.
- Employee engagement is a workplace approach resulting in the right conditions for all members of an organisation to give of their best each day, committed to their organisation’s goals and values, motivated to contribute to organisational success, with an enhanced sense of their own well-being.

In short, employee engagement can be defined as an emotional state where we feel passionate, energetic, and committed towards our work. In turn, we fully invest our best selves—our hearts, spirits, minds, and hands in the work we do.

All the above definitions can be put into the following three concepts –

1. **Intellectual** - The extent to which one is intellectually absorbed in work.
2. **Social** - The extent to which one is socially connected with the working environment and shares common values with colleagues.
3. **Affective** – The extent to which one experiences a state of positive affect relating to one’s work role.

WHY WE NEED TO ENGAGE OUR EMPLOYEE

As David Ulrich has put it in its best-selling book Human resource champions: “Employee contribution becomes a critical business issue because in trying to produce more output with less employee input, companies have no choice but to try to engage not only the body, but also the mind and the soul of every employee”. Ulrich makes two points here.

1. The organization’s human capital becomes increasingly important because more has to be done with fewer people, so people matter more than they did in the past.
2. Modern organizations need employees who are able and willing to invest in their jobs psychologically and this is exactly what work engagement is all about.

Employee engagement is one of the top most concern which is giving sleepless nights to the CEO and leaders in the organization. As per Gallup surveys 2/3 (two third) of the global workforce is either actively disengaged or not engaged. Therefore, there is a huge room for improvement in this area, companies are looking out for means and methods to connect the hearts, souls and minds of employee to work in order to produce more output with less employee inputs. With more than half of workers feeling unengaged, it’s clear that more focus is needed in enhancing the engagement levels. A negative employee mindset may drag down productivity, creating damaging effects on an organization as a whole. This issue further amplifies with the entry of Millennials in workforce. The Millennials will comprise of 75 percent of the global workforce by 2025. The needs and aspirations of this young generation are different and challenging.

Employee engagement has an impact on most of the critical elements of an organization like – profitability, productivity, revenues, customer experience, employee turnover, talent acquisition, market share, work quality, absenteeism, workplace safety, etc. Engaged employees are connected to their organization, more loyal, work harder and motivate others to do the same.

CONCLUSION

In conclusion, employee engagement has a direct correlation with the business outcomes. Organizations need to redefine and understand the correct meaning engagement before investing their time, money and resources. It is a powerful engine for bottom line, growth and profit if implemented correctly. With changing workforce demographics and diversity there is a need to identify the growing needs and aspirations of current and future workforce. A culture of engagement is created when both the organization and the individuals are becoming engaged. The responsibility of engagement has to be equally shared between the employee to be productive and the organization to create a conducive environment where engagement flourishes.

HEALTH AND SAFETY MEASURES- A CASE STUDY WITH SPECIAL REFERENCE TO APGENCO

Naveena Grape Kumari

Research Scholar, Dravidian University Kuppam, A. P.

ABSTRACT

Because of the high number of accidents that happen in development and the outcomes this has for specialists, organizations, society and nations, word related safety and health SH has turned into an imperative issue for partners to deal with the human asset safety and health is a APGENCO worried about the improvement, advancement, and upkeep of the work environment condition, strategies and projects that guarantee the mental, physical, and enthusiastic prosperity of representatives, and also keeping the working environment condition generally free from genuine or potential dangers that could harm representatives. In any case, from alternate points of view and utilizing diverse instruments scientists have contemplated word related dangers in development. There are a few instruments and strategies to research and comprehend word related accidents in the development business. This study is conducted questionnaire from the employees about the health and safety measure in APGENCO providing at their workplace.

Keywords: Health and safety measurements, APGENCO.

1. INTRODUCTION

With a specific end goal to keep employees delivering at any rate at the level showed by their potential at the season of their business, it is fundamental to prevent anything from transpiring that may bring about a transitory or lasting lessening in yield due to sources, for example, mishap or wounds and sickness because of sick health. Since mishap and sickness disturb yield as well as convey with them sizeable money related expenses. It turns out to be critical for modern organization to find a way to counteract or diminish mishap & severity and in addition to dispose of anything that may add to the beginning or prolongation of a disease.

The health and safety measures are the examination factors of the investigation in APGENCO are:

1. Statutory Welfare Measures
2. Medical Facilities
3. Housing Facilities
4. Education Facilities
5. Leave Facilities
6. Transport Facilities
7. Sports and Recreational Facilities

An organization should complete an underlying survey of the safety and health administration framework in APGENCO, and line this up with intermittent audits. The underlying review it should contrast existing safety and health practice in APGENCO and:

- The prerequisites of safety and health enactment
- The arrangements set out in the organization's Safety Statement
- Safety and health direction in the organization
- Existing legitimate and distributed safety and health direction
- Best rehearse in the organization's work area

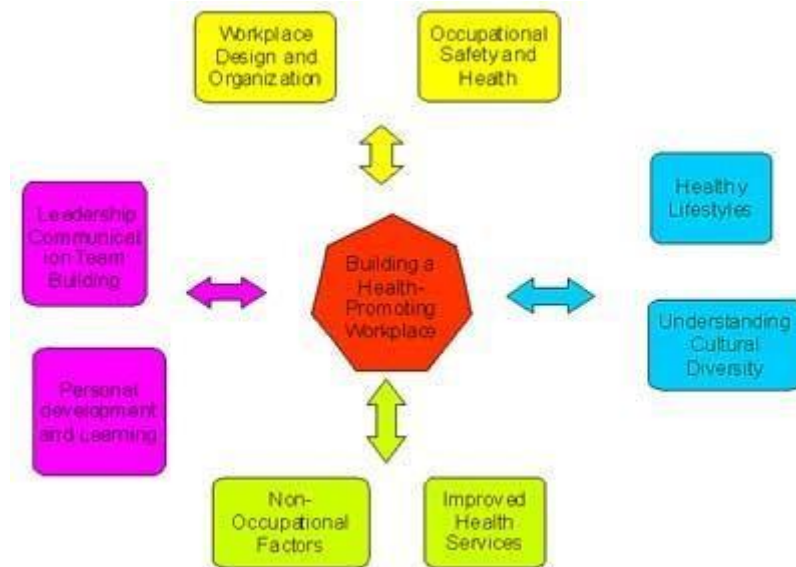


Fig-1: Building a Health Promoting Workplace

The researcher likewise proposes that the managers in the organization are working truly and furthermore adjusting the safety programs in a most ideal manner for the advancement of the organization & employees, the organization may rouse the managers legitimately to do their work to accomplish the assignments

2. NEED FOR AND THE IMPORTANCE OF THE STUDY

The researcher carried out the study with an aim of finding out the effectiveness of health and safety measures carried out in APGENCO. To provide better life and health to the workers in the organization. This topic is to enumerate the difficulties faced by the workers and employees in APGENCO.

Occupational health and safety are the foundation of wellbeing at work. The employer is responsible for providing safe working conditions, but working environment is safe only when the employees and their supervisors cooperate and participate. The aim of this guide is to provide basic information on the development of occupational safety and health in the workplace.

3. REVIEW OF LITERATURE

Johnstone, Quinlan and Walters (2005) [1] inspect the ramifications of the development in more adaptable work rehearses for representative inclusion in word related health and safety. They contend that auxiliary change related with the decrease in union thickness, the development in easygoing and locally established work, and increments in subcontracting have all served to undermine the arrangement of word related health and safety courses of action

Boselie, Paauwe and Richardson (2003) [2] examined the connection amongst HRM and firm execution in three parts in the India health care, tourism and neighborhood government. While two of the three ward HRM execution factors utilized concerned nonattendance (OHS related in any event to some degree), the autonomous factors chose to catch HR control frameworks did exclude OHS.

Fuller and Vassie (2004) [3] utilize a general hazard administration system and propose a best practice approach as a reason for requesting and overseeing OHS. As of late, the expanding accentuation in this assemblage of work on chance administration ideas and strategies, multidisciplinary and on a more extensive, frameworks way to deal with understanding OHS and its administration, has additionally been reflected in alternate classes of the OHS research writing.

Sailesh Sindhu (2012) [4] felt that, worker welfare measures increment the efficiency of organization and advance healthy industrial relations along these lines keeping up modern peace. Organizations give welfare offices to their Employees to keep their inspiration levels high Business houses give numerous such statutory and non-statutory things and approaches to keep up tasteful level of their representative.

P.K Padhi (2007) [5] stated that, the term welfare proposes the condition of prosperity and infers healthiness of the individual. It is an alluring condition of presence including the mental, physical, moral and enthusiastic factor of a man. Satisfactory levels of profit, protected and others conscious states of work and access to some base government managed savings benefits are the major subjective measurements of business which improve personal satisfaction of specialists and their efficiency.

S. Poongavanam (2011) [6] felt that the welfare measure will enhance the physical make-up, insight, ethical quality and way of life of the specialists, which thusly will enhance their proficiency and profitability. From the investigation on work welfare offices in AFT, the researcher presumed that, the different welfare offices, for example, health, safety, container, uniform, training and blessing offices in AFT, empowers laborers to carry on a rich and more agreeable life. It likewise adds to expanding profitability of the venture enhancing proficiency of the laborer and raises their way of life. In this manner the work welfare offices gave by AFT are great.

Ramesh M. (2012) [7] expressed that the primary target of each administration is to give better working offices to the employees in light of a legitimate concern for getting quick, sheltered and proficient work.

Ataul-Huq-Pramanik (2000) [8] says the idea of welfare state picked up prevalence amid the period when the free market instrument officially settled its superiority. The free market system of the west together with the individual flexibility being sustained in a situation of vote based political foundations prompted the development of the welfare state. The motivation behind why the welfare state picked up prominence amid the period when the industrialized world was getting a charge out of financial flourishing was a direct result of the developing requirement for shielding the privileges of nationals from any unanticipated occasions paying little heed to their current financial conditions.

Parul P Bhati, and Dr.Ashokkumar M (2013) [9] close their research, as far as demonstrating that the distinctive welfare arrangements gave to the employees working in an organization under the Factories Act 1948 are having positive connection with the employee fulfillment.

Torjman (2004) [10] exhibited that welfare facilities and diversion represents healthy individual other than encasing among their satisfaction and emotional quotient.

4. OBJECTIVES

1. To study, analyze and appraise different health and safety measures existing in the organization.
2. To analyze the impact of health and safety measures and to recommend solutions wherever there are possibilities for improvement
3. To identify the similarities and differences in health and safety measures provided to different cadres of employees
4. To examine immediate and prompt health and safety measures provided to employees in the organization.

5. RESEARCH METHODOLOGY

The research technique is a scientific and systematic search for related data on a particular subject. It is a cautious examination or request particularly through look for new actualities in any branch of information. Along these lines, it takes a state of graphic examination and it tries to clarify the current states of the employees in regard of the welfare measures and the stand of the workforce in such manner.

Methods of Data Collection

The researchers can acquire data shape primary data and secondary data. The primary data is gathered utilizing precisely detailed questions, intended to collect certainties and alternatives from the respondents. Secondary data was gathered from different secondary sources viz., books, journals, records, registers and sites. Internet and organization records etc.

Sample size

120 respondents of APGENCO have been chosen for this examination

Statistical Tools used for analysis

The data gathered from the sources are grouped, tabulated and analyzed by utilizing the accompanying statistical data. Rate investigation Weighted Average Method, graph are also used to find their viewpoints

Research strategy

This examination grasps outline framework and used self-guided questionnaire from the employees of APGENCO to accumulate data about their safety and health measures adopted by organization.

DATA ANALYSIS AND INTERPRETATION

Table-1: Classification of the respondents based on statutory health and safety measures

S.N O	CONDITI ON	EXCELLENT		GOOD		FAIR		POOR		TOT AL %
		Respon dents	%	Respo ndents	%	Respo ndents	%	Respon dents	%	
1	Drinking water	30	25	30	25	30	25	30	25	100
2	Lunch and restroom	40	33	20	17	30	25	30	25	100
3	Bathing	35	29	35	29	35	30	15	12	100
4	Waste and effluent	58	48	32	27	10	8	20	17	100

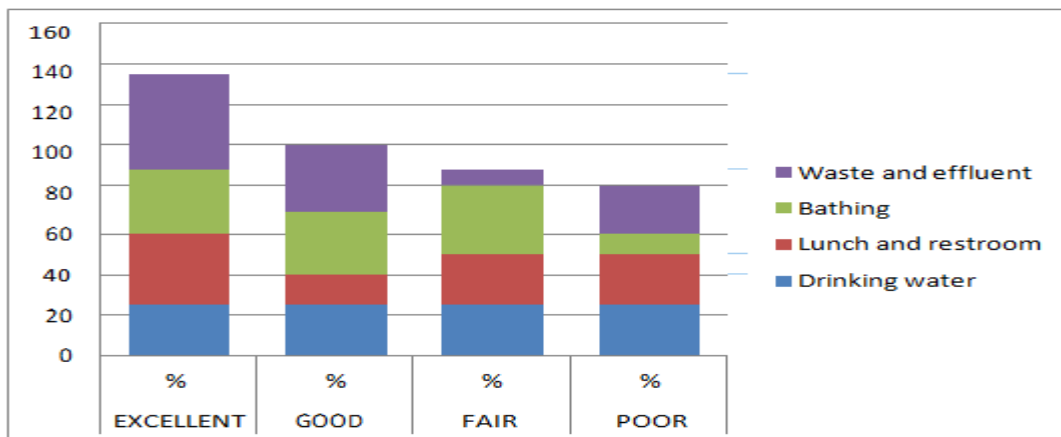


Fig-2: Classification of the respondents based on statutory health and safety measures

It is inferred that 25% of the respondents feel excellent, good, fair and poor about drinking water facility. 33% of the employees feel excellent about the facility of lunch and restroom, 17% feel good, 25% feel pair and rest 25% feel poor about the facility of lunch and rest room, only12% of the respondents feel poor about the condition of the bathing facility, 48% of the respondents feel excellent of the facility of waste and effluents and 17% are not satisfied with overall procedure of waste and effluents in APGENCO overall all the employees are satisfied with statutory health and safety measures.

Table-2: Demands In Respect Of the Housing Facilities

S NO,	Demands In Respect Of The Housing Facilities	FREQUENCY	PERCENTAGE
1	Proper maintenance of the houses	20	17
2	Infrastructure facilities	28	24
3	Provision of water	22	18
4	Maintenance of surroundings of the houses	12	10
5	Proper alteration of houses	28	23
6	Other	10	8
Total		120	100

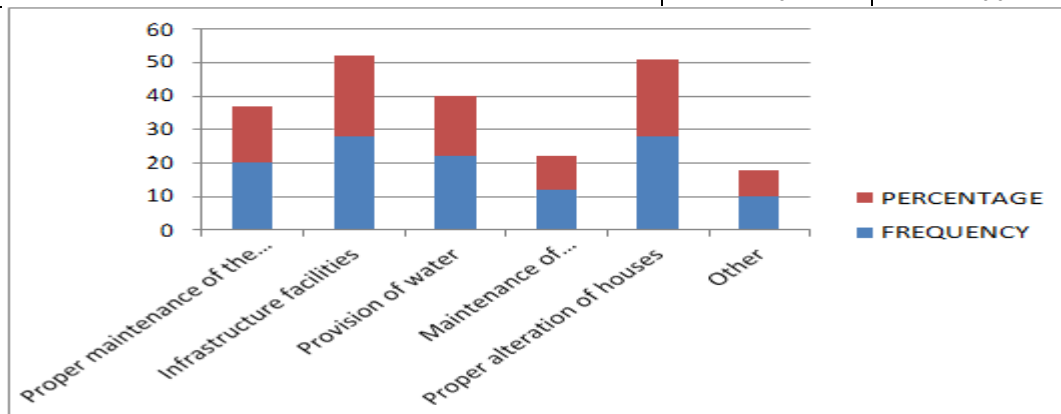


Fig-3: Demands In Respect Of the Housing Facilities

In the issue of housing facilities, 10 percent of the employees say that the poor support of surroundings of the houses is an issue. 23 percent employees request appropriate change of houses. 18 percent employees express that the arrangement of water isn't attractive. Infrastructure facilities ought to be enhanced by perspective of 24 percent employees. 17 percent employees demand proper maintenance of the houses in APGENCO.

6. CONCLUSION

The objectives of safety and health programs in APGENCO incorporate to cultivate a protected and healthy workplace. SH may likewise ensure colleagues, relatives, businesses, clients, and numerous other people who may be influenced by the work environment condition. In the United States, the term word related health and safety is alluded to as word related health and word related and non- word related safety and incorporates safety in APGENCO for exercises outside of work.

Upkeep of the water focuses and machines are not kept up legitimately with the goal that the administration needs to focus in this issue. The drinking water focuses might be cleaned ordinary and the water decontaminating machines, fitted in numerous spots in the grounds might be cleaned every day. For this reason, a few attendees or others might be coordinated by the administration as needs be. The health and safety measures in APGENCO are powerful when they are kept with including support office. So supports ought to be apportioned each year. Be that as it may, the administration bombs in the distribution of adequate assets for the support and change of the health safety measures in APGENCO. It doesn't hear any grievances concerning the welfare measures from the employees' side or their unions' perspectives. Along these lines, it is vital that the welfare measures must be changed and new arrangements, for example, library, net cafe and so forth. Ought to be presented.

Through examiner the researcher acquired the specialist's conclusions about the health and safety from various units. The gathered primary data was translated and get comes about. It was discovered that this organization has given adequate health and safety measures. The work likewise gives great recommendation about Health and Safety in APGENCO, there was clearly an energetic reaction to the venture from all sides.

7 LIMITATIONS OF THE STUDY IN APGENCO

1. This examination is concerned for the most part with the primary data gathered from chose test specialists towards the welfare measures. Their recognition may change as their experience changes at the appropriate time. In this way, their fulfillment, mindfulness, demeanor and discernment are not static and they may change in future.
2. No near endeavors are made in this examination with other comparative investigation units.
3. The research joins both qualitative and quantitative data for recognizing the health and safety measures. Henceforth a portion of the discoveries may not approve any further research in view of quantitative data.

REFERENCES

1. Johnstone, R., Quinlan, M. and Walters, D. (2005). Statutory Occupational Health and Safety Workplace Arrangements for the Modern Labour Market. *Journal of Industrial Relations*, 47, 93-116.
2. Boselie, P., Paauwe, J. and Richardson, R. (2003). Human resource management, institutionalization and organizational performance: a comparison of hospitals, hotels and local government. *International Journal of Human Resource Management*, 14(8), 1407- 1429.
3. Fuller, C.W. and Vassie, L.H. (2004). *Health and Safety Management: Principles and Best Practice*. London: FT Prentice Hall.
4. Satesh Sindhu, 2012, Role of Organisation in Welfare Measures for Employees, *International Journal of research in It & Management*, vol.2(9), September 2012, p.37
5. P.k Padhi, labour and industrial laws, prentice hall India, 2007.
6. S. Poongavanam (2011), "A study on labour welfare facility (with reference to AFT, Pondicherry), *International Journal of Research in Commerce, Economics & Management*", Volume No: 1 (2011), Issue no. 1 (May) ISSN 2231-4245.pp.40- 44.
7. Ramesh M. (2012) "Employees' Perception on Welfare Practices- dy of A.P. Eastern Power Distribution of AP Limited" *Advances in Management*, Vol. 5 (9) Sep. (2012) pp- 56-60.
8. Ataul Huq Pramanik (2000), *Humanomics*, Vol: 16, Issue: 2, Page: 3 – 18.

9. Parul P Bhati, Dr. Ashokkumar M., "Provision Of Welfare Under Factories Act & Its Impact On Employee Satisfaction" *Journal of Business Management and Social Sciences Research (JBM&SSR)* ISSN No: 2319-5614, Vol.2, No.2, February 2013.pp-57-69.
10. Torzman S (2004), *Culture and recreation Links to wellbeing: The caledonn institute of social policy*.
11. Yu Hsing (2001), *International Journal of Social Economics*, Vol: 28, Issue:4, Page: 338 – 343
12. Frick, K. and Wren, J. (2000). Reviewing occupational health and safety management – multiple roots, diverse perspectives and ambiguous outcomes. In Frick, K., Jensen, P.L., Quinlan, M. and Wilthagen, T. (eds). *Systematic Occupational Health and Safety Management: Perspectives on an International Development*, 17-42, Oxford: Elsevier Science Ltd.
13. Fuller, C.W. and Vassie, L.H. (2001). Benchmarking the safety climates of employees working within a partnership arrangement: a case study in the offshore oil industry. *Benchmarking: An International Journal*, 8, 413-430.
14. Hale, A.R., Guldenmund, F.W., Van Loenhout, P.L.C.H. and Oh, J.I.H. (2010). Evaluating safety management and culture interventions to improve safety: effective intervention strategies. *Safety Science*, 48, 1026-1035.
15. Hale, A. (2000). Culture's confusions. *Safety Science*, 34, 1-14.

REPRESENTATION OF WOMEN IN POST COLONIAL HINDI MOVIES

Garima Deewan and M. S. MishraResearch Scholar, Kalinga University Raipur, CG

ABSTRACT

In this study we aim to analyze women's representation of women in post-colonial Hindi movies in Indian cinema by applying the sociological approach which focuses on agency. We want to investigate the interrelation of gender, women and cinema in the context of two Indian films Daman by Kalpana Lajmi and Mrityudand by Prakash Jha. This is a qualitative research which took the form of narrative method for analyzing the selected films. After describing the position of women in Indian society and the evolution of Indian cinema with special attention to emergence of women directors and representation of women on screen, we outlined the plot of both films and then the description of the sub-theme of agency is discussed. These films portray women both as victimized and empowered ones.

Index Terms: Women, Indian Films, gender studies, society, art, cinema.

1. BRIEF INTRODUCTION AND DESCRIPTION ON THE STATE OF THE ART OF THE RESEARCH TOPIC

Gender typically refers to the social process of dividing up people and social practices along the lines of sexual identities (Beasley, 2005). It identifies a set of qualities and behaviors expected from females or males by society. The concept of gender was adopted in order to emphasize the social construction of masculinity and femininity and social ordering of relations between women and men. By the mid-1980s the purview of masculinity studies and femininity had substantially shifted from women's studies to the study of gender, namely analysis of the ways in which all aspects of human society, culture and relationships are gendered (Kandiyoti, 1996). Lorber (1994) defines gender as an all pervasive social institution that establishes a pattern of expectations for individuals, orders the processes of everyday life, is built into the major social organizations of society such as the economy, ideology, the family and politics and is also an entity in and of it. The sociological view explores gender roles. Gender roles are the roles that society assigns to men and women based on their gender. They affect how people perceive and expect themselves and others to behave in masculine and feminine manner. These roles are learned through socialization and are culturally determined. Social norms and values are internalized by children as they learn their social roles and the produced view of gendered individuals (Jackson and Scott, 2002). Gender is not simply about what we are as a male or female but also what we are doing in our encounters with one another. It is constructed through performance and interaction between people.

The medium of cinema representing social and historical practice regarding gender approach is a crucial phenomenon in sociological studies. It can be said that media are crucial in the construction of gender ideologies and in gender socialization. Products of media culture provide materials out of which we forge our identities, our sense of selfhood, our construction of ethnicity, race and nationality, of sexuality and of 'us' and 'them' (Dines and Humez, 2003). Film and cinema are the most commonly used mass media to communicate with the public. The fact that cinema is a mediator of social realities and personal dreams, collective concerns and individual aspirations make it assume a seminal dimension as a humanistic discourse which has the potential to redirect the cultural and material fabric of our everyday lives (Jain and Rai, 2002).

Women's position within media power structures and media representation of women are persistent concerns in every society, because negative stereotyping and lack of female input both reflect and reinforce wider gender inequalities. Films, indeed in the most effective manner maintain the diffusion of traditional female gender roles, which women are depicted in culture and society. Research on gender and cinema has emphasized the question about women's identity. In fact, the study of the images of women in cinema were a central concern of the 'second wave' feminism of the 1960s and 1970s, criticizing women's image in film and women's roles in the film industry (Jackson and Jacjie, 1998).

There is a fundamental transformation in the position of women in modern India with the various reform movements and a gradual change in the perception of women in society. Clearly women have made great progresses towards equality in recent decades. Women have played a significant role in the social and political structure of India. India with its rich.

Heritage through history and culture has been a remarkable country showing great advancement in the field of art. One of the most popular forms of art is Indian drama and cinema. In the 1970s Indian Cinema developed a more socially aware and more politically orientated form of cinema, partly subsidised by public funding, which

was known as Parallel Cinema – running alongside but clearly distinguished from mainstream cinema. Women's image, status and role as a social issue in society are reflected in cinema in India and have been present in even in popular Indian cinema almost right from the start.

The representation of women in cinema has been a major issue of debate amongst feminist film theorists in India. The complex and fascinating relationship between women and cinema has a substantial literature and some interesting work on third world feminism, which illuminates aspects of the representation of women in Indian films. The representation of women and the representation by women on screen are essential for understanding the interplay between women and cinema in India (Gokulsing and Dissanayake, 1998). For analyzing the position and representation of women within power and gender relations in a patriarchal society, we need to consider the role of agency in women's lives. "agency" refers to the capacity of individual humans to act independently and to make their own free choices. Agency, thus, generally refers to micro level actors and to macro level collectives that act. In other words, any social being, whether an individual or a collective, can be considered to have agency. (Ritzer, 2005).

Accordingly, in the proposed study we have tried to analyze women's portrayal in Indian cinema by applying the sociological approach that focuses on agency. The general purpose of this study is to investigate the interrelation of gender, women and cinema in the context of two Indian films *Domination- Daman* in Hindi - directed by Kalpana Lajmi (2001) and *Death Penalty- Mrityudand* in Hindi – directed by Prakash Jha (1997). The choice of the films was based on the fact that these films are comparable to each other having some similar issues to study. Mainly this study attempts to answer the following questions:

- How do films show the domination and stereotyping of women in Indian society?
- How do films represent agency aspects of women's lives?
 - How does Indian cinema integrate and interpret women's agency and subjectivity in films?

2. REVIEW LITERATURE

Considering the subjects of gender, cinema and society is important. It is surprising to find that there is relatively less literature on the said topics. Also notably whatever material is available is primarily from USA and very little work has been done in India. Here, we would like to discuss the writings specifically in the context of the Hindi film industry popularly known as Bollywood.

Mayne (1981) analyzed women's cinema as having two definitions. The first would be those films made by women and the second refers to female audience in Hollywood products. She focused on the issue of the relationship between the inauthentic and the authentic portrayals of female experience as also on women's relationship traditionally and historically as filmmakers and as film consumers. She worked mostly on classical Hollywood films throughout the 1930s, 40s, and 50s, especially on the works of women directors like Dorothy Arzner and Ida Lupino. She found that women function as objects of spectacle and projection of male *Ease of Use* fantasies in classical cinema. She focused on the public and private spheres of women's life, the public including cinema as a field of business and industrial production along with the social institutions related to them, and the private containing home, family and personal life of the character. Using the feminist theory she explored how women interact within the private and public realms.

A study by Shohat (1990) analyzes "oriental" films, which either are stories about the orient, stories located in the orient or at least have some oriental characters in them. Such movies provide us with Hollywood's view of the orient, especially the view of gender (woman) as a product of the western male gaze. Such kind of films show veiled women as a metaphor for their land, which is ripe for western domination, because east is characterized as the other and west as Ego. For instance, in Hollywood films like *Ishtar* (1987) and *Lawrence of Arabia*, oriental women characters are under the power of western men. Similarly, colonized women are under the protection of the colonial patriarchal figure and they are an object of spectacle for the western voyeuristic gaze. The sexual hierarchy shown in these films additionally indicates a western racial view, which occupies the centre of the narrative by white women and men. The white woman is desired by the male protagonist and the darker marginalized women appear as sexually subordinated. It should be noted that in these oriental films the traditional sexual role and gender hierarchies are marked by the domination of the western men.

Similar views are presented by the researchers who have worked on the Hindi cinema. Datta (2000) examined the concept of cultural identity and personalized nationality with implications on gender through media and film. The main question in her study was about how larger ideological forces and market forces impact process of gender presentation in Indian cinema. She mentioned that in the 1980s with the coming of satellite television, the worldview changed. Narrative cinema was inundated by the overriding image of women as being dominated

by masculine ideals of representation such as muscular body and physical aggression and it also presented conservative ideology in valorizing the male and objectifying the female. At the end of the twentieth century globalization has represented the interests of the free market for all the people. This transition and using of nation as a family paradigm has located women in subordinate positions, confined to domestic and motherly roles. The process of globalization simplifies image making from a historical or social context. But she believed that women's movement and struggle for an egalitarian society brought women from the margins to the centre of their texts and focused on female subjectivity. Some filmmakers such as Aparna Sen, Vijaya Mehta and Aruna Raje have shown portraits of protagonist women highlighting their social and sexual identity.

Butalia (1984) stated that the most powerful medium of communication in Indian society is commercial Indian cinema. Many directors have produced films about women's social issues and paid attention to some important women's issues such as marriage, widowhood, dowry and rape. This has shown that the role of women has become more visible on the screen. But it should be noted that in spite of films concerning women's issues being made, we can see only one film in every 100 that shows women as human beings in their own right. Most commercial films continue to portray women as sex objects and as unequal partners. She suggested that Indian cinema should focus more on balancing women's image and avoid the same stereotypes.

Anu Celly (cited in Jain and Rai, 2002) has analyzed aspects of women's representation in "Indian popular cinema". Using semiotic and psychoanalytical approaches she pointed that the image of women is not the reality in their life. On the contrary, women's functions are factors of myth, custom and ritual. She also believes that the victimization syndrome is a component of women's image and life history and usually gazes of the male protagonist control and limit women's subjectivity and sexuality in to an object. For instance even a film like Satyajit Ray's "Devi" which is seen as a kind of revolutionary and pioneering attempt to show women's image as a protagonist, there is a use of myth as a normative paradigm for the ideal construct of womanhood.

Chatterji (1998) has written a book entitled *Cinema Object: Woman: A Study of the Portrayal of Women in Indian Cinema*. This book is perhaps, the first attempt by an Indian film critic within the framework of Indian popular cinema and was the result of three years of intensive research, through films, books and documentation consisting of archival material on Indian cinema. The idea was rooted in a consistent thrashing of ideas and concepts attacking the patriarchal dominance in Hindi popular cinema through articles written in Indian publications and papers presented at seminars on cinema over the past two decades. It is an emotional response to the portrayal of women in Indian cinema based on psycho-analysis, semiology and structuralism. It has sought to place Indian popular cinema in perspective along sociological lines where the subjects of mythology, marriage, adultery, prostitution, rape, suicide and male masquerade have been analyzed through the glasses of an Indian woman addicted to cinema and to women.

Supriya Agarwal (cited in Jain and Rai, 2002) has provided an analysis of the Muslim women's identity in films. She argued that in Hindi cinema between in the 1970s to 1990s the portrayal of woman was projected through stereotypes and the women's point of view was never included in her role. This also holds true for the projection of Muslim women as members of a minority community marginalized in society. They are placed in stereotypes and with little choice in their own lives. In her study she analyzed four Muslim women centered films – *Pakeezah* (1971), *Nikaah* (1982), *Bazaar* (1982) and *UmraoJaan* (1982). In these films we can see that a secondary position is imposed on women by strong environmental forces of society and they are shown to be oppressed by various societal pressures. In fact, women are presented from the male point of view in that they cannot have a respectable or independent identity without being under the protection and control of men. Men are Depicted as strong, powerful and authorized. On the contrary, women are depicted as weak and powerless and have to submit to male authority. She suggested that by formatting a counter hegemonic feminist discourse, all these problems need to be challenged and discussed.

Uberoi (1990) analyzed representation of women in Indian popular art. She has mentioned in her study that women's representation has two processes. The first is the commoditization of women and second is the tropising of the feminine within an overall cultural context that is both homogenizing and hegemonic. She noted that in many genres of presentation in social and cultural activities, women are prominent objects of male desire and potential possessions. She analyzed two main reasons for their invisibility both in society and in media. On the one hand, because of marginalization of women in patriarchal discourse, they have never been allowed to make their full and proper contribution to society and on the other hand society's.

Legitimizing myths and authority have been controlled by males, while women have been possessed and exchanged in the social relations among men. She showed different aspects of modification/objectification of women and women's bodies in related media such as advertising, film and etc. She believed that the Indian

culture and stereotypes have affected women's role in society. The national culture and modern period has seen 'womanliness' subjected to process of hegemonization and homogenization of its identity. The mass media catering to the demands of the market mechanism have been the active instrument of this transformation.

3. DEFINITION OF THE PROBLEM

4. RESEARCH OBJECTIVES 7

He study has two primary objectives and few secondary objectives that are derived from the primary Objectives.

I. Primary objective

The first primary objective of the study is to find out the types and trends of different role portrayed by women in Indian Cenima and Advertisements

Hypothesis

H0: there is no statistically significant association between different role portrayed by women in Indian Cenima and Advertisements with other collarets of advertisements under study (status, setting, credibility, voice-over, eye-contact and product category)

Some sub-objectives are derived from the primary objective.

1. To find out the frequency of different role portrayed by women in Indian Cenima and Advertisements.
2. To find out whether the role portrayed by women has any association with their status in advertisements
3. To find out whether the setting of the advertisements varies according to the role portrayed by women in advertisements
4. To find out whether the role portrayed by women has any association with their credibility in advertisements
5. To find out whether the role portrayed by women in advertisements has any association with the voice over of advertisements
6. To find out whether the role portrayal of women has any association with their eye-contact in advertisements
7. To find out the association between the role portrayed by women and the product categories in the advertisements

II. Primary objectives

The second primary objective of the study is to find out the perception of the respondents' regarding different role portrayal of women in Indian Cenima and Advertisements on the basis of their gender, age and education

Hypothesis

H0: age, gender and education has no impact on the perception of the respondents' regarding different role portrayal of women in Indian Cenima and Advertisements

Sub-objectives that are derived from the primary objective are:

8. To find out the general perception of respondents regarding different role portrayal of women in indian tv ads.
9. To find out the differences in perception among the respondents regarding the role portrayed by women in Indian Cenima and Advertisements on the basis of their gender
10. To find out the perception difference among the respondents regarding the role depicted by women in Indian Cenima and Advertisements on the basis of their age group
11. To explore the perception difference among the respondents regarding the role portrayal of women in Indian Cenima and Advertisements on the basis of their educational qualification.

5. SCOPE OF WORK

Women are constantly Depicted in traditional roles and as sexual objects exclusively in Cinema & Cinema and advertisements. The types and trend of the depiction of women in Cinema & Cinema and advertisements alter over time (Michell & Taylor, 1989; Das, 2000). Thus it is important to have the continuous & constant study on this issue to discover the status of the women represented through the media over the period and to discovery out the opinions of the audience about it. Cinema & Cinema and advertisements are selected for the purpose since of its convincing and omnipresent nature. Among the Cinemas, movies are chosen for the study as they have a very powerful impact with wide coverage.

However, there are numerous studies on the content analysis of the role depiction of male and female in print & visual Cinema and advertisements (Courteney & Lockeretz, 1971, Lysonski 1985, Goffman, 1976; Ford, Voli, Honeycutt, & Casey, 1998; An & Kim, 2007) these depictions are cross cultural in nature. Role depiction of women in Indian and other Asian nation's Cinema and advertisements vary since those of the western Cinema and advertisements (Ford, Voli, Honeycutt, & Casey, 1998; Das, 2000) because of the difference in cultural values, beliefs and religions (Das, 2000). A study led by An and Kim (2007) explore that in South Korean Cinema and advertisements women are most probable to be depicted in main characters than those from the US. Das (2000) while conducting the study on Indian magazine Cinema and advertisements find that women are Depicted less often as sex objects than that of the Cinema and advertisements in western countries. (Das, 2011) claims that Indian women's notions of equal opportunity and feminism vary from those of other nations particularly of western nations. As countries have their diverse religion, values, beliefs and norms (Das, 2000), it will not be fair to simplify the results.

Though wide researches from the western countries added considerably in exploring the gender representation, particularly the depiction of women in various medium of Cinema and advertisements, in Indian context their numbers are few. Of that very few, most of them are attentive on Indian print Cinema and advertisements. Mathew (1990) conducts a study on the role depiction of men in Indian male market separation. Manushi (1998) explores the depiction of housewives that are more prevalent in Television Cinema and advertisements of 1990s. The studies conducted by Das (2000; 2011) on Print and TV Cinema and advertisements respectively find that though the portrayal of women in Cinema and advertisements have changed over the time; still they are Depicted stereotypically. But none of them had any scope to discover the perception of audience in this context. They only analyze the content of the Cinema and advertisements; there is no further tool to cross check the result.

Dwivedy, Patnaik and Sur (2009) try to explore the responses of the younger group (20s-30s) on magazine Cinema and advertisements and find differences on the basis of the gender. The recent studies of Sukumar (2014) and Nagi (2014) have tried to discover the general observation of the audience; but they didn't try to find out the observation difference among the audience on the basis of their gender, age or education. Besides these studies, the audience reply to the gender role portrayal or especially representation of women in Cinema and advertisements has not been studied in Indian context. Few studies examine the reply of the audience over this matter but they are all based on the western context. As contingent on the variation of age, education, occupation and gender, audience will answer back differently to the same communication content in Cinema and advertisements (Dwivedy et.al., 2009), it provides a wide scope to the present study to study the same in Indian context as the values, standards, religions are different here and the perception of people is changing over the time.

The present study will bond the gap by accepting the triangulation of methods to measure the construct i.e. the depiction of women in Indian TV Cinema and advertisements through two different methods, i.e. content analysis of the Cinema and advertisements and exploring the insight and observation difference among the audience on the basis of their gender, age and education through organized questionnaire. It will also cover a wider age group ranging from 18 years to 60 years which additional increase the meaning of the study. The study further tries to look at the effect of cultivation theory according to which, what mass media is repeatedly showing are progressively taking shapes in the society with the constant exposure to it.

Though Cinema and advertisements have many forms from print, billboards to TV and internet Cinema and advertisements, the focus of the study is on Television Cinema and advertisements as it has a very prevailing impact with wide coverage. It produces an situation that seems real through careful blend of verbal and visual mechanisms. As in TV, Cinema and advertisements are repeated through the day they give a lasting impression on viewer's mind.

6. RESEARCH QUESTIONS

Research Question 1: What are the main roles of Indian cinema played by women's?

Research Question 2: To what extent different standards in Indian cinema are showing concern to women empowerment?

Research Question 3: What are the approaches taken for improvement in women participation in Indian cinema?

Research Question 4: What are best stories and novels that put women in their main role?

7. ORIGINAL CONTRIBUTION BY THE THESIS

Original contribution has been made by many research scholar and have been taken the next steps from there to accomplish this existing thesis.

8. RESEARCH METHOD

With the purpose of data collection in the qualitative research we have chosen the narrative method for analyzing the selected films, where we have also tried to study the two stories in certain cultural and social contexts. The choice of the films was based on the fact that these two films are comparable to each other having some similar issues to study. They belong to art house cinema and they are nationally and internationally acclaimed. The films are women-centered and mostly have concentrated on women's issues in different situations, especially in the gender relations context. In these films we can see various aspects of women's lives, and the challenges which they have to face in Indian social contexts. These films also show how women can break the social and the cultural boundaries which they were constrained by.

8.1 Indian Films under Study: Daman and Mrityudand

9.1.1. Daman directed by Kalpana Lajmi

Among all of Lajmi's cinematic works, *Daman*, meaning dominance, is by no means a run of the mill Hindi film. It dares to tackle the hard-hitting subject matter of domestic violence and marital rape.

Daman tells the story of a young woman who is subjected to years of physical and psychological torture at the hands of her husband. Durga is a low caste girl married off to a sadist husband Sanjay Saikia who is a wealthy tea plantation owner. Sanjay Saikia is a pervert and there is nothing decent about him. He is shown as a very one-dimensional person whose only motive in life seems to make everyone's life miserable. From the first day he does everything to humiliate and degrade his wife and while she pines for him he is busy having a good time with another woman. All attempts of Durga to be nice and pleasant to her husband are met with sneers and violence. His idea of showing his love to his wife is scorching her with hot candle wax, disfiguring her face with lipstick and remorselessly raping her. In that mad house the only source of comfort for Durga is her brother-in-law, Sunil who unlike his elder brother is gentle and cultured and the only one who seems to understand Durga. Yet he cannot do much for her. A silent relationship does build up between Durga and Sunil, but there are no signs of physical proximity between the two. Kalpana Lajmi has very tenderly shown their relationship where there are repressed passions but nothing beyond that.

When Durga gives birth to a baby girl, Sanjay refuses to acknowledge her as his daughter. He had wanted a boy, another social issue sandwiched in between by the director. With Sunil's unspoken support and for the sake of her daughter, Durga is willing to endure all the pain and the humiliation. However, things continue like that until Sanjay in a fit of temper decides to marry off his 14-year-old daughter. Sunil protests and in turn is brutally murdered by his brother who throws him in the gushing river. *Durga* is completely shattered with this incident and manages to run away with her daughter to *Gauhati* where an elderly woman gives her and her daughter shelter. Time passes by, but Sanjay soon finds them both and when he tries to lure the daughter back to him by bequeathing all his property to her, she refuses. Furious at being refused and rejected he tries to kill his daughter, but *Durga* emerges as a raging lioness and the immense strength of Goddess *Durga* helps her keep the resolve of not allowing her daughter to suffer the same fate as her. *Daman* depicts women's suffering due to male subjugation and domination. It is a film that highlights the important problem of domestic violence which is a stigma on any society. The film focuses on the dark side of the institution of marriage and conveys the trauma of a victim of marital rape. It brings to light the oppressive conditions of a married woman's life in an arranged marriage. The film portrays how a woman can be physically and emotionally exploited by her husband and shows violence as an indicator of social structure while also offering women's agency as a response to domination. As the film shows, the protagonist despite her subjugation has certain strength to rise above her situation, revolt against her husband and finally get out of a helpless situation even if it means killing him. The film indicates the essential point that women should be able to stand up against domination and fight for their rights (Khan, 2004).

9.1.2 Mrityudand directed by Prakash Jha

Prakash Jha has won eight national awards including the National Award for the Best Feature Film on Social Issues. Among his cinematic works one movie (*Mrityudand*) has been selected for this study. *Mrityudand* (Death penalty) is a Hindi film released in 1997. It was directed and produced by Prakash Jha. *Mrityudand* is a Bihari story of three village women revolting against their husbands and ultimately rushing to their doom. The plot revolves around three women, Ketki, Chandravati and Kanti. Ketki and Chandravati are sister-in-laws while Kanti is a servant. TirpatSingh, a contractor, gets involved with Ketki's husband Vinay and soon, murders

him due to some complications. Ketki witnesses Kanti being exploited by Tirpat. Chandravati, who is neglected by her husband Abhay Singh falls in love with Ram Baran (Om Puri), a Dalit and becomes pregnant. The film shows three women, who have gone through a lot of ordeal in their lives, deciding to rebel against the society. The villagers severally punish their rebellious behavior. They get the ultimate punishment. They get death sentence.

The film is set in the fictional village of Bilaspur, Bihar in 1996. The movie starts with the grisly portrayal of a mob killing of two defenseless women, orchestrated by vested interests, and how village power players later evade administrative inquiries into this atrocity. This incident sets the tone for much of the rest of the movie. It is a film which subtly weaves several sub-plots into itself. The underlying story of the film is about Ketki who gets married to the younger son Vinay of landlord who fortunes have been consumed and who now lives on past glory.

This movie tells the story of a family beset by financial troubles brought on, in part, by the machinations of a corrupt politician and a vicious, thieving businessman. They are quickly plunged into the midst of machinations by several powerful and unscrupulous villagers.

Foremost among them is contractor *Tirpat*, a powerful, corrupt and ruthless man who oppresses poor people and especially women with impunity. *Vinay* too becomes influenced by *Tirpat*, and under this influence spirals down a dark road of domestic abuse, alcoholism, and selfishness that alienates his loving wife and tears apart the whole family, despite her best efforts to fight this. The village is ruled by the contractor and broker *Tripat*, aided by the local politician Pandey. Rambaran (Om Puri) is a lower caste merchant who has been giving loans to the landlord's family. When the businessman – *Tirpat*, the film's unequivocal bad guy – schemes to murder the local *pandit*, the new owner of a valuable quarry, namely, *Chandravati's* husband *Abhay Singh* takes the *pandit's* place. This leaves his younger brother *Vinay*, a newly-married aspiring contractor, in charge of the property and ripe for manipulation. *Tirpat's* schemes bring ruin to *Vinay* and threaten his blissful marriage to *Ketki*.

Apart from portraying the internal politics of caste and economics running in the village which has one foot in the past and one foot in the present, this film discusses emotional and physical violence against women. The eldest sister-in-law *Chandravati* is the long suffering wife of *Abhay Singh* the eldest son of the family. For 17 years of their marital life she has been emotionally and physically abused by *Abhay*, who loses no opportunity to remind her of being a *banjh* (sterile woman). To escape the drudgery at home and to regain clout, *Abhay Singh* murders the temple head, the *pandit* and gets himself ordained as his successor. The result is that he gives up all worldly pleasures and leaves his wife. After a life-threatening illness, she finds comfort in the arms of a family friend, the low caste Rambaran.

As *Vinay* struggles to keep the household going, *Ketki* aides him to start off his own entrepreneurial venture as a contractor, but soon *Vinay* becomes a pawn in the hands of *Tripat* and Pandey. It is the beginning of the end for him as he starts physically and emotionally abusing *Ketki*. In the meantime, Rambaran talks sense to *Vinay* and makes him see the fact that he is being taken for a ride. Rambaran's daily visits to *Chandravati* bring them closer and, as their relationship turns sexual, *Chandravati* discovers she is not sterile. *Vinay* in the meanwhile has taken care of things at home and got back at *Tripat*. Even *Ketki* comes back to him, but *Tripat* has *Vinay* killed to regain his power.

Meanwhile, *Ketki's* maid *Kanti* faces travails of her own. She is forced to give herself to *Tripat's* men to repay her husband's debts to him. However, inspired by *Ketki*, the sisters-in-law and an army of other women terrorized by *Tirpat* and his cronies stand up and fight against the subjugation they have endured. The rest of the movie deals with their efforts to break out of this morass, both within their relationship as well as outside of it, and *Vinay's* and especially *Ketki's* long, hard, and bloody struggle to confront and defeat the forces of oppression and male domination in the village. The film ends with a melodramatic showdown, a literal battle of the sexes, which leaves no doubt that justice has been done, though with a price.

Mrityudand is a film that straddles the art-house and mainstream filmy universes. It is used as a microcosm of the decadent landlord culture. The landlords are just coming to terms with the new class politics that through the reservation policy puts them at an advantage. It is the story of class conflict immersed in the economic power games being played by power brokers and middlemen at the grassroots level. Additionally, the film is a commentary on social and gender injustice and social problems. *Mrityudand* is a film that attacks the very concept of male dominance in a relationship and in the society. The film states that it's the man's virility and animal strength that makes him attack a woman, but affirms that what is more important is the upbringing of the

man. *Prakash Jha's Mrityudand* witnessed a new face of the educated Indian women, willing to rebel and fight for her rights.

9.1.3 Portrayal of Women in the study Films through Agency

After looking at the general plots of the films *Daman* and *Mrityudand*, in the following section we examine the twin processes of Indian women having agency in representation in cinema. We will see how gender is organized by culture and interrelated within larger social relations; how Indian culture and tradition affect women and their status in society; what is the level of women's agency and submissiveness through their interaction's patterns; how cultural beliefs and interactional patterns have formed women's representation in cinema; and what kind of characters are represented in the selected films specifically in the area of power and autonomy of women. The important point is how cinema reflects those mentioned facts and shows woman as a victim or as an agent. The subjects of empowerment, decision making, education, rebellion, participation are the themes related to agency.

9.1.4 Education

The rise of feminist ideas has led to the tremendous improvement of women's condition throughout the world in recent times. Access to education has been one of the most pressing demands of these women's rights movements. Education is a potent tool in the emancipation and empowerment of women, the greatest single factor which can incredibly improve the status of women in any society. Education enables women not only to gain more knowledge about the world outside of her hearth and home but helps her to get status, positive self-esteem, and self-confidence, necessary courage and inner strength to face challenges in life that social structure throws at her.

Since the prehistoric times women were denied opportunities and had to suffer due to the hegemonic masculine ideology. This unjustifiable oppression had resulted into a movement that fought to achieve the equal status of women all over the world. Women's education in India is the consequence of its progress and it has led to the tremendous improvement in women's condition. More importantly, it has helped bolster the agency of women.

In *Daman* the director pays great attention to the topic of education of women. When Durga's husband finds her after she has left him and wants to take their daughter with him she talks to her husband about equal right between man and woman and importance of women's education. She asserts that "*My friend and I were discussing marriage and studies. She was telling me how liberal her husband is. He believes in equal rights for man and woman in marriage. And I told my friend that I too wanted to finish my studies but you refused. Now no one will come in my child's way. She will have every right to complete her education and choose her own husband. She will not be like me*". In this film we can see that Durga's husband wants his daughter married at an early age without completing her studies. Durga feels angry and says that "*I just want Deepa to have a bright future now. I want her to complete her education, to ensure that I am ready to do any work*".

In the second film *Mrityudand*, the protagonist is an educated woman who gets married after receiving her college degree. She has a strong character and manages different situations of familial and public relations in her village community. Although in this film there is no direct focus on the subject of the education of women yet it is quite clear that it is Ketki, an educated woman who is the first woman to rebel against the patriarchal system and it is she who motivates the other women to join her in this fight against male domination. Thus in both films although women's education is not a focal issue, yet its importance is depicted.

9.1.5 Decision Making and Participation

In most societies males make the importance decisions in the family and in the society. In the family as well as in the society the decision making power is denied to the women that makes women voiceless, destroys their self-confidence and causes them to feel less important in the family as well as in the society. In India too, a large percentage of women do not have decision making power. They cannot make decisions independently, not even related to their own life. They have to take permission of male members for each and every issue, be it their education, marriage, or their children.

Autonomy is the ability to obtain information and make decisions about one's own concerns. It facilitates access to material resources such as food, land, income and other forms of wealth, and social resources such as knowledge, power, prestige within the family and community (Acharya et al., 2010). Limitations to women's physical, sexual, economic, social and political autonomy may affect women's decision-making processes. On the contrary if the women attain this autonomy, it becomes a source of their empowerment and agency.

Both films have shown how once the women take the first step towards decision making autonomy, the process of their liberation begins. In *Daman* Durga, who could not take decisions regarding her own life, becomes

empowered when she decides that she would not let her daughter suffer the same fate and would ensure that her daughter gets the right to make the decisions related to her life. She says to her daughter, *"It will not happen as long as I am alive. You will have all the rights to choose your life partner. You have to complete your education. You have to reach your goal. You have to achieve something and prove yourself"*.

In *Mrityudand* too, Ketki chooses the way she would lead her life in the face of great resistance as she feels that she can recognize what is right and what is wrong for her. In a scene when she is taking her sister-in-law away from their house for recuperation after an illness, she is asked by a woman *"Why are you leaving your husband in this condition? Don't you need to look after him and his needs?"* She answers *"It will be just for a couple of days. The cook and the maid can take care of the men folk"*. This is a small step towards exerting her power of decision making. Also, when Chandravati realizes that she is pregnant with the child of her lover, she says to her friend that *"I've broken all the rules. I have done it. I decided to. It is the first time I have used my will. How long does one follow the rules? And what rules are these that force us to tolerate endlessly? How much? And for whose sake? I don't care about the consequences."*

9.1.6 Empowerment and Rebellion

Empowerment contains within it, the word power. So naturally it follows that empowerment is about power and about changing the balance of power. As far as the women's empowerment is concerned, it is about gaining control over one's life which includes many dimensions such as economic, social and political (Bheemarasetty,, 2012). Comprehensively, women's empowerment is a state of being that reflects a certain level of critical consciousness about external realities and an awareness about their internal thought construction and belief systems that affect their well-being in terms of gender justice and social justice, as well as the determination to use their physical, intellectual emotional and spiritual resources to protect their lives and sustain values that guarantee gender equity at personal, social, economic, political and institutional level.

Recognizing women's rights and believing their ability are essential for women's empowerment and development. Once women realize their own capabilities and potentials it strengthens their self image and fosters them with confidence to take action in life. Empowerment of women is the fundamental to the basics of human rights where women have neither to beg for power nor search for power hierarchy to exercise power against others. On the contrary they demand to be accepted as human first of all.

Indian society has been marked by male chauvinism but now the society has started to realize women's importance and is slowly learning to accept women's empowerment and women as active agents, participating in and guiding their own development. Signs of this can be seen in cinematic narratives also.

In *Daman*, the director has emphasized women's empowerment and improvement of women's status with help of education. In a sequence the police officer expresses his perception about women's empowerment and tells Durga that *"Be aware. Move ahead in life. Get out of this lonely existence. You can fight against the atrocities of men. You can demand for safe guarding women's rights and fight for protecting their self-respect. Only the laws of the country will not be able to protect you. You will find yourself strong and well equipped only with a weapon like education. This will cause social awareness among women"*. She replies that *"That is why I will complete Deepa's (her daughter's) education. She will have every right to live life. I will not create any obstacles in her life. Neither will I force her into marriage. She should be economically independent so that no man can treat with her the way my husband did with me"*.

In *Mrityudand* also we can observe the heroine Ketki, an educated woman, is a very strong person. After her husband started to abuse her, he wants to touch her. But she tells him that *"Don't touch me. There is a limit to one's tolerance. Do you think you could drag me into bed, after just saying sorry? Would that set everything right? What do you think women are? Mere toys? Everything is finished; I've fallen in my own esteem. Hitting me is not a small thing. Does this not matter much to you? Do I have no identity of my own? Do I not matter at all?"* When her husband tells her *"What about my needs? You remember your limits woman"*, she replies *"You can't define limits with violence. You are my husband, not God"*. Clearly Ketki comes across as a strong person who has the strength to defy her husband although they live in a highly patriarchal system.

In another sequence when Kanti the maid tells Ketki about her apprehensions regarding the contractor to whom her husband owes money and who is asking for sexual favors in return, Ketki says to her *"He can't force you to repay. And he can't burn your house. It's just that you don't know what the law says. You mustn't be afraid if he comes calling again. Don't think you are weak just because you are a woman"*. Through this statement she offers hope to all women who feel helpless in the face of patriarchy by making them aware of their rights.

Similarly, the idea of women rebelling against the man-made norms is also presented in both films. With regards to women's agency and rebellion, Durga in *Daman* rebels against the misbehavior of her husband and leaves him taking her daughter with her whom she is planning to marry off to an old man. And when he becomes a nuisance in their life and she feels her daughter's life is threatened by him, she finally becomes Mother Durga, the Hindu goddess signifying female dynamism, who is the destroyer and slayer of demons, and kills her husband rebelling against the image of the dutiful wife who tolerates everything her husband does.

It is interesting to mention that *Durga's* daughter is quite unlike her mother. She clearly expresses her feeling of hatred towards her father for causing her mother's sufferings. She tells her boyfriend, "*I am not a devoted and submissive wife. My father has returned to make life hell for me and my mom. Protecting women, love, marriage is that all you men can think about. I don't want to be dependent on you or any other man. What made you think that I will remain just a wife and go through all the agony my mother has gone through all her life*". She, too, rebels against the stereotype of the 'good girl' that she is expected to be.

In *Mrityudand* too, the presentation of women's empowerment and rebellion is done through various scenes. In one such sequence, a poor woman in village stands up to her boss when he treats her in badly. The man says to her that "*You talk to me in this way in front of the whole village. What do you think you can do? A whore*". She replies that "*If I am the whore you are my pimp. I'll say it. A hundred times over! I spit on you.*" It is an important moment as an ordinary women stands up to the might of a powerful man.

In another sequence some women under the leadership of Ketki go to Tripat Singh's place to protect a poor woman. The man says to her that "*Enjoy the display of my power. Welcome to the show*". She asserts that "*I can see Contractor Tripat Singh. But I am amazed. Why aren't all these people who seem to be enjoying your circus, not clapping? May be your show isn't over yet. Maybe this poor woman hasn't been abused enough. What are you waiting for? Go ahead. Rip her clothes off. Show the people the power of your brute force. Then they will clap for you. They will cheer you all the way. And they will remember this circus for a long time to come. I'll leave of course. But not without my sister. Stop me if you can. Maul me if you will. Perhaps the villagers will enjoy your circus even more.*" This impressive scene reveals that how women can come together and break men's domination and rebel against patriarchy.

Then there is Chandravati, the otherwise meek and traditional wife of Ketki's brother-in-law who rebels against the social norms by bearing a low caste man's child because her husband neglects her. On learning about this, the husband tries to hit her and she tells him in this scene, "*Come on. Try and kill me. Show me your strength. Even if it be like this, let me for once, feel the pleasure of fulfillment. What a hypocrite you are. I was dead for all you cared. Why have you come back now? To assert your authority? To exhibit your might? Did you think you can hurt me just because I am a woman? You thought you could break me. I too am full of life. I want to live*". It is worth noting that the director of *Mrityudand* has emphasized women's agency which has been Depicted in many sequences as mentioned above. There is an impressive statement in end of the movie about women's empowerment. Ketki tells the audience that "*Do not think I am weak. Do not deprive me of my dignity. I am not powerless. I have done my duty as a woman. I shall bear my responsibility as a mother. With all my love I shall nourish my child. And I shall tell my child never do an injustice to the weak. And never ever succumb to injustice.*" Thus, as the above discussion on the films *Daman* and *Mrityudand* has made it clear cinema can be an important medium for the depiction of both the structural dimensions of a society, as also the agency phenomenon.

9.1.7 Comparative Analysis

Daman tells us the story of Durga who is shown to endure immense ill-treatment – physical and emotional – by her oppressive husband. She chooses to leave him in order to save her daughter from being ruined by an early marriage and on being pursued by her husband who now threatens the life and freedom of her daughter, she kills him. The second film *Mrityudand* portrays three women's story. There is Ketki who lives in a traditional family and tries to stand up to the patriarchal system. There is Chandravati who is the epitome of the quietly suffering woman who tolerates injustice mutely. And then there is Kanti, an impoverished woman who is exploited by men since she bears the double cross of not only being a woman but also being poor.

It is significant to note that in both films, women who have led unhappy lives search for liberation from societies ruled by men. They suffer from the injustices heaped on them by the patriarchal system but choose not to be viewed as victims. Instead, they all strive to change their dependent and subordinated positions. They go through a lot of hardship in their lives but decide to rebel against the society by making efforts to impose their own will and demands on their relations with men, both in the private and public spheres. They are presented as changing image of women moving away from traditional portrayals of enduring, self-sacrificing women

towards self-assured assertive and ambitious women making society aware of their demands. Let us now discuss the commonalities and differences in the films in terms of the sub-themes which are related to women's agency within the two selected Indian films.

9.1.8 Education

Education as a source of women's empowerment is a significant subject which has been stressed by Indian filmmakers. In many films it has been depicted that educated women are more aware of their needs and rights and that it is more likely that an educated woman would try to challenge the patriarchal rules which hinder her development. In the Indian film Daman, once again the protagonist Durga is depicted as a woman who is not educated and leads a miserable life having to tolerate ill-treatment by her husband and his family. In a poignant scene she is shown to rue her being uneducated and displays her desire for educating her daughter so that she can be spared of the kind of existence that Durga herself has led. Finally, although the film Mrityudand does not focus directly on the subject of women's education, however, it is shown that in a village full of traditional inhabitants, it is an educated woman Ketki who first stands up to the injustices inherent in patriarchy and then motivates other women to rebel against the exploitation and domination of men. Thus, there is a similarity between both films which extol the virtues of education, directly or indirectly. However, it is important to take note of the fact that of the both films, it is the one directed by women which focus more clearly on this subject whereas in the male directed film, the issue is touched upon indirectly only.

9.1.9 Decision Making and Empowerment

One of the main indicators of agency is decision making power. It is a well-known fact that patriarchy is characterized by men making all the decisions whereas women stand at the sidelines merely conforming to the norms and decisions made by men. In this sense the capacity to be able to take independent decisions would indicate empowerment for them. In the films under study it becomes relevant to see whether the central female characters individually take any decisions or do they also portray the traditional roles of women following their men's directions. In Daman the protagonist takes the decision to leave her home to bring to an end her misery on account of the abuse she suffers at her husband's hand. Mrityudand shows Ketki as a woman who first takes the decision to defy the males in her household and the village and then to lead the other women towards emancipation from domination system. The other character Chandravati, an otherwise traditional woman decides to break the social norms, leave her home and have an affair with a low caste man. Thus in both films women become sensitized to their power and try to challenge the existing structure by taking some bold decisions..

9.1.10 Rebellion

It is interesting to mention that most of women characters in the two selected films have a touch of rebellion in their personality. These are a woman who attempt to assert their individuality through their actions, sometimes not even thinking about the consequences of this actions. The protagonist Durga in Daman rebels against her husband's violence and finally kills him, thereby breaking away from the expected image of a submissive woman. Notably in Mrityudand, rebellion is emphasized by showing all women coming together and rebelling against the patriarchal system assertively. In the Indian films Daman and Mrityudand, however, we see greater evidence of women's agency to rebel against the social norms and patriarchal ideology and their capacity to change the system.

10 CONCLUSION

Cinema is a social phenomenon. It is a reflection of the society. Films, can thus, be examined as a cultural product and as a social practice. Films reflect society's main values, ideas and beliefs. The cinematic studies in the field of sociology usually study sociological themes such as social structure, hegemony, patriarchy, subordination, marginality, with special attention to the issue of effects of caste, social class, religion, tradition and ethnicity in the analysis of representations in films. Gender too, is an important aspect of the cinematic narratives. Gender is culturally constructed in social interaction and social structure in the course of cinema which depicts and captures the real lives of people in the social and cultural spheres. In fact, the theme of cinema as a reinforcer of traditional structure or as a tool of social transformation is one of the integral debates in the sociological analysis of films. Our study too is a modest effort in this regard. In this study we have discussed the linkage of gender and media with specific focus on women's depiction on screen. The general purpose of this study was to investigate the interrelation of gender, women and cinema in the context of Indian films. The mode of study that we made use of was qualitative research method which took the form of narrative method for analyzing the selected films. These films have focused on similar issues related to gender relations. Both films belong to the category of art cinema. The films show women characters both as oppressed beings and also as empowered individuals. By examining the representation of women in Indian cinema, with the help

of film criticism theory and literature on agency, we have tried to unearth the importance of emerging women's cinema. We focused on the agency aspect of women in challenging the traditional social norms. In the Indian film *Daman*, *Durga* turns into a murderer. In *Mrityudand*, the act of all women in the village coming together and attacking the errant males is seen as an empowering feat. Which leads to the question that can this highly emotional and exciting scene in the cinematic and dramatic context be replicated in real life? If yes, what would be its further consequences?

It is possible that the political and social conditions in India might make it somewhat difficult for the directors to move away from the typical treatments of their respective films, which may be especially true in the case of women directors. However, the end result remains the same. Even if to some extent agency is depicted in the portrayals of all female characters, yet, it appears that in all cases patriarchy, signifying structure wins. In the two studied films in this paper, we could see the typical male and female stereotypes and the portrayal of the patriarchal structure dominating not only the life of the women characters but also the narrative of the film. This makes it clear that in film circles all over the world it is the male gaze that rules the cinematic narratives. What can be further added to this is that this male gaze is not limited to the male directors but is very much a part of the women directors' work as well. The explanation is simple. Women directors, despite their desire to produce works that deal with women's issues, are themselves unable to transcend the cultural value structure that pervades the society in which they have been raised and in which they live.

In conclusion, we would like to re-iterate that the application of agency debate in this study was done with the aim of extending film analysis, especially the study of women's portrayal, from the usual psychoanalytical and semiotic approaches to a more sociological examination. In cinematic terms it means that since the image of women in cinematic representations reflects the realities of women's lives, then by showing empowerment and agency of women on screen, perception of society may be changed and people can be made have a better understanding of women's social and cultural issues. Since so much of discrimination becomes internalized as cultural values, cultural action and educational interventions are imperative to break down existing gender stereotypes fostered by patriarchy, both in films and in real life.

11 REFERENCES

- [1] Acharya D. R., Bell J.S., Simkhada P., Van Teijlingen E.R., and Regmi P.R. (2010). Women's Autonomy in Household Decision-Making: A Demographic Study in Nepal. *Reproductive Health*, 7:15. doi:10.1186/1742-4755-7-15.
- [2] Beasley, C. (2005). *Gender and Sexuality*. London: Sage Publications.
- [3] Bheemarasetty, P. D. (2012). Women Empowerment: A Challenge. *Social Science Research Network*, available at: <http://dx.doi.org/10.2139/ssrn.1997087>
- [4] Butalia, U. (1984). Women in Indian Cinema. *Feminist Review*, (17), 108-110.
- [5] Chatterji, S. A. (1998). *Subject Cinema, Object Women*. Kolkata: Parumita Publications.
- [6] Datta, S. (2000). Globalization and Representations of Women in Indian Cinema. *Social Scientist*. 28(3/4): 71-82.
- [7] Dines, G. and Humez, J.M. (2003). *Gender, Race and Class in Media*. London: Sage Publications.
- [8] Gokulsing K. M., and Dissanayake W. (1998). *Indian Popular Cinema: A Narrative of Cultural Change*. London: Trentham Books Limited.
- [9] Jain J., and Rai S. (2002). *Films and Feminism*. New Delhi: Rawat Publications.
- [10] Jackson S., and Jacjie J. (1998). *Contemporary Feminist Theories*. Edinburgh: Edinburgh University Press.
- [11] Jackson S. and Scott S. (2002). *Gender: A Sociological Reader*. London: Routledge.
- [12] Kandiyoti D. (1996). *Gendering the Middle East*. London: I.B. Tauris Publishers.
- [13] Khan, A. (2004). *Daman: Review*. [Online] available at: <http://www.rewaj.com/entertainment/daman.html>.
- [14] Lorber, J. (1994). *Paradoxes of Gender*. New Haven: Yale University Press.
- [15] Mayne, J. (1981). The woman at the Keyhole: Women's Cinema and Feminist Criticism. *New German Critique*, (23): 27-43

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-
- [16] Ritzer, G. (2005). *Encyclopedia of Social Theory*. London: Sage Publications.
- [17] Shohat, E. (1990). Gender in Hollywood's Orient. *Middle East Report*. No. 162
- [18] Uberoi, P. (1990). Feminine Identity and National Ethos in Indian Calendar Art. *Economic and Political Weekly*. 25(17): WS41-WS48.

EVOLUTION OF CORPORATE SOCIAL RESPONSIBILITY-A HISTORICAL PERSPECTIVE

Farhana Sultana and Geeta Thakur

Research Scholar, J. S. University, Shikohabad

ABSTRACT

There is a remarkable past related with the growth period of the CSR concept. It is evident that the businesses had concern for society for decades. For the past 30 years and above the corporate managers have strived to define the organizations responsibility towards the society. Historically it was mentioned that the corporation’s responsibility is to provide a improve the financial benefits to its shareholders, but later with the establishment of new government bodies emphasizing the environment, employees and customers as legal stakeholders, the corporate executives have broadened their corporate responsibility towards the elaborated stakeholders who have financial, legal and ethical rights. During 1950’s in the early works on CSR, it was termed as societal responsibility rather than corporate social responsibility. .With these varied emphases in the evolution of CSR a conceptual framework is proposed to give two areas of approaches that can be followed by the organizations (i.e. Ethical and market approach) which base their emphasis on either environmental needs or human needs of the society or both. Emphasizing the CSR activities of the organization also depends on the strategy of the organizations to reach out to their consumers either by building their equity or by emphasizing ethically on environmental concerns or human concerns. It also depends on the managers, if they think morally or immorally in initiating their CSR activities to attain market share.

Corporate social responsibility concept has spread widely across National and International companies. Many business firms are actively involved in CSR activities with the objective of having high impact on the reputation of the company in turn resulting into higher profits. Companies can gain a number of benefits by involving in CSR activities. CSR activities help the organization in building trust and social bonds with the stakeholders that indeed will be an asset, and the increased attention paid on CSR will determine the success of the organization in the long run.

There is a remarkable history related with the growth period of the CSR concept. It is evident that the businesses had concern for society for decades. For the past 30 years and above the corporate managers have strived to define the organizations responsibility towards the society. Historically it was mentioned that the corporation’s responsibility is to provide a improve the financial benefits to its shareholders,, but later with the establishment of new government bodies emphasizing the environment, employees and customers as legal stakeholders, the corporate executives have broadened their corporate responsibility towards the elaborated stakeholders who have financial, legal and ethical rights During 1950’s in the early works on CSR, it was termed as societal responsibility rather than corporate social responsibility. The below illustration depicts the major emphases given in different eras of CSR development.



EVOLUTION OF CORPORATE SOCIAL RESPONSIBILITY (CSR) WITH EMPHASES

With these emphases of CSR evolution in different eras, our review is to focus on the related models developed both in theory and practices and to see new dimensions in which the businesses should feel responsible towards stakeholders, mainly at the universal level with regards to businesses and society relationships.

For purposes of definitional review and in modern era of social responsibility, it is considered to take in to consideration the recent concepts of CSR. . Therefore, we begin with literature review from 1950's to 1970's, and the latest developments in this area are mainly from the point of view of the stakeholders.

LITERATURE REVIEW

Howard R. Bowen (1953) of his landmark book *Social Responsibilities of the Businessman* has argued to mark the inception of the modern period of literature on this subject.

Bowen (1953) initially defined social responsibilities of businessmen as obligations of businessmen is to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society” (p. 6).

Davis (1960) argued that social responsibility is a vague idea but needs to be followed from managerial point. He mentioned that the business decisions can be justified to have greater long-run returns, thereby giving it back, should be the social responsibility.

Walton (1967) stated that social responsibility is to maintain relationship between the corporation and society, and states that the top executives should maintain corporates relationship with the related groups in achieving their respective goals.

Preston (1978) and Carroll (1979), stated that corporate social performance (CSP) framework, have challenged the agency theory perspective. As exposed by Carroll (1979), this model includes the social issues involved which are a part of economic responsibilities of an organization.

Freeman (1984) emphasizes that firms have relationships with various groups and that these stakeholders will effect simultaneously effect the actions and will be affected by the actions of an organization..

Friedman (1970) states that engaging in CSR is a conflict of interests between the of managers and shareholders. He asserts that managers use CSR activities based on their personal, social and career interest at the cost of shareholders. Based on this he states that the resources should be used wisely from the societal point of view for increasing firms efficiency.

“To fully meet their corporate social responsibility, enterprises should have in place a process to integrate social, environmental, ethical, human rights and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders, with the aim of maximizing the creation of shared value for their owners / shareholders and for their other stakeholders and society at large identifying, preventing and mitigating their possible adverse impacts” (EC, 2011: 6).

Schrader (2011) as well as Shrivastava (2014) have found that corporations and Sustainable Human Development can be achieved from mutually favorable CSR activities in a wide range of Sustainable Human Development magnitudes.

PARADIGM OF CSR

1. **Pyramid of CSR.** (Carroll, 1971): There are four types of social responsibilities, which forms the total corporate social responsibility of a business. They are economic, legal, ethical, and philanthropic. The pyramid of CSR represents that the business has different components that forms the total CSR activities. Though the components have been considered as separate, they are not mutually exclusive. The relationship between economical & legal, economical & ethical and economical & philanthropic is not stated.
2. **Moral Management and stakeholders** (Archie.B.Carroll): The model forms a relationship between the ethical responsibilities of the management with its stakeholders. It describes the major ethical management approaches towards the major stakeholders as Immoral, Amoral & Moral. In the model, the moral manager's perspective towards the stakeholders is considered as important and profiled. Its focuses on the high expectations from moral managers, which may be hard to find and it is based on the characteristics of the management and their perspective towards the others in the society.
3. **Corporate Involvement in Society-A Strategic Approach** (Michael.E.Porter and Mark.R.Kramer): The model reveals social impacts, value chain social impacts & social dimensions of competitive context. It emphasis is on adding social dimension to its value preposition to have competitive advantage in the market. It is found that practically not all the companies can establish a value proposition around social issues.

4. **Capability Approach Perspective** (Kerstin Anstatt and Jurgen Volkert): The model focuses on capabilities, which are the results of Sustainable Human Development Governance, which influence individual resources like its financial, personal, social & environmental factors of a business. It also focuses on the instrumental freedoms involving social and environmental conversion factors. However, this can be applied to large corporations and SME's may find it difficult to apply as the CSR Standards are defined according to the corporate rule setters needs.

CONCEPTUAL FRAMEWORK

Based on the previous studies a conceptual framework has been proposed to determine two approaches ethical and market approach, which gives emphasis on environment and human issues that the corporations can adopt to take up CSR activities more effectively.

Figure-1: Corporate Social Responsibility (CSR) Approach Matrix

<i>Emphasis</i> <i>Approach</i>	<i>Environmental Emphasis</i>	<i>Human Emphasis</i>
<i>Ethical Approach</i>	<i>Ecofriendly</i> <i>Low Pollution</i> <i>Waste Management</i> <i>Low Carbon Emission</i> <i>Clean Energy(Solar/Wind Energy)</i> <i>Degradable Packaging</i> <i>Awareness Programs</i>	<i>Health and safety</i> <i>Healthy food processing</i> <i>Drinking water/Public utility services</i>
<i>Market Approach</i>	<i>Competitive Advantage over previous technology</i> <i>Organic Products</i> <i>Water conservation</i>	<i>Education-Awareness creation.</i> <i>Human Resource development.</i> <i>Establishment of innovation centers.</i> <i>Sports event sponsorship</i>

1. **Ethical Approach:** Ethical Approach is an approach, which is followed by the organization by emphasizing its CSR activities towards development of the society by following the ethical society norms and expected corporate behavior by the management, which should adopt morally accepted behavior towards its stakeholders. The ethical approach is not just a duty of the managers or a moral manager but it is to be adopted by all the stakeholders involved in the organization to initiate CSR activities.
 - **Ethical Approach with environment emphasis:** This approach emphasizes on initiating CSR activities by the organizations, which are ethically focused on environmental issues faced by the stakeholders. This approach is already practiced by various organizations like Hero MotoCorp Ltd. (formerly Hero Honda Limited) which is one of the leading 2-wheeler manufacturing automobile company, which is actively engaged in environmental programs with their vision to build a greener and safer environment for the society.
 - **Ethical Approach with human emphasis:** This approach emphasizes on ethical involvement of organizations in development of human resources by providing health and safety programs to the stakeholders. Organizations like National Thermal Power Corporation Limited (NTPC) is focusing its CSR activities by providing piped drinking water system, hand pumps in about 80 villages. It also provides water tankers to the village people during the summers when there is acute shortage of water due to severe heat.
2. **Market Approach:** Market Approach is an approach, which is followed by the organization by emphasizing its CSR activities towards achievement of higher market share. It is followed with some intentions to achieve a competitive advantage over other organizations, technology, awareness programs, etc. "It is the preferred way to reach out to consumers and it is also one of the preferred ways to build your equity and respect in the consumer's mind" as said by John.
 - **Market Approach with environment emphasis:** This approach emphasizes on initiating CSR activities by the organizations, which are towards achieving the market share by focusing ethically on the environmental issues in the society. They initiate their activities by achieving their market share by environment friendly initiatives. The organizations focus on making competitive advantage over the previous technology, producing organic products, water conservation, which are environment friendly. Brands like ITC, Nestle, and Godrej have also initiated programs for environment emphasis.

- **Market Approach with human emphasis:** This approach emphasizes on initiating CSR activities by the organizations, which are towards achieving the market share by focusing on Human emphasis. The organizations try to initiate programs to create education awareness, human resource development, establishment of innovation centers, sponsoring sports events, etc. Hindustan Unilever Limited (HUL) has introduced various CSR initiatives, which are also closely tied to its businesses – the Lifebuoy hand-washing program aimed at personal cleanliness to keep diseases at bay, and the Pureit water purifier program that helps get the poor access to clean drinking water.

CONCLUSION

The concept of CSR had a varied history in evolution. In 1960's Emphasis was given by the organizations on Economic and Technical Interest. (According to Keith Devis). In 1970's Emphasis was focused on social responsiveness. (According to Committee for Economic Development-CED). In 1980's Emphasis on social responsibility was as a process rather than an outcome. (According to Thomas M. Jones). In 1990's Emphasis was based on ethical and philanthropic functions. (According to Carroll-Pyramid of CSR). In Recent Years Emphasis was to avoid sequential model of pyramid, but to fulfill each of them all the times. (Economic, legal, ethical & philanthropic). According to Dona. J. Wood).

With these varied emphases in the evolution of CSR a conceptual framework is proposed to give two areas of approaches that can be followed by the organizations (i.e. Ethical and market approach) which base their emphasis on either environmental needs or human needs of the society or both. Emphasizing the CSR activities of the organization also depends on the strategy of the organizations to reach out to their consumers either by building their equity or by emphasizing ethically on environmental concerns or human concerns. It also depends on the managers, if they think morally or immorally in initiating their CSR activities to attain market share.

REFERENCES

- Bowen, H. R. (1953). Social responsibilities of the businessman. New York: Harper & Row.
- Carroll, A. 1979. A three dimensional model of corporate performance. Academy of Management Review, 4: 497-505.
- Davis, K. (1960, spring). Can business afford to ignore social responsibilities? California Management Review, 2, 70-76.
- European Commission (EC) (2011), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions: A renewed EU strategy 2011-14 for Corporate Social Responsibility, Brussels, 25.10.2011, COM(2011).
- Freeman, R. 1984. Strategic management: A stakeholder perspective. Englewood Cliffs, NJ: Prentice-Hall.
- R. Eells and C. Walton, Conceptual Foundations of Business (Homewood. 111: Richard D. Irwin, 1961).
- Schrader, Ch. (2011). Beiträge multinational Unternehmen zur Nachhaltigen Entwicklung in Base of the Pyramid-Märkten. München und Mering: Rainer Hampp Verlag.
- Shrivastava, S, Jones, R., Selvarajah, Ch., Van Gramberg, B. (2014), "Organizational Justice. A Senian Perspective", Journal of Business Ethics, pp. 1-18.
- Walton, C. C. (1967). Corporate social responsibilities. Belmont, CA: Wadsworth.
- Wright, P., & Ferris, S. 1997. Agency conflict and corporate strategy: The effect of divestment on corporate value. Strategic management Journal, 18: 77-83.
- Economic times accessed on 10.10.2019, 11:20 am <<https://economictimes.indiatimes.com/news/india-unlimited/csr/csr-compendium/union-bank-of-india/csrcompendiumlist2017/63398146.cms>>
- India CSR news accessed on 10.14.2019, 1:20 am <[https://csrbox.org/India_CSR_news_-A-list-of-10-big-CSR-projects-in-skills-development-in-India-\(FY-2016-17\)_289](https://csrbox.org/India_CSR_news_-A-list-of-10-big-CSR-projects-in-skills-development-in-India-(FY-2016-17)_289)>

INTER-DISCIPLINARY INNOVATIONS WITH INTERNET OF THINGS

P. Naga Kavitha

Assistant Professor, Department of Computer Science, St, Ann’s College for Women, Hyderabad

ABSTRACT

Due to inter-disciplinary techniques used in the realization of Internet of Things (IoT), there are many emerging forms of innovation. It leads to significant transformations in business and society. Physical objects are becoming components of IoT to form innovative use cases in human living, transportation and healthcare to mention few. With telecommunications, computing and sensing technologies, a host of new possibilities are witnessed. For instance, the most important innovation with inter-disciplinary nature of IoT is real time health monitoring which saves lives of people. With integration of physical and digital worlds, large volumes of human behavioural data can be obtained, analysed to generate Business Intelligence (BI). Thus computational approaches and social sciences are effectively combined to form Computational Social Science (CSS). With big data, cloud computing and IoT, there has been considerable progress in witnessing a multi-disciplinary field known as data science. The prediction of Nikola Tesla, protean inventor, to realize a “global brain” is becoming a reality with inter-disciplinary innovations. It is realized with inexpensive technologies participating in IoT such as connected mobile devices, sensors, actuators, RFID tags, RFID readers, GPS locators, QR codes and accelerometers. Virtual reality, augmented reality and even human augmentation with IoT integration are going to leverage benefits in every conceivable field of the world. This paper throws light into exciting possibilities of inter-disciplinary innovations of IoT

Keywords: Internet, Internet of Things, innovation, use cases, inter-disciplinary innovations

1. INTRODUCTION

Internet of Things (IoT) is the technology that helps combine physical and digital things. IoT architecture itself showed multiple disciplines working together. Before looking at its ability to have innovations in the multi-disciplinary context, Figure 1 shows the architectural overview of IoT.

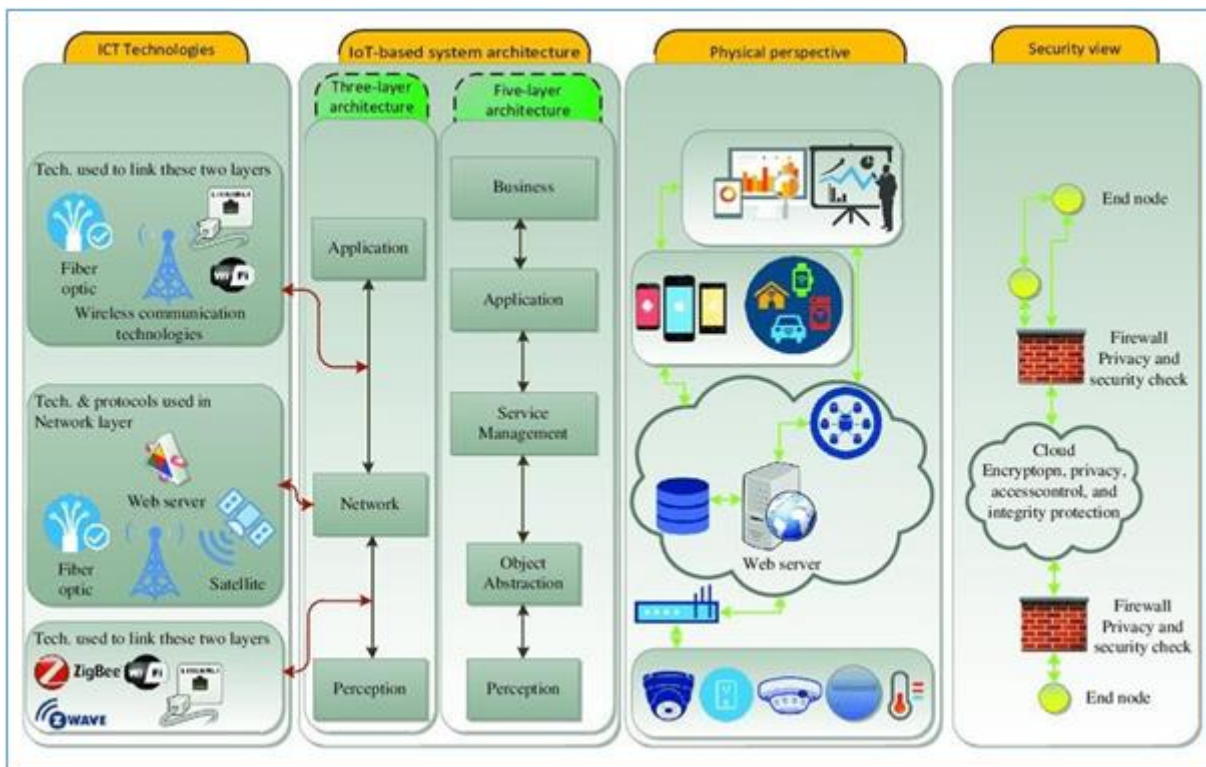


Figure-1: Interdisciplinary architecture of IoT based system

As shown in Figure 1, the architecture of IoT based system is made up of many interdisciplinary technologies. It involves computer science, electrical engineering, telecommunications, sensor technologies and appliances to mention few. It is estimated that in next 2 years, there will be 30 billion connected devices participating in IoT use cases. Different devices like controllers, appliances, smart phones, sensors and computers interact with each other without human intervention. This is known as Machine to Machine (M2M) interaction. The layers in the

inter-disciplinary arena include different IoT technologies, IoT based system architecture with 3 or more layers, physical perspective and security view. The study of reference papers [1]- [12] provided many valuable insights.

2. INTER-DISCIPLINARY INNOVATIONS WITH IOT

There are many inter-disciplinary innovations with IoT. Only some of them are provided here due to problem with the page limit.

Interdisciplinary Approach for Security

With respect to security, it is essential to have interdisciplinary thinking. It is not an IT-only problem. It is beyond computer science. It involves different aspects and devices and things involved in the system. Sometimes, it depends on the expertise of the people and even security awareness of the people. Being careful with suspicious links and creating strong passwords are some examples awareness is emphasized to have overall security.

Human Computer Interaction

Human Computer Interaction (HCI) helps in providing different means of interaction. In fact, it is an essential thing. In the wake of IoT, it is possible to have M2M communications as well. However, it is understood that Artificial Intelligence (AI) has been our focus in terms of training programs to teach how to act like humans. However, there is missing link here. Acting like human is not sufficient. For successful AI, there is need for training on how to think like human. This paradigm shift makes the IoT based AI get completeness. Thus user-centred and interactive design with multidisciplinary approach helps in realizing more accurate solutions.

Brain - Computer Interface

Brain-Computer Interface (BCI), unlike HCI, enables human brain to have interfacing with computer. With IoT technology it is made possible. The BCI can help in acquiring brain signals, analyse and translate them into certain commands that can be followed by devices to fulfil human aspirations. It enables cognitive interactivity between human brain and computers. Electroencephalography (EEG) has paved way for BIC to be realized. Integrating BCI and IoT (multi-disciplinary) can help to achieve many applications like emotion recognition, heart rate monitoring and so on.

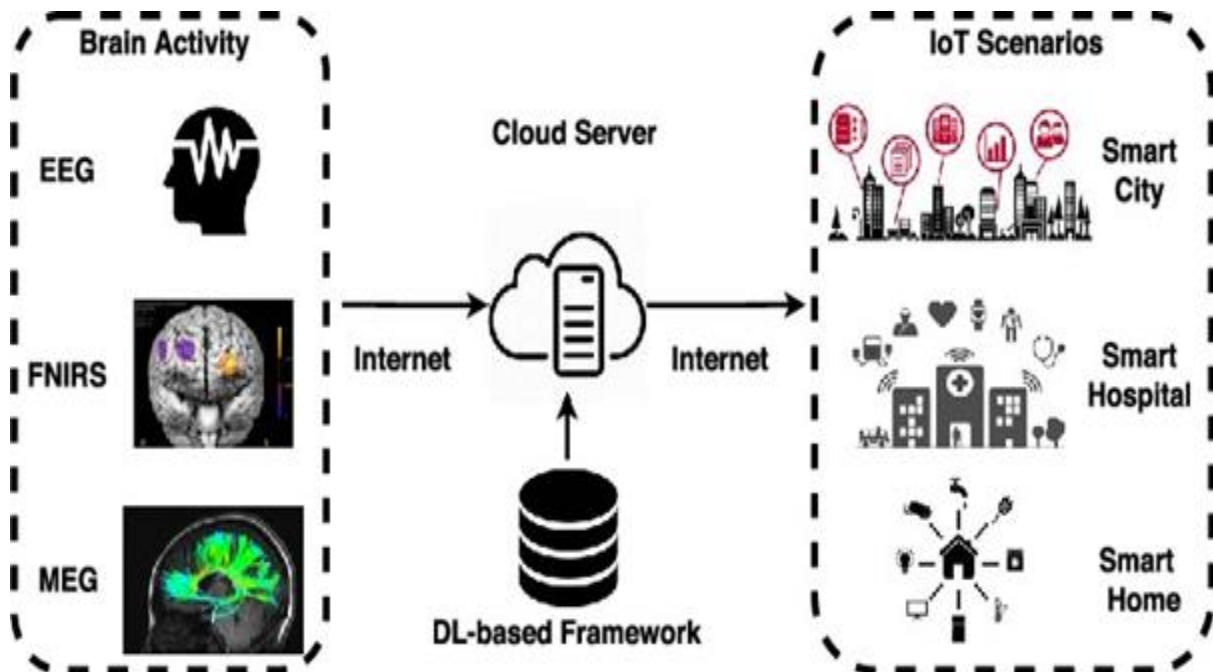


Figure-2: BCI scenario helping to control IoT use cases

As can be seen in Figure 2, the technologies like EEG, MEG and FNIRS reflect brain activity. These signals reach cloud server through Internet. Then the data will reach IoT applications and the brain signals are converted to corresponding commands to get executed. This research also witnesses inter-disciplinary technologies.

Remote Health Monitoring

Remote health monitoring is an important use case of IoT where many disciplines work together. It involves sensor technologies, actuators, telecommunications, electrical engineering, data science, computers and smart phones. Figure 2 illustrates this scenario well.

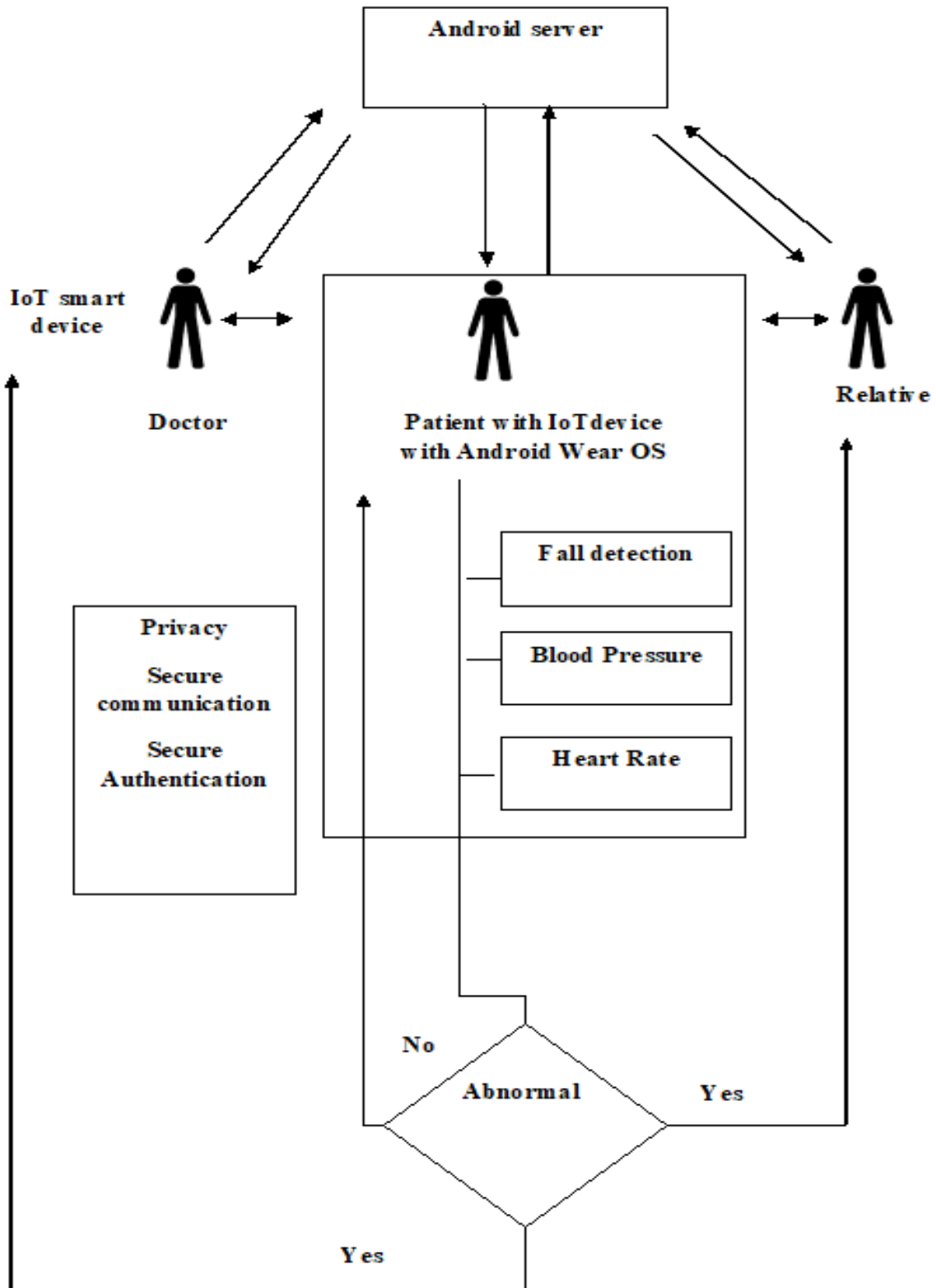


Figure-2: Overview of the proposed methodology

As presented in Figure 2, the proposed security framework is built around a case study IoT use case known as “Remote Patient Monitoring”. Patient has wearable devices with Android Wear OS in each device. This device is able to obtain vital signs of patients and find whether they are abnormal. If the signs are abnormal, it sends notifications to doctor and relative of patient. The monitoring is made for fall detection, blood pressure and Heart Rate. Android server is integrated with the application where data is maintained. Doctor and relative of patient gets details from Android server.

Precision Agriculture

It is the technology driven agriculture that paves way for accurate decision making and ensure that there will be innovation in agricultural practice.

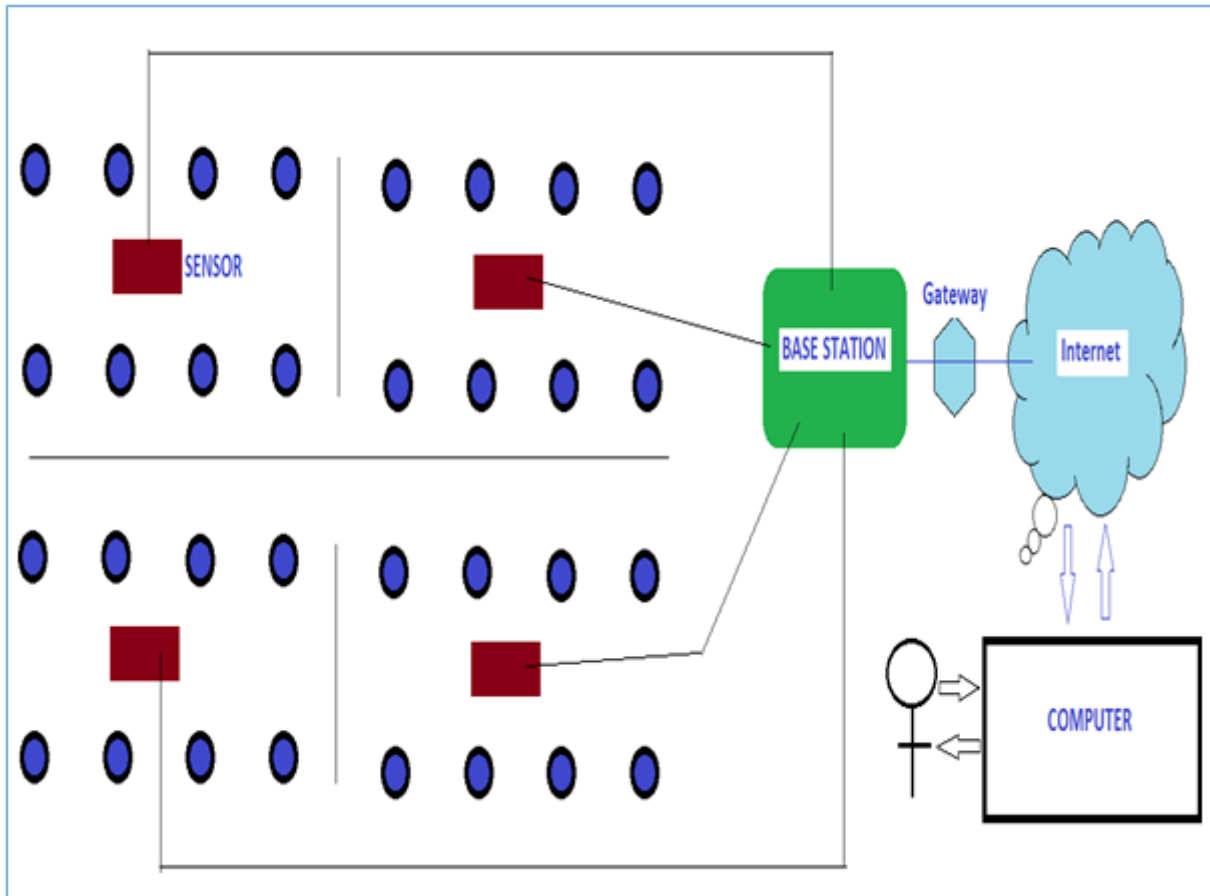


Figure-4: Precision agriculture scenario

As shown in Figure 4, the IoT technology is used for precision agriculture. Sensors are able to capture the needs of trees and based on that technology driven inputs are given to field to obtain optimal production by reducing cost.

3. CONCLUSION AND FUTURE WORK

In this paper, we described various aspects that prove that it is possible to have inter- disciplinary innovations with IoT technology. It innovations are realized in many use cases. Some of the important use cases include the changes in traditional HCI, emergence of BCI and remote health monitoring. Since IoT technology includes usage of things, electronic devices, telecommunications, electrical engineering, sensor technologies and so on. In fact, IoT enables integration between physical and digital things together to realize plenty of possibilities. This paper provides some insights on the inter-disciplinary innovations. In future, we intend to continue our research to realize a remote health monitoring system.

REFERENCES

- [1] Razmak, J., and Belanger, C. H. (2016). Interdisciplinary Approach: A Lever to Business Innovation. *International Journal of Higher Education*, 5(2). P1-10.
- [2] Hacklin, F., and Wallin, M. W. (2013). Convergence and interdisciplinarity in innovation management: a review, critique, and future directions. *The Service Industries Journal*, 33(7-8), P774–788.
- [3] Hayhurst, D. R., Kedward, K. T., Soh, H. T., and Turner, K. L. (2012). Innovation-led multi-disciplinary undergraduate design teaching. *Journal of Engineering Design*, 23(3), P159–184.
- [4] M. R., and Lant, T. K. (2018). Facilitating innovation in interdisciplinary teams: The role of leaders and integrative communication. *Informing Science: the International Journal of an Emerging Tran discipline*, 21, P157- 178.
- [5] Upton, Zee (2012) Wound Management Innovation Cooperative Research Centre - a new model for inter-disciplinary wound research. *International Wound Journal*, 9(2), pp. 111-114.
- [6] Jones, Casey (2010) "Interdisciplinary Approach - Advantages, Disadvantages, and the Future Benefits of Interdisciplinary Studies, 7, P1-7.

- [7] Pedersen, D. B. (2016). Integrating social sciences and humanities in interdisciplinary research. *Palgrave Communications*, 2(1). P1-7.
- [8] Rons, N. (2011). Interdisciplinary Research Collaborations: Evaluation of a Funding Program. *Collnet Journal of Scientometrics and Information Management*, 5(1), P17–32.
- [9] Denise J. Stokholm, M. (2008). A Holistic Approach to Interdisciplinary Innovation Supported by a Simple Tool. In U. B. Montedo, F. L. Marcia, & L. I. Szelwar (Eds.), *Proceedings of the 9th International Symposium of Human Factors in Organizational Design and Management* , p143-149.
- [10] Rekers, J., and Hansen, T. (2015). Interdisciplinary research and geography: Overcoming barriers through proximity. *Science and Public Policy*, 42(2), P242-254.
- [11] Dr. Laura Morgan. (2017). INTERDISCIPLINARY TEXTILE DESIGN RESEARCH FOR MATERIAL INNOVATION: SYNTHESISING DESIGN, SCIENCE AND INDUSTRY COLLABORATION. *Textile Design Research Conference*, p1-18.
- [12] Gill, S. V., Vessali, M., Pratt, J. A., Watts, S., Pratt, J. S., Raghavan, P., and DeSilva, J.M. (2015). The Importance of Interdisciplinary Research Training and Community Dissemination. *Clinical and Translational Science*, 8(5), P611–614.

PERCEPTIONS INVESTOR'S BEHAVIOR TOWARDS VARIOUS INVESTMENT AVENUES AT HYDERABAD METRO CITY- AN EMPIRICAL STUDY

Fouzia Begum

Assistant Professor, Department of Business Management, Bharat Institute of Engineering & Technology, Mangalpally, Hyderabad

ABSTRACT

This paper examines the perceptions of Investors Behavior towards Investment Avenues at Hyderabad Metro City. The prime objective of the study is to assess the different alternative investments and the factors while choosing the investment avenues and association amid the savings and investment patterns among select investor's behaviour towards investment Avenues of the individual/single investors of Hyderabad City by various age groups. This study has applied the objectives and methodology of this research is an exploratory – survey research. A sample size of the respondents was chosen using Yamane's technique from Hyderabad District of telangana. The total households (population) in Hyderabad District are 8, 49,051. Out of them, the researcher drew a sample size of 400 by using Yamane's formula (Yamane, 1967) with 5% precision value. A structured questionnaire was developed based on 5 points Likert scale. The primary data were collected from representative respondents of the above city householders through the use of a structured questionnaire and analysed using percentages, Descriptive statistic and Pearson Chi- Square analysis by using SPSS (Statistical Package for Social Sciences. Findings of the study is Calculated value of χ^2 (48.266) is greater than the table value of χ^2 (34.27). Hence, H_0 is rejected and concluded that there is a significant relationship between the savings and preference of Investments Avenues. Further, it is concluded that savings positively affected the investment avenues. Majority respondents (39%) are preferred to investment in Insurance / Pension Schemes, followed by 32% respondents are preferred to investment in banks.

Keywords: Annual Income, Savings, Demographic factors, Investment avenues, Investor's Behaviour, Dimensions of Investment Choices, Awareness of Investment Options.

1. INTRODUCTION

Investors are the backbone of the Indian capital market. **Investment** is putting money into something with the expectation of profit. Investment is the employment of funds on assets with the aim of earning income or capital appreciation. The word originates in the Latin "vestis", meaning garment, and refers to the act of putting things (money or other claims to resources) into others' pockets. Investment act as a key element in business because based on capital, inventor ascertains a specified quantity to produces output, purchase of land, tools. In its broadest sense, an **investment is a sacrificing of current money or other resources for future benefits**. Numerous avenues of investment are available today. Means we can either deposit money in a bank account or purchase a long term government bonds or invest in the equity shares of a company or acquire a plot of land or invest in some other form. Investments may be classified as financial and economic investment. **Financial investments means** money which is used for purchase of financial assets such as stock, bonds, real estate, post office certificates are all know as financial investments. **Economic investment means** the net additions to the capital stock of the society which consists of goods and services that are used in the production of other goods and services. Addition to the capital stock means an increase in building, plants, equipment and inventories over the amount of goods and services that existed. The two aspects of any investment are time and risk. People want regular income without risk they can invest in the government securities. "Investment may be defined as an activity that commits funds in any financial/marketable or physical form in the present with an expectation of receiving additional return in the future." For example, a Bank deposit is a financial asset, the purchase of gold is a physical asset and the purchase of bonds and shares is marketable asset.

Elements of investment / nature

Investor have three main objectives while investing their money namely, (1) increasing rate of return (2) reducing the risk (3) safety. Other objectives like risk, safety, liquidity. etc.,

2. NEED FOR AND IMPORTANCE THE STUDY

This study very much useful to employees or business mans to select suitable requirement funds which yields them maximum returns from their savings. Apart from understanding business, it has become a source of profession by becoming an investment bankers, or shareholders, or debenture holders who provide securities to sell and supporting in the dealing of Mergers and Acquisitions (M & A). There is a common perception of investors is to purchase when the market supports in increased and not to invest in the falling period.

STATEMENT OF THE PROBLEM

Level of Education, kinds of occupation, responsibilities, family commitments etc, determine the ability to investment'. Present financial crises living cost of the Hyderabad has been increasing it include (1) Education fees (2) House rent, (3) Medical expenses (4) Family members (5) unexpected. Hence, the problem arises what affects or influences the investor's decision. No comprehensive study has been made to study this behaviour of urban householders in Telangana State. Hence, the present study is an attempt to study and analyse the investing behaviour of investors in Hyderabad twin cities.

3. REVIEW OF LITERATURE & RESEARCH GAP

D. S. Chaiubey and Rajat P.Dimri (2009) in their they identify the investment perceptions and their behavior for designing positive effective investment policies. Analysis of the study also found that a majority of the respondents are the shifting trend of investors from post office and other government investment schemes to investments in banks, mutual funds and equity etc. **Walia and Kiran (2009)** observed that the understanding of investor's expectations from mutual funds has become necessary issue to study due to mutual funds inability to accelerate the required pace of growth. **Bhanu sireesha & Sree laxmi (2013)** found that gender, age and friends are mostly influencing the investment decisions of the respondents. It is concluded that the respondents of the study are conservative in nature and show less concern for money multiplication and liquidity. **Sanjay Kanti Das (2014)** in his study he observed that the majority responds are invested in bank deposits remain the most popular instrument of investment followed by insurance and small saving scheme to get benefit of safety and security of their life and investment. It was found that there's a desire for increasing the money acquisition among the center category households. **Priti Mane (2014)** Conclude that mutual fund linked with share market and investors are not taking advice from authority advisor to lead them for their investment in mutual fund so it creates the problem to pick out the open-end fund arrange favorable for them. **Nayak (2010)** seeks to examine that there is significant difference between the various demographic variables and investor's knowledge of grievances, awareness of functions of redressal agencies, loading of complain and their satisfaction level. **Sindhu, et al (2014)** has used Convenience sampling technique for selecting respondent for their study. In some previous studies, solely one issue has been taken as variable quantity and every one the biases and their elements have not been thought of as variable. **Meir Statman (1997)** has explained the popularity of an entirely anti-rational phenomenon, dollar cost averaging, using four elements of behavioural finance theory – prospect theory, aversion to regret, cognitive errors and self control. **Chandra Abhijeet and Kumar Ravinder (2008)** discuss the irrationality of individual investors and investigate into their behaviour. Thirteen psychological biases and seventeen contextual factors affecting investment behaviour were identified by the researchers and Principal Component Analysis was done to identify the five major factors which appear to drive investor behaviour in India. These were prudence and precautious attitude, conservatism, under-confidence, informational asymmetry and financial addiction.

Research Gap

According to the review of related literature, the previous studies have investigated the impact of inventor behavior in the investment avenues but especially there is no comprehensive study in the Hyderabad of Telangana on the inventor perceptions towards investment avenues. To fill this gap, the study has been undertaken to find out the inventor perception towards investment avenues in Hyderabad of Telangana. Based on the research gap, the following objectives were framed for the study.

4. OBJECTIVES OF THE STUDY

The main objective of the study is to analyze the perceptions of inventor's behavior towards investment avenues at Hyderabad metro city. However, in order to give direction to the study, the following specific objectives are set forth.

The specific objectives of the study are:

- 1) To study the overview of investment avenues.
- 2) To examine the behavioral influences of investors on savings and investments.
- 3) To assess the investors preferences and income wise preferences and age wise preference for investment avenues.

HYPOTHESES OF THE STUDY

Based on the objectives of the study, the following hypotheses of the study are framed.

- (i) **H₀**: There is no significance difference between the age groups of Investor behavior on the investment avenues.
- (ii) **H₀**: There is no significance difference between the male and female Investors on the investment avenues.
- (iii) **H₀**: There is no significant relationship between savings of the respondents and the preference of Investment Avenue.

5. RESEARCH METHODOLOGY

The study is based on both primary and secondary data. The primary information was collected by serving a structured questionnaire to the respondents and direct interview method. The secondary data were collected from 1. Published reports 2.Theses, 3. Articles.

5.1 Research Design

The study adopted a survey research design. Copies of the questionnaire served as an instrument for data collection, and the generated data were analysed using Chi- Square. A total of 400 respondents were selected as the sample size using Yamane's sampling technique. The Yamane's sampling technique was further adopted to give equal opportunity for selection to every element of the population. Chi-Square was used to test the hypotheses. Data were presented and analysed using simple statistical tables and percentages. The value of the Chi-Square was calculated using the formula;

$$\chi^2 = \sum \frac{(o-e)^2}{e}$$

Decision Criteria:

The researcher shall determine whether to accept to or reject the null or alternative hypothesis. The decision rule is that.

5.2 Pilot Study

The questionnaire was first tested with 40 respondents to calculate whether the questionnaire met the objectives. Few questions were partially altered and reformed, and data collection was nonstop after conforming to the getting of the objectives of the study.

5.3 Sample Selection

The total households (population) in Hyderabad District are 8, 49,051. Out of them, the researcher drew a sample size of 400 by using Yamane's formula (Yamane, 1967) with 5% precision value. Further, the data were collected from 400 respondents. Yamane (1967) developed an easy formula to determine the sample sizes. The standardized questionnaire was used to collect the data by interviewing the household heads.

Formula:

$$n = \frac{N}{1 + N(e)^2}$$

n = Sample size,

N = Total number of saving households in an area

e = Precision value, set as 5% (0.05)

Where, N= 849051

Yamane (1967) developed an easy formula to determine the sample sizes.

5.4 STATISTICAL TOOLS

A) DESCRIPTIVE STATISTICS

(i) Standard Deviation

The concept of Standard Deviation was first introduced by **Karl Pearson** in 1893. Standard Deviation is powerful method/tool of the measures of dispersion. It is also called as **Root Mean Square Deviation**. Standard Deviation is denoted by small **Greek letter σ (read as Sigma)**. "*Standard Deviation is the square root of the arithmetic average of the squares of the deviations measured from mean*". It is a measure of dispersion. It tells us how spread out the data is from the mean (Average).

(ii) Co-efficient of Variance (C.V.)

The standard deviation is an absolute measure of dispersion. The relative measure is known as the co efficient of variation. *It is developed by Karl Pearson. Co efficient of variation is denoted by C.V .and is obtained as follows.*

C.V= Standard Deviation/ Arithmetic Mean* 100 It is used in such problems where we want to compare the variability of two are more than two variables in the series of the data. A group which has more variability as compare to the other or has more co-efficient of variation, consistency would be less and vice versa.

Higher C.V. Lower Consistency, reliability, Uniformity

Lower C.V. Higher Consistency, reliability, Uniformity

Chi-Square Test

The chi-square test is an important test amongst the several tests of significance. It is one of the simplest and most widely used non-parametric statistical tests. It is a statistical measure used in the context of sampling analysis to (i) test the goodness of fit; (ii) test the significance of association between two attributes; and (iii) test the homogeneity or the significance of population variance.

$$\text{Chi-Square} = (O - E)^2 / E,$$

Reject: $X^2 > \text{Table value}$ & Accept: $X^2 \leq \text{Table value}$

Where, O = observed values and E = expected values.

Chi-Square has an approximate Chi-Square distribution and critical values of Chi-Square are obtained from the table of Chi-Square distribution.(Sathyanarayana Gardasu, 2019)

6. SCOPE AND PERIOD OF THE STUDY

In today’s competitive environment a lot of investment avenues are being provided by various Public and private financial organizations, people are totally confused to decide where to make an investment. The present study was mainly focuses to understand the awareness level of the people on various investment opportunities from various financial institutions, factors considered for investment, and also to understand behavior of investors in gaining a better understanding of what an investor look for in investment avenues. This study aims to gain knowledge about key factors that influence investment behavior and ways these factors impact investment risk tolerance and decision making process among men and women and among different age groups. The study covers a period of 2 months i.e., from May to June 2019. The reason for selecting this period is the researcher was free no classes to teach for M.B.A. students.

7. OVERVIEW OF INVESTMENT AVENUES

Investment alternatives are available into two broad categories, viz, financial assets and real assets. Financial assets are paper (or electronic) claim on some issues such as the government or a corporate body. The important financial assets are equity shares, corporate debentures, government securities, and deposit with banks, post office schemes, mutual fund shares, insurance policies, and derivative instruments. Real assets are represented by tangible assets like residential house, commercial property, agricultural farm, gold, precious stones, and art. As the economy advances, the relative importance of financial assets tends to increase. Investors are free to select any one or more alternative avenues depending upon their needs. All categories of investors are equally interested in safety, liquidity and reasonable return on the funds invested by them. In India, investment alternatives are continuously increasing along with new developments in the financial market. Investment is now possible in corporate securities, public provident fund, mutual fund etc. Thus, wide varieties of investment avenues are now available to the investors.

8. PRIMARY DATA ANALYSIS

TABLE NO-1: DEMOGRAPHIC ROFILE OF THE RECONDENTS

Demographic Factors	Annual income						Total
	Less than 120000	120000-240000	240000-360000	360000-500000	500000-1000000	above 1000000	
AGE							
18-28(%)	63(64.28)	28(28.57)	4(4.08)	3(3.06)	0(0)	0	98(100)
28-38(%)	55(31.42)	71(40.57)	32(18.28)	10(5.71)	3(1.71)	4(2.28)	175(100)
38-48(%)	17(23.28)	27(36.98)	21(28.76)	3(4.10)	1(1.36)	4(5.47)	73(100)
48-58(%)	10(27)	11(29.72)	12(32.4)	3(8.10)	1(2.70)	0(0)	37(100)

58- 68(%)	8(47)	4(23.52)	3(17.64)	1(5.88)	1(5.88)	0(0)	17(100)
TOTAL (%)	153(38.25)	141(35.25)	72(18)	20(5)	6(1.5)	8(2)	400
GENDER							
MALE	110(30.89)	131(36.79)	75(21.06)	22(6.17)	7(1.96)	11(31.42)	356(100)
FEMALE	27(61.36)	10(22.72)	5(11.36)	2(4.54)	0(0)	0(0)	44(100)
TOTAL	137(34.25)	141(35.25)	80(20)	24(6)	7(1.75)	11(2.75)	400(100)
OCCUPATION							
Private job	59(32.59)	77(42.54)	35(19.33)	5(2.76)	2(1.10)	3(1.65)	181(100)
Govt. Job	8(5.75)	37(26.61)	65(46.76)	16(11.51)	5(3.59)	8(5.76)	139(100)
Business	14(17.5)	25(31.25)	21(26.25)	11(13.75)	3(3.75)	6(7.5)	80(100)
TOTAL	81(20.25)	139(34.75)	121(30.25)	32(8)	10(2.5)	17(4.25)	400(100)

Source: Primary Data

Table No-1: is depicted the demographic factor wise income of respondents

AGE

Income of the respondents is based on age wise analysis reveals that the **age group of 18-28** majority i.e., 64.28% respondents earned less than Rs. 1,20,000 /- p.a., followed by 28.57% respondents earnings between Rs. 120000-240000/-. In the **age group of 28-38**, majority i.e., 40.37% respondents earned between 120000-240000, followed by 31.42% respondents earned less than Rs. 120000 p.a. Next age group of the respondents i.e., **38-48** majority i.e., 36.98% respondents earned between Rs 120000/- to 240000. While in the **age group of 48-58** majority i.e., 32.4% respondents earned between Rs. 240000/- to 360000/-, followed by 29.27% respondents earns between 120000/- to 240000. The majority of the respondents from the **age group of 58+** and above i.e., 47% earned less than 120000/-, followed by 23.52% respondents earnings between 120000-240000.

Finally, the majority of the respondents across the age group i.e., 38.25% earned less than Rs. 120000/-, followed by 35.25% earnings between Rs. 120000/- to 240000/-, least i.e., 1.5% respondents only one respondent earned a between 500000 to 10, 00, 0000/.

GENDER

As per the above table, it is depicted that the income reveals that the majority of the Males i.e., 36.79%, earned between Rs 5, 00, 000 to 10, 00,000. But as per female analysis income of these members reveals the majority i.e., 61.36% and least is 4.54%.

OCCUPATION

Occupation wise analysis indicates that the maximum income of the private job respondents is 42.54%, belong to 120000- 240000, followed by 32.59% belongs to less than 1200000. On the other hand maximum income of the Govt. job i.e., 46.76% belongs to 240000-360000 income respondents.

Q. No: 1 what is the source of funds for your Investment?

Table No-2: The source of funds for your Investment

VARIABLE	NO OF RESPONDENTS	PERCENTAGE
Salary	221	55.25
Business	147	36.75
Rental income	32	8.00
TOTAL	400	100

Source: Survey result

Table 2 reveals that majority respondent’s percentage of the source of fund for Investment is 55.25% (salary), followed by 36.75 % source of their savings (business) and the least percentage is 8% of rental incomes.

Q. No: 2 PERCEPTIONS OF INVESTOR’S PREFERENCES FOR THE INVESTMENT AVENUES:

TABLE NO-3: INVESTOR’S PREFERENCES FOR THE INVESTMENT AVENUES

VARIABLE	NO OF RESPONDENTS	PERCENTAGE
Bank / Post office Schemes	128	32
Insurance / Pension Schemes	157	39
Share market / Mutual funds	84	21

Real Estate	31	8
TOTAL	400	100

Table 3 reveals that the majority respondents (39%) are preferred to investment in Insurance / Pension Schemes, followed by 32% respondents are preferred to investment in banks.

Q. No: 3 whether there is any relationship between savings and investments avenues?

Table No-3: Relationship between savings and preference of Investments Avenue

VARIABLE	NO OF RESPONDENTS	PERCENTAGE
STRONGLY AGREE	323	80.75
AGREE	77	19.25
DISAGREE	0	0
STRONGLY DISAGREE	0	0
UNDECIDED	0	0
TOTAL	400	100

From Table 3 indicates that 80.75 % of the respondents strongly agree with the statement of “Relationship between Incomes and Savings” while 19.25 % of respondents agree with the above statement. But lastly, the investigator concluded that there is a relationship between saving and investment.

HYPOTHESIS TESTING (CHI -SQUARE TEST)

Ho1: There is no significant relationship between the savings and preference of Investments Avenue

Table No-7: Observed values

Variable	Strongly agree	Agree	Disagree	Strongly Disagree	Undecided	Total
Strongly agree	323	0	0	0	0	323
Agree	0	77	0	0	0	77
Disagree	0	0	0	0	0	0
Strongly Disagree	0	0	0	0	0	0
Undecided	0	0	0	0	0	0
Total	323	77	0	0	0	400

Source: Primary data

Table No-8: Expected frequencies

Variable	Strongly agree	Agree	Disagree	Strongly Disagree	Undecided	Total
Strongly agree	290	33	0	0	0	323
Agree	33	40	0	0	0	77
Disagree	0	0	0	0	0	0
Strongly Disagree	0	0	0	0	0	0
Undecided	0	0	0	0	0	0
Total	323	73	0	0	0	400

Source: Primary data

Table No-9: Showing calculation of χ^2 - value

<i>O</i>	<i>E</i>	<i>O-E</i>	$(O-E)^2$	$(O-E)^2/E$
323	290	33	1089	3.75517
0	33	-33	1089	3.75517
0	0	0	0	0.0000
0	0	0	0	0.0000
0	0	0	0	0.0000
0	33	-33	1089	3.7551
77	40	37	1369	37.000
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

2. P. Bhanu Sireesha & Ch. Sree Laxmi (2013) "Impact of Demographics on Select Investment Avenues: A Case Study of Twin Cities of Hyderabad and Secunderabad, India", *International Journal of Marketing, Financial Services Management Research* Vol.2, No. 6, pages-9
3. **Sanjay Kanti Das (2014)** A Study on Investor's Investment Pattern in various Avenues (empirical study in Coimbatore City), *Global Journal for Research Analysis*, Volume 3, Issue 1, January, 2014, ISSN No. 2277-8160.
4. Mane P (2016) A Study of Investors Perception towards Mutual Funds in the City of Aurangabad. *The SIJ Transactions on Industrial, Financial and Business Management* 4: 30-38.
5. Nayak, M. K. (2010). Investigating the nature of investor's grievances and assessing the role of the grievance redressal Agencies. *Journal of Law and Conflict Resolution*, 2(4), 60-65
6. Statman, M. (1995), A Behavioral Framework for Dollar-Cost Averaging, *Journal of Portfolio Management*, Vol. 22, No. 1, pp. 70-78
7. Chandra Abhijeet and Kumar Ravinder (2008), Determinants of Individual Investor Behavior : An Orthogonal Linear Transformation Approach, Munich personal RePEc Archive Paper No. 29722, posted on March 20, 2011, 07:29, <http://mp.ra.ub.uni-muenchen.de/29722>
8. **Dr. Sathyanarayana Gardasu (2019). Perceptions of accounting professionals towards leases (IFRS - 16) – evidence from Hyderabad", *Journal of Emerging Technologies and Innovative Research*, February 2019, Volume 6, Issue 2. <http://www.jetir.org/papers/JETIRY006003.pdf>.**

**PERCEPTIONS OF ACCOUNTING PROFESSIONALS TOWARDS LEASES (IND-AS -116) –
EVIDENCE FROM HYDERABAD**

Arshiya SultanaAssistant Professor, School of Business Management, Bharat Institute of Engineering & Technology
Mangalpally, Hyderabad

ABSTRACT

The main purpose of this paper is to study the perceptions of auditors and accounting professionals on leases (IND AS -116). This study has applied objectives and methodology of this research is an investigative – survey research. While the Accounting Standard board (ASB) has retained AS 1's finance lease / Operating lease distinction for lessors, the distinction is no longer relevant for lessees. All lease contracts, together with renting contracts, will be recognised on the balance Sheet of the lessees, with some exceptions in limited circumstances. The standard will have broad implications for many stakeholders and metrics, including finance departments, property teams, banking covenants, remunerations schemes, and regulatory compliance.

IND AS 116 will replace AS 19 for reporting periods beginning on or after 1st January 2019 with a retrospective application by default. The present paper reports on an investigative research of professional of two different sub – groups of responds there are chartered accountants and professional accountants about issues relevant adopting IND AS 116 Leases. The primary data was collected from respondents of Hyderabad through the use of a structured questionnaire and analysed using means scores, standard deviation, and Pearson Chi- Square analysis by using SPSS (Statistical Package for Social Sciences). Finally, conclude that there is a significant impact of IND AS 116 on financial statements (Income statement & Balance sheet) of the Indian companies..

Keywords: IND AS-116, AS 19 Vs. INDAS116, IND AS 116 Impact.

1. INTRODUCTION

Leasing is an imperative and broadly used financing solution. It allows companies to access and use property and equipment without incurring big cash outflows at the start. It also facilitates the flexibility and enables lessees to address the issue of obsolescence and residual value risk. In fact, sometimes, leasing is the only way to obtain the use of a physical asset that is not available for purchase. Lease: A lease is an agreement whereby the lessor conveys to the lessee in return for a payment or series of payments the right to use an asset for an agreed period. All leases result in a company (the lessee) obtaining the right to use an asset at the start of the lease and if lease payment is made over time also obtaining financing. The new standard on leases i.e. Indian Accounting Standard (Ind AS) 116, Leases is expected to be applicable from 1 April 2019. The new standard has major impact for lessees. It eliminates the classification of leases as either finance leases or operating leases as required by Ind AS 17, Leases. It introduces a single on-balance sheet accounting model that is similar to current finance lease accounting model. Therefore, majority of operating leases will be on-balance sheet of a lessee as if it has borrowed funds to purchase an interest in the leased asset. This accounting will make entities look asset-rich but at the same time heavily indebted too

2. THE NEED FOR AND IMPORTANCE OF THE STUDY

Leasing is an imperative and extensively used financing solution. It enables enterprises to right to use the property and equipment without improving big cash outflows at the start. It similarly offers elasticity and enables lessees to address the issue of undesirability and residual value peril. In fact, sometimes, leasing is the only way to obtain the use of a physical asset that is not available for purchase.

Under the previous standard rules i.e., AS 19, lessees account for lease transactions either as operating or as finance leases, depending on complex rules and tests which, in practice, use 'bright-lines' resulting in all or nothing being recognised on balance sheet for sometimes economically similar lease transactions. The impact on a lessee's financial reporting, asset financing, IT, systems, processes, and controls is expected to be substantial. Many companies lease a vast number of big-ticket items, including cars, offices, power plants, retail stores, cell towers, and aircraft.

RESEARCH GAP

Though there were no studies on impact of IND AS 116 implementation on forthcoming financial statements of the MNCs. There was no study which focused on airline, shipping companies because this IND AS 116 much more effect on the above companies'. Hence, this research topic has been taken up.

3. OBJECTIVES OF THE STUDY

The main objective of the study is to analyse the impact of IND AS 116 towards implementation on Financial Performance. However, in order to give direction to the study, the following specific objectives are set forth.

The specific objectives of the study are:

1. To study the overview of IND AS 116.
2. To examine the differences between AS 19 & IND AS 116
3. To analyse the perceptions of accounting professionals towards leases IND AS -116.

HYPOTHESES OF THE STUDY

Based on the objectives of the study, the following hypotheses of the study are framed.

- (i) There is no impact of implementation of IND AS 116 on income statement of the companies.
- (ii) There is no impact of implementation of INDAS 116 on balance sheet of the companies.

4. RESEARCH METHODOLOGY

The study is based on both primary and secondary data. The primary information was collected by serving a structured questionnaire to the respondents and direct interview method. The secondary data were collected from 1. Published reports 2. Websites such as www.Ifrs.org.in. and www.pwc.ocm.

Sample Selection

The sample of 51 per cent of accounting professionals such as senior most accountants, chartered accountants, Fellow chartered accountants (FCA) of ICAI, PWC (Price water Coopers), KPMG and Deloitte, and others respectively; for the study was taken. Approximately 76 top level executives. Stratified random sampling was used to select accounting executives from various departments of the above companies.

STATISTICAL TOOLS

The study used appropriate statistical tools such as percentages, standard deviation, coefficient of variation, Chi-Square test

Chi-Square Test

The chi-square test is an important test amongst the several tests of significance. It is one of the simplest and most widely used non-parametric statistical tests. It is a statistical measure used in the context of sampling analysis to (i) test the goodness of fit; (ii) test the significance of association between two attributes; and (iii) test the homogeneity or the significance of population variance.

Chi-Square = $(O - E)^2 / E$,

Reject: $X^2 > \text{Table value}$ & Accept: $X^2 \leq \text{Table value}$ Where, O = observed values and E = expected values.

Chi-Square has an approximate Chi-Square distribution and critical values of Chi-Square are obtained from the table of Chi-Square distribution.

5. OVERVIEW OF IND AS 116

Ind AS 116 sets out the principles for the recognition, measurement, presentation, and disclosure of leases. The objective is to ensure that lessees and lessors provide relevant information in a manner that faithfully represents those transactions. This information gives a basis for users of financial statements to assess the effect that leases have on the financial position, financial performance and cash flows of an entity.

Ind AS 116 will replace current Ind AS 19 Leases, from its proposed effective date 1 April 2019. An entity shall apply this Standard consistently to contracts with similar characteristics and in similar circumstances. (Source: www.kpmg.org.in)

Why IND AS 116

The main reason is that under IND AS 116, lessees were still able to hide certain liabilities resulting from leases and simply not present them on the face of the financial statements. I'm talking about operating leases, especially those with non-cancellable terms. Under the new standard, lessees will need to show all the leases right in their statement of financial position instead of hiding them in the notes to the financial statements.

Lease

A contract is or contains a lease if it conveys the right to control the use of an identified asset for a period of time in exchange for consideration. .

This new standard will ominously modification the accounting for lessees’ leases and could have far-reaching implications for a company’s finances and operations.(www.pwc.com)

Objective of IND AS 116

The objective of this standard is to facilitate the principles for recognition, measurement, and disclosure in relation to financial lease and operating lease transactions in the financial statements of lessees and lessors.

Scope of IND AS 116

The scope of IND AS 116 is normally allied to AS 19 and contains all contracts that convey the right to use an asset for a period of time in exchange for consideration.

This standard ought to be applied in accounting for all leases other than the following lease agreements.

- (a) lease agreements to explore for or use natural resources, such as oil, gas, timber, metals and other mineral rights; and (b) licensing agreements for items such as motion picture films, video recordings, plays, manuscripts, patents and copyrights; and (c) lease agreements to use lands.(Source:www2.deloitte.com)

IND AS 116 permits two exemptions:

1. Leases with the lease term of 12 months or less with no purchase option (applied to the whole class of assets)
2. Leases where underlying asset has a low value when new (applied on one-by-one basis).

Classification of leases as per IND AS 116

Unlike lessees, lessors need to classify the lease first, before they start accounting. There are 2 types of leases defined in IFRS 16:

1. A finance lease
2. An operating lease

(www.ifrsbox.com)

Differences between AS 19 and IND AS 116

Based on the survey method and direct interview method the researcher observed the following major difference from the respondents. These differences have shown in the table format for easy to understand.

Table No-1: Differences between AS 19 and IND AS 116

Differences	AS 19	IND AS 116
1.Financial Lease(Major Changes)	The previous version of AS 19(Lease) was criticized because it did not required lessees to recognize assets and liabilities arising from Operating lease. Certain criteria to be met to recognize a lease as finance lease; such as	IFRS 16 introduced a <i>single lessee accounting model</i> and requires a lessee to recognize assets (right-of-use) and liabilities for all leases with a term of more than 12 months (unless the underlying
	Substantially transfer of risks and rewards.	Asset is of low value.
2.Operating lease	Lease is recognizing as operating lease if the recognition criteria for finance lease is not met.	For Lessee: There’s concept of operating lease, however, lessees may choose to EXPENSE out item of low value and lease with a term of less than the 12 months. For Lessor: Lease is recognizing as operating lease it the recognition criteria for finance lease is not met.

6. PERCEPTIONS OF ACCOUNTING PROFESSIONALS TOWARDS LEASE IND AS -116.

The Perceptions of accounting professionals towards lease IND AS -116 is completely based on primary data; this data was collected through questionnaire from accounting professional of ICAI, PWC, KPMG, and Deloitte and others. In this questionnaire various issues such as challenges, and suggestions pertaining to implementation/adoption of IND AS 116 in India covered by the researcher.

The questionnaire also contains the questions to find out the core domain /area of impact on the financial statements such as (1) Impact on Income Statement, (2) impact on Balance Sheet, (3) Impact on financial ratios other functional areas.

The researcher analysed the primary data through various statistical tools i.e., percentages, descriptive statistics, and Chi- Square test using Statistical Package for Social Sciences (SPSS).

TABLE NO-2

Profile of Respondents			
	Variable	Frequency	Percentage
Gender	male	61	80
	female	15	20
	Total	76	100
Qualifications	B. Com, C.A.	43	56
	B.Com, C.A, C.S	20	27
	B.Com, C.A, M.Com,	13	17
	B.Com, C.A, M.Com, M.B.A, Ph.D.	0	0
	Total	76	100
Experience	0-5 Years	21	28
	6-15 Years	37	49
	16- 25 Years	14	18
	26 Above	4	5
	Total	76	100

7. PRIMARY DATA ANALYSIS

1. Why has the ASB Developed a new leases standard? The reason for IND AS116?

The majority respondents (82%) say that the main reason is that under AS 19, lessees were still able to hide certain liabilities resulting from leases and simply not present them on the face of the financial statements. Under the new standard, lessees will need to show all the leases right in their statement of financial position instead of hiding them in the notes to the financial statements (Or) eliminate off-balance sheet financing(2) under IAS 17, lessees needed to classify the lease as either finance or operating. If the lease was classified as operating, and then the lessees did show neither asset nor liability in their balance sheets – just the lease payments as an expense in profit or loss. But, respondents told that some operating leases were non-cancellable, and therefore, they represented a liability (and an asset) for the lessees.

2. Are there any significant benefits accrued after adoption of IND AS116

Table No-3

VARIABLE	YES	NO	TOTAL
MALE	49	12	61
FEMAL	8	7	15
TOTAL	57(75)	19(25)	76(100)

Source: Primary data

The Table 1 indicates that 75 % majority respondents have mentioned that many benefits accrued to companies who have adopted IND AS 116. The benefits cited by them to market into investors.

(a) Better transparency there is more inside of liability is lost by leases. (b) There will be much better comparability between companies. For example, new airline companies that /own most of the aircraft and finance assets loans. And another hand there are airlines that least most of the fit.

3. Does IND AS 116 apply to service contracts?

Table No-4

VARIABLE	YES	NO	TOTAL
MALE	8	53	61
FEMAL	7	8	15
TOTAL	15(20)	61(80)	76(100)

Source: Primary data

From the above table, it is concluded that 80% of the respondents mentioned that IND AS 116 does not be relevant to services contracts. For the reason that IND AS 116 does not change the accounting for service. It is required to be applied only to leases or lease components of a contract.

4. Does IND AS 116 –Effects on the Income Statement?

Table No-5

VARIABLE	YES	NO	TOTAL
MALE	49	12	61
FEMAL	3	12	15
TOTAL	52(68)	24(32)	76(100)

Source: Survey results

The Table 3 indicates that 68% of the respondents accepted with the statement of “Does IND AS 116 –Effects on the Income Statement”. They cited the following effects that IND AS 116 will have on companies’ income statement. (i) Recognition of the expense related to leases for both an individual lease and a portfolio leases; (ii) Presentation of the expense related to leases.

5. Does IND AS 116 –Effects on the Balance Sheet?

Table No-6

VARIABLE	YES	NO	TOTAL
MALE	57	4	61
FEMAL	9	6	15
TOTAL	66(87)	10(13)	76(100)

Source: Primary data

The above table reveals that 87% of the respondent’s perceptions are that IND AS-116 effects on the company balance sheet because the ASB consider the effect that it will have on companies Balance Sheet such as, Lease Assets, Financial Liabilities and Equity.

Table 7 :Impact of IND AS-116 on implementation financial performance in Indian companies (N=76)

Averages, Standard Deviations, and Coefficient of variations for Likert scale questions:

Q.NO.	Factors	(SA) (5)	(A) (4)	(DA) (3)	(SDA) (2)	(UD) (1)	Total	Mean	SD	CV
12	IFRS 16 impact on the he Balance sheet	40	26	5	6	0	76	2.647	0.705	0.266
13	IFRS 16 impact on the Income Statement	36	29	2.65	8	0	76	2.367	0.6177	0.260

Source: Primary data

Four questions were distributed to assess the impact of Ind as 116 implementation in Indian companies. The mean response of the two questions was more than 2.647 and the standard deviation was also less than 0.36, which indicates that the respondents’ perceptions were close to one another and there is not much deviation among the respondents response. Finally, it is revealed that on an average the respondents agreed that the implementation of IND AS 116 has impact on financial statements of Indian companies.

8. HYPOTHESIS TESTING (CHI -SQUARE TEST)

H01: There is no impact of implementation of IND AS 116 on income statement of the companies.

Table No-8: Observed Frequency

VARIABLE	YES	NO	TOTAL
MALE	49	12	61
FEMAL	3	12	15
TOTAL	52	24	76

Source: Primary data

Table No-9: Expected Frequency

VARIABLE	YES	NO	TOTAL
MALE	41	20	61

FEMAL	11	4	15
TOTAL	52	24	76

Source: Primary data

Table No-10: Showing calculation of χ^2 – value

O	E	O-E	(O-E) ²	(O-E) ² /E
49	41	8	64	1.2549
3	11	-8	64	5.8181
12	20	-8	64	3.2000
12	4	8	64	16.000
χ^2				26.273

Source: MS.Excel 2009

Calculated value of Chi-Square = 26.273 Degree of Freedom = (r-1) (c-1) = (2-1)(2-1) = 1*1 =

Table value of χ^2 for dof = 1 @ 5% level of significance = 3.84

Result: Calculated value of χ^2 (26.273) is greater than the table value of χ^2 (3.84), Hence H0 is rejected and concluded that there is a significant impact of IND AS 116 on Income Statement.

Ho2: There is no impact of implementation of IND AS 116 on balance sheet of the companies

Table No-11: Observed Frequency

VARIABLE	YES	NO	TOTAL
MALE	57	4	61
FEMAL	9	6	15
TOTAL	66	10	76

Source: Primary data

Table No-12: Expected Frequency

VARIABLE	YES	NO	TOTAL
MALE	53	8	61
FEMAL	13	2	15
TOTAL	66	10	76

Source: Primary data

Table No-13: Showing calculation of χ^2 – value

O	E	O-E	(O-E) ²	(O-E) ² /E
57	53	4	16	0.2539
9	13	4	16	1.2307
4	8	4	16	2.0000
6	2	4	16	8.000
χ^2				11.4846

Source: MS.Excel 2009

Calculated value of Chi-Square = 11.4846 Degree of Freedom = (r-1) (c-1) = (2-1)(2-1) = 1*1 =

Table value of χ^2 for dof = 1 @ 5% level of significance = 3.84

Result: Calculated value of χ^2 (11.4846) is greater than the table value of χ^2 (3.84), Hence H0 is rejected and concluded that there is a significant impact of IND AS 116 on Balance Sheet of the companies.

9. CONCLUSIONS & SUGGESTIONS

Based on the descriptive statistics and Chi –Square test analysis it is concluded that there is an impact of IND AS 116 Implementation on the financial performance of Indian companies. To Give proper training to staff or arrange some dedicated staff for the convergence process of Ind as 116. So that planning and implementation both will get a commence soon and ends with proper care and on period. The Accounting professionals perspective suggested that each airline would have to analyse their operating costs, and determine whether they should d get a better ROI from leasing or from buying - or even if they have the cash flow to buy and maintain a fleet in the first place. In simplistic terms, Ind as 116 brings everything (or almost) onto the balance sheet. It's a

means of transparency and a way for investors to analyse the health of the company. It's not a law but it is a sign of best practice for companies.

REFERENCES

1. www.ifrs.org.in.Retrived on 25-8-2019.
2. www.pwc.org.in. Retrieved on 29-8-2019
3. https://www2.deloitte.com/content/dam/Deloitte/sg/Documents/audit/s_ea-audit-IFRS-16-guide.pdf. Retrieved on 21-8-2019.
4. [Www.kpmg.org.in](http://www.kpmg.org.in). Retrieved on 23-8-2019.
5. www.ifrsbox.com. <https://www.ifrsbox.com/ifrs-16-leases-summary/>.Retrieved on 26-8-2019.
6. www.iasplus.com<https://www.iasplus.com/en/standards/ifrs/ifrs-16>). Retrieved on 29-8-2019.
7. [www. Ey.com](http://www.ey.com) Retrieved on 24-8-2019 [https://www.ey.com/Publication/vwLUAssets/ey-ind-as-116-leases/\\$File/ey-ind-as-116-leases.pdf](https://www.ey.com/Publication/vwLUAssets/ey-ind-as-116-leases/$File/ey-ind-as-116-leases.pdf)
8. [www. mca.ac.in](http://www.mca.ac.in). Retrieved on 24-8-2019 http://mca.gov.in/Ministry/pdf/RuleIndAsEng_30032019.pdf
9. www.taxguru.ac.in . retrieved on 24-8-2019 <https://taxguru.in/chartered-accountant/overview-ind-116-leases-proposed-1-4-2019.html>

APPLICATIONS OF LINEAR ALGEBRA IN MACHINE LEARNING

M. Maria Lavanya

St. Ann’s College for Women, Mehidipatnam, Hyderabad, Telangana

ABSTRACT

Linear algebra is a field of mathematics that could be called the mathematics of data. It is a pillar of the field of machine learning, and many recommend it as a prerequisite subject to study prior to getting started in machine learning. The concepts of Linear Algebra are crucial for understanding the theory behind Machine Learning. Linear algebra is about vectors and matrices and in machine learning we are always working with vectors and matrices (arrays) of data. Linear algebra is essential for the mathematics of data. It provides useful shortcuts for describing data as well as operations on data that we need to perform in machine learning methods. They give better intuition for how algorithms really work under the hood, which enables us to make better decisions. This paper discusses on the most important concepts of Linear Algebra that are used in Machine Learning and about applications of linear algebra in machine learning.

Keywords: Linear algebra, Machine learning, Matrices, Vectors, Applications of Linear Algebra.

1. INTRODUCTION

Linear algebra[1] is a sub-field of mathematics concerned with vectors, matrices, and linear transforms. It is a key foundation to the field of machine learning[1][2][3] from its notations which are used to describe the operations of algorithms and its implementation. Linear algebra is integral to the field of machine learning. Linear algebra can be said to be a branch of mathematics which places concern on linear equations like linear functions and their representations through matrices and vector spaces, so we’ll focus on the very basic part of linear algebra which is Matrices & Vectors[2].

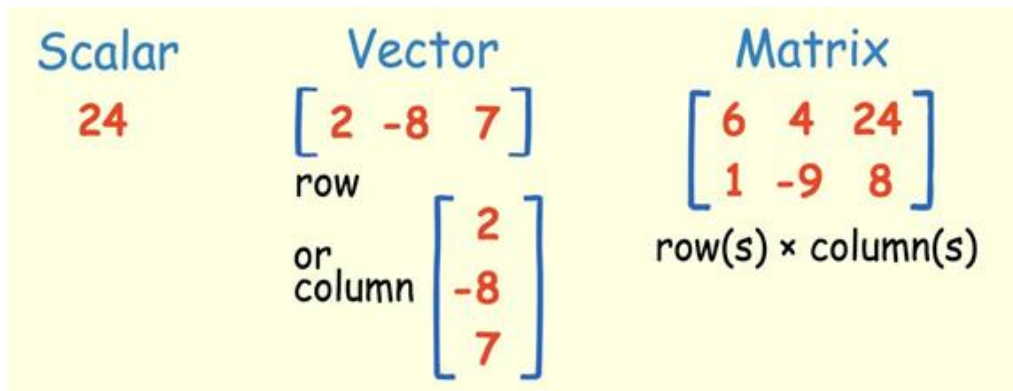


Fig-1.1: Mathematical Objects

Machine learning [3] is a subfield of artificial intelligence (AI). The goal of machine learning generally is to understand the structure of data and fit that data into models that can be understood and utilized by people. Machine learning algorithms[3][4][8] instead allow for computers to train on data inputs and use statistical analysis in order to output values that fall within a specific range. Because of this, machine learning facilitates computers in building models from sample data in order to automate decision-making processes based on data inputs. Any technology user today has benefitted from machine learning.



Fig-1.2: Mathematics for Machine Learning: Linear Algebra

Minimum Linear Algebra for Machine Learning

Linear Algebra is a foundation field of machine learning. The notation and formalisms[5] are used by other branches of mathematics to express concepts that are also relevant to machine learning. For example, matrices and vectors are used in calculus, needed when we want to talk about function derivatives when optimizing a loss function. The following 3 topics[4],[5] are useful to learn a minimum of linear algebra to improve capabilities in machine learning:

- Notation: Knowing the notation [1][2] will help us to read algorithm descriptions in books and websites to get an idea of what is going on.
- Operations: Working at the next level of abstraction in vectors and matrices can help us to learn how to do or apply simple operations like adding, multiplying, inverting, transposing, etc. on matrices and vectors.
- Matrix Factorization: Diving into over any other would be matrix factorization, specifically matrix decomposition methods[2] like SVD and QR. The numerical precision of computers is limited and working with decomposed matrices allows you to sidestep a lot of the overflow/underflow that can result. Also, a quick LU, SVD or QR decomposing using a library will give us an ordinary least squares for regression problem.

2. APPLICATIONS

Images and Photographs

Perhaps we are more used to working with images or photographs in computer vision applications. Each image[3] that we work with is itself a table structure with a width and height and one pixel value in each cell for black and white images or 3 pixel values in each cell for a colour image. A photo is yet another example of a matrix from linear algebra. Operations on the image, such as cropping, scaling, shearing, and so on are described using the notation and operations of linear algebra[1][2].

One Hot Encoding

Sometimes we work with categorical data in machine learning. Categorical data are variables that contain label values rather than numeric values. The number of possible values is often limited to a fixed set. Categorical variables are often called nominal. It is common to encode categorical variables to make them easier to work with and learn by some techniques. A popular encoding for categorical variables is the one hot encoding[3][4][6]. A one-hot encoding can be applied to the integer representation. This is where the integer encoded variable[5][6] is removed and a new binary variable is added for each unique integer value. In the “color” variable example, there are 3 categories and therefore 3 binary variables are needed. A “1” value is placed in the binary variable for the color and “0” values for the other colors.

For example

Red,	Green,	Blue
1,	0,	0
0,	1,	0
0,	0,	1

Each row is encoded as a binary vector, a vector with zero or one values and this is an example of a sparse representation, a whole sub-field of linear algebra.

Linear Regression

Linear regression [7] is an old method from statistics for describing the relationships between variables. It is often used in machine learning for predicting numerical values in simpler regression problems. There are many ways to describe and solve the linear regression problem, i.e. finding a set of coefficients that when multiplied by each of the input variables and added together results in the best prediction of the output variable. If we have used a machine learning tool or library, the most common way of solving linear regression is via a least squares optimization that is solved using matrix factorization methods from linear regression, such as an LU [11] decomposition or a singular-value decomposition, or SVD. Linear regression can be stated using Matrix notation; for example: $y = X \cdot b$ where X is the input data and each column is a data feature, b is a vector of coefficients and y is a vector of output variables for each row in X.

x11, x12, x13

$X = \begin{pmatrix} x_{21} & x_{22} & x_{23} & x_{31} & x_{32} & x_{33} & x_{41} & x_{42} & x_{43} \end{pmatrix}$

b_1

$b = (b_2) b_3$

y_1

$y = (y_2) y_3 y_4$

Regularization

In many methods that involve coefficients, such as regression methods and artificial neural networks, simpler models are often characterized by models that have smaller coefficient values. A technique that is often used to encourage a model to minimize the size of coefficients while it is being fit on data is called regularization[8]. Common implementations include the L2 and L1 forms of regularization. Both of these forms of regularization are in fact a measure of the magnitude or length of the coefficients as a vector and are methods lifted directly from linear algebra called the vector norm[9].

Principal Component Analysis

Often, a dataset has many columns like tens, hundreds, thousands, or more. It is hard to know which features of the data are relevant and which are not. Methods for automatically reducing the number of columns of a dataset are called dimensionality reduction[8], and perhaps the most popular method is called the principal component analysis, or PCA[9]. This method is used in machine learning to create projections of high-dimensional data for both visualization and for training models[8]. The core of the PCA method is a matrix factorization method from linear algebra.

Singular-Value Decomposition

It is a matrix factorization method from the field of linear algebra. It has wide use in linear algebra and can be used directly in applications such as feature selection, visualization, noise reduction, and more[8].

Latent Semantic Analysis

In the sub-field of machine learning for working with text data called natural language processing, it is common to represent documents as large matrices of word occurrences. For example, the columns of the matrix may be the known words in the vocabulary and rows may be sentences, paragraphs, pages, or documents of text with cells in the matrix marked as the count or frequency of the number of times the word occurred. This is a sparse matrix representation of the text. Matrix factorization methods[2], such as the singular-value decomposition can be applied to this sparse matrix, which has the effect of distilling the representation down to its most relevant essence. This form of data preparation is called Latent Semantic Analysis[10], or LSA.

3. CONCLUSION ANF FUTURE WORK

In this paper, we explained applications of Linear algebra[1][3] in machine learning that we may be familiar with that use and require linear algebra. Specifically, the use of linear algebra structures when working with data such as images. Linear algebra concepts when working with data preparation such as one hot encoding and dimensionality reduction. The linear algebra notation and methods are also used in sub-fields such as deep learning, natural language processing, and recommender systems[8].

REFERENCES

- [1] Gilbert Strang, "Introduction to Linear Algebra", Fifth Edition, 2016.
- [2] Gene Golub and Charles Van Loan, "Matrix Computations", 2012.
- [3] Oliver Theobald "Machine Learning For Absolute Beginners: A Plain English Introduction (Machine Learning for Beginners)", January 1, 2018
- [4] Tom M. Mitchell, "Machine Learning", 1 Jul 2017
- [5] John D. Kelleher, Brian Mac Namee, and Aoife D'Arcy, 3. "Fundamentals of Machine Learning for Predictive Data Analytics: Algorithms, Worked Examples, and Case Studies"
- [6] Jason Brownlee, "How to One Hot Encode Sequence Data in Python", July 12, 2017
- [7] Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining, Introduction to Linear Regression Analysis (Wiley Series in Probability and Statistics) Hardcover-27 Apr 2012
- [8] Peter Harrington, "Machine Learning in Action"
- [9] Takeshi Furuhashi, "Basics of Multivariate Analysis II (Principal Component Analysis): Theory and exercise using R"

-
-
- [10] Thomas K. Landauer, Danielle S. McNamara, Simon Dennis, Walter Kintsch “Handbook of Latent Semantic Analysis” 1st Edition
- [11]. Gilbert Strang, ”Linear Algebra and Its Applications”, 17 Nov 2005
- [12] Basics of Linear Algebra for Machine learning <https://machinelearningmastery.com/examples-of-linear-algebra-in-machine-learning/>

STUDY OF SELECTE PUBLIC AND PRIVATE BANKS IN HYDERABAD

K. Mamatha¹ and Dr. V. B. Devi Bala²Assistant Professor¹ and Associate Professor², Department of Business Management, Bharat Institute of Engineering & Technology, Hyderabad

ABSTRACT

The reported study focuses on the wide spread silent issue the “Stress” and throws a light on a comparative analysis of causes of stress among the employees and its effect on the employee performance at the workplace in public and private banks in Hyderabad, and determine the level of differences if any, among both the areas employees. A survey of 210 employees divided into two equal parts of the public and private banks respectively carried out to assess the thirteen independent variables and its effect on employees’ performance, the dependent variable. The descriptive analysis, factor analysis carried out to arrive at the conclusions. To measure the reliability of the likert scale used for this research, and internal consistencies of the survey questionnaire, the reliability static as said above. Stress means strain from the quarrel between our external environment and us, foremost to emotional and physical stress. In our speedy competition paced world, it is unsustainable to live without stress, whether you are a working adult or a student. Job stress level of permanent employees in private and public sector banks, results founded the private sector banks’ employees significantly affected more by stress due to no control on their jobs, social unsupported by the managers, and mechanistic and strict organizational structure than the public sector bank’s employees. This article highlights employees stress management in public and private sector banks in Hyderabad- an analysis. Finally concluded that private sector employees facing more stress than those in the public sector.

Keywords: Stress and Job stress, Emotional and Physical Pressure, Public And Private Banks, Management Factors, Importance Management Factors, Factor Analysis, Impact Factors.

INTRODUCTION

The origin of the concept of stress predates antiquity. The term derived from the Latin word “Stringere” to mean hardship, strain, adversity or affliction. The occupational stress has been of great concern to employees and other stakeholders of organizations. The researchers agree that occupational stress is a serious problem in many organizations. Stress is a worldwide phenomenon and now- a-days no organisation can claim to be stress free. Every job is challenging and more demanding. It requires high standard of performance, high quality in work and getting aspirations and expectation fulfilled. Every employee is forced to have a stressful and hectic lifestyle. Nowadays Stress Management is more important in the service, financial and banking sector. There is no such thing as stress less job. Every person in their work is revealed, to tension and worry as they get through the duties allocated to them. Banking industry plays a predominant role in the developing the Indian economy. The nature of banking employee’s job is very vapid, as it includes the direct customer face to face interaction in all positions. This study reveals that a huge number of bankers are outside high level of stress by virtue of their job and the reasons behind this stress include heavy work load, long working hours, not proper reward system, lack of job autonomy, organizational culture, role conflict etc. and the major reason is lack of management support to employees in banking sector. The employees will indicate a number of symptoms indicating top-level stress among them (ArpitaBelapurkar, and Apeksha Jain (2011). However, if these indications are not perceived in prior Stage, they can reason critical health problems among employees such as depression, heart problems, diabetes etc. Not only health but personal life of bankers are also being affected because of high job stress, most employees are unable to expend time at the house or with members of the family. However, with the help of relevant management methods and techniques by management, the stress of banker’s level to be decreased, to great extent. The type of research conducted is „Casual“ as this research explores the effect of one variable over other.

NEED FOR AND THE STUDY

Stress is anamplfactor of the human survival, is said to have extensive influence more than the lives of the human being, and the organization. In the current era, the quality and zeal of stress are too vicious, that the present age has been Age of nerves, Stress, and Depression“. As human beings spend most of their time at work, the work place has been imagining being a dynamic subscriber and of stress. At the place of work, different roles are executed which have to be in integration with the roles at home and other places. The stress inspires due to roles performed by an individual as employees at work place, has been one of the most persuasive firms stressors, the outcomes of which have been evaluated to be costly to the firm. The public and

private sector commercial banks have also witnessed the relative lack of efforts to analyze the role stress phenomenon exhaustively.

REVIEW OF LITERATURE AND RESEARCH GAP

The discussion of the previous literature recognized significant gap that will be explored in the study. In this study, all studies in the area of employee's satisfaction and expectation towards public and private sector banks are limited for differentiating with respect to the organizational stress and surviving procedure in private and public sector banks in Indian finance system. But there is no study on a comparative study on the stress management in public and private sector banks in Telangana state. The feature of the relationship between mental health with emotional maturity, emotional intelligence and self-acceptance correlation analysis reveals that mental health is positively related to emotional maturity, various factors related to stress, organizational, personal, environmental, psychological, emotional factors and impact factors of stress management in public and private sector banks in Telangana state. MUSYOKA MARY ET.AL (2012) the result of the study is that low level of stress is positive impact on performance but the stress is increase it decrease the performance of employees and its affect the organization. PARILLA S. ERIC (2012). The investigator observed that the middle level employees faced the peak degree of stress and the level of stress compared to the other job position. The result that personal characteristics (age, gender, income number of family members) has not correlated to job stress while job position has correlated with job stress. Productivity and stress has negatively correlated. SATYANARAYAN.K.S & DR MARAN.K (2011) found that the main factor of stress has workload, weakness and low physical situation. Important correlation amid workload and emotional tiredness and there is no significant different in stress variable and gender.

The previous discussion of the literature identified a significant gap that will be explored in the study. The Most of the studies in the area of employees' satisfaction and expectation towards public and private sector banks are limited to comparing with respect to the organizational stress and surviving procedure in private and public sector banks in the Indian finance system. But no study on a qualified study on the stress management in public and private sector banks in Hyderabad (Ayyappan and SakthiVadivel, M.(2013).

STATEMENT OF THE PROBLEM

In the present and earlier period decades, the banking sectors have been undergoing sea variations in terms of globalization efforts and liberalization policies, downing, and novel technology and so on, that had generated stressful weather to the employees working in the sectors. This coming of technological resolution in all human being life with globalization, a privatization policy has too much changed conventional patterns in all sectors

RESEARCH QUESTION

What are the main sources of stress in public and private sector bank and if there are any differences in stress variables i.e., work overload, role overload etc. among the banking sectors and how do they influence employee's performance in both the sectors.

OBJECTIVES OF THE STUDY

The objective of the study is to present the focal sources of stress in public and private banks if there are any variations in stress variables between the banks and how do they influence employee's performance in both the sectors. The following objectives are developed for a study about stress management in public and private sector banks in Hyderabad.

1. To analyze the factors influencing the stress perceived by the bank employees in public and private sectors of selected banks in Hyderabad.
2. To impact of management stress factors towards in public and private sector banks in Hyderabad.
3. To identify the various factors of stress prevailing in different levels among employees in public and private sector banks in Hyderabad.

TESTING OF HYPOTHESES

The Hypotheses is testing and framed. The study is based on the following frame work.

H01: There is no association between stress management of public and private sector bank employees in Hyderabad of Telangana State.

H0 2: There is no significant relationship between comparative studies of the acceptance level of employees in public and private sector banks and various factors relating to stress management in Hyderabad of Telangana State.

RESEARCH METHODOLOGY

In this study, researcher used both the primary and secondary data. The Primary data have been collected from the field survey through structured questionnaire to the employees of public and private sector banks in Telangana state. The secondary data were collected from various books, journals, web portal, records from the banks in Telangana district and RBI Bulletins.

Sampling Design

The researcher intends to use Stratified random sampling, under stratified sampling the population has been divided into stratum based on the job position. Each stratum is more homogeneous than the total population. The researcher will select the respondents for the sample from each stratum. The population of the study is in Telangana state which has 21 Public Sector Banks and 21 private sector banks based on convenient sampling technique. A total number of public and private sector banks comprise 42; there are two categories of banks: 1) Public Sector Banks (21) and 2) Private Sector Banks (21). The sample selection of two public sector banks namely State Bank of India (SBI), and Indian Overseas Bank (IOB), and also selection of two private sectors banks namely; Axes Bank and ICICI bank, situated in Hyderabad of Telangana State, and was selected for the study. Convenience sampling technique has been used to select the sample 210 respondents for the study. The samples consist of two categories public sector bank employees (21) and private sector bank employees (21) totally 42. This study is descriptive in nature.

Sample size

The sample population is a subset of the entire population, and inferential statistics is to generalize from the sample to the population (Furlong et. al, 2000). A sample size of two hundred and ten (210), 105 each from public and 105 from the private sector banks around the Hyderabad Metro, Telangana, India.

Demography of sample

Response	Frequency	Percent
Public Banks		
Male	75	71
Female	30	29
Total	105	100
Private banks		
Male	69	66
Female	36	34
Total	105	100

Statistical Tools

In this study, the researcher used statistical tools like, mean, standard deviation, coefficient variance, and factor analysis. For analyzing data the researcher used Statistical Package for Social Sciences (SPSS) package. The interpretation of the study is done by using tables to give meaningful results.

SCOPE AND LIMITATIONS OF THE STUDY

The study aims at analyzing comparative study on stress management in public sector banks and private sector banks in Hyderabad of Telangana state. The scope of the study has been limited to certain banking sectors aspects of employees job stress namely the different stress factors chosen for the research are organization factors, environment factors, work factors, personal factors, health factors, , psychological factors, emotional factors, impact factors and stress management in public and private sector banks in Hyderabad . The study has the following limitations.

1. The field survey is restricted only to 260 employees (i.e. 21 public and 21 private sector Banks) in Hyderabad of Telangana state.
2. This study only commercial banks cannot be generalized the cooperative banks and foreign banks.
3. This study limited to only Hyderabad region.

EMPLOYEES STRESS MANAGEMENT IN BANKING SECTOR: A COMPARATIVE STUDY OF SELECTED PUBLIC AND PRIVATE BANKS IN HYDERABAD

The researcher use to test the stress factors relating to work, Important Measures/Practices, Managing the Stress Factors and factor analysis for public and private sector banks and impact factors an analysis.

Descriptive Statistics for Managing the Stress Factors

The descriptive statistics for managing the stress factors of the respondents in the public sector banks and private sector banks is given in the Table 1.

Table-1: Descriptive Statistics for Managing the Stress Factors (Public Sector Banks)

S.No	Variables	N	MEAN	S.D.	C.V.
1.	Discussion with management, family or colleagues	210	1.554	0.826	0.428
2.	Finding a solution to solve the problem	210	1.458	0.794	0.439
3.	Having relaxation activities (walking, reading, seeing movies, playing, hearing songs)	210	2.142	0.533	0.201
4.	Hiding the problem	210	2.432	0.600	0.199
5.	Having other types of activities: smoking, eating, giving up on alcohol and tobacco	210	2.915	0.688	0.190
6.	Learning the methods to sort out problems and taking decisions	210	2.339	0.697	0.239
7.	Establishing and maintaining an adequate social support	210	2.020	0.634	0.253
8.	Developing a healthy lifestyle: keeping a normal weight, exercising on regular basis	210	1.732	0.801	0.373
9.	Boosting the self-esteem: establishing priorities and limits, taking part in activities that grow one's self-esteem, establishing realistic goals	210	1.563	0.606	0.301
10.	Positive communication with other people	210	1.768	0.604	0.276
11.	Identifying and sorting out conflicts when they emerge	210	1.894	0.646	0.275
12.	Turn to prayer or spiritual thoughts	210	1.561	0.654	0.332
13.	Build satisfactory relationship with supervisor	210	1.625	0.584	0.289

Table 1 shows the descriptive statistics of the stress management in the public sector banks. The highest mean score for stress factors have the other type of activities are smoking, eating, giving up on alcohol and tobacco with mean score of 3.915, followed by hiding the problem with mean score of 2.432, learning the methods to sort out problems and taking decisions with mean score of 2.339, their relaxation activities (walking, reading, seeing movies, playing, hearing songs) with mean score of 2.142, and also finding the solution to solve the problem with mean score of 1.458. They are identifying and sorting out conflicts when they emerge, build satisfactory.

Relationship with the supervisor, positive communication with other people and developing a healthy lifestyle: (keeping a normal weight, exercise), and turn to prayer or spiritual thoughts with respective mean scores of 1.768, 1.732, 1.561, of the respondents. Managing the stress factors for discussion with management, family or colleagues (mean 1.554), boosting the self-esteem (mean 1.563) and Finding a solution to solve the problem (mean 1.458) has scored least level of the mean score of the respondents in the public sector banks (Malik, N.(2011).

Managing stress factors (Private Sector Banks)

Managing the stress required in the work place to improve a positive communication with other people, set the practical forecast for the amount of work you can finish in the time you have convenient available, avoid negativity and negative people, and also try to maintain a positive attitude about your work and your co-workers are important factors. Managing the stress factors of the respondents in private sector banks given in the below Table 2.

Table-2: Managing stress factors (Private Sector Banks)

S. No	Particulars	SA	A	N	DA	SDA	Total	Mean
1.	Discussion with management, family or colleagues	38	41	37	68	26	210	2.02
		18.00	20.00	17.67	32.38	12.38	100	
2.	Finding a solution to solve the	26	43	66	41	34	210	2.38
		12.38	20.47	31.42	19.61	16.19	100	
3.	Having relaxation activities (walking, reading, seeing movies, playing, hearing songs)	16	28	106	24	36	210	2.10
		7.610	13.33	50.47	11.42	17.14	100	

4.	Hidingthe problem	28	46	95	17	24	210	3.17
		13.33	21.90	40.28	10.18	13.37	100	
		27	39	110	19	15	210	
5.	Havingother types ofactivities: smoking, eating,givingup on	14.53	18.64	46.00	11.35	9.21	100	1.51
		20	44	83	44	19	210	
6.	Learningthe methods tosort out problems and takingdecisions	11.53	20.74	35.76	20.76	11.15	100	2.52
		27	35	115	38	45	210	
7.	Establishing and maintaining anadequate social support	10.38	13.46	44.23	14.61	17.30	100	1.83
		38	55	86	51	30	210	
8.	Developingahealthylifestyle (normal weight,	14.61	21.15	33.07	19.61	11.53	100	2.36
		46	68	43	80	23	210	
9.	Boostingthe self-esteem	17.69	26.15	16.53	30.76	8.84	100	2.92
		37	57	84	58	24	210	
10.	Positive communicationwith other	14.23	21.92	32.30	22.30	9.23	100	3.02
		43	31	56	61	19	210	
11.	Identifying and sortingout conflicts when they emerge	20.38	15.76	25.38	27.30	11.15	100	1.86
		34	44	60	51	21	210	
12.	Turn to prayer or spiritual thoughts	16.92	20.76	26.92	23.46	11.92	100	2.38
		37/14.2	46/21.5	58/26.1	65/28.8	14/9.26	210/100	
13.	Build satisfactoryrelationship with supervisor							2.39
Overall		13.01	28.22	20.10	13.84	5.8	100	3.23

The stress management shows an overall total of thirteen factors 13.11 per cent, 28.22 per cent, 20.10 per cent, 13.84 per cent and 15.8 per cent of strongly agree, agree, neutral, disagree and strongly disagree respectively towards the respondents managing the stress factors in the private sector banks in Telangana state. The average acceptance score shows the highest mean score of 3.17 for hiding the problem and least score for having other types of activities: smoking, eating, givingup on1.51 towards stress management in private sector banks.

FACTOR ANALYSIS FOR PUBLIC AND PRIVATE SECTOR BANKS

Analyses were done with the core objective to find out the underlying common factors among the variables included in this survey. Principal component factoring method with variance rotation was used utilize for factor extraction.

Table 3 reveals the results of the factor analysis. An arbitrary value of 0.48 and above is considered significant loading. As per the above technique a positive loading reveals that larger the worth/value of the variable, superior is the involvement/ contribution to the factor. On the other hand, a negative loading implies that greater the value, lesser its contribution to the factor or vice versa.

Table-3: Communalities for Impact of stress

S.No.	Variables	Initial	Extraction
1.	Stress decrease the job satisfaction	1.000	.301
2.	It affects physical and mental health	1.000	.375
3.	It decrease of work quality	1.000	.461
4.	Increasing the absenteeism	1.000	.462
5.	Increasing the staff fluctuation	1.000	.539
6.	Lack of interest and motivation	1.000	.319
7.	Affecting the balance family/work	1.000	.600
8.	Stress lead to lack of control	1.000	.609
9.	It decrease the level of patience, empathy, flexibility, tolerance	1.000	.657
10.	Stress increasing the degree of frustration	1.000	.608
11.	It leads to misuse drugs	1.000	.614
12.	Tiredness	1.000	.508
13.	Have poor interpersonal relationship	1.000	.525

14.	Angry	1.000	.427
15.	Eatingdisorder	1.000	.623
16.	Bore	1.000	.613
17.	Bodily-injuries	1.000	.620
18.	Low self-esteem	1.000	.510

Source: Computed from Primary data, Extraction Method: Principal Component Analysis.

From the Table 3 reveals that in the data interpretation on “impact stress” through factor analysis, out of 18 variables, “It reduces the level of patience, empathy, flexibility, tolerance,” variable got high commonality value (0.657). It means extracted factors are capable to describe low variance in that the variable more effective than other variables and “Stress decrease the job satisfaction” variable got lowest commonality value (0.301). It means that the extracted factors are not able to describe much variance in that variable. Such type of the variable may be dropped from the analysis (Shahid, et.al (2011)).

Table-3(a): Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.185	18.137	18.137	3.195	18.237	18.237
2	1.860	8.123	26.264	1.870	8.723	26.964
3	1.483	7.364	33.99	1.583	7.564	34.528
4	1.124	7.739	41.72	1.124	7.139	41.667
5	1.072	6.968	48.135	1.082	6.468	48.135
6	1.033	5.749	53.884	1.013	5.249	53.417
7	.866	5.933	58.417			
8	.837	5.605	64.022			
9	.846	4.175	68.397			
10	.879	4.216	73.113			
11	.814	4.479	77.692			
12	.753	4.926	81.818			
13	.625	3.167	85.485			
14	.666	3.869	88.854			
15	.533	3.252	92.206			
16	.422	2.899	95.205			
17	.402	2.185	98.19			
18	.328	1.710	100			

Source: Computed from Primary data, Extraction Method: Principal Component Analysis.

Table 3(a) depicts the percentage of variance in respect of 18 variables in the impact of stress. These variables have been rotated to ascertain the cumulative percentage of variance. The factor 1 causes 18.137 per cent of variance, factor 2 causes 8.123 per cent of variance, factor 3 causes 7.364 per cent of variance, factor 4 causes 7.739 per cent of variance, factor 5 causes 6.968 per cent of variance, and factor 6 causes 5.749 per cent of the variance in impact of stress. The overall six factors cumulatively contribute 53.884 per cent.

Table-3(b): Communalities for Managing the Stress Factors

S. No.	Variables	Initial	Extraction
1.	Discussion with management, family or colleagues	1.000	.715
2.	Finding a solution to solve the problem	1.000	.417
3.	Having relaxation activities (walking, reading, seeing movies, playing, hearing songs)	1.000	.519
4.	Hiding the problem	1.000	.292
5.	Having other types of activities: smoking, eating, giving up on alcohol and tobacco	1.000	.511
6.	Learning the methods to sort out problems and taking decisions	1.000	.411
8.	Establishing and maintaining an adequate social support	1.000	.516
	Developing a healthy lifestyle (normal weight, exercising regularly)	1.000	.609
9.	Boosting the self-esteem	1.000	.529
10.	Positive communication with other people	1.000	.509

11.	Identifying and sorting out conflicts when they emerge	1.000	.515
12.	Turn to prayer or spiritual thoughts	1.000	.603
13.	Develop peer support	1.000	.221
14.	Plan instead of responding to pressure	1.000	.318
15.	Build satisfactory relationship with supervisor	1.000	.607

Source: Computed from Primary data, Extraction Method: Principal Component Analysis.

From the Table 3(b) in the data interpretation on “managing the stress factors in the job” through factor analysis, out of 18 variables, “Discussion with management, family or colleagues” variable got high communality value (0.715). It means extracted factors are able to explain low variance in that the variable more effective than other variables and “Hiding the problem” variable got lowest communality value (0.292). It means that the extracted factors are not able to explain much variance in that variable. Such variable may be dropped from the analysis.

SUGGESTIONS

- The bank ought to take the novel proposal to identify the stress affected grouping in the organization at regular intervals and to provide them adequate level of support to fight it.
- Training by behavioural scientists must be given to bank employees to serve

CONCLUSION

The present study concluded that employees in both the public and private sectors face moderate levels of stress, of which they are subject to role erosion the most and resource inadequacy the least. Additionally, there is no significant / noteworthy diversity in overall role stress amid public and private sector employees. Although it is noted that private sector employees facing slightly more stress than those in the public sector. The analysis of the impact of various socio-demographic factors on stress level reveals that educational qualifications and work experience have a significant impact on employees' stress levels. Various stress factors relating to work, organization, personal, health environment, psychological, emotional, the impact of stress, management of stress, prevention of stress, and important measure to reduce the stress factors. Employees stress management towards public sector banks in Hyderabad of Telangana state.

REFERENCES

1. Arpita Belapurkar, and Apeksha Jain (2011) “Impact of Job Stress on Job Satisfaction of Employees Working In Banking Sector” *Altius Shodh Journal of Management & Commerce*, Vol.4.Issue No.3, pp.1-9.
2. Ayyappan and Sakthi Vadivel, M. (2013) “The Impacts of Occupational Stress of Selected Banking Sector Employees in Tamil Nadu” *International Journal of Finance & Banking Studies*, Vol.2. Issue No.2, pp.100-108.
3. Malik, N. (2011) “A Study on Occupational Stress Experienced by Private and Public Banks Employees in Quetta City”. *African Journal of Business Management*, Vol.5., Issue No.8
4. Shahid, N., M. Latif, K., Sohail, N. S. & Muhammad, A. A. (2011), Work stress and employee performance in banking sector evidence from district Faisalabad, Pakistan, *Asian Journal of Business and Management Sciences*, Vol.1., Issue No. 7, pp38- 47.
5. Thulasipriya, B.(2014)“ Investment Pattern of Government Employees An Empirical Study” *International Journal on Global Business Management & Research*, Vol.3.Issue No.1.pp.35-41.
6. Parilla, S. Eric. (2012). Level of stress experienced by NWU Employees: Towards developing A Stress Management. *Asian journal of management research*. vol.2, no.2.
7. Satyanarayan, S. K. & Dr Maran, K. (2011). A Study on Stress Management in IT Industry. *Journal of Management Research and Development (JMRD)*. vol.1(1), Pg.21- 26, retrieved from <http://www.prjpublication.com/JMRD.asp>.
8. Musyoka, Mary., Ogotu, Martin. & Awino, Bolo. Zachary. (2012). Employee stress and performance of companies listed in the Nairobi securities exchange. *DBA Africa management review*. vol.3, no.1, pg. 115-129

SECURITY ISSUES AND COMPARATIVE STUDY ON CRYPTOGRAPHIC ALGORITHMS IN MANET

Dr. V. Harsha ShastriLecturer, Department of CSE, Loyola Academy, T. S., Alwal

ABSTRACT

Mobile Ad-hoc Networks consists of nodes that communicate with each other without any infrastructure in a wireless medium. The infrastructure is not fixed. Due to the de-centralized control, nodes in the network face lot of problems while sending the data from one node to another. The data needs to be securely transferred among the nodes so that the intruders cannot learn the message travelled. For this we have to apply stronger cryptographic algorithms to protect the data. In this paper, we discuss the cryptographic algorithms needed for MANET.

Keywords: Mobile Ad-Network (MANET), Attacks, Encryption, ECC, RSA, DES

I. INTRODUCTION

MANET is an autonomous system in which mobile hosts are allowed to move freely through wireless links. They have the feature of self configuring and self management. It is a network of mobile routers connected by wireless links - the union of which forms an unplanned topology. They can act as routers at the same time and don't have fixed infrastructure. They are easily vulnerable to many types of attacks due lack of any centralized controller. The nodes may join or leave the network arbitrarily in time. As the nodes are in mobility, the topology is dynamic. This type of network may operate in a standalone way, or would be connected to the larger Internet. MANET is used in areas like personal area networking, disaster relief, conferences, emergency operations etc. MANETs are vulnerable to various types of attacks on different layers some of the attacks are signal jamming, sniffing, packet dropping, flooding, denial of service. A single solution cannot resolve all types of attacks.

Characteristics of MANET

- Node acts as router or host.
- MANET is capable of multi hop routing
- The network topology is dynamic
- In MANET, the nodes have less power and light weight.
- The reliability, efficiency, stability and capacity of wireless links are often lesser when compared with wired links.
- It is low cost network.

Challenges in MANET

- It has limited wireless transmission range.
- There is no centralized administration control, so it is difficult to find the paths between nodes.
- Unprotected wireless channel.
- Scalability is one of the issues in the placement of nodes
- Selfish nodes decrease the performance
- They will be packet losses and nodes are moving during transmission.
- Due to mobility in nodes, they have routing problems.
- It has battery constrained energy efficient problem.

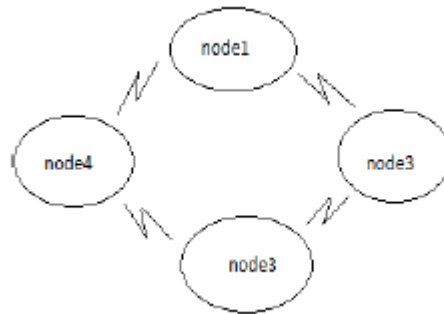


Fig-1: Mobile Ad hoc Network

We need a method to encrypt the packets using the cryptographic techniques so that even if an attacker attacks on the network and may able to capture the data packets he only gets the encrypted packets and further investigation is to be done by the attacker to decrypt those data packets.

The architecture of MANET consists of three types of technologies

- Enabling technologies
- Networking
- Middleware and Applications

Enabling technologies: These technologies consist of network topologies like BAN, PAN and WLAN. BAN is known as body area network and it consists of devices connected to each other like headphones connected with computer or any Bluetooth devices. The communication range is 1 to 2 meters. PAN is known as personal area network which consists of devices like wireless audio systems and has a communication range of 12-15 meters. WLAN is also known as wireless area network which consists of devices connected to internet by using wireless microwaves having communication range of 100 to 500 meters.

Networking: The networking protocols are used for the one hop transmission services that are capable of sending data packets from one user to another user or from one user to multiple users at the same time. For successful transmission of data, network has to create an end to end communication between the sender and the receiver.

Middleware and Applications: MANETS has increased in the field of military and non military services. With the growth of new technologies like WiFi, Bluetooth etc, MANETS are also the one which needs further development. The Mantes are used in emergency services like flooding, earthquake etc. The flexibility of MANET makes them to use in the place of other services like Personal Area Network, Education services, commercial services and sensor Networks etc.

II. LAYERS USED IN MANET

Name of the Layer	Purpose	Attack
Application Layer	Runs services on the network	DoS, worms, SQL injections and viruses
Transport Layer	maintenance of session between two communication devices	Session hijacking and Covert Channel
Network Layer	Packet forwarding	Flooding, Packet Dropping and Denial of Service.
MAC Layer	Placed between Data link Layer and Physical layer and provides channel access control mechanisms.	signal jamming and sniffing

Table-1: Purpose and attacks in various layers

III. SECURITY CRITERIA IN MANET

There are different security criteria with respect to MANET

Availability: The network continues to provide services regardless of the state of the network. A denial of service attacks is based to attack this property [9].

Integrity: Integrity guarantees that alerting of message is not done and it can be done malicious or accidental [9]. It assures that the data received are exactly same as sent by an authorized entity.

Confidentiality: The message cannot be even viewed in its original form by any unauthorized person. The transmitted message must make sense to only the intended receiver.

Authenticity: The sender and receiver prove their identities. This property ensures that the parties are genuine not impersonators or intruders.

Non repudiation: The sender and receiver cannot be able to deny about sending and receiving the message [10].

Authorization: Assigning different access rights to the different types of the users. For example, a network management can be performed by network administrator only.

IV. ATTACKS IN MANET

There are two types of attacks in the MANET. First is the internal attack and second is the external attack. An external attack creates congestion, sends false routing information or causes unavailability of services. In an internal attack, the malicious node from the network gains unauthorized access and impersonates as a genuine node. It can analyze traffic between other nodes and may participate in other network activities.

Denial of Services attack: This attack normally prevents the use or management of communication facilities. It may attack a single node or the entire network. If the attack is successful, the services will not be available to other nodes. The attacker uses jamming method or battery exhaustive method.

Impersonation: It is a severe threat to the network. If authentication mechanism is not properly implemented, a malicious node will act as a genuine node and monitor the traffic. It can send false routing messages and can gain access to confidential information of the users.

Eavesdropping: This is a passive attack. The node simply observes the confidential or personal information. This information can be later used or misuse by the malicious node. The secret information like location, public key, private key, password etc. can be fetched by eavesdropper. Because such data are very important, they should be kept away from the unauthorized or attacker access.

Routing attacks: In the mobile ad-hoc networks, attacks against routing are generally classified into the two categories: attacks on routing protocols and attacks on packet forwarding/delivery [4]. Attacks on routing protocols aim to block the propagation of the routing information to the victim even if there are some routes from the victim to other destinations. Attacks on the packets forwarding try to disturb the packet delivery along a predefined path.

V. SECURITY SOLUTIONS IN MANET

There are two general solutions to avoiding such attacks, using IDSs and cryptography. In the first solution all nodes or some of them are equipped with intrusion detection system (IDS) in order to detect the intrusions and then isolate the adversary nodes from the network. One of the disadvantages of IDSs is that the detection of the intrusions is not a deterministic task, so there exists a large number of false positives and false negatives in the detections. Also according to the wireless nature of MANETs, using such a mechanism cannot prevent eavesdropping, therefore cannot achieve confidentiality. Hence, using IDSs is not a complete solution for securing MANETs [1].

The second solution for providing security within MANETs is Cryptography [1]. It enables the user to transmit confidential information across any insecure network so that it cannot be used by an intruder. Two processes involved in Cryptography are encryption and decryption of text. It uses various mechanisms or algorithms.

There are two general categories of cryptographic algorithms. The first one is named Symmetric Key Cryptography which defines a shared key between each pair of nodes. If all shared keys are the same, the method will be called Shared Key Cryptography. Examples include DES and AES. But it has some limitations. One major limitation is the key distribution problem. If the node is compromised then the whole security in the whole network is destroyed. The second cryptographic algorithm is called Asymmetric Cryptography. In this kind of cryptography each node has two keys, public key and private key. The public key of each node is public for any node and the private key is known only by the owner of the key. Here, if a node wants to send a message to another one, it should encrypt the message by the destination node's public key. The encrypted message will be decrypted with the private key that is known just by the destination node.

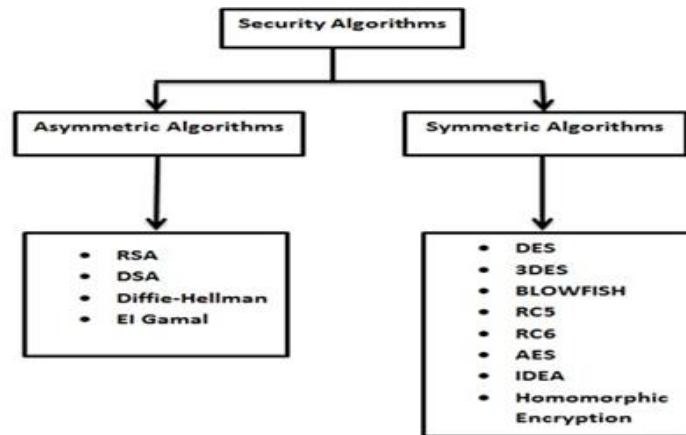


Fig-2: Security Algorithms in MANET

a. ENCRYPTION ALGORITHMS IN MANET

DES (Data Encryption Standard): DES is the block cipher that encrypts 64-bit data blocks and encryption of the data is performed using a 56-bit secret key [4]. DES consists of sixteen rounds and two permutation layers. DES uses a shared key both to encrypt and decrypt the message. DES possesses strong Avalanche effect and is flexible as it works in CBC, ECB, CFB and OFB modes. DES suffers from Brute Force attack and relatively slow in software [3]

AES (ADVANCED ENCRYPTION STANDARD): AES [6] can process the 128 bit data blocks and uses key lengths of 128, 192, or 256 bits. Because of the key size, AES may be known to as AES-128, AES-192 and AES256 respectively. Unlike DES, AES is not a feistel structure. Number of rounds in AES depends on key length i.e. for a key length of 128, number of rounds is 10 and similarly for 192 and 256 bit keys, it is 12 and 14 respectively. AES provides security against all known attacks, simple in the design and good speed of computation.

The problems of key distribution are solved by public key cryptography. Some examples of the public-key cryptosystems are: RSA, Diffie-Hellman and DSA.

RSA (Rivest, Shamir and Adleman): A public key encryption algorithm developed by Ronald Rivest, Adi Shamir, and Leonard Adleman in 1977. Its security depends on the difficulty of decomposition of large numbers. RSA [5] was the first algorithm known to be suitable for signing as well as encryption, and one of the first great advances in public key encryption.

Diffie-Hellman: It is first public key algorithm in 1976. Diffie–Hellman [3] establishes a shared secret key that can be used for secret communications by exchanging data over a public network. Discrete Logarithm Problem makes it extremely difficult to crack. Diffie– Hellman algorithm easily falls prey to man-in-the-middle attack [3].

Elliptic Curve Cryptography: The elliptic curve cryptosystem is one of the three cryptosystems presently in use for public key cryptography (PKC), the other two being discrete logarithm systems and integer factorization systems. The Digital Signature Algorithm (DSA) cryptosystem is the best-known example of the discrete logarithm problem while the RSA cryptosystem is based on the integer factorization problem. ECC, based on elliptic curves, was designed independently in 1985 by Neal Koblitz and Victor Miller.

The attitude of a point, whose coordinates follow to a particular cubic equation along with the point at infinity O (the point at which the attitude/position in the projective plane intersects the line at infinity,) is known as an elliptic curve. The equation of E (Fp) for the distinctive p > 3 can be defined as $y^2 = x^3 + ax + b$ (1) where $a \in Fp$ and $b \in Fp$ are constants such that

$$4a^3 + 27b^2 \neq 0 \text{ (2).}$$

In the binary case, the defining equation of E (F₂^m) can be inscribed as: $y^2 + xy = x^3 + ax^2 + b$ (3) where $a \in F_2$ and $b \in F_2^m$ are constants and $b \neq 0$.

A group of points can be formed with the support of a chord-and-tangent rule (extended addition) in an elliptic curve E defined over the field K as denoted in Figure 2.

By means of basic coordinate geometry and given two points $P_1 = (x_1, y_1)$ and $P_2 = (x_2, y_2)$, one builds arithmetic to compute the point $P_3 = (x_3, y_3) = P_1 + P_2$ as follows:

$$x_3 = \lambda^2 - x_1 - x_2 \quad (4)$$

$$y_3 = \lambda(x_1 - x_3) - y_1 \quad (5)$$

where $\lambda = \{[(y_2 - y_1)/(x_2 - x_1), \text{ if } P_1 \neq P_2], [(3x_1^2 + a)/(2y_1), \text{ otherwise}]\}$

Let P1 and P2 be two discrete points and let them interconnect the elliptic curve in a straight line, then the straight line will put up with the third intersection with the curve. The sum of P1 and P2, represented as P3, is derived from the reflection of the third intersection on the x-axis.

The elliptic curve cryptography has two algorithms namely Elliptic Curve Digital Signature Algorithm (ECDSA) and Elliptic Curve Diffie-Hellman (ECDH). A digital Signature algorithm is used for authenticating a device or a message sent by the device. ECDSA is an alternate of the Digital Signature Algorithm (DSA) that performs on elliptic curve groups. ECDH is a key agreement protocol that grants two parties to establish a shared secret key that can be used for private key algorithms. Both parties interchange some public information to each other. Using this public data and their own private data these parties computes the shared secret. Any third party, who doesn't have access to the private details of each device, will not be able to compute the shared secret from the available public information.

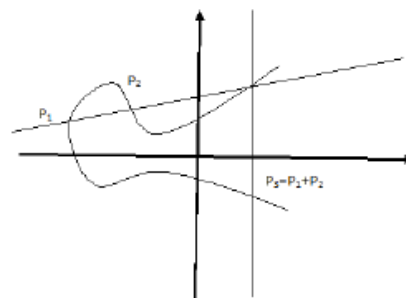


Fig-3: Addition of two elliptic curve points

Hashing Algorithm: The MD5 message-digest algorithm is the widely used cryptographic hash function that produces a 128-bit (16-byte) hash value. An MD5 hash is typically expressed the hexadecimal number, 32 digits long. MD5 processes a variable-length message into the fixed-length output of 128 bits. The input message is divided into the chunks of 512-bit blocks (sixteen 32-bit words); the message is padded so that its length is divisible by 512 [11].

S.NO	CHARACTERISTICS	YEAR	BLOCKSIZE (Bits)	KEYLENGTH (Bits)	SECURITY	SPEED
	ALGORITHMS					
1.	DES	1997	64	56	Proven Inadequate	Very slow
2.	AES	2000	128, 192 or 256	128, 192 or 256	High secure	Very fast
3.	RSA	1977	128	1024-4096	Considered secure	Very Slow
4.	ECC	1985	128, 192 or 256	256	Highly Secure	Fast
5.	DIFFIE- HELLMAN	1976	-	-	Not secure	Slow

Table-2: Comparison of existing security algorithm of MANET

VI. FUTURE WORK

The Security provided by these algorithms can be enhanced further, if more than one algorithm is applied to data. Our future work will explore this concept and a combination of algorithms will be applied either sequentially or parallel, to secure the data during transmission from intruders and other attacks in mobile ad hoc network.

VII. CONCLUSION

This paper presents the detailed study of the popular Encryption Algorithms such as DES, AES, RSA, Diffie Hellman, ECC and hashing algorithms. The use of internet and network is growing rapidly. So there are more requirements to secure the data transmitted over different networks using different services. To provide more security to the network and data, different encryption methods are used. In this paper, a survey on the existing works on the Encryption techniques has been done.

REFERENCES

[1] Mohammed Gharib, Ehsan Emamjomeh-Zadeh, Ashkan Norouzi-Fard and Ali Movaghar, "A Novel Probabilistic Key Management Algorithm for Large-scale MANETs", IEEE,27th International Conference on Advanced Information Networking and Applications Workshops,2013

- [2] Athulya M S,Sheeba V S, "Security in Mobile Ad-Hoc Networks",IEEE-20180,ICCCNT'12,26th -28th July 2012
- [3] Veerpal Kaur,Aman Singh, "Review of Various Algorithms Used in Hybrid Cryptography", International Journal of Computer Science and Network, Volume 2, Issue 6, December 2013
- [4] Ajay Kushwaha,Hariram Sharma, "Enhancing Selective Encryption Algorithm for Secured MANET", IEEE, Fourth International Conference on Computational Intelligence, Modelling and Simulation,2012
- [5] Khushdeep Kaur, Er. Seema, "Hybrid Algorithm with DSA, RSA and MD5 Encryption Algorithm for wireless devices", International Journal of Engineering Research and Applications, Vol. 2, Issue 5, September- October 2012
- [6] Gulshan Kumar, Rahul Saha, Mritunjay Kumar Rai, "DSAB – A Hybrid Approach for Providing Security in MANET", INTERNATIONAL JOURNAL OF INFORMATION SECURITY SCIENCE, Vol.1, No.3
- [7] Jayashree.A.Patil,Nandini Sidnal, "Survey - Secure Routing Protocols of MANET", International Journal of Applied Information Systems (IJAIS),Volume 5– No.4, March 2013
- [8] Amol Bhosle, Yogadhar Pandey, "Review of authentication and digital signature methods in Mobile ad hoc network", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET),Volume 2, Issue 3, March 2013
- [9] Rashid Sheikh, Mahakal Singh Chandee, Durgesh Kumar Mishra, "Security Issues in MANET:A Review",IEEE,2010
- [10]Wenjia Li,Anupam Joshi, "Security Issues in Mobile Adhoc Networks:A Survey"
- [11]Edna Elizabeth N., Subasree S., S. Radha,"Enhanced Security Key Management Scheme for MANETS", WSEAS TRANSACTIONS on COMMUNICATIONS, Volume 13, 2014.

IMPACT OF MICRO, SMALL AND MEDIUM ENTERPRISES (MSMEs) ON EMPLOYMENT GENERATION IN ANDHRA PRADESH, INDIA

Dr. Sathyanarayana Gardasu¹ and G Harish²

Associate Professor¹ and Assistant Professor², Department of Business Management, Bharat Institute of Engineering & Technology, Hyderabad

ABSTRACT

Micro, Small and Medium Enterprises (MSME) sector has emerged as a highly vibrant and dynamic sector for the development of the Indian economy. MSMEs not only play a vital role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in the industrialization of rural & backward areas, thereby, reducing regional imbalances, assuring more equitable distribution of national income and wealth. MSMEs are complementary to large industries as ancillary units and this sector contributes enormously to the socio-economic development of the country. The main purpose of this research is to determine the impact of MSMEs on employment generation and also to identify the problems of Micro, small scale enterprises in A.P. The findings of the study are that MSMEs have a significant impact on employment generation and MSMEs have significant impact on job creation and by extension economic development in Andhra Pradesh by using Chi-Square Test. And also found that the biggest problems faced by the firms are Finance, Marketing and Lack of Skilled Labour. Infrastructure here comprises of factors like condition of the industrial areas, electricity or energy supply, transportation facilities etc.

Keywords: MSMEs, Employment Generation, Problems in MSMEs.

I. INTRODUCTION

Micro, Small and Medium Enterprises (MSME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last five decades. MSMEs not only play a crucial role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in the industrialization of rural & backward areas, thereby, reducing regional imbalances, assuring more equitable distribution of national income and wealth. MSMEs are complementary to large industries as ancillary units and this sector contributes enormously to the socio-economic development of the country. The Sector consisting of 36 million units, as of today, provides employment to over 80 million persons. The Sector through more than 6,000 products contributes about 8% to GDP besides 45% of the total manufacturing output and 40% of the exports from the country.

The MSME sector has the potential to spread industrial growth across the country and can be a major partner in the process of inclusive growth. Khadi is the proud legacy of our national freedom movement and the father of the nation. Khadi and Village Industries (KVI) are two national heritages of India. One of the most significant aspects of KVI in the Indian economy is that it creates employment at a very low per capita investment. The KVI Sector not only serves the basic needs of processed goods of the vast rural sector of the country but also provides sustainable employment to rural artisans. KVI today represent an exquisite, heritage product, which is ‘ethnic’ as well as ‘ethical.

In India, the enterprises have been classified broadly into two categories: (i) Manufacturing; and (ii) Those engaged in providing/rendering of services. Both categories of enterprises have been further classified into micro, small and medium enterprises based on their investment in plant and machinery (for manufacturing enterprises) or on equipment’s (in the case of enterprises providing or rendering services). The present ceiling on investment to be classified as micro, small or medium enterprises is as under:

Micro, small and medium enterprises as per MSMED Act, 2006 are defined based on their investment in plant and machinery (for manufacturing enterprise) and on equipment for enterprises providing or rendering services. The present ceilings on investment for enterprises to be classified as micro, small and medium enterprises are as follows:

Classification	Manufacturing Enterprises*. (Investment limit in Plant & Machinery)	Service Enterprises** (Investment limit in equipment)
Micro	Rs. 2.5 million / Rs. 25 lakh	Rs. 1 million / Rs. 10 lakh
Small	Rs. 50 million / Rs. 5 crore	Rs. 20 million / Rs 2 crore
Medium	Rs 100 million / Rs 10 crore	Rs. 50 million / Rs 5 crore

Source: (MSME)1

2. LITERATURE REVIEW

Grimsholm&Poblete, (2010)² conducted a comprehensive qualitative study of external and internal factors hampering the development of Small and Medium Enterprises in Thailand. It replicates quite generalized outcome applicable to most of the south Asian countries producing low cost, low value added and labour intensive products. Important factors hindering, growth according to the study are lack of access to finance, competition, barriers to trade, management competence, lack of skilled labour, low investment in R&D and new technology

Ministry of Micro, Small and Medium enterprises, (2013)³ published the Inter Ministerial Committee for Accelerating Manufacturing in MSMEs' paper reporting slowdown in the overall growth of MSMEs in recent years, especially post 2009. It highlighted the significance of MSMEs, changing trends in employment growth in this sector and addressed concerns regarding establishing an enterprise and running it successfully. It also recommended support systems for encouraging start-ups, doing and expanding business and eases of closure and exit and also drew light on the need to do so. It also suggested changes in labour laws and gives product specific recommendations.

Barnabas Gbam (2017)⁴ examined that Small and Medium Scale Enterprises have a significant impact on employment generation and remain one of the most viable tools for job creation in Plateau State.

Finally, he reveals that MSMEs have a significant impact on employment generation in Plateau State through increased expansion of markets for local goods and services, improved economic growth and development, and a reduction in the unemployment problems of the state.

In the above situation, small and medium scale enterprises are believed to come to the rescue of both the graduates and the state government by giving the ample required jobs. This study thus examines the extent to which small scale enterprises have impacted on the generation of employment for youths in Andhra Pradesh., India.

3. OBJECTIVES OF THE STUDY

The primary aim of this study is to ascertain the impact of MSMEs on employment generation in Andhra Pradesh.

The specific objectives include

- i. To determine the extent to which MSMEs have impacted on employment generation in Andhra Pradesh., India.
- ii. To highlight some specific small scale enterprises opportunities available for Andhra Pradesh residents.
- iii. To identify the problems of small scale enterprises in Andhra Pradesh.

Research Hypotheses

The main purpose of this research is to determine the impact of MSMEs on employment generation in Andhra Pradesh. Therefore the following hypotheses are tested in this study using 5% level of significance:

Ho1: There is no significant impact of MSMEs on employment generation in Andhra Pradesh.

Ho2: Employment generation has no significant effect on the economic development of Andhra Pradesh.

4. RESEARCH METHODOLOGY

This study majorly focused on micro, small and medium enterprises located in industrial areas and prominent markets of Andhra Pradesh. Various manufacturers, service providers, start-ups from the food industry, and textile manufacturing industry were interviewed as a part of the study. Both primary and secondary data was collected for the study. Secondary data was collected from specific reports, articles, and other internet sources. Primary data was collected by personally interviewing people or sending them questionnaires. To capture a wide spectrum of problems different kinds of MSMEs were interviewed including manufacturing

Research Design

The study adopted survey research design. Copies of questionnaire served as an instrument for data collection, and the generated data were analysed using Chi- Square. A total of 80 respondents were deliberately selected as the sample size. The simple random sampling technique was further adopted to give equal opportunity for selection to every element of the population.

Chi-Square was used to test the hypotheses. Data were presented and analysed using simple statistical tables and percentages. The value of the Chi-Square was calculated using the formula;

$$\chi^2 = \frac{(O-E/E)^2}{E}$$

Decision Criteria

The researcher shall determine whether to accept to or reject the null or alternative hypothesis. The decision rule is that;

1. If the calculated X2 is more than the tabulated value of X2, the null hypothesis (Ho) is not to be accepted and the alternative hypothesis (H1) is to be accepted.
2. If the calculated X2 is less than the table value of X2, the null hypothesis (Ho) is accepted.

Primary Data Analysis and Interpretation

Out of the 100 copies of the questionnaire distributed, 90 were correctly filled and returned. The data are presented below:

Question No1: Does Micro, Small and Medium Scale Enterprises have significant impact on employment generation in Andhra Pradesh?

Table No-1

FREQUENCY				PERCENTAGE(%)			
Yes	No	Unsure	Total	Yes	No	Unsure	total
85	2	3	90	94	2.22	3.78	100

Source: Field 2019

From table 1 above, it can be seen that eight five (85) respondents agreed that Small and Medium Scale Enterprises have significant impact on employment generation in Andhra Pradesh, whereas two (2) respondents disagreed and three (3) of the respondents were unsure.

Question No 2: Have MSMEs been able to reduce the unemployment problem in Andhra Pradesh?

Table No-2

FREQUENCY				PERCENTAGE(%)			
Yes	No	Unsure	Total	Yes	No	Unsure	total
87	2	1	90	96.67	2.22	1.11	100

Source: Field 2019

The above Table reveals that eighty seven (87) respondents were of the opinion that MSMEs have been able to reduce the unemployment problem in Andhra Pradesh, while two (2) respondents disagreed and one (1) of the respondents were not sure.

Question No 3: Have MSMEs been able to increase the economic growth and development in Andhra Pradesh?

Table No-3

FREQUENCY				PERCENTAGE(%)			
Yes	No	Unsure	Total	Yes	No	Unsure	total
79	7	4	90	87.77	7.77	4.46	100

Source: Field 2019

Table 3 reveals that seventy nine (79) respondents had the view that MSMEs have been able to increase the economic growth and development in Andhra Pradesh; whereas seven (7) respondents had a contrary view and four (4) of these were not sure.

Question No 4: Has the expansion of markets for local goods and services in Andhra Pradesh been impacted by MSMEs?

Table No-4

FREQUENCY				PERCENTAGE (%)			
Yes	No	Unsure	Total	Yes	No	Unsure	total
72	11	7	90	80	12.22	7.78	100

Source: Field 2019

Table 4 indicated that seventy two (72) respondents were of the opinion that the expansion of markets for local goods and services in Andhra Pradesh has been impacted by MSMEs, while eleven (11) respondents were disagreed and seven (7) of the respondents were not sure.

Question No 5: Can government participation in MSMEs improve its performances for employment generation in Andhra Pradesh?

Table No-5

FREQUENCY				PERCENTAGE(%)			
Yes	No	Unsure	Total	Yes	No	Unsure	total
84	2	4	80	93.34	2.22	5.44	100

Source: Field 2019

Table 5 reveals that eighty four (84) respondent’s opinions that government participation in MSMEs can improve its performances for employment generation in Andhra Pradesh; whereas two (2) respondents had a contrary opinion and four (4) of the respondents were unsure.

Question No 6: Has there been any effort from both the public and the private sector to reduce the challenges faced by the MSME sub sector in Andhra Pradesh?

Table No-6

FREQUENCY				PERCENTAGE(%)			
Yes	No	Unsure	Total	Yes	No	Unsure	total
71	13	6	90	78.89	14.44	6.67	100

Source: Field 2019

It is shown in table 6 that seventy -one (71) respondents were of the view that there have been some efforts from both the public and the private sectors to reduce the challenges faced by the MSME sub sector in Andhra Pradesh, whereas thirteen (13) respondents had a contrary view and nine (6) of the respondents were not sure.

Question No: 7 what are the major problems faced by MSME in Andhra Pradesh?

The result of quantitative analysis conducted by the author. A perception of the majority respondent’s shows the problems affecting growth of manufacturing sector enterprises and Service sector enterprises in MSME sector. The biggest problems faced by the firms are Finance, Marketing and Lack of Skilled Labour. Infrastructure here comprises of factors like condition of the industrial areas, electricity or energy supply, transportation facilities etc. which also play an important role in holding back the company’s growth.

TESTING OF HYPOTHESIS

Data were analysed by the use of the chi-square technique to test the above hypotheses. The level of significance adopted for the test of hypothesis is 5 %.

Test of Hypotheses

Table-7: Contingency Table of Observed (Fo) And Expected (Fe) Frequency

QUESTION	YES	NO	UNSURE	TOTAL
1	85(69.17)	2(6.17)	3(4.17)	90
2	87(69.17)	2(6.17)	1(4.17)	90
3	79(69.17)	7(6.17)	4(4.17)	90
4	72(69.17)	11(6.17)	7(4.17)	90
5	84(69.17)	2(6.17)	4(4.17)	90
6	71(69.17)	13(6.17)	6(4.17)	90
Total	478	37	25	540

Source: Responses of Questionnaire

From the above table, the figures in the bracket represent the expected frequency (Fe) while those figures outside the bracket represent the observed frequency (Fo)

RT-CT
GT

The expected frequency was computed using the formula: $Fe = \frac{RT \times CT}{GT}$ Where: Fe = Expected Frequencies, RT = Row Total, GT = Grand Total, CT = Column Total. As it is shown in table seven.

Table No-8: Contingency Table of Calculated Chi-Square

Row and column	Fo	Fe	Fo-Fe	(Fo -Fe)2	(Fo-Fe)2/Fe
R1C1	85	69	16	256	3.7101
R1C2	2	6	-4	16	4.0000
R1C3	3	4	1	1	0.2500
R2C1	87	69	18	324	4.6956
R2C2	2	6	-4	16	2.6666
R2C3	1	4	-3	9	2.2500
R3C1	79	69	10	100	1.4492
R3C2	7	6	1	1	0.1666
R3C3	4	4	0	0	0.0000
R4C1	72	69	3	9	0.1304
R4C2	11	6	5	25	4.1666
R4C3	7	4	3	9	2.2500
R5C1	84	69	15	225	3.2608
R5C2	2	6	4	16	2.66666
R5C3	4	4	0	0	0.0000
R6C1	71	69	2	4	0.0579
R6C2	13	6.	7	49	8.1666
R6C3	6	4	2	4	1.0000
SUM					41.1570

From the table $X^2 = 41.1570$ Testing of Significance

The above statistical calculation is tested at 0.05(5%) level of significance and 10 degree of freedom (df) is used. The degree of freedom is obtained by: $d.f = (Row-1) (column - 1)$ $Df = (6-1) (3-1)$, $df = (5) (2)$ $df = 10$. The critical (tabulated) value of $X^2 = 18.30$, while the calculated value of $X^2 = 41.1570$.

Decision Rule

From the above statistical test, since the calculated value of $X^2 (41.1570)$ is greater than the critical (tabulated) value of $X^2 (18.30)$, we therefore reject the null hypotheses (H_0) in favour of the alternative hypotheses (H_1) and then conclude that MSMEs have a significant impact on employment generation in Andhra Pradesh.

Furthermore, the result obtained and the decision taken from our tested hypothesis implies that MSMEs have significant impact on job creation and by extension economic development of Andhra Pradesh as the difference between the calculated chi-square of $X^2 (41.1570)$ and the critical value of $X^2 = 18.30$ greatly disclose and confirms our previous expectation.

5. CONCLUSION

MSMEs development has been seen as a means of creating greater substantial, employment opportunities, and conserving foreign exchange earnings and galvanizes economic growth and development of any country. The undesirable rate of youth unemployment in Andhra Pradesh is the main rational motivator of this study. After successfully carrying out the research, the findings reveal that MSMEs have a significant impact on employment generation in Andhra Pradesh through increased proliferation, of markets for local goods and services, ameliorate economic growth and development, and a reduction in the unemployment problems of the state.

The contributions of these MSMEs have been slightly strengthened by both private and government involvement through different encouragement agencies and programmes. These MSMEs, however, meeting several challenges as they endeavour, towards generating the much needed jobs. But notwithstanding, there are good prospects for their growth and development as great opportunities abound in the Andhra Pradesh.

Based on the findings from this study, it can be trustingly concluded that Small and Medium Scale Enterprises have a significant impact on employment generation and rest one of the most viable tools for job creation in Andhra Pradesh. And also found that the biggest problems faced by the firms are Finance, Marketing and Lack of Skilled Labour. Infrastructure here comprises of factors like condition of the industrial areas, electricity or energy supply, transportation facilities etc. This is evident in the fact that MSME is one of the biggest employers of labour, generating employment for millions of people in various economic activities such as: carpentry, handset repairs, sewing, weaving, hairdressing, poultry farming, beads making, , bakery and manufacturing of other industrial products. If actual attention is given to the sector, it is capable of reducing unemployment to the

barest minimum and generating the highest earnings for the state and country at large. Therefore, to accomplish, full employment and to be amidst the topmost 20 enlarge countries of the global by the year 2020, the MSME sub sector should be given all the crave, attention and support from the national, state and local governments as well as Non-Governmental Organizations (NGO's) as this will provide an avenue for sustainable employment generation and economic development as a whole.

6. RECOMMENDATIONS

The following are the recommendations that will promote efforts to generate more employment opportunities through MSMEs:

- i. Government should intensify its efforts in reforming and stabilizing the power sectors as to put an end to the energy crisis and epileptic power supply in the state and country at large.
- ii. Support and sponsorship for SMEs should be devoid of politics and favouritism in terms of finance as it is one of the major problems of MSMEs development in the state.
- iii. Governments should develop the local technological base of the country as most MSMEs use obsolete and out-dated technology which makes their production difficult. This can be done by transfer of technology.
- iv. Government policies and programmes geared towards training youths in various skills and businesses should be proactive and pragmatic in meeting the dynamic and constant changing business environment given the current state of the economy.

REFERENCES

1. MSME_at_a_GLANCE_2016_Final.pdf <http://msme.gov.in/about-us/about-us-ministry>.
2. Grimsholm & Poblete (2010) Internal & External factors hampering SME Growth, Accessed 2th July 2017. <http://uu.divaportal.org/smash/get/diva.2.32383/FULLTEXT041.pdf>.
3. Ministry of Micro, Small and Medium enterprises, Report (2013) .Retrieved on 6th July 2017.
4. Barnabas Gbam(2017) Impact of Small and Medium Scale Enterprises on Employment Generation in Plateau State, Nigeria, IOSR Journal of Business and Management(IOSR-JBM,p-ISSN:23197668. Volume19,Issue6. Ver.I(June2017),PP47-54.

A SCIENTIFIC APPROACH TO PUBLIC SENSING STREAM CLASSIFICATION FOR TINY MESSAGES

Dr. K. Rajeshwar Rao¹, Dr. Chinthireddy Prakash² and Dr. D. Kiran³

ABSTRACT

Within this paper, we present a genuine-time monitoring system for traffic event recognition from Twitter stream analysis. The machine fetches tweets from Twitter based on several search criteria processes tweets, by making use of text mining techniques and lastly performs the classification of tweets. The primary difficulty experienced in working with problems of text mining is because the vagueness of natural language. Social systems happen to be lately employed like a resource for event recognition, with particular mention of the traffic congestion and vehicle accidents. The goal would be to assign the right class label to every tweet, as associated with a traffic event or otherwise. The traffic recognition system was useful for real-time monitoring of countless regions of an Italian man, road network, permitting recognition of traffic occasions almost instantly, frequently before website traffic news internet sites. To be able to evaluate the data originating from social systems, we exploit text mining techniques, which employ methods in the fields of information mining, machine learning, statistics, and Natural Language Processing (NLP) to extract significant information. We employed the support vector machine like a classification model, so we achieved precision by solving a binary classification problem (traffic versus non traffic tweets). I was also in a position to discriminate if traffic is because an exterior event or otherwise, by solving a multiclass classification problem and acquiring an precision.

Keywords: Traffic event detection, tweet classification, text mining, social sensing.

I. INTRODUCTION

People intensely use social systems to report (personal or public) real life occasions happening around them or just to convey their opinion on the given subject, via a public message. Social systems allow individuals to create a name and allow them to share it to be able to develop a community. The resulting social networking will be the groundwork for maintaining social relationships, finding users concentrating on the same interests, and locating content and understanding joined by other users. The consumer message shared in social systems is known as Status Update Message (SUM), and it will contain, in addition to the text, meta-information for example timestamp, geographic coordinates (latitude and longitude), name from the user, links with other sources, hash tags, and mentions [1]. Lately, social systems and media platforms happen to be broadly utilized as a resource for that recognition of occasions, for example traffic jam, occurrences, disasters (earthquakes, storms, fires, etc.), or any other occasions. A celebration can be explained as a genuine-world occurrence that occurs inside a specific space and time. However, event recognition from social systems analysis is really a tougher problem than event recognition from traditional media like blogs emails, etc., where texts are very well-formatted. To be able to evaluate the data originating from social systems, we exploit text mining techniques, which employ methods in the fields of information mining, machine learning, statistics, and Natural Language Processing (NLP) to extract significant information. The primary difficulty experienced in working with problems of text mining is because the vagueness of natural language. Throughout the text mining process, several operations can be carried out, with respect to the specific goal, for example: i) linguistic analysis through the use of NLP techniques, indexing and record techniques, ii) text filtering by way of specific keywords, iii) feature extraction, i.e., conversion of textual features (e.g., words) in number features (e.g., weights), that the machine learning formula has the capacity to process, and iv) feature selection, i.e., decrease in the amount of features so as to take into consideration just the best ones. Twitter is nowadays typically the most popular micro-blogging service it counts greater than 600 million active users, 3 discussing greater than 400 million SUMs each day. Regarding the purpose of this paper, Twitter has lots of advantages within the similar micro-blogging services. First, tweets are as much as 140 figures, improving the real-some time and news-oriented nature from the platform. Actually, the existence-duration of tweets is generally very short, thus Twitter may be the social networking platform that is most effective to review SUMs associated with real-time occasions. Second, each tweet could be directly connected with meta-information that constitutes more information. Third, Twitter messages are public, i.e., they're directly provided with no privacy limitations. Within this paper, we advise a smart system, according to text mining and machine learning algorithms, legitimate-time recognition of traffic occasions from Twitter stream analysis.

II. SYSTEM FRAMEWORK

The machine architecture is service-oriented and event-driven, and consists of three primary modules, namely: i) “Fetch of SUMs and Pre-processing”, ii) “Elaboration of SUMs”, iii) “Classification of SUMs”. The objective of the suggested product is to fetch SUMs from Twitter, to process SUMs by making use of a couple of text mining steps, and also to assign the right class label to every SUM. We recall that both “Elaboration of SUMs” and also the “Classification of SUMs” modules require setting the perfect values of the couple of specific parameters, using a supervised learning stage. For this aim, we exploited an exercise set composed by some SUMs formerly collected, elaborated, and by hand labeled. The primary tools we've exploited for developing the machine are: 1) Twitter’s API, 4 which supplies direct accessibility public stream of tweets 2) Twitter4J, 5 a Java library that people utilized as a wrapper for Twitter’s API 3) the Java API supplied by Weka.

Fetch of SUMs and Pre-Processing: The very first module, “Fetch of SUMs and Pre-processing”, extracts raw tweets in the Twitter stream, according to a number of search criteria. Each fetched raw tweet contains: the consumer id, the timestamp, the geographic coordinates, a retweet flag, and also the text from the tweet [2]. The written text could have more information, for example hash tags, links, mentions, and special figures. Within this paper, we required only German tweets into consideration. Following the SUMs happen to be fetched based on the specific search criteria, SUMs are pre-processed. To be able to extract just the text of every raw tweet and take away all meta-information connected by using it, a normal Expression filter is used.

Elaboration of SUMs: The 2nd processing module, “Elaboration of SUMs”, is dedicated to transforming the group of pre-processed SUMs, i.e., some strings, in some number vectors to become elaborated through the “Classification of SUMs” module. For this aim, some text mining techniques are used in sequence towards the pre-processed SUMs. The written text mining steps performed within this module are: tokenization, stop-word filtering, stemming, stem filtering, and have representation.

Classification of SUMs: The 3rd module, “Classification of SUMs”, assigns to every elaborated SUM a category label associated with traffic occasions [3]. Thus, the creation of this module is an accumulation of N labeled SUMs. To the purpose of labeling each SUM, a classification model is utilized.

III. SYSTEM DEESIGN

As mentioned formerly, a supervised learning stage is needed to do the setup from the system. Particularly, we have to find out the group of relevant stems, the weights connected with all of them, and also the parameters that describe the classification models. Throughout the learning stage, each SUM is elaborated by making use of the tokenization, stop-word filtering, and stemming steps. Then, the entire group of stems is made. Then, we compute the load of every stem. To be able to choose the group of relevant stems, an element selection formula is used. Finally, we identified the group of relevant stems RS by selecting all of the stems that have an optimistic IG value.

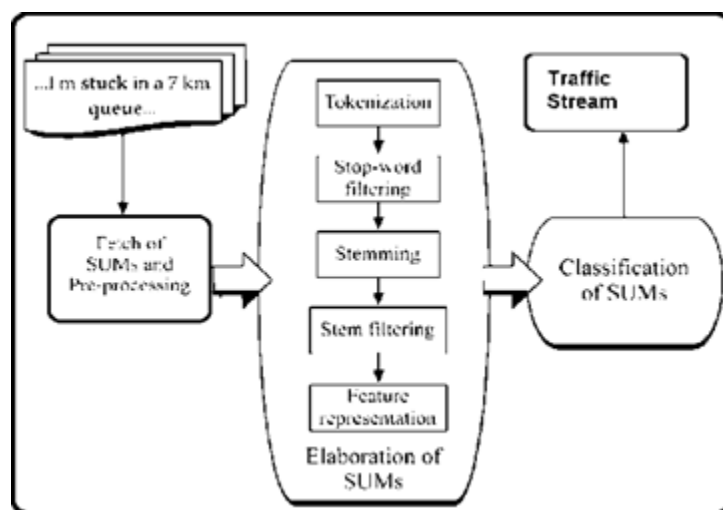


Figure-1: Twitter traffic detection model

Traffic Recognition System: We performed several experiments using two different datasets. For every dataset, we built and compared seven different classification models: SVM, NB, C4.5, kNN (with k comparable to 1, 2, and 5), and PART.

Real-Time Traffic: The goal is to carry out a continuous monitoring of frequently busy roads and highways to be able to identify possible traffic occasions in tangible-time or perhaps advance with regards to the traditional

press [4]. The machine is implemented like a service of the wider service-oriented platform to become developed poor the SMARTY project. The service could be known as by each user from the platform, who would like to understand the traffic conditions inside a certain area. Within this section, we try to show the potency of our bodies in figuring out traffic occasions in a nutshell time. We simply present some recent results for the two-class problem. For that setup from the system, we've employed as training set the general dataset described. The machine continuously performs the next operations: i) fetches, having a time frequency of z minutes, tweets originated in confirmed area, that contains the keywords caused by Cond A, ii) performs a genuine-time classification from the fetched tweets, iii) detects a potential traffic-related event, by analyzing the traffic class tweets in the considered area, and, as needed, transmits a number of traffic warning signals with growing intensity for your area. For the exact purpose of evaluating the potency of our bodies, we want that every detected traffic-related event is appropriately validated. Validation can be carried out diversely including: i) direct communication with a person, who had been present right now from the event, ii) reports attracted up through the police and/or local administrations, iii) radio traffic news iv) official real-time traffic news internet sites v) local newspapers. We've attempted to construct a significant group of traffic occasions, associated with some major Italian metropolitan areas, which recommendations the official confirmation [5]. The chosen set includes occasions properly recognized by the suggested system and confirmed via official traffic news internet sites or local newspapers.

IV. CONCLUSIONS

The machine, built on the SOA, has the capacity to fetch and classify streams of tweets and also to inform the people that use the existence of traffic occasions. In addition, the machine can also be in a position to discriminate if your traffic event is a result of an exterior cause, for example football match, procession and manifestation, or otherwise. Within this paper, we've suggested a method legitimate-time recognition of traffic-related occasions from Twitter stream analysis. We've exploited available software programs and condition-from-the-art approaches for text analysis and pattern classification. We've proven the outcomes of the monitoring campaign, performed in September and early October 2014. We've discussed the capacity from the system of discovering traffic occasions almost in real-time, frequently before online news internet sites and native newspapers. These technologies and methods happen to be examined, tuned, adapted and integrated to be able to build the general system for traffic event recognition. One of the examined classifiers, we've proven the brilliance from the SVMs, that have achieved precision, for that 2-class problem, and also the 3-class problem, by which we've also considered the traffic because of exterior event class. The very best classification model continues to be useful for real-time monitoring of countless regions of an Italian man, road network.

REFERENCES

- [1]. T. SAKAKI, Y. MATSUO, T. YANAGIHARA, N. P. CHANDRASIRI, AND K. NAWA, "REAL-TIME EVENT EXTRACTION FOR DRIVING INFORMATION FROM SOCIAL SENSORS," IN PROC. IEEE INT. CONF. CYBER, BANGKOK, THAILAND, 2012, PP. 221–226.
- [2]. T. SAKAKI, M. OKAZAKI, AND Y. MATSUO, "TWEET ANALYSIS FOR REAL-TIME EVENT DETECTION AND EARTHQUAKE REPORTING SYSTEM DEVELOPMENT," IEEE TRANS. KNOWL. DATA ENG., VOL. 25, NO. 4, PP. 919–931, APR. 2013.
- [3]. N. V. GUPTA, S. GURPREET, AND S. LEHAL, "A SURVEY OF TEXT MINING TECHNIQUES AND APPLICATIONS," J. EMERGING TECHNOL. WEB INTELL., VOL. 1, NO. 1, PP. 60–76, AUG. 2009.
- [4]. J. R. QUINLAN, C4.5: PROGRAMS FOR MACHINE LEARNING. SAN MATEO, CA, USA: MORGAN KAUFMANN, 1993.
- [5]. P. AGARWAL, R. VAITHIYANATHAN, S. SHARMA, AND G. SHRO, "CATCHING THE LONG-TAIL: EXTRACTING LOCAL NEWS EVENTS FROM TWITTER," IN PROC. 6TH AAAI ICWSM, DUBLIN, IRELAND, JUN. 2012, PP. 379–382.
- [6]. Y.-C. CHEN, W.-C. PENG, AND S.-Y. LEE, "EFFICIENT ALGORITHMS FOR INFLUENCE MAXIMIZATION IN SOCIAL NETWORKS," KNOWLEDGE AND INFORMATION SYSTEMS, VOL. 33, NO. 3, PP. 577–601, DEC. 2012.
- [7]. A. LABRINIDIS AND H. JAGADISH, "CHALLENGES AND OPPORTUNITIES WITH BIG DATA," PROC. VLDB ENDOWMENT, VOL. 5, NO. 12, 2032–2033, 2012.
- [8]. Y. LINDELL AND B. PINKAS, "PRIVACY PRESERVING DATA MINING," CRYPTOLOGY, VOL. 15, NO. 3, PP. 177–206, 2002.

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- [9] W. LIU AND T. WANG, "ONLINE ACTIVE MULTI-FIELD LEARNING FOR EFFICIENT EMAIL SPAMFILTERING," KNOWLEDGE AND INFORMATION SYSTEMS, VOL. 33, NO. 1, PP. 117-136, OCT. 2012.
 - [10] E.Y. CHANG, H. BAI, AND K. ZHU, "PARALLEL ALGORITHMS FOR MINING LARGE-SCALE RICH-MEDIA DATA," PROC. 17TH ACM INT'L CONF. MULTIMEDIA, (MM '09,) PP. 917-918, 2009.
 - [11] R. CHEN, K. SIVAKUMAR, AND H. KARGUPTA, "COLLECTIVE MINING OF BAYESIAN NETWORKS FROM DISTRIBUTED HETEROGENEOUS DATA," KNOWLEDGE AND INFORMATION SYSTEMS, VOL. 6, NO. 2, PP. 164-187, 2004.

EFFECT OF SOCIAL COMMERCE ON CONSUMER PERCEPTION: AN EMPIRICAL STUDY

VA Sasi Rekha and Shivanee SharmaAssistant Professor, Department of Commerce, Kasturba Gandhi Degree and PG College for Women West
Maredpally, Secunderabad

ABSTRACT

In the last decade the business environment has evolved to see a greater involvement of social media and the consumer participation in business process. The technological advancements happening in the environment are not only affecting the production methods but have changed the outlook towards marketing, buying and selling, shopping behavior, consumer feedback mechanisms, etc.

The increased popularity of the social media sites like Facebook, WhatsApp, LinkedIn, etc., has actually changed the face of the commercial operations and has hugely impacted both the consumers and the sellers. It has paved way for greater opportunities and new business models by way of E-Commerce.

In this context Social Commerce is an emerging phenomena world over for marketers, businesses, researchers alike both on and off internet. The participation of consumers can be seen in terms of exchange of information about products and services through online collaboration and advice from trusted individuals for making better and informed purchase decisions. In the light of the above, this paper seeks to understand the impact of social commerce on the consumer perception.

Keywords: Social Commerce and Consumer perception.

OBJECTIVES OF THE STUDY

- To understand the effect of social commerce on consumer perception.

SCOPE OF STUDY

The scope of study extends to a sample of 111 respondents.

SOURCES OF DATA

The study on topic, “Effect of Social Commerce on Consumer perception-An Empirical Study ” is based on primary data.

1. INTRODUCTION

The business world has evolved from the ancient system of barter and moved towards the physical market wherein the consumers exchange money for commodities but these markets had their limitations in terms of limited choice, geographical boundaries, no feedback and review, no customer care service, etc. With the advent of globalization, the market expanded beyond the domestic boundaries. This was followed by rampant use of computers and introduction of internet which broke the boundaries of physical market giving birth to e-commerce.

E-commerce or Electronic commerce means buying and selling of goods and services using the internet. It also includes exchange of money and data in execution of the above transaction. This has change the outlook towards marketing, buying and selling process, buyer-seller relation, feedback system, etc.

The increasing popularity of social media, Facebook, WhatsApp, LinkedIn, has actually changed the face of business world. Furthermore Blogs and Consumer rating forums also gained popularity. The marketers realised that the consumers trusted reviews of other consumers as an authentic source more than any kind of advertisements and promotional measures.

This paved way to newer business opportunities and enhanced the visibility of the enterprises which led to the emergence of the new phenomenon of Social Commerce worldwide.

Social Commerce

The term social commerce was coined by Yahoo! in November,2005 describing a set of online collaborative shopping tools such as shared picklists, ratings and other user generated content regarding product information and advice. Herein the users were allowed to comment and rate the pick lists which they could share with others. According to David Beisel, Social Commerce denoted user generated commercial content on e-commerce site. Further to this Steve Rubel included collaborative e-commerce tools to enable consumers “to get advice from trusted individuals, find goods & services for purchase”

Social Commerce is a fallout / subset of E-commerce involving social media which promotes social interaction and contribution from users for assistance in online buying and selling. The thrust was on to increase and built customer trust on one retailer. This is helpful to both buyer and sellers as the sellers can engage the customers according to their behavior and to ensure that they visit their website more often. It help the customers to get a platform where they can talk about the brands, products and services, research, compare and choose a product in an informed manner.

The scope of Social Commerce has accentuated by the advent of various social media tools and smart phone culture. New technologies like Augmented Reality have also been integrated with the social commerce enabling the customers to visualize the products like LensKart. Some notable examples of Social Commerce are Pinterest, Beta Brand, Cafe Press, The Find, etc.

Consumer Perception

It is a marketing concept which speaks about what consumers think about a brand or a Company and its offerings. It can be positive or negative feelings, inhibitions, expectations or experiences of a customer.

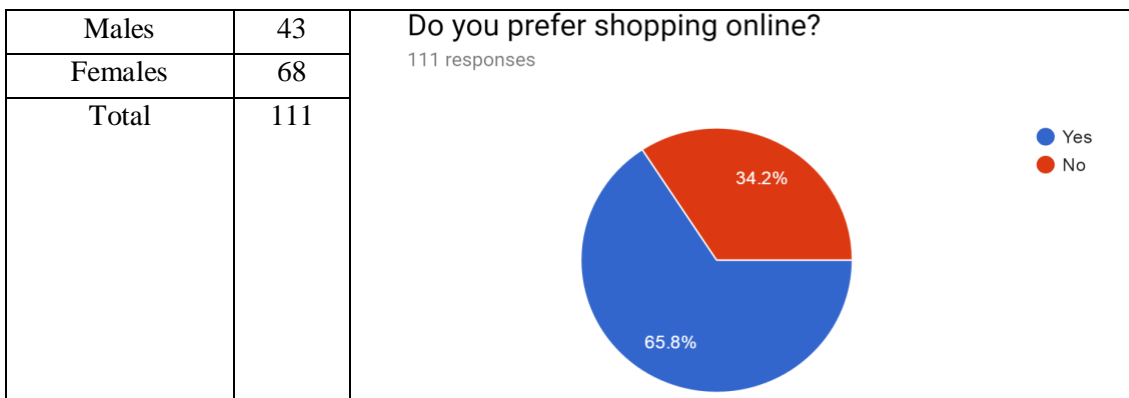
The factors that affect consumer perception may include price, quality, services, packaging, branding, reputation etc. It is very critical for a seller to know the stand point of the customer as it will lead to greater levels of customer satisfaction and result in higher market value [Fornell et al (1992)]. This will also help to maintain a loyal customer base.

In today’s context, consumer behaviour has become dynamic and challenging. Social media ratings and reviews of other customers play a great role in forming opinions of customers towards any product / service or brand. Business enterprises are taking support of these social platforms and exploiting them to convince the customers and meet their aspirations.

2. DATA ANALYSIS AND INTERPRETATION

A study was conducted with the help of a questionnaire on a sample size of 111 respondents and the following results were obtained. The data consisted of members from different walks of life, age profile, gender and monthly income ranging from less than Rs 20,000 to more than Rs 1, 00,000.

(a) Sample Details.



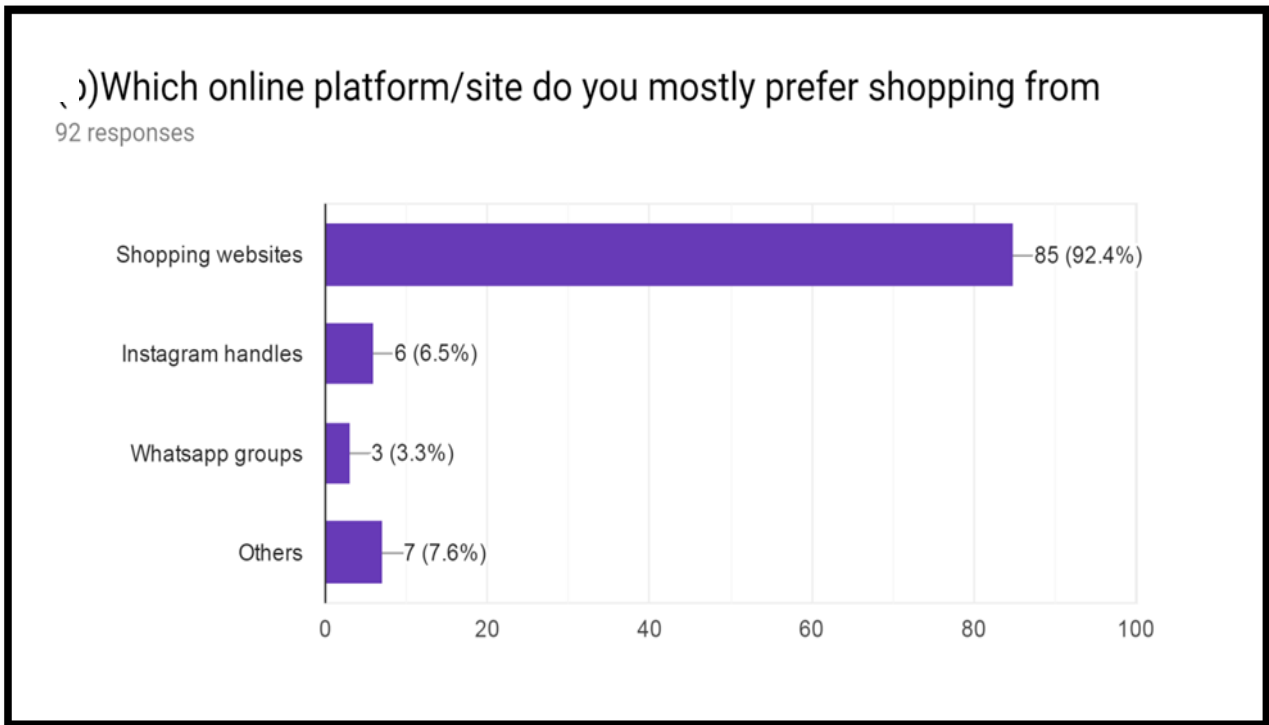
Out of the 111 respondents, 73 prefer shopping online (65.8%) and 38 prefer to shop offline (34.2%). Out of these 73 preferring online shopping, 32 are male (43.8%) and 41 are female (56.1%).

(b) Frequency of Shopping.

No. of times of shopping in a month	Male	Female
2 to 5	5	10
More than 5	5	-
Once a month	7	7
As per requirement	15	24
Total	32	41

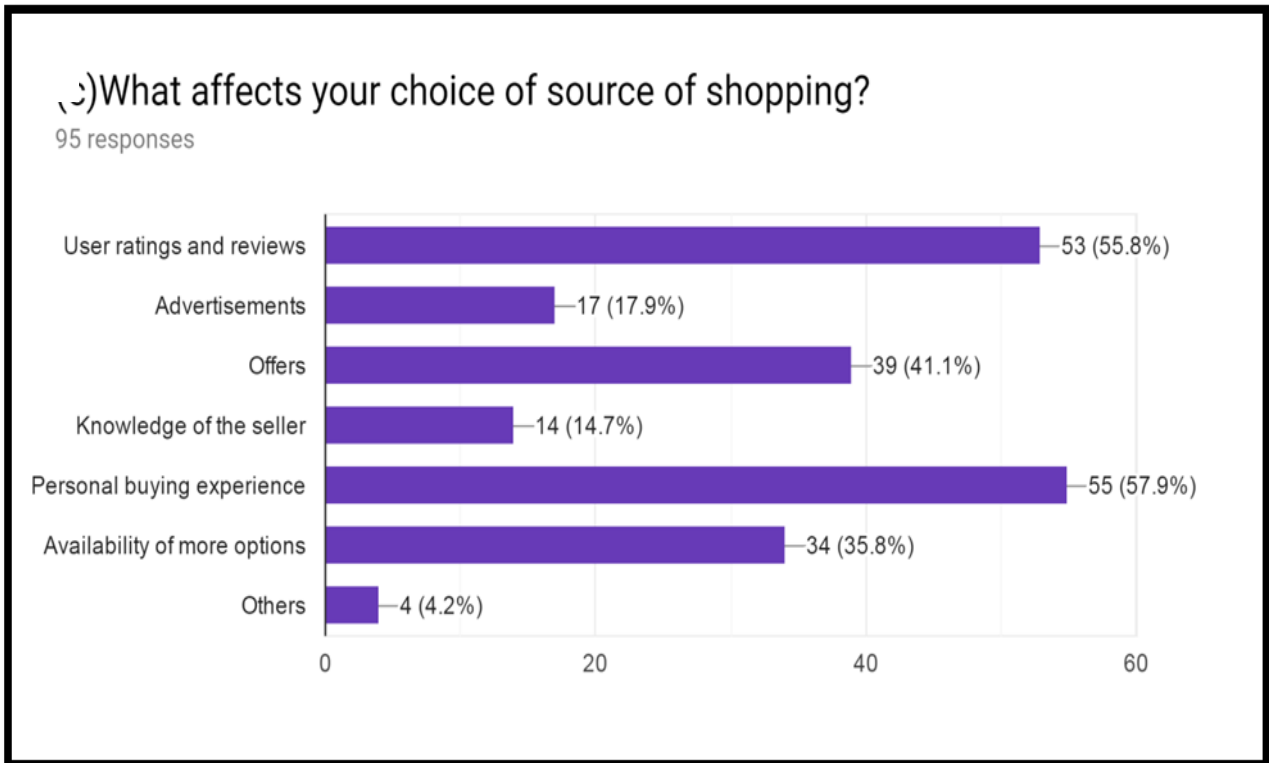
More number of females (58.53%) shop according to the requirement as compared to males (46.8%).

(c) The Most Preferred Online Platform/Websites for Shopping.



Most of the respondents (92.4%) prefer shopping websites over other online shopping portal. And the interesting part to note here is that some of the respondents, who prefer offline shopping, also shop online.

(d) Criterion for Choice of Source of Shopping.



- Most of the respondents go by the user rating and reviews (55.8%) and by their previous buying experiences (57.9%) while selecting their source of shopping.
- The survey also shows that the respondents give least importance to advertisements (17.9%) and knowledge about the sellers (14.7%). Availability of the offers (41.1%) and options (35.8%) also affect their choice to some extent.

(e) Type of Product Shopped.

- On the basis of gender the choice of product is as follows:

Books/ Stationery		Reservation		Electronic Goods		Banking/Trading		Gifts/ Greeting cards		Apparel & Accessories	
M	F	M	F	M	F	M	F	M	F	M	F
22	26	22	16	26	19	12	13	9	12	20	40

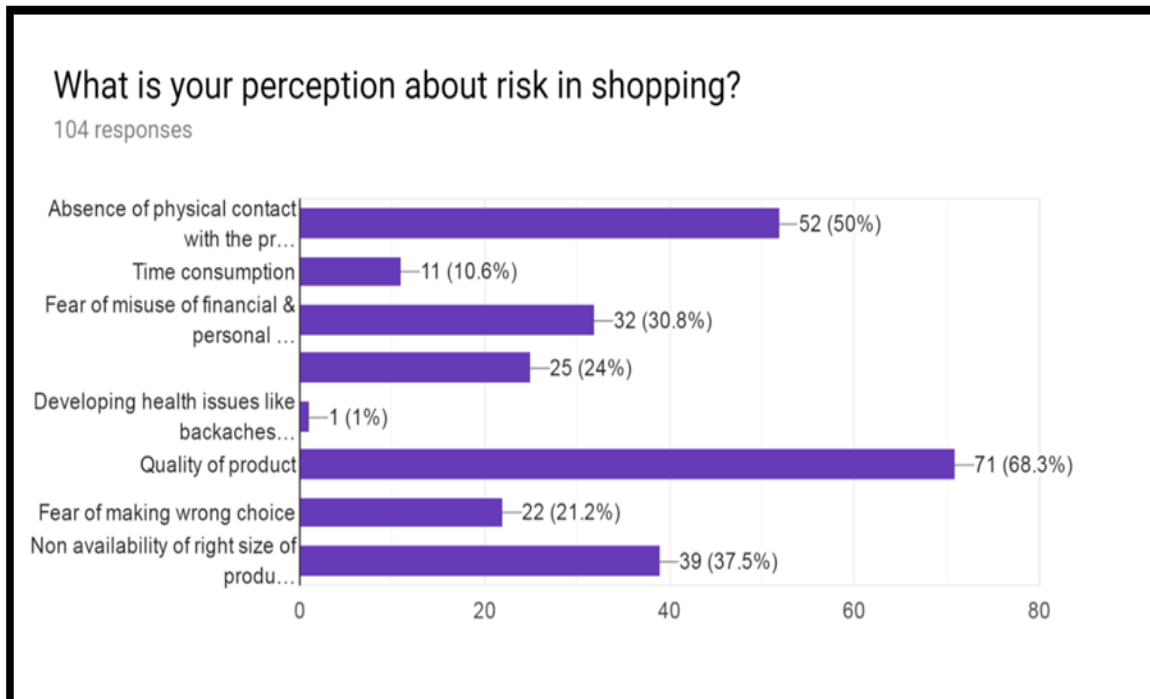
Most of the male respondents prefer to shop electronic goods (23.42%) followed by books/stationery (19.81%) and reservation (19.81%) whereas female respondents prefer to shop for apparel & accessories (31.74%) followed by books/stationery (20.63%).

- On the basis of monthly income the choice of product is as follows:

Monthly Income	Books/Stati onery	Reservation	Electronic Goods	Banking/ Trading	Gifts/ Greeting Cards	Apparel/ Accessor- ies
Less than 20K	2	1	3	2	-	1
20K-40K	8	4	5	5	1	3
40K-60K	9	7	6	-	4	2
60K-80K	3	3	2	2	2	-
80K-100K	3	3	5	3	1	-
Above 1L	23	20	24	13	13	2

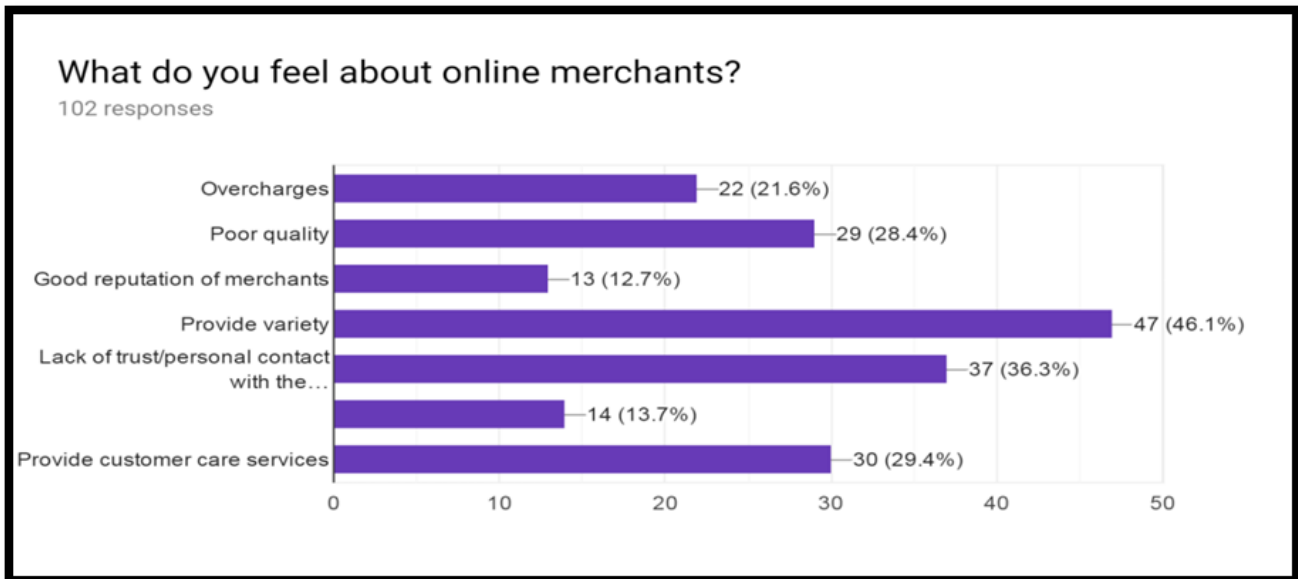
It can be inferred from the above table that the respondents having monthly income above 1 lakh shop more online. They spend more on electronic goods (53.3%) and on books/stationery (47.9%). Spending on apparel/accessories is the least across all income levels.

(f) Perception About Risk in Shopping.



- Most of the respondents are doubtful about the quality of the products (68.3%) bought online. They also prefer physical contact with the product before buying (50%).
- The respondents are least worried about the health issues (1%) and the time consumed while shopping (10.6%).
- Some of the respondents are concerned about the misuse of financial and personal details (30.8%) and non availability of the right size (37.5%).

(g) Opinion about the online merchants.



- Most of the respondents agree that the online merchants provide variety (46.1%) and the customer care services (29.4%) but at the same time they lack trust on them (36.3%) and are also worried about poor quality (28.4%) and overcharges (21.6%).
- Some of the respondents do feel that the online merchant possess expertise and resources (13.7%) and also good reputation (12.7%).

3. CONCLUSION

After the study it can be concluded that the social commerce plays a significant role in building the consumers' perception about online shopping. It can be seen that even some of those who do not prefer shopping online, do indulge in buying products online on some occasions because of ready availability of user ratings and reviews and variety and offers.

Majority of the respondents feel comfortable in purchasing electronic goods, reservations of tickets and books and stationery. Very few respondents prefer buying apparel and accessories online. Majority of respondents prefer shopping on websites as compared to other online platforms.

However, people are still skeptical about the misuse of the information provided by them on these online portals. Also, many respondents enjoy the experience of going out for shopping. Some of them also give importance to brand loyalty and familiarity with the seller.

4. SUGGESTIONS/RECOMMENDATIONS.

- The online shopping portals should provide concrete security measures to protect the information provided by the consumers.
- The online shopping portals should enrich the buying experience by providing virtual space to the consumers by way of augmented reality.
- To build the trust of the consumers the shopping portals should provide authentic and good quality products.
- The online shopping portals should also provide customized services to the consumers.

BIBLIOGRAPHY

- <https://link.springer.com/article/10.1007/s12525-016-0225-2>
- <https://www.tandfonline.com/doi/abs/10.2753/JEC1086-4415160201>
- <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.299.4862&rep=rep1&type=pdf>
- <https://link.springer.com/article/10.1007/s12525-016-0225-2>
- <https://www.tandfonline.com/doi/abs/10.2753/JEC1086-4415160204>

- <https://journals.sagepub.com/doi/abs/10.1509/jmkr.47.2.215>
- <https://www.sciencedirect.com/science/article/pii/S156742231200124X>
- https://en.wikipedia.org/wiki/Social_commerce
- <https://www.shopify.com/encyclopedia/what-is-ecommerce>
- <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1751-228X.2008.00048.x>
- <https://pib.gov.in/newsite/PrintRelease.aspx?relid=191018>
- https://www.ru.ac.za/media/rhodesuniversity/content/iwr/documents/Final_Report_RU-TD_workshop_May_2016.pdf
- <https://www.investopedia.com/terms/s/social-commerce.asp>
- **Survey of Social Commerce Research** by Anuhya Vajapeyajula, Priya Radhakrishnan, Vasudeva Varma In *The Third International Conference on Mining Intelligence and Knowledge Exploration* International Institute of Information Technology, IIIT Hyderabad, India Report No: IIIT/TR/2015/-1 Centre for Search and Information Extraction Lab International Institute of Information Technology Hyderabad - 500 032, INDIA December
- Fornell, C. (1992). A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing*, 56, 6-21. <https://doi.org/10.2307/1252129>
- <https://www.marketing91.com/customer-perception-important/>
- https://www.researchgate.net/publication/269741689_Customer_Perceived_Value_in_Social_Commerce_An_Exploration_of_Its_Antecedents_and_Consequences
- https://www.researchgate.net/publication/325694880_The_Influence_of_Social_Commerce_on_Consumer_Decisions
- <https://www.sciencedirect.com/science/article/abs/pii/S0736585317301533>

APPENDIX

EFFECT OF SOCIAL COMMERCE ON CONSUMER PERCEPTION

1. Age:
2. Gender:
3. Profession
4. Qualification
 - (a) SSC or below (b) HSC (c) UG (d) PG (e) Others
5. Monthly Income:
 - (a) 0 – 20K (b) 20K – 40K (c) 40K – 60K (d) 60K-80K (e) 80K- 1L (f) More than 1L
6. Marital Status
 - (a) Married (b) Unmarried
7. Family Type?
 - (a) Nuclear (b) Joint
8. Do you prefer shopping online?
 - (a) Yes
 - (b) No
9. If No.
 - (a) How often do you shop?
 - i. Once a month

-
-
- ii. Two to five times a month
 - iii. More than five times a month
 - iv. According to the requirement
 - (b) Where do you prefer shopping from?
 - i. Malls
 - ii. Departmental store
 - iii. Local market
 - iv. Factory outlet
 - v. Others
 - (c) What affects your choice of source of shopping?
 - i. Advertisement
 - ii. Offers
 - iii. Feedback from family and friends
 - iv. Brand Loyalty
 - v. Acquaintance with the seller
 - vi. Others
 - (d) What is the reason for not purchasing online? ((may mark more than one option)
 - i. Worrying about personal and financial details being leaked
 - ii. Lack of awareness about online transactions
 - iii. I enjoy going out for shopping
 - iv. Others
 - 10. If Yes,
 - (a) How often do you shop?
 - i. Once a month
 - ii. Two to five times a month
 - iii. More than five times a month
 - iv. According to the requirement
 - (b) Which online platform / site do you prefer shopping from?
 - i. Shopping websites
 - ii. Instagram
 - iii. WhatsApp group
 - iv. Others
 - (c) What affects your choice of source of shopping?
 - i. Advertisement
 - ii. User rating
 - iii. Offers
 - iv. Acquaintance with the seller
 - v. Availability of options
 - vi. Previous buying experience
-
-

-
-
- vii. Others
 - (d) What kind of product / service do you buy online?
 - i. Books/ Stationery
 - ii. Reservation
 - iii. Electronic goods
 - iv. Banking / Trading
 - v. Gifts / greeting cards
 - vi. Apparels & accessories
 - vii. Others
 - 11. What is your perception about risk in online shopping? (may mark more than one option)
 - (a) Absence of physical contact with the product
 - (b) Time consuming
 - (c) Fear of misuse of personal and financial details
 - (d) Fear of non-delivery after payment
 - (e) Developing health problems like backache, weak eyesight etc
 - (f) Quality of product
 - (g) Fear of making wrong choice
 - (h) Non-availability of right size of product
 - 12. What do you feel about online merchants? (may mark more than one option)
 - (a) Overcharges
 - (b) Poor quality
 - (c) Good reputation of merchants
 - (d) Provide variety
 - (e) Lack of trust / personal contact with the merchant
 - (f) They possess expertise and resources
 - (g) Customer care services
-
-

THE PC AND LAN DIAGNOSIS EXPERT SYSTEM

R. Arjunarao and S. LakshmiAssistant Professor, Department of Computer Science, Aurora's Degree & PG College

ABSTRACT

The PC and Local Area Networks (LAN) diagnosis expert system is the application of symbolic and non algorithmic problem solving methods in the area of troubleshooting and maintaining computers and local area networks. Basically it will rely on the use of judgmental rules or heuristics with theoretical laws and definitions to provide expert level solutions to complex problems and appropriate explanation or reasoning capability at different levels of detail. The knowledge will be represented in knowledge base as conditional statements so that it can be used by the inference engine with the help of data directed strategy.

Keywords: Conditional Statements, Heuristics, Knowledge Base, Inference Engine, Data Directed

I. INTRODUCTION

Since the development of computers, human beings are totally or partially dependent on the use of these machines in almost every aspect of life. Artificial intelligence is one of the areas where computers are being intelligent artificially and being competent to the ability of human intelligence in handling different problems in the highly dynamic environment.

Expert systems are computer applications which embody some non-algorithmic expertise for solving certain types of problems [1].

Many expert systems are built with products called expert system shells. The shell is a piece of software which contains the user interface, a format for declarative knowledge in the knowledge base, and an inference engine. The knowledge engineer uses the shell to build a system for a particular problem domain.

Data-driven reasoning, or forward chaining, is an efficient way to solve problems that can be modelled as "structured selection" problems. That is, the aim of the system is to pick the best choice from many enumerated possibilities. Diagnostic systems also fit this model, since the aim of the system is to pick the correct diagnosis. Diagnosis requires far more critical decision making on a wide range of options.

Experts at computer hardware fault diagnosis are good at the task with little formal training in the design and functionality of the equipment[2]. These experts seem to develop knowledge that is largely separate from design knowledge, but is sufficient and powerful for doing diagnosis. The diagnosis of faults in complex computer systems is a difficult task. Experts at this task work on diagnosing many different systems or sub-systems. In addition, they are often required to diagnose new systems or sub-systems. The complexity and variety of equipment that they are faced with prevents them from having complete knowledge of the structure and function of each system. As a result they must focus on the diagnostically relevant portion of the available data in solving each problem.

Experts use inexact models of the components in the hardware in addition to strategies for acquiring data relevant to the current problem. In this manner, experts solve problems without resorting to complex causal reasoning. This system demonstrates the usefulness of implementing knowledge in a form similar to that used by experts. This type of reasoning can be more efficient than reasoning from first principles. The knowledge acquisition task for future problems can be much reduced by using the information about how experts structure the diagnostic knowledge. In addition, by using strategies based on expert knowledge, an expert system can have increased coverage and solve novel problems.

The PC and LAN diagnosis system is an AI program designed to provide expert-level solutions to complex problems related to failure of personal computers and local area networks. It is designed to be easy to use and flexible enough that it can be modified and expanded easily by domain experts and knowledge Engineers.

II. METHODOLOGIES

An easy way to comply with the conference paper formatting requirements is to use this document as a template and simply type your text into it.

A. Knowledge acquisition /Elicitation

Many knowledge acquisition /Knowledge Elicitation (KE) methods have been used to obtain the information required to develop the system. These methods can be classified into direct and indirect ways based on how the knowledge engineer obtain information from the domain expert. Direct methods involve directly questioning a

domain expert on how they associate a problem with a particular diagnosis. These methods are successful, only if both the knowledge engineer and the domain expert are communicating well and the domain expert has to be willing to share information required from them. Indirect methods are used in order to obtain information that can not be easily engineered by the knowledge engineer or that can not be easily expressed directly by the domain expert.

- 1) **Interviewing:** Interviewing involved asking the domain expert questions about the domain of the problem and how they react to the specified problem. The interview session was successful because the knowledge engineer was familiar with the domain. In cases where the domain experts failed to articulate their knowledge, other methods have been employed which are listed below. The domain expert builds a model at every stage of the elicitation so that it can be modified and updated by the domain experts and it also helped to uncover the information needed.
- 2) **Role playing:** In Role Playing, the expert adapts a role and acts out a scenario where their knowledge is used [Geiwitz, et al., 1990]. The intent is that by viewing a situation from a different perspective, information will be revealed that was not discussed when the expert was asked directly.
- 3) **Teach back:** In Teach back, the knowledge engineer attempted to teach the information back to the domain expert, who then provided corrections and filled in gaps.
- 4) **Observation:** In Observation methods, the knowledge engineer observes the expert performing a task. This prevents the knowledge engineer from inadvertently interfering in the process, but does not provide any insight into why decisions are made.
- 5) **Goal related:** In Goal Related methods, focused discussion techniques are used to elicit information about goals and sub goals.
- 6) **Questions:** This is a method used to determine how the expert gathers information by having the expert as the knowledge engineer questions.
- 7) **Document analysis:** Document analysis involves gathering information from existing documentation. May or may not involve interaction with a human expert to confirm or add to this information.

TABLE-I

Category	Examples	Type	Results
Interview	Structured Unstructured Semi-Structured	Direct	Varies depending on questions asked
Role Playing	Role Playing	Indirect	Procedures, difficulties encountered due to role
Teachback	Teachback	Direct	Correction of Misconceptions
Observation	Observation		Procedure followed
Goal Related	Goal Decomposition Dividing the Domain	Direct	Goals and subgoals, groupings of goals
Questions	Questions	Indirect	Information used to solve problems, organization of problem space
Document Analysis	Document Analysis	Indirect (usually)	Varies depending on available documents, interaction with experts

B. Knowledge Representation

Knowledge representation is a systematic means of encoding knowledge of a human expert in an appropriate medium.

It is important and crucially affects the ease and speed with which the inference engine can use it. Knowledge representation implies a systematic means of encoding what an expert knows about a knowledge domain in an appropriate medium[2].

The type of knowledge used here is surface knowledge where procedural and declarative knowledge is put into heuristics to solve a problem quickly. It uses production rules because these rules are quite efficient in diagnosis problems.

A production system is a program that reasons with rules, especially when the inference is data –directed forward chaining. This representation is popular because almost every piece of knowledge can be written as a rule. In addition rules are easy for a human expert to read, understand and maintain.

Production rule involve simple syntax that is flexible and easy to understand. They are quite efficient in diagnosing problems of the form

- if (condition)
- then (conclusion)

Each production rule in a knowledge base implements a chunk of expertise and when fed to the inference engine, as part of a set should synergistically yield a better result than any of the rules individually.

C. Modelling

A different view of knowledge acquisition is that of a modeling activity .An expert system is not a container filled with knowledge extracted from an expert, but an operational model that exhibits one desired behavior observed or specified in terms of real world phenomena . This desired behavior can coincide with some behavior as exhibited by an expert. if one wants to construct an expert system that performs medical diagnosis , the behavior of a physician in asking questions and explaining the problem of a patient may be a good starting point for a description of the intended problem solving behavior of the expert system. However, the expert system is hardly the functional and behavioral equivalent of an expert . There are a number of reasons for this. Firstly the introduction of information technology often involves new distributions of functions and roles of agents. The expert system may perform functions which are not part of the experts’ repertory. Secondly the underlying reasons process of the expert often can not be made fully explicit. Knowledge, principles and methods may be documented in a domain but, these are aimed at a human interpreter and are not descriptions of how to solve problems in a mechanical way.

Thirdly there is an inherent difference between the capabilities of machines and humans .for a machine it presents no problem to store a large number of hypothesis in short term memory. Where as humans this is impossible.

So, in the modeling view knowledge acquisition essentially is a constructive process in which the knowledge engineer can use all sorts of data about the behavior of the expert, but in which the ultimate modeling decisions have to be made by the knowledge engineer in a constructive way.

In KADS we have adopted the modelling perspective on knowledge acquisition[3]. The KADS approach can be characterized through the two main principles that underlie the process of building knowledge based systems, namely: the principle of multiple models and the principle of knowledge level modeling as a way to describe problem solving expertise in an implementation independent way.

The model suite provides task decomposition in knowledge engineering, which reduces the complexity. While a model is built, other aspects can be left for later. The common KADS models are shown in the image below:

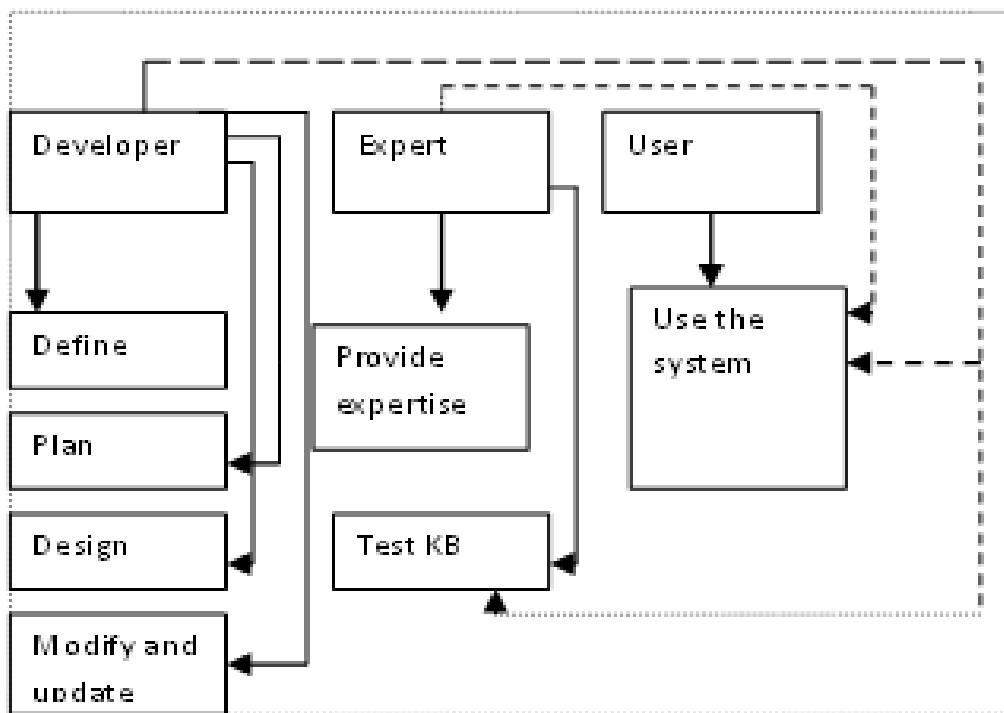


Fig-1: Agent model of the PC and LAN diagnosis expert system

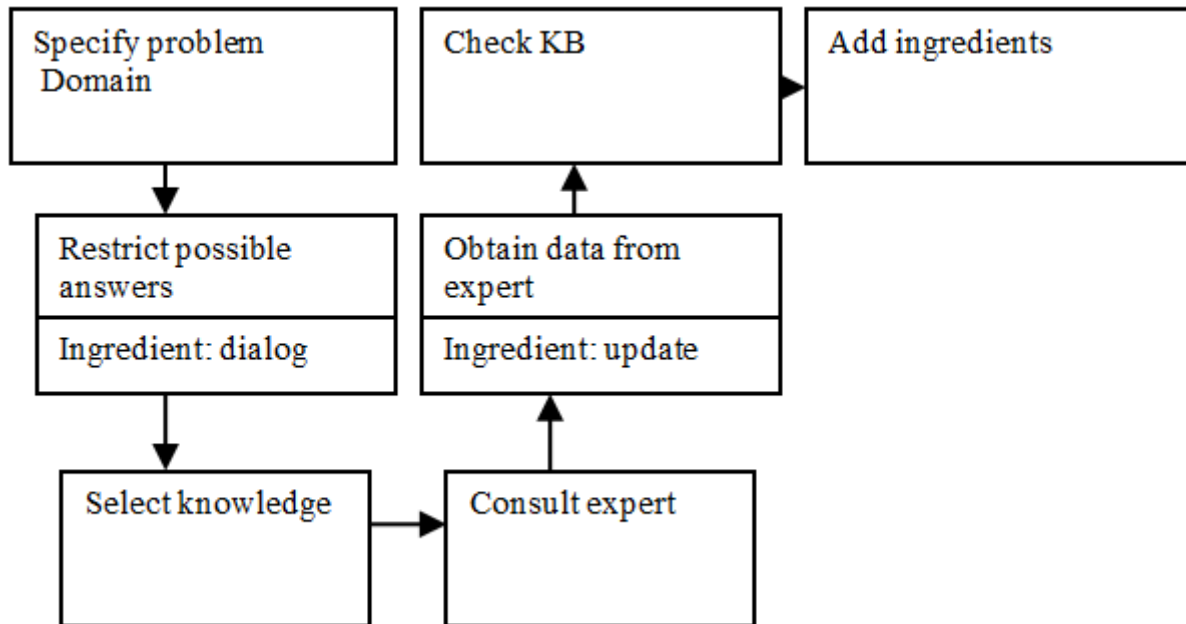


Fig-2: Communication model of the PC and LAN diagnosis expert system

D. Shell used: CLIPS

CLIPS is a forward-reasoning, pattern-matching knowledge-based system shell. It was developed by the Artificial Intelligence section of the Johnson Space Center of NASA. Its name stands for C Language Implementation of Production System. CLIPS is extremely popular because it is highly portable, low cost, and easily integrated with external programs developed in C [Girratano et al 89]. As mentioned previously, its forward-reasoning ability made it a natural selection for this project because of the natural "flow" of control in the knowledge-base derives new facts, and eventually the conclusion, from the existing set of facts. CLIPS represent this type of forward flow of reasoning extremely well. And with so many intended uses of this system, the low cost, low memory requirements of CLIPS increases its marketability across machines.

III. RESULTS

During the design of the expert system, multiple failures have been considered and during its development it has shown that the system diagnosed several fault conditions .the user has to interact with the system through scroll dialog where the user should answer questions from the two options, that is either "yes" or "no".

IV. CONCLUSIONS

An artificially intelligent system "The PC nad LAN Diagnosis Expert System" was designed to aid in the diagnosis of faults in personal computers and Local Area Networks. The use of Rules to construct the knowledge base was efficient to diagnose the faults but it was not sufficient since it is a form of representing knowledge which is shallow knowledge of the domain expert. That is they are limited, they can't deal with fault situations where no specific rules exist.

REFERENCES

- [1] Jackson, P. (1999) .What are Expert systems? England: Pearson Education.
- [2] Durkin,J., "Expert System Design and Development", New Jersey:Prentice-Hall,1994.
- [3] Schreiber , G., Wielinga,B., &Hoog, R.(1994).CommonKADS: a comprehensive methodology for KBS development.
- [4] Waterman, D.A.(1986),A Guide to Expert Systems, Addison-Wesley publishing company.
- [5] ALEXANDER, J ., FREILING, M ., SHULMAN, S ., REHFUSS, S . & MESSICK, S . (1988). Ontological analysis : an ongoing expriment . In J . BOOSE & B . GAINES, Eds . KnowledgeBased Systems, Volume 2 : Knowledge Acquisition Tools for Expert Systems, pp . 25-37 .London: AcademicPress.

QUANTITATIVE AND QUALITATIVE ANALYSIS OF ZOOPLANKTON OF OSMAN SAGAR LAKE BY FOLD SCOPE

Dr. Tasneem Jahan, Dr. D. Sirisha, Shradha, Ayesha Naveed and Ishrat Fatima
St. Ann's College for Mehdiapatnam, Hyderabad

ABSTRACT

The present study was designed to determine Zooplankton abundance quantitatively and qualitatively in Osman sagar lake of Hyderabad by using fold scope. Which is inexpensive, light weight microscope with a battery powered by LED illumination. The study has been carried in the year 2017-2018. (During Rainy Season). The identified zooplankton were under 4 groups Copepods, Rotifera, Cladocera and diatoms. The order in which they are found Rotifera > Cladocerans > Copepods > Diatoms .

Keywords: Zooplankton, Fold scope, Osman sagar, Hyderabad.

INTRODUCTION

The plankton community is composed of phytoplankton (primary producers) and zooplankton (secondary producers) phytoplankton present biological wealth of the water body and it forms a base of food chain. Zooplankton forms a principal component of food for fish. The zooplanktons are important component of the aquatic life in lakes . Zooplanktons are primary food sources for large invertebrates. Due to their capacity of nutrients cycling and due to their position , they play a vital role in the functioning of lake ecosystem (Thakur et al. 2013) .

MATERIALS AND METHODS

Study Area

Osman Sagar Lake also known as Gandipet lake .It is just 20 Kms away from the city. Lake is spread over 46 kms and of osman sagar reservoir is $17^{\circ} 23^{\prime} N$ $78^{\circ} 18^{\prime} E$ a tributary of Musi river in the year 1920. It is one of the source of drinking water for Hyderabad and Secunderabad. It was constructed by Osman Ali khan last region of Nizam of Hyderabad state. As the authors / Investigator team were interested to promote the Foldscope among the college students and encourage the students to develop aptitude forwards biodiversity studies the investigators worked with the students team of St. Ann's College for women, used fold scope supplied by DBT to get results.

Collection of water samples

The water samples were collected in the rainy season of 2018-2019. Samples were collected from 8 A.M to 9.A.M About 50 liters of water is filtered by passing water through plankton net made of bolting silk cloth having mesh size of 25 micro meter. Samples were washed into wide mouth bottles and preserved by adding 5% formalin solution Further analysis was done by putting 1ml of the preserved sample on Sedgwick –Rafter cell and studying it under the paper microscope- Foldscope. A fold scope is device developed and designed by Manu Prakash, Stand Ford University. This Fold scope is paper based microscope based on the “Origami” Japanese Art. This smart phone attached Foldscope can be used successfully in the field studies and for laboratory studies for qualitative analysis keys were used and results were expressed in No/L the importance of zooplankton in the food web of open water ecosystem .The presence and dominance of zooplankton species play significant role in functioning of fresh water ecosystem. Therefore present investigation is formulated to investigate the information regarding qualitative and quantitative analysis of zooplankton with low cost-hand hold microscope (Foldscope).

LOCATION MAP OF OSMAN SAGAR





Osman Sagar Lake

RESULTS AND DISCUSSIONS

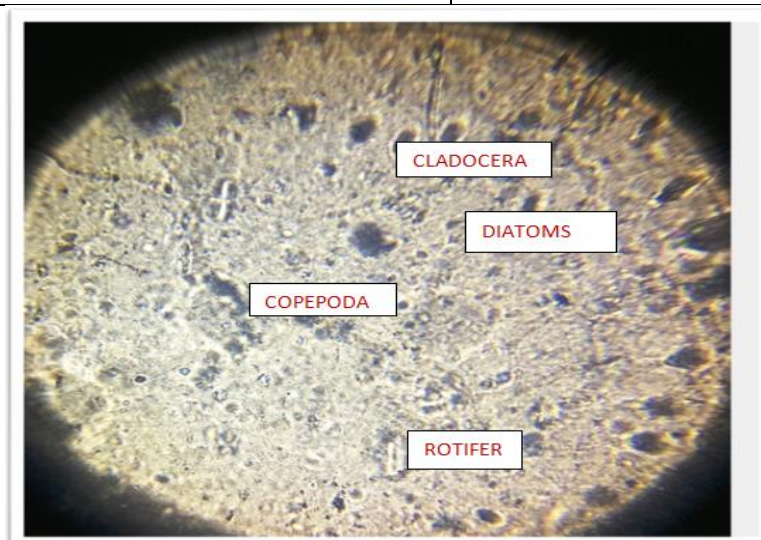
Zooplankton are organisms that have animal like the biggest are of five millimeters and smallest are just one thou sandth of this size .They Float, drift or weakly swim in the water. Zooplanktons are indicators of lake productivity and help in assessing the changing environment of lakes . Zooplankton are represented by the taxonic group of Rotifera ,Cladocera,Copepods &Diatoms . Rotifera are most abundance group of zooplankton .Rotifera have a very short life cycle and importance soft bodies metazoans. They are most sensitive to environmental changes and they are indicators of water quality .The Results indicated that the distribution of zooplankton were some in pelagic zone and littoral zone irrespective of seasonal periodicity Rotifiers are highest compared to other species .

QUALITATIVE & QUANTITATIVE ANALYSIS

The major group of zooplanktons observed by qualitative analysis are,Copepods, cladocerans, rotifers and diatoms. Rotifers and cladocerans are in plenty followed by copepods.

$$\text{Volume of zooplankton(m}^3\text{)} = \frac{\text{Total volume of zooplankton}}{\text{Volume of water filtered.}}$$

S.no	Type of zooplanktons	Density of zooplanktons
1.	Rotifers	1530/l
2.	Cladocerans	1220/l
3.	Copepods	930/l
4.	Diatoms	890/l



FOLD SCOPE PICTURE-OSMAN SAGAR SAMPLE

LEGEND FOR FIGURE

The following zooplanktons were seen in osman sagar sample

- COPEPODS
- CLADOCERANS
- ROTIFERS
- DIATOMS

CONCLUSIONS

Dr. Manuprakash Fold scope can be used with a naked eye or by hooking to camera which has a magnification to visualize and identify bacteria. Foldscope has brought students, teachers, scientist together to go anywhere with their minds to have scientist potential to bring microscope world into their hands to bring micro scope world into their hands without any expensive equipment.

REFERENCES

1. Plafkin JL, Barbour MT, Porter KD, Gross SK, Hughes RM. 1989. Rapid assessment protocols for use in streams and rivers: benthic macroinvertebrates and fish. Washington (DC): EPA. Rosenberg DM, Resh VH, editors. Freshwater biomonitoring and benthic macroinvertebrates. New York (NY): Chapman & Hall.
2. Pradhan A, Bhaumik P, Das S, Mishra M, Khanam S, Hoque BA, Mukherjee I, Thakur AR, Chaudhuri SR. 2008. Phytoplankton diversity as indicator of water quality for fish cultivation. *Am J Environ Sci.* 4(4):406–411. doi: 10.3844/ajessp.2008.406.411
3. Thakur RK, Jindal R, Singh UB, Ahluwalia AS. 2013. Plankton diversity and water quality assessment of three freshwater lakes of Mandi (Himachal Pradesh, India) with special reference to planktonic indicators. *Environ Monit Assess.* 185(10):8355–8373. doi: 10.1007/s10661-013-3178-3

QUALITATIVE ANALYSIS OF PLANTS USING VERMICOMPOST

Juvaria Azmath, Divya Deepthimahanthi, Nisa, Charu Agarval and Yousra
Department of Zoology, St. Ann's College for Women, Mehdiapatnam Hyderabad

ABSTRACT

Vermicomposting is a method of using worms to transform organic waste into a nutrient-rich fertilizer. It is a healthy and clean way to eliminate wastes going into our landfills, which improves the environment. Vermicomposting is inexpensive, and only takes two to three months to produce results. Vermicompost improves the root structure, plant growth, new shoots and blooms of plants. An increase in crops is also noticeable. Vermicompost also has ingredient that repels insects, and it can be used as an insect repellent. Vermicomposting can be done indoors, because worms are sensitive to extremes of hot and cold temperatures. Keeping worms healthy is the key to nutrient-rich fertilizer. For the worm bedding, egg cartons that have been broken down or lint from your dryer are good options. Vermicomposting uses red worms. When the scraps exit the worms' intestines, "worm castings" are formed. These castings are an immaculate, natural fertilizer. Vermicomposting has gained popularity in both industrial and domestic settings because, as compared with conventional composting, it provides a way to treat organic wastes more quickly. In manure composting, it also generates products that have lower salinity levels.

Studies and live experiment were carried out to see the output of using pesticides, vermicompost and chemicals on the following plants Hibiscus sabdariffa (Gongura), Mentha (Pudina) and Purslane (Kulfa) after which each plant's leaf and soil analysis was done, their starch, phosphorous, carbon to nitrogen ratio content was also estimated. It was found that plants grown with vermicompost had more starch, sufficient phosphorous and sufficient c-n ratio while on the other hand plants treated with pesticides and chemicals had less or normal starch levels, deficient and highly deficient phosphorous levels and slightly or highly deficient c-n ratio respectively. A significant plant growth and nutrition enhancement was recorded in plants treated with vermicompost.

The present study aims to promote soil health and its plant growth providing effects further substantiating the use of organic amendments instead of fertilizers.

Keywords: Vermicompost, Plant Growth, Carbon-Nitrogen Ratio, Phosphorous, Starch Content.

INTRODUCTION

Vermicompost (vermi-compost, vermiculture) is the product of the composting process using various species of worms, usually red wigglers, white worms, and other earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermicast. Vermicast (also called worm castings, worm humus, worm manure, or worm feces) is the end-product of the breakdown of organic matter by earthworms. These castings have been shown to contain reduced levels of contaminants and a higher saturation of nutrients than the organic materials before vermicomposting. Vermicompost contains water-soluble nutrients and is an excellent, nutrient-rich organic fertilizer and soil conditioner. It is used in farming and small scale sustainable, organic farming. Vermicompost has been shown to be richer in many nutrients than compost produced by other composting methods. It has also outperformed a commercial plant medium with nutrients added, but levels of magnesium required adjustment, as did pH.

However, unlike compost was lower in microbial biomass, soil microbial activity, and yield of a species of ryegrass than municipal compost. It is rich in microbial life which converts nutrients already present in the soil into plant-available forms. Unlike other compost, worm castings also contain worm mucus which helps prevent nutrients from washing away with the first watering and holds moisture better than plain soil. Increases in the total nitrogen content in vermicompost, an increase in available nitrogen and phosphorus, as well as the increased removal of heavy metals from sludge and soil have been reported. The reduction in the bioavailability of heavy metals has been observed in a number of studies.

SOIL

1. Improves soil aeration
2. Enriches soil with micro-organisms (adding enzymes such as phosphatase and cellulase)
3. Microbial activity in worm castings is 10 to 20 times higher than in the soil and organic matter that the worm ingests

4. Attracts deep-burrowing earthworms already present in the soil
5. Improves water holding capacity^[42]

PLANT GROWTH

1. Enhances germination, plant growth, and crop yield
2. Improves root growth and structure
3. Enriches soil with micro-organisms (adding plant hormones such as auxins and gibberellic acid)^[citation needed]

ECONOMIC

- Biowastes conversion reduces waste flow to landfills
- Elimination of biowastes from the waste stream reduces contamination of other recyclables collected in a single bin (a common problem in communities practicing Single-stream recycling)
- Creates low-skill jobs at local level
- Low capital investment and relatively simple technologies make vermicomposting practical for less-developed agricultural regions

ENVIRONMENTAL

- Helps to close the "metabolic gap" through recycling waste on-site
- Large systems often use temperature control and mechanized harvesting, however other equipment is relatively simple and does not wear out quickly^[citation needed]
- Production reduces greenhouse gas emissions such as methane and nitric oxide (produced in landfills or incinerators when not composted).

MATERIALS USED

Vermicompost, pesticides, chemicals, 3 different plants – Hibiscus sabdariffa(Gongura),Mentha(Pudina) andPurslane(Kulfa) , lab equipments for the estimation of the contents.

METHODOLOGY

All vegetables and other fruits scraps or wet waste is dumped into the vermicompost pit. Vermicompost by using earthworms and subjected to composting,worms eat organic waste and excrete the materials as the nutrient rich fertilizer contains high level of humus so produced vermicompost is mixed into the soil. 3 specimens was used were- Hibiscus sabdariffa(Gongura), Mentha (Pudina) and purslane (Kulfa).

OBSERVATION

Starch content in Hibiscus sabdariffa (gongura)

	Pesticides	Vermicompost	Chemicals
Slight blue	Starch less	-	-
Dark blue	-	Starch more	-
Light blue	-	-	Starch normal amount



Slight blue color indicates less amount of starch



Dark blue color indicates more amount of starch



Light blue color indicates normal amount of starch

Phosphorus Content in Hibiscus sabdariffa (Gongura)

	Pesticide	Vermicompost	Chemicals
Bluish green	Slightly deficient	-	-
Dark blue	-	Sufficient	-
No colour	-	-	Highly deficient



Bluish green color indicates slightly deficient in phosphorus



Dark blue color indicates sufficient amount of phosphorus



No color indicates highly deficient in phosphorus

C/N ratio in Hibiscus sabdariffa (Gongura)

	Pesticide	Vermicompost	Chemicals
Light blue	Slightly deficient	-	-
Dark blue	-	Sufficient	-
No colour	-	-	Highly deficient



Light blue color indicates slight deficiency in C/N ratio



Dark blue color indicates sufficient amount of C/N ratio



No color indicates high deficiency in C/N ratio

DESCRIPTION

In the present review, vermicompost is described as an excellent soil amendment and a biocontrol agent which make it the best organic fertilizer and more eco-friendly as compared to chemical fertilizers. Vermicomposting is a process where worms are used to transform organic waste products into fertilizers for agricultural use and as soil amendments to improve soil health. Vermicompost is used in agriculture as both an organic fertilizer and a soil amendment due to its large biological component and abundant nutrient concentrations, Vermicompost is an ideal organic manure for better growth and yield of many plants. It can increase the production of crops and prevent them from harmful pests without polluting the environment. Application of vermicompost increased seed germination, stem height, number of leaves, leaf area, leaf dry weight, root length, root number, total yield, number of fruits/plant, chlorophyll content, TSS of juice, micro and macro nutrients, carbohydrate (%) and protein (%) content and improved the quality of the fruits and seeds. Studies suggested that treatments of humic acids, plant growth promoting bacteria and vermicompost can be used for a sustainable agriculture discouraging the use of chemical fertilizers.

REASONS FOR ESTABLISHMENT

1. To provide hands on training in vermicomposting.
2. To minimize the organic waste in the campus.
3. To prevent environmental pollution.
4. To improve the quality of soil.
5. To enhance germination, growth and yield.
6. Biowastes conversion reduces waste flow to landfills.

BENEFITS OF USING VERMICOMPOST

- Produces higher quality crops and better yield than chemical fertilizer.
- 100% recycle able and green- no pollution.
- Makes the plants healthy, resistance to diseases.
- Produces bigger and stronger plants and make flower plants bear more blooms.
- Contains high level of humus.

RESULT

The use of vermicompost for growth of plants was found to be much better and safer option than pesticides. The plants which were grown using vermicompost showed a good growth and were found to be healthy and resistance to disease than when compared to the plants grown with pesticide.

CONCLUSION

The plants grown with vermicompost showed much better results in the form of increased plant growth and Nutrient quality was improved. After the lab estimation was done it was found that the plants treated with vermicompost had more of starch content, sufficient levels of phosphorus (Dark blue) and optimum or sufficient carbon to nitrogen ratio (dark blue) when compared to the pesticides and other chemicals used. Thus the use of Vermicompost for growth for plants is a much better and safer options than the other alternatives it may be used to promote sustainable agriculture and also for the safe management of agricultural.

REFERENCES

1. Vermi composting tech – soil health to human health by Ranganathan L.S
2. Handbook of Vermicomposting - e-book by Dr.E.Sreenivasan
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5387063/>
4. <https://www.pthorticulture.com/en/training.../controlling-algae-on-growing-media/>
5. <https://www.maximumyield.com/algae-friend-or-foe/2/1180>
6. "Composting with earthworms". *Herron Farms Dawsonville Ga*. Retrieved March 26, 2013.
7. "Vermicomposting: A Better Option for Organic Solid Waste Management" (PDF). Retrieved 2009-02-21.
8. "Comparison of the effectiveness of composting and vermicomposting for the biological stabilization of cattle manure" (PDF). *Chemosphere*. **72** (7): 1013–1019. doi:10.1016/j.chemosphere.2008.04.016. PMID 18511100
9. "Compost or Worm Castings?". *Big Red Worms*. Retrieved 2018-04-23.
10. "Vermiculture". *www.worm-farm.co.za*. Retrieved 2016-02-21.

RELIABLE ROUNDED AND TRUNCATED AFFORDABLE FIR FILTERS WITH MCM AND ACCUMULATION

C. Swapna
(P.hd) J. S. University

ABSTRACT

Low-cost finite impulse response (FIR) designs are presented using the concept of faithfully rounded truncated multipliers. We jointly consider the optimization of bit width and hardware resources without sacrificing the frequency response and output signal precision. Non-uniform coefficient quantization with proper filter order is proposed to minimize total area cost.

Multiple constant multiplication or accumulation in a direct FIR structure is implemented using an improved version of truncated multipliers. Comparisons with previous FIR design approaches show that the proposed designs achieve the best area and power results.

INTRODUCTION

Finite impulse response (FIR) filters are of great importance in digital signal processing (DSP) systems since their characteristics in linear-phase and feed-forward implementations make them very useful for building stable high- performance filters. The direct and transposed-form FIR filter implementations are illustrated in Figure 1(a) and (b), respectively. Although both architectures have similar complexity in hardware, the transposed form is generally preferred because of its higher performance and power efficiency. The multiplier block of the digital FIR filter in its transposed form [Figure. 1(b)], where the multiplication of filter coefficients with the filter input is realized, has significant impact on the complexity and performance of the design because a large number of constant multiplications are required. This is generally known as the multiple constant multiplications (MCM) operation and is also a central operation and performance bottleneck in many other DSP systems such as fast Fourier transforms, discrete cosine transforms (DCTs), and error-correcting codes.

$$x = x_{-5} + x_{-3} + x_{-1} + x$$

Although area, delay, and power- efficient multiplier architectures, such as Wallace and modified Booth multipliers, have been proposed, the full flexibility of a multiplier is not necessary for the constant multiplications, since filter coefficients are fixed and determined beforehand by the DSP algorithms. Hence, the multiplication of filter coefficients with the input data is generally implemented under a shift-adds architecture, where each constant multiplication is realized using addition/subtraction and shift operations in an MCM operation

For the shift-adds implementation of constant multiplications, a straightforward method, generally known as digit-based recoding, initially defines the constants in binary. Then, for each “1” in the binary representation of the constant, according to its bit position, it shifts the variable and adds up the shifted variables to obtain the result. As a simple example, consider the constant multiplications 29x and 43x. Their decompositions in binary are listed as follows:

$$29x = (11101)_{bin}$$

$$x = x_{-4} + x_{-3} + x_{-2} + x \quad 43x = (101011)_{bin}$$

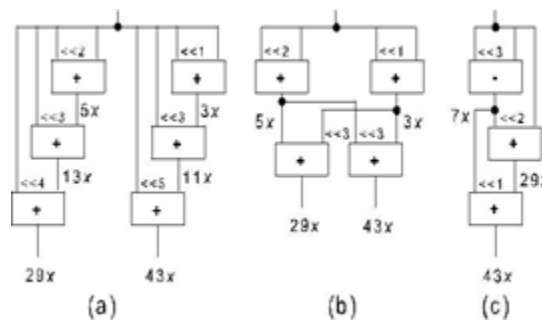


Figure-1: Six addition operations are illustrated

However, the digit-based recoding technique does not exploit the sharing of common partial products, which allows great reductions in the number of operations and, consequently, in area and power dissipation of the MCM design at the gate level. Hence, the fundamental optimization problem, called the MCM problem, is

defined as finding the minimum number of addition and subtraction operations that implement the constant multiplications. Note that, in bit-parallel design of constant multiplications, shifts can be realized using only wires in hardware without representing any area cost.

The algorithms designed for the MCM problem can be categorized in two classes: common sub expression elimination (CSE) algorithms and graph-based (GB) techniques. The CSE algorithms initially extract all possible subexpressions from the representations of the constants when they are defined under binary, canonical signed digit (CSD) or minimal signed digit (MSD). Then, they find the “best” subexpression, generally the most common, to be shared among the constant multiplications. The GB methods are not limited to any particular number representation and consider a larger number of alternative implementations of a constant, yielding better solutions than the CSE algorithms.

Multiplier less based designs realize MCM with shift-and add operations and share the common sub operations using canonical signed digit (CSD) recoding and common subexpression elimination (CSE) to minimize the adder cost of MCM, more area savings are achieved by jointly considering the optimization of coefficient quantization and CSE. Most multiplier less MCM-based FIR filter designs use the transposed structure to allow for cross-coefficient sharing and tend to be faster, particularly when the filter order is large.

Proposed Method

A generic flow of FIR filter design and implementation can be divided into three stages: finding filter order and coefficients, coefficient quantization, and hardware optimization, as shown in Figure.

2. In the first stage, the filter order and the corresponding coefficients of infinite precision are determined to satisfy the specification of the frequency response. Then, the coefficients are quantized to finite bit accuracy.

Finally, various optimization approaches such as CSE are used to minimize the area cost of hardware implementations. Most prior FIR filter implementations focus on the hardware optimization stage. After FIR filter operations, the output signals have larger bit width due to bit width expansion after multiplications. In many practical situations, only partial bits of the full-precision outputs are needed. For example, assuming that the input signals of the FIR filter have 12 bits and the filter coefficients are quantized to 10 bits, the bit width of the resultant FIR filter output signals is at least 22 bits, but we might need only the 12 most significant bits for subsequent processing.

We adopt the direct FIR structure with MCMA because the area cost of the flip-flops in the delay elements is smaller compared with that of the transposed form. Furthermore, we jointly consider the three design stages, in order to achieve more efficient hardware design with faithfully rounded output signals.

After coefficient quantization, we perform recoding to minimize the number of nonzero digits. In this brief, we consider CSD recoding with digit set of $\{0, 1, -1\}$ and radix-4 modified Booth recoding with digit set of $\{0, 1, -1, 2, -2\}$ and select the one that results in smaller area cost. While most FIR filter designs use minimum filter order, we observe that it is possible to minimize the total area by slightly increasing the filter order. Therefore, the total area of the FIR filter is estimated using the subroutine `area_cost_estimate()` using the approach in [20]. Indeed, the total number of PPBs in the MCMA is directly proportional to the number of FA cells required in the PPB compression because a FA reduces one PPB. After Step 1 of uniform quantization and filter order optimization, the non-uniform quantization in Step 2 gradually reduces the bit width of each coefficient until the frequency response is no longer satisfied. Finally, we fine-tune the non-uniformly quantized coefficients by adding or subtracting the weighting of LSB of each coefficient and check if further bit width reduction is possible. We can find the filter order M and the non-uniformly quantized coefficients that lead to minimized area cost in the FIR filter implementation.

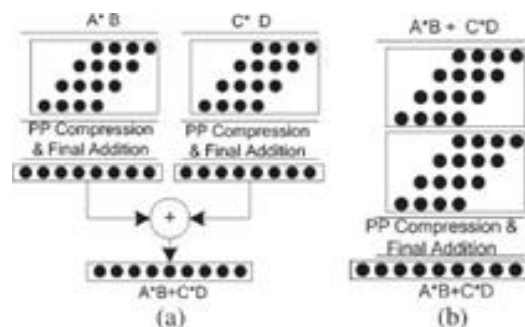


Figure-2: Multiplication/accumulation using

(a) individual PP compression and (b) combined PP compression.

PP Truncation and Compression

The FIR filter design in this brief adopts the direct form in Figure 2(a) where the MCMA module sums up all the products

$\hat{a}_i \times x[n - i]$. Instead of accumulating individual multiplication for each product, it is more efficient to collect all the PPs into a single PPB matrix with carry-save addition to reduce the height of the matrix to two, followed by a final carry propagation adder. Figure 2 illustrates the difference of individual multiplications and combined multiplication for $A \times B + C \times D$.

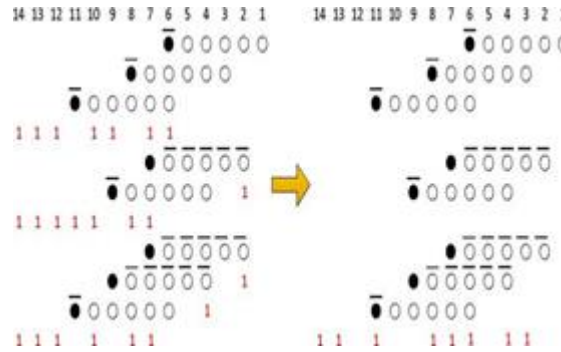


Figure-3: Generation of PPBs considering sign extension and negation.

In order to avoid the sign extension bits, we complement the sign bit of each PP row and add some bias constant using the property $\bar{s} = 1 - s$, where s is the sign bit of a PP row, as shown in Figure. 5.1 All the bias constants are collected into the last row in the PPB matrix. The complements of PPBs are denoted by white circles with overbars.

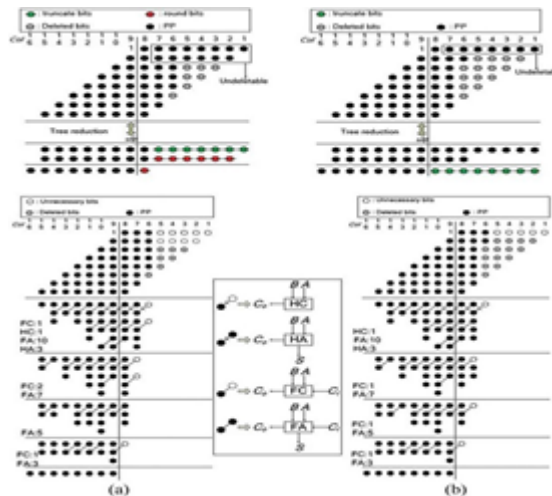


Figure-4: Truncated multiplier designs using (a) the present version and (b) the improved version.

In the faithfully rounded FIR filter implementation, it is required that the total error introduced during the arithmetic operations is no larger than one ulp. We modify a recent truncated multiplier design in present version so that more PPBs can be deleted, leading to smaller area cost. Figure 4 compare the two approaches. the removal of unnecessary PPBs is composed of three processes: deletion, truncation, and rounding. Two rows of PPBs are set undeletable because they will be removed at the subsequent truncation and rounding. The error ranges of deletion, truncation, and rounding before and after adding the offset constants are given as follows:

$$\begin{aligned}
 -\frac{1}{2} \text{ulp} &\leq E'_D \leq 0 & -\frac{1}{4} \text{ulp} &\leq E_D = E'_D + \frac{1}{4} \text{ulp} \leq \frac{1}{4} \text{ulp} \\
 -\frac{1}{2} \text{ulp} &< E'_T \leq 0 & -\frac{1}{4} \text{ulp} &< E_T = E'_T + \frac{1}{4} \text{ulp} \leq \frac{1}{4} \text{ulp} \\
 -\text{ulp} &< E'_R \leq 0 & -\frac{1}{2} \text{ulp} &< E_R = E'_R + \frac{1}{2} \text{ulp} \leq \frac{1}{2} \text{ulp} \\
 -\text{ulp} &< E = (E_D + E_T + E_R) & \leq \text{ulp}. &
 \end{aligned}$$

Figure4(a) shows an example of the approach in present, where the gray circles, crossed green circles, and crossed red circles represent respectively the deleted bits, truncated bits, and rounded bits. In this brief, we

propose an improved version of the faithfully rounded truncated multiplier design as shown in Figure 4(b) Only a single row of PPBs is made undeletable (for the subsequent rounding), and the PPB elimination consists of only deletion and rounding. The error ranges of deletion and rounding in the improved version are as follows:

$$\begin{aligned}
 -ulp \leq E'_D \leq 0 & \quad -\frac{1}{2}ulp \leq E_D = E'_D + \frac{1}{2}ulp \leq \frac{1}{2}ulp \\
 -ulp < E'_R \leq 0 & \quad -\frac{1}{2}ulp < E_R = E'_R + \frac{1}{2}ulp \leq \frac{1}{2}ulp \\
 -ulp < E = (E_D + E_R) & \leq ulp.
 \end{aligned}$$

Since the range of the deletion error in the improved version is twice larger than that in present , more PPBs can be deleted, leading to smaller area in the subsequent PPB compression.

Figure.5 shows the illustrative architecture of MCMA with truncation (MCMAT) that removes unnecessary PPBs.

The white circles in the L-shape block represent the undeletable PPBs. The deletion of the PPBs is represented by gray circles. After PP compression, the rounding of the resultant bits is denoted by crossed circles. The last row of the PPB matrix represents all the offset and bias constants required including the sign bit modifications.

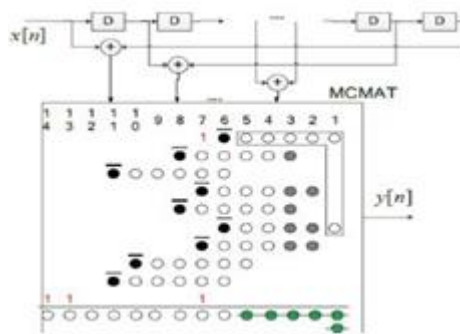


Figure-5: Overall FIR filter architecture using multiple constant multipliers/ accumulators with faithfully rounded truncation (MCMAT).

CONCLUSIONS

This brief has presented low-cost FIR filter designs by jointly considering the optimization of coefficient bit width and hardware resources in implementations. Although most prior designs are based on the transposed form, we observe that the direct FIR structure with faithfully rounded MCMAT leads to the smallest area cost and power consumption.

With recursive IIR filters, we can generally achieve a desired frequency response characteristic with a filter of lower order than for a non-recursive filter (especially if elliptic designs are used). A recursive filter has both poles and zeroes which can be selected by the designer , hence there are more free parameters than for a non-recursive filter of the same order (only zeroes can be varied). However, when the poles of an IIR filter are close to the unit circle, they need to be specified very accurately (typically 3 to 6 decimal places) if instability is to be avoided

Most of prior FIR filter designs are based on the transposed structure because the major goal is to minimize the cost of adders in MCM that takes less than 20% of the total area. Indeed, the MCM cost in transposed-form NRSCSE and MBPG (and with further coefficient optimization) can be effectively reduced. However, the SAs are not optimized, and the area of DFFs in the transposed forms is larger because of the range expansion of the results after MCM. Take as an example the 121-tap filter C with 19-bit coefficients and 12-bit signals. The direct form requires only 12 * 120 = 1440 flip-flops, while the transposed form calls for 3701 flip-flops, a significant increase because a resettable DFF cell has about the same area as a FA cell.

REFERENCES

1. M.M.Peiro,E.I.Boemo and L. Wanhammar “Design of high-speed multiplierless filters using a nonrecursive signed common subexpression algorithm,” IEEE Trans. Circuits Syst. II, Analog Digit Signal Process.
2. C.H. Chang, J. Chen, and A. P. Vinod, “Information theoretic approach to complexity reduction of FIR filter design,” IEEE Trans. Circuits Syst.
3. F.Xu, C. H. Chang, and C. C. Jong, “Contention resolution algorithms for common subexpression elimination in digital filter design,” IEEE Trans. Circuits Syst.

4. I.C. Park and H.J. Kang, "Digital filter synthesis based on an algorithm to generate all minimal signed digit representations," *IEEE Trans. Computer Aided Design Integrated Circuits Syst.*
5. C.Y. Yao, H.H. Chen, T.F. Lin, C.J. J. Chien, and X.T. Hsu, "A novel common subexpression-elimination method for synthesizing fixedpoint FIR filters," *IEEE Trans. Circuits Syst., I*
6. O. Gustafsson, "Lower bounds for constant multiplication problems," *IEEE Trans. Circuits Syst. II, Exp. Briefs,*
7. Y. Voronenko and M. Puschel, "Multiplierless multiple constant multiplication,"
 - a. *ACM Trans. Algorithms*, vol. 3, no. 2, pp. 1–38, May 2007.
8. D. Shi and Y. J. Yu, "Design of linear phase FIR filters with high probability of achieving minimum number of adders," *IEEE Trans. Circuits Syst.*
9. R. Huang, C.H.H. Chang, M. Faust and Y. Manoli, "Signextension avoidance and word-length optimization by positive-offset representation for FIR filter design," *IEEE Trans. Circuits Syst. II, Exp. P.* K. Meher, "New approach to look-up-table design and memory-based realization of FIR digital filter," *IEEE Trans. Circuits Syst. I, Reg. Papers,*
10. P. K. Meher, S. Candrasekaran, and A. Amira, "FPGA realization of FIR filters by efficient and flexible systemization using distributed arithmetic"
11. S. Hwang, G. Han, S. Kang, and J.S. Kim, "New distributed arithmetic algorithm"
12. H.J. Ko and S.F. Hsiao, "Design and application of faithfully rounded and truncated multipliers with combined deletion, reduction, truncation, and rounding".
13. H. Samueli, "An improved search algorithm for the design of multiplierless FIR filters with powers-of-two coefficient," *IEEE Trans. Circuits Syst.*
14. Y. C. Lin and S. Parker, "Discrete coefficient FIR digital filter design based upon an LMS criteria," *IEEE Trans. Circuits Syst.*
15. Blad and O. Gustafsson, "Integer linear programming-based bit-level optimization for high-speed FIR filter architecture," *Circuits Syst. Signal Process.*, vol. 29, no. 1, pp. 81–101, Feb. 2010.
16. F. Xu, C. H. Chang, and C. C. Jong, "Design of low-complexity FIR based on signed-powers-of-two coefficients with reusable common subexpressions," *IEEE Trans. Comput.-Aided Design Integr. Circuits*

HOW WE ARE SOCIALLY CONNECTED OR ISOLATED? A SERIOUS ISSUE

Neetu Yadav¹ and Rakhi Sarraf²¹Lords University, Alwar²Mahrishi Arvind University, Mundiaramsar, Jaipur

ABSTRACT

Our present generation belongs to 21st century, an era of technology: that suggests a nuance relationship between online technology (the internet, social media, and virtual reality) and sociability (perspective talking, emotional intelligence/ balance, individual identity, empathy, social recognition). Technology has change how we interact with each other. It has turned friend into a verb and has made it possible to share mundane news with hundreds or thousands of people who might know only you slightly, if at all. We might be stick or glued to our smart phones, even when we should be focused on driving a car, listening to our kid talk, keep texting on phone, instead of listening to the lectures of professors. We easily loose our focus here and now. At its core, social media holds out the promise of connection. A key idea behind Facebook, Twitter, Snapchat, Instagram, Imo and many other sites is that we can create rich network of friends, receive frequent updates from people in our life and build a sense of community or connection. For e.g. on social sites someone have hundred of friends yet in reality, the experience does not live up to the hype. Despite this ever present promise of community, most of us feel alone and isolated, suffer from depression because of loneliness. People have thousands of friends online but they may have few actual friends or people in real life that they can rely on.all this raises the question? How we are socially connected or isolated? or How social media made us more or less connected?.

Keywords: Technology, Social Media, Smart Phones, Social sites.

INTRODUCTION

Technology is designed with a purpose of solving problems; it has to meet human needs and wants. We use technology in so many ways; at least everyone uses technology in one-way or another. A problem exists when we encounter difficulty; problem-solving is human behavior, though our approach varies from person-to-person.

The birth of the group chat brought about the death of the group activity. It seems almost impossible to organize a time and place where we can draw everyone in a group chat out “IRL”. But how is it that this amazing piece of technology that enables us to communicate with people more instantly and efficiently than ever before, actually seems to be preventing us from connecting in the real world? And saying that, where is the line between the real world and the cyber world these days anyway?

It is discussed in the conversation between Barack Obama and Prince Herry , the pair It turned to the topic of social media. Here’s what Obama said- “Social media is a really powerful tool for people of common interests to convene and get to know each other and connect. But then it’s important for them to get offline, meet in a pub, meet at a place of worship, meet in a neighborhood and get to know each other”.

The former president’s statements about social media are agreeable and measured. They don’t evoke moral panic, but they do offer a clear warning about the rise of new technologies and potential fall of social relations..

These sentiments feel comfortable and familiar. Indeed, the sober cautioning that digital media ought not to replace face-to-face interaction has emerged as a widespread truism, and for valid reasons. Shared corporality holds distinct qualities that make it valuable and indispensable for human social connection. With the ubiquity of digital devices and mediated social platforms, it is wise to think about how these new forms of community and communication affect social relations, including their impact on local venues where people have traditionally gathered. It is also reasonable to believe that social media pose a degree of threat to community social life, one that individuals in society should actively ward off.

However, just because something is reasonable to believe doesn’t mean it’s true. The relationship between social media and social relations is not a foregone conclusion but an empirical question - Does social media make people less social? Luckily, scholars have spent a good deal of time collecting cross-disciplinary evidence from which to draw conclusions. Let’s look at the research:

In a germinal work of 2007, communication scholars Nicole Ellison and colleagues establish a clear link between Facebook use and college students’ social capital. Using survey data, the authors show that Facebook usage positively relates to forming new connections, deepening existing connections, and maintaining connections with dispersed networks (bridging, bonding, and maintaining social capital, respectively). Ellison and her team repeated similar findings in 2011 and again in 2014. Burke, Marlow and Lento showed further

support of a link between social media and social capital based on a combination of Facebook server logs and participant self-reports, demonstrating that direct interactions through social media help bridge social ties.



TECHNOLOGY

Technology is a body of knowledge devoted to creating tools, processing actions and the extracting of materials. The term "Technology" is wide, and everyone has their way of understanding its meaning. We use technology to accomplish various tasks in our daily lives, in brief; we can describe technology as products and processes used to simplify our daily lives. We use technology to extend our abilities, making people the most crucial part of any technological system.

We apply technology in almost everything we do in our daily lives; we use technology to work, we use technology for communication, transportation, learning, manufacturing, securing data, scaling business and so much more. Technology is human knowledge which involves tools, materials, and systems. The application of technology typically results in products. If technology is well applied, it benefits humans, but the opposite is true, if used for malicious reasons.

Many businesses are using technology to stay competitive, they create new products and services using technology, and they also use technology to deliver those products and services to their customers on time and within budget. A good example is mobile phones companies like **Apple & Samsung**, these mobile empires, use high-end technology to create new smart phones and other electronic devices to stay competitive. This competitive edge is gained through employing advanced technology.

Communication Technology related to daily basis

This is a system that uses technical means to transmit information or data from one place to another or from one person to another. Communication is a daily essential for all; it is used to convey ideas, exchange information, and express emotions. Humans use communication technology tools like phones, computers, emails, fax or messaging tools to stay in touch with friends and family. Businesses use communication technology tools to facilitate the flow of information in a workplace, to help in decision making, to serve customers needs and requests, to promote new products or services to targeted consumers and so much more.

SOCIAL MEDIA

"Social media are primarily Internet-based tools for sharing and discussing information among human beings."

Social media is computer-based technology that facilitates the sharing of ideas, thoughts, and information through the building of virtual networks and communities. By design, social media is internet-based and gives users quick electronic communication of content. Content includes personal information, documents,

videos, and photos. Users engage with social media via computer, tablet or smart phones via web-based software or web application, often utilizing it for messaging.”



SMARTPHONE

A smart phone combines a cell phone with email and Web, music and movie player, camera, camcorder, GPS navigation, voice recorder, alarm clock, flashlight, photo album, address book and a lot more. It is also a personal assistant that delivers information and answers questions about almost everything. A lot more personal than a personal computer, a smart phone is generally within reach at all times. With the help of these smart phones all social sites accessible to everyone.

SOCIAL SITES

A social networking site is an online platform that allows users to create a public profile and interact with other users on the website. Social networking sites usually have a new user input a list of people with whom they share a connection and then allow the people on the list to confirm or deny the connection. After connections are established, the new user can search the networks of connections to make more connections. Example of social sites are face book, Instagram, Twitter, Whatsapp, Imo, hike, Snapchat etc. these social sites are easily accessible to all having smart phones.

We see that all people are connected to social sites sitting in a room but they are unaware of the problem of the persons living in the same family. People have no time to go to relatives homes to express good wishes on festivals but only a text message is enough for the relatives and friends.

Social media has become a huge part of our everyday life. We have consumed ourselves with this obsession of posting, sharing, filtering, selfieing, liking, commenting, and worrying. But what do we actually worry about? Many people would say that their social media pages do not affect how they see themselves or how happy we are, but in reality it does. We perfectly filter our pictures so they look more attractive to someone else. We keep our ‘following’ count lower than our ‘followers’. It is all about an image. We can have hundreds of people following us or friends, but in real life we have three. Why do we feel we need this satisfaction from strangers or people we barely know liking what our lunch looked like that day? The answer is simple.

It boosts your self esteem. If you were to talk around on a regular day and had 100+ people tell you they liked your outfit or compliment you, things would get a little redundant and for some of us, uncomfortable. Social media gives us a platform to express our everyday lives, conveniently, discreetly, and on our own terms without actually having to talk to someone.

And on the other hand we see that today’s generation of teenagers have developed their own personal space even living in a family of members. Teenagers do not share their personal things with family members. They avoid going to social programs and always stay home with their technological blessing that is mobile phone with internet.

It has become a serious matter now days to make our youth more productive with secure social feelings of family, society and nation. Teachers play an important role in this matter.

ROLE OF TECHNOLOGY IN THE CLASSROOM

- Technology Promotes individual learning.
- It promotes Students engagement in the classroom.
- Technology Helps students learn how to write and spell.
- Technology Encourages group learning.
- It encourages group sharing.
- It prepares students for technical working environments.
- Technology encourages risk-taking due to the challenges it presents.
- Technology assists students with disabilities
- Technology bridges the gap between teachers and students
- Technology simplifies teachers work







Disadvantages of Technology in The Classroom

- Distraction in the classroom
- Expensive
- Requires Training

PROS

-  Social media entry is cost effective.
- Brand quality is enhanced. 
-  Customer service is improved.
- Everyone is a potential customer. 
-  Products and services make a better impact.
- Search engine visibility is increased. 

CONS

-  The use of social media can be time-consuming.
- Benefits from social media can take a long time to materialize. 
-  Social media can open the risk of negative exposure.
- Brand image can be subjected to unwanted changes. 
-  Face-to-Face Interaction vs Online Communication
- Social media tools change from time-to-time 

CONCLUSION

Although you can create an account on Facebook, Instagram , Snapchat, and other social media platforms without paying any money, there’s a hidden cost: the sacrifice of your privacy. Social media companies are

tracking a tremendous amount of information about our activity online, and they are selling this information for profit. These companies have become huge businesses by offering advertisers and other interested parties data about the items we click on, the things we might like or dislike, and the opinions we express. In general, we don't pay to use social media services because we are the product being sold.

And secondly shopping on our smart-phone in the middle of class, texting at funerals etc are ridiculous activities.. These are a few of the examples that MIT professor Sherry Turkle offered during her TED Talk on Thursday, in which she argued that “technology is taking us places we don't want to go.”Turkle, a psychologist who leads MIT's Initiative on Technology and Self, believes that while our constant communication and social media engagement does make us connected? In One major issue, she said, is that when we text, email or post to a social networking site, we're able to project ourselves as we want to be seen. “We get to edit, we get to delete, and that means we are paying attention to the things we want to pay attention to. And that leaves us increasingly disconnected from our friends, family and co-workers as we simply turn to our devices when a conversation no longer interests us are connected, it's coming at the sacrifice of real conversation. And she thinks that will have some serious consequences for our relationships, our self-perceptions and our emotions.

A study last year found that a larger circle of friends on social media doesn't mean much at all—that there seems to be a cap on the number of true friends we have, no matter what our social media profiles might indicate. The authors suggest that for real friendships, there needs to be actual in-person contact to sustain it: Virtual connections do not a true friendship make And other work has not only hinted at the failure of social media to connect us, but it's laid out some of the specific mechanisms behind it. A study a few years ago, for instance, looked at how people related to others' posts on Face book. Making any kind of comparison between the self and another was linked to more feelings of depression—and not just for upward comparisons, where a person's life seems better than yours, but downward ones, too, where you feel superior. Even neutral comparisons were linked to depression, which seems to suggest that without the back-and-forth of real social relationships, the snapshot-style comparisons that come along with social media may be part of the problem, if not an actual cause.

And this is really the rub: A central reason that we keep coming back to social media, other studies have found, is that we keep thinking it will give us a boost and make us feel better. But in reality, it makes us feel worse. That errant belief is part of the vicious cycle.

This creates a situation that Turkle said makes us, “expect more from technology and less from each other.” In the long run, she thinks technology is ultimately headed towards creating a Siri-like program that can offer “companionship without the demands of friendship.”

And we can conclude that we are not connected socially rather isolated emotionally. We can see people are diagnosed with depression, stress, inferiority complexes, jealousy etc. all these problems are the outcome of these social connections between people in this technological world at the end human beings become victims in the hand of social sites and technology. And this is a serious issue for the individual, family, society, nation and world.

REFERENCES

- I. Bartz, J. A., Zaki, J., Bolger, N., Hollander, E., Ludwig, N. N., Kolevzon, A., & Ochsner, K. N. (2010).
- II. Oxytocin selectively improves empathic accuracy. *Psychological Science*, 21, 1426-1428. Batson, C.D. (2009).
- III. These things called empathy: eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), *The Social Neuroscience of Empathy* (pp. 3–15).
- IV. Cambridge: MIT Press. Batson, C. D., & Moran, T. (1999).
- V. Kayla Watterson, November 30th 2017, *Personal Phone*
- VI. Kayla Watterson, November 30th 2017, *Teenager Social Media Happiness*
- VII. Maialisa, November 30th 2017, *Anxiety*, Retrieved from URL.
- VIII. www.google.com.
- IX. www.forbes.com
- X. Communication technics (book by S.Chand publication).

-
- Gram. *Journal of Child Psychology and Psychiatry*, 49, 743-753. Beeney, J. E., Franklin Jr, R. G., Levy, K. N., & Adams Jr, R. B. (2011). I feel your pain: emotional closeness modulates neural responses to empathically experienced rejection. *Social Neuroscience*, 6(4), 369-376. Benford, P., & Standen, P. (2009). The internet: a comfortable communication medium for people with Asperger syndrome (AS) and high functioning autism (HFA)?. *Journal of Assistive Technologies*, 3, 44-53. Online Technology and Sociability 35 Beranuy, M., Oberst, U., Carbonell, X., & Chamarro, A. (2009). Problematic Internet and mobile phone use and clinical symptoms in college students: The role of emotional intelligence. *Computers in Human Behavior*, 25, 1182-1187. Blakemore, S. J., & Choudhury, S. (2006). Development of the adolescent brain: implications for executive function and social cognition. *Journal of Child Psychology and Psychiatry*, 47(3-4), 296-312. Bollen, J., Mao, H., & Zeng, X. (2011). Twitter mood predicts the stock market. *Journal of Computational Science*, 2(1), 1-8. Boutyline, A., & Willer, R. (2017). The social structure of political echo chambers: Variation in ideological homophily in online networks. *Political Psychology*, 38(3), 551-569. Bradley, N., & Poppen, W. (2003). Assistive technology, computers and Internet may decrease sense of isolation for homebound elderly and disabled persons. *Technology and Disability*, 15(1), 19-25. Braun, R., & Koopmans, R. (2009). The diffusion of ethnic violence in Germany: The role of social similarity. *European Sociological Review*, 26(1), 111-123. Brewer, G., & Kerslake, J. (2015). Cyberbullying, self-esteem, empathy and loneliness. *Computers in Human Behavior*, 48, 255-260. Burke, M., Kraut, R., & Williams, D. (2010, February). Social use of computer-mediated communication by adults on the autism spectrum. In P
 - Boyd, D. (2008). Taken out of context: American teen sociality in networked publics.
 - Freydkin, D. (2016, July 14). Sophia Bush's shares her foolproof social media mantra: 'Don't be cruel'. Retrieved November 30, 2017, from <https://www.aol.com/article/2015/09/29/sophia-bushs-foolproof-social-med...>
 - Kayla Watterson, November 30th 2017, *Personal Phone*
 - Kayla Watterson, November 30th 2017, *Social Media Logos*
 - Kayla Watterson, November 30th 2017, *Teenager Social Media Happiness*
 - Maialisa, November 30th 2017, *Anxiety*, Retrieved from URL
 - mkhmarketing, March 8 2013, *Growing Social Media*, Retrieved from URL
 - Purrier, J. (2017, April 24). Automation And Society: Will Democracy Survive The Internet Of Things? Retrieved November 30, 2017, from http://www.huffingtonpost.co.uk/john-purrier/internet-of-things_b_161401...
 - Steinfield, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology*, 29(6), 434-445. doi:10.1016/j.appdev.2008.07.002
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WHITE COLLAR CRIMES: A HIGH SOCIETY SIN

Rakhi SarrafMahrishi Arvind University, Mundiaramsar, Jaipur

ABSTRACT

White collar crime can have a large impact on the society and it does not only affect the criminals. It is also called as a socio-economic crime because it has a direct impact on the society. When a white collar crime is committed huge losses on business occur which have a direct impact on the consumers and the society. White collar crime basically means the crime committed by the educated people belonging to a higher class of society during the course of their occupation. This paper emphasis how white collar crime differentiates from the blue or ordinary crimes. This article further discussed the common types of white collar crimes evolved in India from last few years and how this has become a socio-economic crime. The paper encompasses various legislations of Indian laws which talks about the punishment of these types of crimes. Finally it has been concluded with his some suggestions .

Keywords: White collar crime, blue or ordinary crimes, economic offences, frauds, embezzlement

INTRODUCTION

White Collar Crimes are the crimes committed by a person of high social status and respectability during the course of his occupation. It is a crime that is committed by salaried professional workers or persons in business and that usually involves a form of financial theft or fraud.

The term “White Collar Crime” was defined by sociologist Edwin Sutherland in 1939. These crimes are non-violent crimes committed by business people through deceptive activities who are able to access large amounts of money for the purpose of financial gain.

HISTORICAL BACKGROUND

- Edwin Sutherland an American sociologist who first defined the white collar crimes in the global. He described this crime to be committed by the person of high social status as compared to those who commit ordinary crimes during the course of his employment.
- In 1934, Again Morris drew attention to the necessity of a change in emphasis regarding crime. He arrested that anti-Social activities of persons of high status committed in course of their profession must be brought with the category of crime and should be made punishable.
- E.H. Sutherland through his pioneering Work emphasised that these ‘ Upper Workedl crimes which are committed by the persons of upper Socio-economic groups in course of their occupation - violating the trust , Should be termed as “ White Collar Crime “ So as to be distinguished from traditional crime which he called “ Blue Collar Crime “
- The concept of White Collar Crimes found its place in criminology for the first time in 1941.It is said that crimes have been taking place since the time human beings started living together. There are various crimes which have swept away with times and there are some which have found different dimensions to them with the society becoming modern. The ancient Vedic text says that the concept of white collar crime has existed in society from the very beginning.

GROWTH IN THE MODERN ERA

In India rapid industrialization after the First World War (1914 to 1919) led to a class divide. There existed two classes of people, the capitalist, the class owing the major means of production, or say the bourgeois institution and the proletariats or the working class. The extreme business condition with the fast growing economy led to the social exclusion of the proletariat class.

The high level of competitiveness and greed for enjoying monopoly led to the growth of criminalist behaviour. The seed of white collar crimes was planted by this time. Where the nation was busy in the freedom movement, and fighting war, these criminal acts grew up posing a threat to the growth of the Indian economy.

WHITE COLLAR DIFFERENTIATE OTHER CRIMES AS-

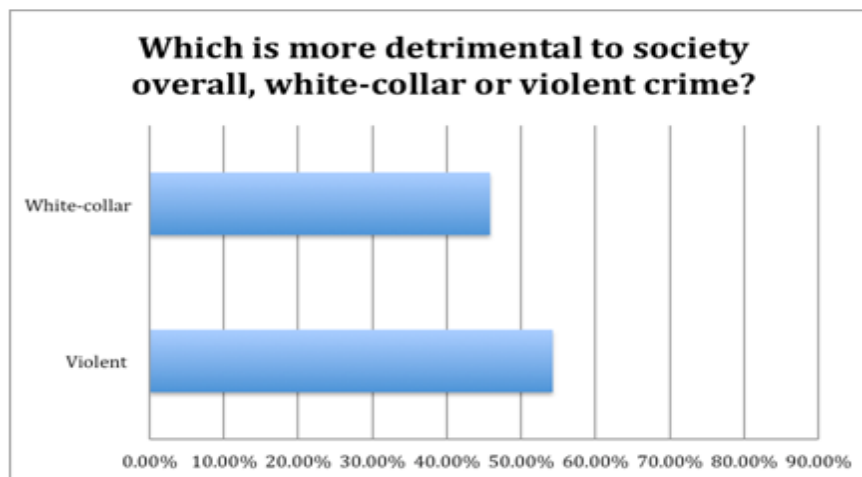
1. **Blue-collar** crime refers to crime that is most likely committed by people from a lower social class, while **white-collar** crime refers to crime that is most likely committed by people from a higher social class.
2. **Street crime** causes physical injuries, and, all too often, death. **White collar crime** causes a loss of money.

3. A **black collar** crime is an action or omission committed by a religious or judicial figure that constitutes an offense that may be prosecuted by the state and is punishable by law. That Priest is guilty of child molestation, which is **black collar crime**. illegal activities involving or related to religion by religious figures.

Basis Of Comparison	White Collar Crime	Blue Collar Crime
Meaning	A job that requires clerical work	A job that require physical labor
Place of work	Office	Field or industry
Job performed by	Employees	Workers
Remuneration	Salary	Wages
Basis of payment	Performance	Hours worked
Requirement of Job	Brain	Muscle power
Payment Cycle	Monthly	Daily
Social Status	High	Low
Effect on society	Indirect but Grievous	Direct but less than white Collar Crime

Main difference between blue and the white collar crime is that the economic loss of white collar crime is thousands time higher than that of the ordinary crimes. The financial loss which the society has to bear is higher in white collar crimes than the crimes committed by the people of low-social standard.

White collar crime committed out of greed and it is very well planned and executed on the other hand blue crimes are usually committed out of rage, revenge and other emotions. In white collar crime harm is caused to the casualties or cash but harm is physical in case of blue collar crime.



TYPES OF WHITE COLLAR CRIMES

White Collar Crime is pervasive in almost all the professions and occupations in the society. There are different types of white collar crimes. Some of them are as follows:

- i. **Bank Fraud:** Bank Fraud means to engage in such activities in order to defraud a bank or using illegal means to obtain assets held by financial institutions.
- ii. **Blackmail:** Blackmail means demand for money by threatening some person to cause physical injury or exposing his secrets.
- iii. **Bribery:** Bribery means offering money, goods or any gift to someone in order to have control over his actions. It is a crime whether someone offers or accepts a bribe.
- iv. **Computer Fraud:** Computer frauds are such frauds which involve hacking or stealing information of some other person.
- v. **Embezzlement:** When someone entrusted with money or property uses it for his own use, it is embezzlement.
- vi. **Extortion:** When a person illegally obtains someone’s property by actual or threatened force.

- vii. **Insider-Trading:** When someone uses the confidential information to trade in shares of publicly held corporations.
- viii. **Money-Laundering:** Money Laundering means the concealment of origin of illegally obtained money.
- ix. **Tax fraud or Tax Evasion:** Tax evasion is committed with an intention to conceal one's actual taxable income and one's original position to the authorities. This concealment of income is done to reduce the tax liability in the eyes of government. In simple words it means to hide the money obtained from the illegal means in order to reduce one's liability to pay tax and to show low income to the tax authorities. Tax evasion has a negative impact on the social values as it demoralized honest tax payers and they might also want to do tax evasion also it gives economy power in the hand of few undeserving people.
- x. **Cybercrime:** Cybercrime is the biggest cause leading to this type of crime in India. It is the latest problem prevailing in the cyber world. Cybercrime is the crime which is related to 'computer networks'. With the rapid increase of advancement of technology there is also a rapid increase in the crime related to the technology. Cybercrime involves the persons who are expert in computer related technology. And it is committed against the victim directly or indirectly to cause a harm to his reputation or to harm in physical or mental way using internet, networks and other technological sources. Hacking, Child pornography, Copyright infringement, Cyber terrorism, Cyber stalking are some of common examples of cybercrime.

WHITE COLLAR CRIMES IN INDIA

White-collar crime is widespread not only in the developed world, but in emerging economies like India as well. White Collar Crimes are rapidly increasing in our country with the advancement of commerce and technology. The recent developments in the technology have given new dimensions to computer related crimes known as cyber crimes. As such, the white collar crimes are increasing with the development of new websites. The areas affected by these crimes are banking and financial institutions, industry, business etc.

Thus crime is an act or omission which constitutes an offence and is punishable under the law. As the white collar crimes are increasing on daily basis, it injures the society on a large scale because the laws are not properly administered and therefore there is a need to curb the factors that are helping in the commission of such crimes.

Legislation against white collar crime in India -There are several provision that exists for identifying white collar crime. Government in order to ensure that the criminal committing white collar crime be punished has brought in the following legislations-

1. The Companies Act, 1960
2. The Income Tax Act, 1961
3. Indian Penal Code, 1860
4. The Import and Exports (Control) Act, 1947
5. The Industrial (Development and Regulation) Act, 1951.,
6. The Essential Commodities Act, 1955
7. Companies Act, 1956
8. the Foreign Exchange (Regulation) Act, 1974
9. The Prevention of Corruption Act, 1988
10. The Negotiable Instrument Act, 1881
11. The Prevention of Money laundering Act, 2002
12. The Information Technology Act, 2005
13. The Imports and Exports (control) Act, 1950
14. The Special Court (Trial of offences relation to Transactions in Securities) Act, 1992
15. Prevention of Money Laundering Act, 2002.
16. The Central Vigilance Commission Act, 2003
17. The Economic Offender's Bill, 2017,

White Collar Crime is not a phenomenon but an emerging concept in our country. Thus, Indian Penal Code, 1860 has already codified some of the offences related to white collar crime in a comprehensive manner. The term "White Collar Crime" has not been defined anywhere in the Indian Penal Code. But the dimension of the crime is so wide that certain offences under Indian Penal Code is closely linked with white collar crime such as bribery , corruption , food adulteration , forgery , fraud , cheating (Section 463 of Indian Penal Code(45 of 1860) , extortion(Section 415 of Indian Penal Code (45 Of 1860)) etc.

Codified criminal law has also provided the punishment for the offences that comes under the dimensions of white collar crime or socio- economic offences.

The Reserve Bank of India has issued directions to be strictly followed by the banks under KYC (Know Your Customer) guidelines. The banks and financial institutions are required to maintain the records of transactions for a period of ten years.

Information Technology Act, 2000 has been enacted to provide legal recognition to the authentication of information exchanged in respect of commercial transactions.

Section 43 and 44 of Information Technology Act prescribes the penalties of various crimes. Though the focus of Information Technology Act is not on cybercrime as such, this Act has certain provisions that deal with white collar crimes. Chapter XI deals with the offence of cyber crime and chapter IX deals with penalties and adjudication of crime. Apart from this, many issues are unresolved due to lack of focus.

➤ **Some of the Penalties for white collar crimes mentioned in the Companies Act, 2013:-**

Section 454 of the Companies Act, 2013 says that the Central Government, by an order stated in the official gazette, has the power to appoint an adjudicating officer who will have the right to adjudicate penalty under the provisions of this act. The Central Government will also decide the jurisdiction for the officers.

The adjudicating officer can impose a penalty on the company or its officers on the grounds of noncompliance with the given provision under the Act. In case an officer who has been penalised by the adjudicating officer is dissatisfied with his action, he could file an appeal to the regional director would be having jurisdiction in that matter.

Punishment for fraud:-Section 447 of the Companies Act, 2013 provides punishment against the commission of fraud. It states that in case a person is found guilty of an offence of fraud he would be imprisoned for a period not less than 6 months and which extend to 10 years. And he will also be subject to fine which should not in any case be less than the amount involved in fraud and which may extend to 3 times the amount involved in the fraud. In case the fraud has been committed against the interest of the general public than the term of imprisonment would not be less than 3 years.

Punishment for false statement:-Section 448 of the Companies Act, 2013 states that: if a person deliberately makes a false statement, knowing it to be false or deliberately omits any material fact, knowing it to be material than he would be held liable for his wrongful act. This false statement can be made either through return, report, certificate, financial statement, prospectus, statement or any other documents required for the purpose mentioned under this Act or any rules made under it.

Punishment for furnishing false evidence:-Section 449 of the Companies Act, 2013 provides for punishment for furnishing false evidence.

Punishment when no specific punishment or penalty has been provided:-Section 450 of the Companies Act, 2013 states that in case a punishment or penalty for a crime, which has been committed either by an officer of a company or by any other person who contravenes any of the provisions of this act, then under this section he would be penalized with a fine which may extend to 10 lakh rupees. In case the contravention continues the person would be asked to pay a fine which may extend to 1,000 rupees everyday till the intervention continues.

Punishment when the default has been repeated:-Section 451 of the Companies Act, 2013 lays down that, when a company or any officer of that company commits an offence for which he has already been penalized and has also faced imprisonment, in case commits the same offence again within a period of 3 years, than that company and every one of those officers involved in the commission of the offence for the second time shall be punished with twice the amount of fine, in addition to the term of imprisonment provided in the act for that offence. But, in case the offence was committed after a period of 3 years of commission of the offence for the first time then this rule would not be applicable.

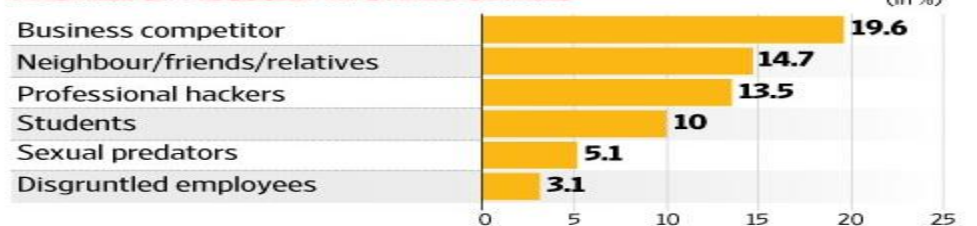
UP TOPS CYBER CRIMES LIST

NCRB, in its 2016 report, said India had registered 11,592 cases of cyber crimes in 2015; Uttar Pradesh topped the list with 2,208 cases, followed by Maharashtra with 2,195 cases. A bulk of the crimes was committed primarily for financial gains by people in white-collar jobs, but sexual cyber crimes also dominated stats.

MOTIVES OF CYBER CRIME



PROFILE OF ACCUSED IN CYBER CRIMES



Source: NCRB Report (2016)

WHITE COLLAR CRIME IN DIFFERENT PROFESSIONS:

1) In Medical And Health

- i. Making of false medical certificates by the doctors.
- ii. Fake and intended prolong the treatment in order to increases the bills.
- iii. Sex discrimination of the child by the doctors on the compulsion of the patient to gain money.
- iv. Delaying of time by doctors to increase the amount of money in the bills.
- v. Sale of sample medicines which are not allowed to the chemists.

2) In Legal Profession

- i. Fabrication of forged documents.
- ii. Frightening the witnesses of the other party.
- iii. Violation of ethical standard of legal profession to gain money.

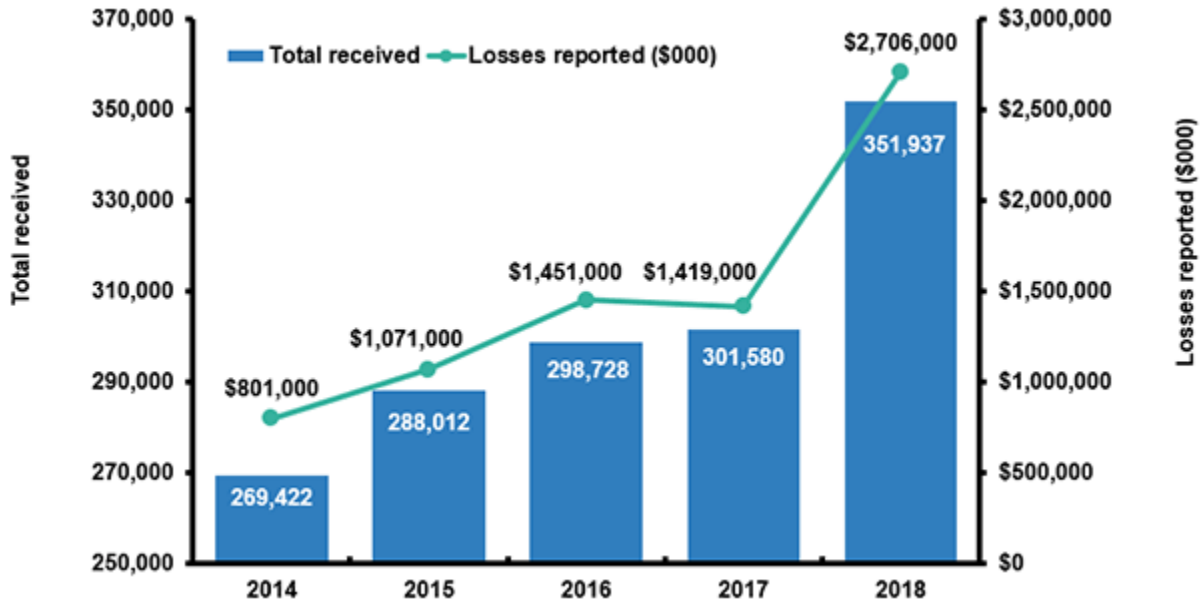
3) In Education

- i. Collecting huge sums of money in the name of donations by students in order to give them admission.
- ii. Merit based admission is replaced by donations.
- iii. Collect enormous amount of money in the name of government grants.

White Collar Crime Statistics:- Each year, government departments and organizations track white collar crime statistics, publishing the results every few years. of the white collar crime statistics are shocking to those unaware of this crime’s prevalence. Fraud and other white collar crimes cost businesses and individuals more than \$400 billion each year in the U.S.

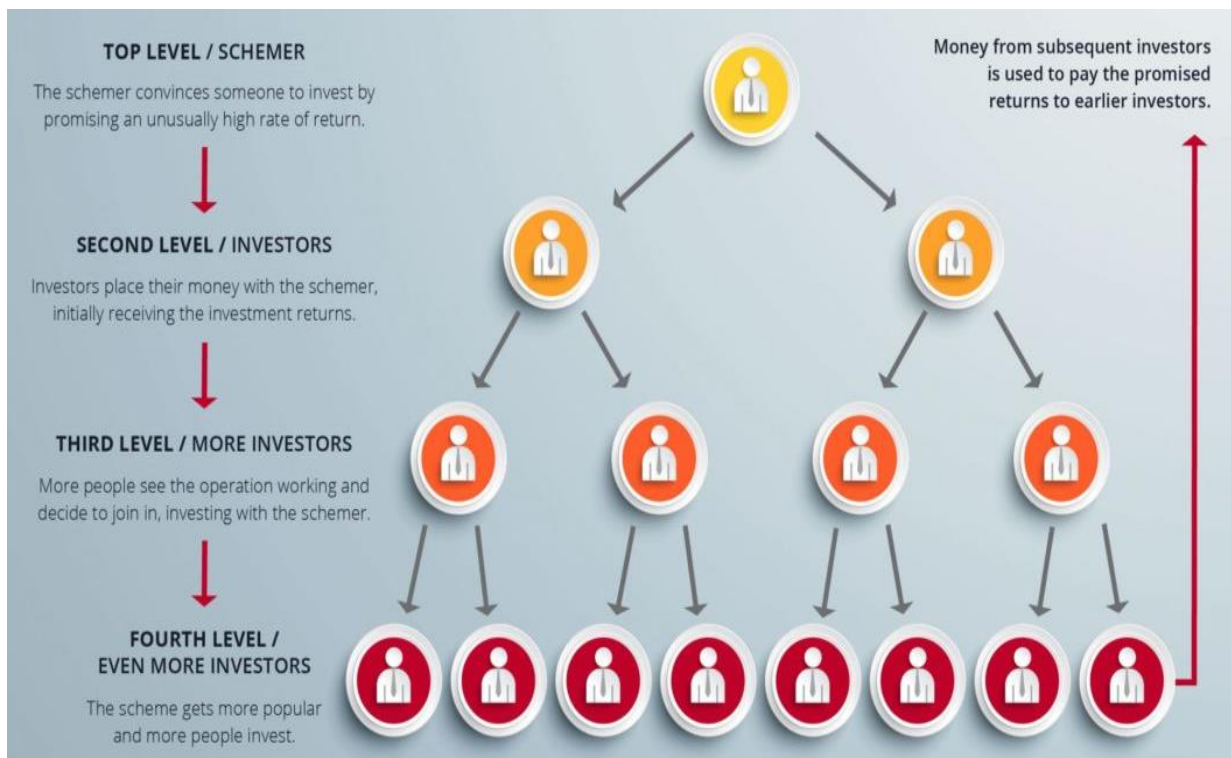
- White collar crime most commonly occurs in companies with fewer than 100 employees
- 75% of white collar crime is committed by men
- The typical perpetrator of white collar crime is a college-educated male of Caucasian descent
- On average, companies lose \$9 or more per day, per employee due to fraud
- Managers are responsible for four times the amount of loss than employees
- Each year, there are around 5,000 arrests per 100,000 people in the United States for white collar crimes

- Of those arrests, 635 are related to property crimes
- Bribery accounts for the fewest white-collar-crime-related arrests
- Estimates show that one out of every four households will be the subject of a white collar crime at some point in their life



VARIOUS FRAUDS AND SCAMS ARE

- **Ponzi Scheme** – A fraudulent investment scheme in which payment to the original investors comes from the investments funds of newer investors. By promising a high rate of return from an investment opportunity that doesn’t actually exist, new investors join in, garnering pay from even newer investors. These scams collapse when the influx of new gullible investors runs out.



Ponzi scam, also known as pyramid scam is a type of affinity scam where the scammer would through emails and advertisements offer one to earn huge profits by sitting at the comfort of their living room, only by investing a certain amount of money. They also keep exciting offers like early birds would be able to make more profits. After investing their money in such schemes people land up having nothing in their hand, as the scammer runs away with the money leaving behind no clue of their existence so as to track them.



THE CASES OF PONZI SCHEME IN INDIA ARE

1. In November, 2018, Gaylen Rust of Utah was accused by the Government for running ponzi scheme and generating huge wealth, like that if 25-40% per year, which is about 47 to 200 million of money. It was found that more than 200 people had become a victim of this scheme.
2. In the same year when Gaylen ruth was found guilty, in the month of September, a person by the name of Claud R. 'Rick' Koerber, from Utah itself, was found guilty of running a ponzi scheme. Under this the investors in the property had suffered a loss of 100 million.
3. In 2017, Michael Scronic from New York, was held levied with civil and criminal charges, causing a loss of 27,000 million dollars to the investors.

o **Pump and dump scam**

A company who owns a large amount in a low-priced stock, which is actually an illegitimate business, will find potential investors and persuade them to invest in their stock. As more people would invest, the price of the stock would increase and when it reaches its peak the scammers would sell all the shares, earn profit and run away, taking with him all your money.

It was in 2015 when Rakesh Jhunjhunwala was said to have raised his wealth by purchasing 2,50,000 odd shares because of which though his shares of the 'Surana Solar' experienced an 18% rise, but after the dump-sum scam was discovered, the prices quashed. That is how a loophole in the system was also discovered. The happening of such scams reveals that there is no proper system to check the authenticity of the information being supplied. And taking the advantage of such a loophole, the Surana Solar made namesake deals easily with the investors causing them great loss.

o **Scams by way of sending spam emails**

Often the scammer sends spam mails making fake offers and promises. In the year 2017, a record of 7.5 million cases of spam mails was discovered. Once you reply to such emails you get caught in the trap as these mails are fraudulent. Most of these mails are regarding microcap stock where investments are highly risky when compared to other stocks.

The customers of the ICICI Bank became a victim of such scam where certain group of people representing themselves to be an official of the bank, asked for sensitive information about the bank account and defrauded them. The fraud was finally discovered by the manager of the bank when a few of the customers who had received such spam mails filed a complaint. Such a scam in the IT Act is defined as 'phishing'.

o **The kick-back fraud**

A kickback fraud is one in which one person bribes another with something of value in order to convince the other to take a favourable decision. For example, a contractor in order to get the approval for building complex bribes the government official with a promise to give a small part of the land to him. In another example, a biomedical company offers a doctor to advertise his products by advising it to his patients and in return, the company would provide him with free travelling for the next 5 years.

○ **Racketeering**

It refers to a wrongful act or says criminal act of a person where he indulges in illegal business with a profit motive.

The number of cases of racketeering has experienced a rise in the recent times. According to a report published in India Today in February, 2019, Raju alias Hakla was arrested for his involvement in 113 cases of murder, dacoity and robbery. A kidney racket case was revealed in 2019 where a businessman from Gujarat, Brijkishore Jaiswal, was about to undergo an illegal kidney transplant. This happened in Powai's Hiranandani hospital. When the wrongful practice was unveiled, the CEO of the hospital, Sujit Chatterjee and 5 other people were taken under arrest.

○ **Fraud over calls**

Commonly known as telemarketing fraud, these frauds are made over the phone calls. Here, a person is approached to make an investment for building a charitable organization, or asks for their bank account details to obtain a certain amount for charitable purposes. The amount received is then used for any other purpose other than the one it has been taken for.

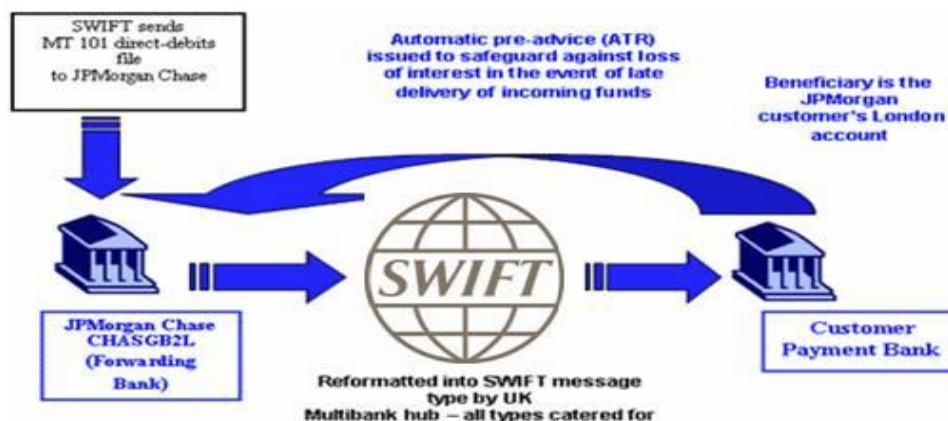
○ **Cellular phone fraud**

The Cellular phone fraud refers to tampering, manipulating or making an unauthorized use of cellular phones or service. The offender in this case would make a fake account in your name and get an access to your bank account details, credit card details, and make payments without your consent. The offender may even sell your cell phone to other criminals to use it in commission of illegal acts.

RECENT CASES ON WHITE COLLAR CRIME IN INDIA

- The **INX Media case** refers to an ongoing high-profile money laundering investigation in India. It involves allegation of irregularities in foreign exchange clearances given to INX Media group for receiving overseas investment in 2007. P. Chidambaram was union finance minister at the time. His son Karti Chidambaram has been implicated by the investigating agencies. As of September 2019, there were no reports of charges filed against P. Chidambaram. The CBI is reported to be conducting a probe.
- **Neerav Modi Bank scam**-This bank scam is being called the biggest scam (Rs 11,400 crore) in the banking sector of India. The main accused of the scandal is billionaire jeweller Nirav Modi and his uncle Mehul Surakshi (owner of Gitanjali James). Both of them had received "Letter of Undertaking" from the consent of the employees of PNB's Mumbai branch and withdrawn the funds from the foreign banks on the guarantee of Punjab National Bank. However, the Enforcement Directorate has seized assets of Nirav worth over Rs 5870 crore.
- **Bank Scam by Vijay Mallya**- Mallya's Kingfisher Airlines had borrowed Rs 9,432 crore from 13 banks till February 2018. The State Bank of India was the biggest lender with 1600 cr. followed by the PNB 800 cr, IDBI 650 cr and Bank of Baroda lend 550 cr. Malya left India on March 2, 2016 and hiding in the London and the government of India is fighting for his extradition till date.
- **Allahabad Bank Scam**:-Kolkata-based Allahabad Bank has said it has an exposure of ₹2,363 crore in the PNB fraud case.

SWIFT stands for the "Society for Worldwide Interbank Financial Telecommunications". It is a messaging network that financial institutions use to securely transmit information and instructions through a standardized system of codes.



SWIFT stands for the "Society for Worldwide Interbank Financial Telecommunications". It is a messaging network that financial institutions use to securely transmit information and instructions through a standardized system of codes. To do the scam in the Allahabad bank; the SWIFT technique is misused by the internal employees of the Allahabad bank. The internal banking system of the Allahabad bank was not attached to the SWIFT that is why the transactions were not mentioned in the accounting book of the Allahabad bank. That is why there was no transaction record found between the PNB and Nirav Modi.

- **Rotomac Pen Scam**-The Promoter of Rotomac pen Vikram Kothari, allegedly fraudulently cheated Rs. 3,695 crore with seven banks. Kothari has misappropriated loans worth Rs 2,919 crore from 7 banks and the total outstanding amount, including interest on him, is Rs. 3,695 crore. The CBI has arrested managing director of Rotomac Global Pvt Ltd Vikram Kothari.

THE BANKS WHOSE MONEY IS TRAPPED IN THIS SCAM ARE-

- | | |
|--------------------------------|------------------|
| 1. Bank of India:- | Rs 754.77 crore |
| 2. Indian Overseas Bank:- | Rs 771.07 crore |
| 3. Union Bank of India:- | Rs 458.95 crore |
| 4. Bank of Baroda:- | Rs 456.53 crore |
| 5. Allahabad Bank:- | Rs. 330.68 crore |
| 6. Oriental Bank of Commerce:- | Rs 97.47 crore |
| 7. Bank of Maharashtra: | Rs 49.82 crore |

This scam is related to the biggest Private Sector Bank of the country i.e. SBI leading the consortium of 14 public and private sector. The principle loan is about Rs. 824 crore, adding the interest due would indicate a loss of more than Rs 1,000 crore to the banks.

The main accused in this scam is Kanishka Gold Pvt. This company did not pay a loan of Rs. 824 crore, which has been converted into "NPA". The CBI has registered a case against Chennai-based company Kanishka Gold and ED has started investigating the fraud. The director of this company Bhupendra Kumar Jain and his wife Neeta Jain have fled the country.

THESE BANKS HAVE LENT MONEY TO THE KANISHKA GOLD PVT;

- | | |
|---------------------------------|---------------|
| 1. State Bank of India:- | Rs 240 crore |
| 2. Punjab National Bank (PNB):- | Rs 128 crore |
| 3. Bank of India:- | Rs 46 crore |
| 4. IDBI:- | Rs 49 crore |
| 5. Syndicate Bank:- | Rs 54 crore |
| 6. Union Bank:- | Rs 53 crore |
| 7. UCO Bank:- | Rs. 45 crores |
| 8. Central Bank:- | Rs. 22 crores |

- **R P Info Systems Bank Scam**:-The CBI has booked a computer manufacturer R P Info Systems and its directors for allegedly cheating a consortium of 9 banks with amount of **Rs. 515.15 crore**. This company has used fraud documents to take the loan. CBI had raided the offices of the company in Kolkata and other places on February 28, 2018.

- **Simbhaoli Sugar Mills Bank Scam**:-CBI has registered another bank fraud against one of India's largest sugar mills- Simbhaoli Sugars Ltd, amounting to **Rs 200 crore**. There are 10 people have been booked, including the chairman of Simbhaoli Sugar Mills Limited Gurmeet Singh Mann, Deputy Managing Director Guralp Singh and CEO GSC Rao.



- **Noida Ponzi scheme** - A special investigation team (SIT) probing an alleged Ponzi scheme run by Anubhav Mittal, managing director of Ablaze Info Solution, concentrated their efforts on suspicious transactions by nearly 200 gold and diamond dealers.
- **Maharashtra scholarship scam** - An investigation of alleged misappropriation of government scholarships intended for Other Backward Class students found that hundreds of institutes across the state had pocketed several thousand crore rupees since 2010. On 5 April 2017, the CBI registered six cases against **Winsome Diamonds and Jewellery** and Forever Precious Jewellery and Diamonds and their chief promoter, Jatin Mehta, for allegedly cheating three government banks of ₹1,530 crore.
- A public-interest litigation petition was filed against Adani Group, Reliance Group, Essar Group **and other mining and energy companies** for an investigation of alleged ₹290 billion overcharges for Indonesian coal and imported power equipment from 2011 to 2015.
- **Abhishek Verma arms deals scandal**- Abhishek Varma is believed to be the main arms dealer and the prime suspect in the Scorpene submarines deal case, AgustaWestland VVIP helicopters bribery scandal, and Navy War Room leak case.

Belonging to a politically connected family with both his parents holding government portfolios, Abhishek was exposed to the media and public life since his childhood days. He was even named as the youngest billionaire at the age of 28 in 1997.

In 2006, Abhishek was accused of receiving kickbacks of approximately \$200 million, through a \$4-5 billion Indian military deal involving the Indian government's purchase of six Scorpene-class submarines. Further, in 2012, the **CBI raided his residence** and establishments after registration of multiple cases of corruption and money laundering against him and his wife. He was arrested in 2012.

He was also named as a suspect in the 2013 **AgustaWestland VVIP helicopters bribery scandal**, where it was alleged that leaders in Indian government revived bribe exceeding ₹50 million. In April 2017, a special CBI court acquitted the couple of the charges.

- **Wakf Board land scam**- Pegged to be possibly the biggest land scam in the country till date, the Karnataka Wakf Board land scam involves the alleged misappropriation of land allocation worth Rs 2,000 billion.

In 2012, the Karnataka State Minorities Commission submitted a report alleging that 27,000 acre of land controlled by the Karnataka Wakf Board had either been embezzled or allocated illegally. The said property was supposed to be donated to the underprivileged and poor through the Muslim charitable trust.

Anwar Manippady, Chairman of the Karnataka State Minorities Commission, said that over 50 percent of the land has been misappropriated by politicians and board members. This was supposedly done in collusion with the real estate mafia for a fraction of its market value under the watch of the Karnataka Wakf Board.

- **Telgi scam**-This scam seems to be straight out of a Hollywood movie. In 2002, Abdul Karim Telgi was charged for counterfeiting stamp paper in India.

He appointed 350 fake agents to sell stamp papers to banks, insurance companies, and stock brokerage firms. The scam spread across 12 States and the amount involved was pegged at Rs 200 billion.

The investigation revealed that Telgi enjoyed support from various government departments that were involved in the production and sale of high-security stamps. In January 2006, Telgi and several associates were sentenced to 30 years rigorous imprisonment.

- The 'Coalgate' scam-September 2012 unearthed a scam that involved bureaucrats, political leaders and several ministers from the ruling political party. The Comptroller and Auditor General, India's audit watchdog, reported inefficient and possibly illegal allocation of coal blocks between 2004 and 2009.

While initially the loss to the exchequer was pegged at Rs 10.7 lakh crore, the final report stated that the scam amounted to Rs 1.86 lakh crore.

Essentially, the Government of India followed a system of competitive bidding to allocate coal blocks. However, CAG's investigation revealed that the government followed another route that was "opaque and subjective".

As a result, CAG noted that both the private and public sector enterprises paid less, resulting in loss revenue for the government.

- 2G Spectrum scam-This scam surfaced when it was revealed that the government, in 2008, had undercharged mobile telephone companies for frequency allocation licences. These licences are used to create 2G spectrum subscriptions for cell phones.

The Comptroller and Auditor General of India stated that “the difference between the money collected and that mandated to be collected was Rs 1.76 trillion”.

In February 2012, the Supreme Court of India declared the allotment of spectrum as “unconstitutional and arbitrary” and cancelled the 122 licences issued in 2008 under A. Raja, then Minister of Communications and IT.

- Adarsh Housing Society scam-A posh 31-storey building located in Colaba, Mumbai, was constructed for the welfare of war widows and personnel of Defence ministry. In 2011, the Comptroller and Auditor General of India observed that over a period 10 years the society flouted various Environment ministry rules. It was noted that politicians, bureaucrats and military officers bent several rules concerning land ownership, zoning, and floor-space index.

It was also alleged that members allocated flats to themselves in the cooperative society below market rates. In 2011, the Comptroller and Auditor General of India said,

The episode of Adarsh Co-operative Housing Society reveals how a group of select officials, placed in key posts could subvert rules and regulations in order to grab prime government land – a public property – for personal benefit.

The scam forced the then Chief Minister of Maharashtra, Ashok Chavan, to resign in 2010. Further, the CAG also indicted **three other former chief ministers** -Vilasrao Deshmukh, Sushilkumar Shinde and Shivajirao Nilangekar Patil - **two former urban development ministers**— Rajesh Tope and Sunil Tatkare - and **12 top bureaucrats**, for various illegal acts.

Image source :- Indian Express

- Commonwealth Games scam-The Commonwealth Games scam took India by storm in 2010 involving a pilferage of around Rs 70,000 crore. Since its inception, the games were tangled in a maze of corrupt deals. This included inflated contracts, criminal conspiracy, cheating, and forgery.

And in the centre of the corruption was **Suresh Kalmadi**, the then Pune Lok Sabha MP. Investigation suggested that the organising committee ran as a sort of “**badmaash company**,” and he was charged under the Prevention of Corruption Act.

Kalmadi allegedly **awarded a Rs 141-crore contract to Swiss Timing** for its timing equipment, a deal inflated by Rs 95 crore. Further, it was reported that Indian athletes were forced to stay in shabby apartments instead of the flats allotted to them by the authorities.

- Satyam scam-Dubbed as ‘India’s Enron scandal’, the 2009 corporate scam shook the Indian investors and shareholders community. Ramalinga Raju, the Chairman of Satyam Computer Services, confessed that he had falsified the company's accounts, inflating the revenue and profit. The fraud involved Rs 14,000 crore.

The CBI investigated the case and Raju, along with 10 other members faced imprisonment. Tech Mahindra took over the company.

MEASURES TO PREVENT WHITE COLLAR CRIMES ARE

1. The top investigating agencies of the country like the Central Bureau of Investigation, the Enforcement Directorate, the Income-tax Department, The Directorate of Revenue Intelligence and the Customs Department, needs strengthening, by way of implementing strong regulating policies. The Central Vigilance Commission should monitor the working of the officials sitting at top positions and also cross-check their works, so as to ensure transparency in the system.
2. Every investigating officer must be trained in such a manner that, no matter how complicated the case is, they would be able to easily resolve it.
3. To uproot the existence of such crimes, it is very important to include strict laws into the system..
4. Fast track courts and tribunals should be set in all the parts of the country for the early disposal of these cases.

5. The electronic and print media should be utilized in the right way to spread awareness about white collar crimes. The general people need to be aware of such crimes and that they are taking place everywhere, from a small cafe to big multinational companies. The media has a key role to play in reducing the rate of increasing white collar crimes. It has been noted that most of the white collar crimes go unreported. So, if the media becomes more active towards publishing frauds and scams at higher levels and revealing how do the people at higher position in a company use their powers arbitrarily, and also make efforts in making people aware about the white collar crimes, and avoid corrupt practices, then this would definitely help in reducing the rate at which the white collar crimes are being committed.
6. Stringent laws and hefty fine and long term imprisonment should be given to the offenders for committing such crimes. And for this to happen, the Indian Penal Code, 1860 should be amended and include provisions for the white collar crimes. For example, the IPC could have a separate chapter dealing with white collar crimes.
7. The government may set up a separate body which would look into the matter of crimes and criminality prevailing in the country.

CONCLUSIONS AND SUGGESTIONS

The advancement of science and technology in last few decades has created a new form of crime which is known as “white collar crime”. It is a socio- economic offence due to which economy suffers a lot. The person who commits these types of crime is called socio-economic offenders.

White collar crimes have two surprising features, first, that they are non-violent crimes, though the criminals have the tendency to gain control or have a sense of entitlement, and, second, that they are committed by people in the higher profession.

As our society is growing towards modernity and the world is experiencing new technological advancement, the rate of crime is also increasing at a faster rate. Particularly the growth in white collar crimes has been enormous. From the medical profession to educational institutions, these crimes are being committed everywhere.

The term white collar is not defined in criminal law but although certain form of white collar crime is defined in Indian Penal Code. These forms of crime have closed linked with white collar crime. The provision of white collar crime also deals with the punishment and fine associated with the nature of crime. The recent bill pending in Parliament, The Economic Offender’s Bill, 2017, is an initiative of NDA Govt. to have jurisdiction on economic offenders to flee off to other country to escape from their criminal liability. The above mentioned acts along with legal provisions of Indian Penal Code, 1860 should be harmoniously interpreted in such a strict manner to control problem of white collar crimes in India. White collar crimes are the crimes which cause harm to the economy of the country as a whole.

- There is no proper definition of White collar crime in Indian laws. These socio-economic crimes should not be taken leniently by the government.
- Punishment regarding White collar crime should be stricter as harsh punishment can prevent these crimes to a great extent.
- If the crime is very heinous the punishment might also be extended to life imprisonment.
- People are not aware about most of these crimes so the public awareness through any communication medium is also necessary.
- Government should impose strict regulations regarding economic thefts of the country.

I would like to conclude by saying that if everyone at a particular business or company would keep an eye out for anything suspicious that alone would detour potential thieves. The real solution to this problem is going to have to come from the people who are being affected by it.

If these crimes continue to grow at the present rate, they will be out of control before we know it.

The use of forensic data analytics can lessen, detect, monitor or investigate potentially improper transactions, events or patterns of behavior related to misconduct, fraud and non-compliance issues. The use of artificial intelligence and predictive analytics could emerge as the future of anti-fraud controls.

REFERENCES

1. "FBI — White-Collar Crime". FBI.

2. Sutherland, Edwin Hardin (1949). *White Collar Crime*. New York: Dryden Press, p. 9.
3. "White Collar Criminal Defense Guide". Law Offices of Randy Collins. Retrieved 23 December 2016.
4. Andrew Restuccia and Emily Holden (16 May 2018). "Pruitt taps outside attorney for help amid investigations". Politico.com. Retrieved 17 May 2018.
5. <https://blog.ipleaders.in/analysis-white-collar-crimes-india/>
6. <http://study.com/academy/lesson/what-is-white-collar-crime-definition-statistics-examples.html>
7. <http://criminal.findlaw.com/criminal-charges/white-collar-crime.html>
8. <http://public.getlegal.com/legal-info-center/white-collar-crime/>
9. <https://www.scribd.com/doc/11531899/Whit-Collar-Crime>
10. https://shodhganga.inflibnet.ac.in/bitstream/10603/43935/8/08_chapter%202.pdf Para 4; A.I.R. 1987 SC 1321,1964 A.I.R. 295 SCR (4) 224
11. Anosh Ekka v. Central Bureau of Investigation
12. Arun Kumar Mishra v. Directorate of Enforcement
13. People v. Fort , 138 Mich. App. 322 (Mich. Ct. App. 1984)
14. SEBI v. Burman Plantation and Others, (2013)
15. Abhay Singh Chautala v. C.B.I., (2011)
16. Binod Kumar v. State of Jharkhand and Others, (2011)
17. D.K. Gandhi v. M. Mathias, 6th August, 2007
18. Jacob Mathew v. State of Punjab, (2005) 6 SCC 1 (para 18)
19. Galaxy Nirmaan Pvt. Ltd. v. Acit, new Delhi, 19th May, 2017
20. Emperor v. Kanayalal Mohanlal Gujar, (1939) 41 BOMLR 977
21. <http://www.legalserviceindia.com/legal/article-530-white-collar-crime-detail-study.html>
22. Khan, A. (2013). *White Collar Crime-Study of Emerging India*. 2013.M.D University.
23. <http://www.legalservicesindia.com/article/1378/White-collar-crime-and-its-changing-dimensions-in-India.html>
24. <https://www.jagranjosh.com/general-knowledge/which-are-the-biggest-banking-scams-of-india-1531229357-1>
25. *Khandelwal, Peeyush (13 February 2017)*. "Noida Ponzi scheme: SIT probe in Rs 3,700 crore online scam focus on 'core investors'". *Hindustan Times*. Retrieved 13 February 2017.
26. *Deshpande, Vivek (22 August 2017)*. "Maharashtra scholarship scam: Probe reveals institutes pocketed crores by using different ploys". *The Indian Express*. Retrieved 22 August 2017.
27. "Winsome, Lose Some: Jatin Mehta and the Great Rs 7,000 Crore Diamond Heist". Retrieved 1 May 2017.
28. *Desk, Online (17 September 2017)*. "Adani group, Reliance ADAG, Essar accused of cheating in Rs 290 billion scam". *www.newindianexpress.com*.
29. https://en.wikipedia.org/wiki/List_of_scandals_in_India
30. <https://yourstory.com/2017/12/8-scams-india>
31. "Govt's defence of Chidambaram rings hollow". *The Pioneer*. 8 May 2012. Retrieved 10 May 2012.
32. "Aircel-Maxis Deal: Parliament Disrupted Over PC's Role". *Outlook India*. 8 May 2012. Archived from the original on 10 November 2013. Retrieved 10 May 2012.
33. "Aircel-Maxis Deal: PC Dismisses Charges as Reckless". *Outlook India*. 10 May 2012. Archived from the original on 10 May 2012. Retrieved 10 May 2012.
34. "Document shows Chidambaram delayed Aircel-Maxis deal by 7 months". *India Today*. 8 May 2012. Retrieved 10 May 2012.
35. "Govt trapped in own web of deceit". *The Pioneer*. 9 May 2012. Retrieved 10 May 2012.

-
36. "Chidambaram's son a direct beneficiary of 2G scam: Subramaniam Swamy - Times of India".
 37. "Chidambaram expected to appear before ED on Tuesday in Aircel-Maxis money laundering case". *4 June 2018*.
 38. *Chidambaram, Narita (26 April 2012)*. "Subramanian Swamy exposes Chidambaram,son in corruption case". *One India*. Retrieved 27 October 2016.
 39. "Chidambaram arrested in INX Media case after high drama". *The Hindu. Special Correspondent. 21 August 2019*. ISSN 0971-751X. Retrieved 22 August 2019.
 40. "In 2nd Round of Interrogation, CBI Quizzes Chidambaram on Meeting With Indrani Mukerjea | LIVE Updates". *News18. 22 August 2019*. Retrieved 22 August 2019.
 41. "P Chidambaram's arrest: As it happened". *India Today*. Retrieved 22 August 2019.
 42. *DelhiSeptember 6, Press Trust of India New; September 6, 2019UPDATED:; Ist, 2019 01:27*. "INX Media case: Chidambaram lands in Tihar Jail that currently has 17,400 inmates". *India Today*. Retrieved 5 September 2019.

DNA EVIDENCE – A MAGIC BULLET**Rakhi Sarraf**Mahrishi Arvind University, Mundiaramsar, Jaipur

ABSTRACT

DNA testing has become an established part of criminal justice process, and the admissibility of the test results in the courtroom has become routine. There is not, and has never been, controversy about its ability to eliminate suspicion in cases where the suspect's DNA does not match the evidentiary sample. Debate continues, however, concerning the extent to which the guilt can be inferred when an apparent match occurs. In most cases, the best it can ever do is to place a suspect at the scene of the crime. However, the uncritical adoption of 'forensic biologic evidence' as the objective solution to the problem of determining criminal identity raises the possibility of 'scientific appropriation' of the criminal justice process and ignoring the fact that in most contested criminal cases, the crucial issue is not identity but of consent or mens rea, for which DNA evidence provides no assistance. This paper examines the current debate over the many roles that DNA can, and should, play in criminal justice system.

Forensic DNA (deoxyribonucleic acid) analysis or DNA profiling has played a major role in the criminal justice system. New techniques and technologies for DNA profiling continue to evolve every year. This paper reviews the literature reported during January 2011 through June 2013 in the field of forensic DNA analysis.

DNA is generally used to solve crimes in one of two ways. In cases where a suspect is identified, a sample of that person's DNA can be compared to evidence from the crime scene. The results of this comparison may help establish whether the suspect committed the crime. In cases where a suspect has not yet been identified, biological evidence from the crime scene can be analyzed and compared to offender profiles in DNA databases to help identify the perpetrator. Crime scene evidence can also be linked to other crime scenes through the use of DNA databases.

Keywords- DNA, DNA fingerprinting, criminal, forensic science, evidence, variable number tandem repeats (VNTRs), short tandem repeats (STRs), polymerase chain reaction (PCR), touch DNA, poly-acrylamide gel electrophoresis (PAGE).

INTRODUCTION

DNA is a complex molecule made out of small basic building blocks called nucleotides — Adenine (A), Thyamine (T), Guanine (G) and Cytosine (C). There are four different types of nucleotides, combined in different orders generating a single stranded DNA sequence. Based on base complementation of nucleotides a second strand will assemble and then the newly formed double stranded DNA will twist in to a helical shape.

In the human genome (all DNA in an individual) DNA consists of 3.2 billion nucleotides divided in to 23 chromosomes (thread-like structures located inside the nucleus of cells). Therefore, when comparing two individuals it is very likely to find many differences in the nucleotide order. The nucleotide order found in certain regions of the genome can be used as a unique fingerprint to individually identify a particular individual. Thus, such regions can be targeted to develop a DNA fingerprinting profile of an individual. DNA fingerprinting is very useful in the detection of crime and legal pursuits.

DNA FINGERPRINTING

DNA profiling (also called DNA fingerprinting, DNA testing, or DNA typing) is a forensic technique used to identify individuals by characteristics of their DNA. A DNA profile is a small set of DNA variations that is very likely to be different in all unrelated individuals, thereby being as unique to individuals as are fingerprints (hence the alternate name for the technique). DNA profiling should not be confused with full genome sequencing. First developed and used in 1985, DNA profiling is used in, for example, parentage testing and criminal investigation, to identify a person or to place a person at a crime scene, techniques which are now employed globally in forensic science to facilitate police detective work and help clarify paternity and immigration disputes. DNA fingerprinting has also been widely used in the study of animal populations and has revolutionized the field of zoology.

Although 99.9% of human DNA sequences are the same in every person, enough of the DNA is different that it is possible to distinguish one individual from another, unless they are monozygotic ("identical") twins. DNA profiling uses repetitive ("repeat") sequences that are highly variable, called variable number tandem repeats (VNTRs), in particular short tandem repeats (STRs). VNTR loci are very similar between closely related humans, but are so variable that unrelated individuals are extremely unlikely to have the same VNTRs.

- Science of fingerprinting was first used by Sir William Herschel as a method of identification in 1858.
- In India the science of fingerprints was discovered by chance during a murder investigation in Jalpaiguri in 1897.
- Alec Jeffreys (1984) invented the DNA fingerprinting technique at Leicester University, United Kingdom.
- Dr. V.K. Kashyap and Dr. Lalji Singh started the DNA fingerprinting technology in India at CCMB (Centre for Cell and Molecular Biology) Hyderabad.
- The modern process of DNA profiling was developed in 1988 by Alec Jeffreys.

➤ **Principle of DNA Fingerprinting:**

By their differences, about 0.1% or 3×10^6 base pairs (out of 3×10^9 bp) provide individuality to each human being. Human genome possesses numerous small non-coding but inheritable sequences of bases which are repeated many times. These sequences occur near telomere, centromeres, Y chromosome and heterochromatic area. The area with same sequence of bases repeated several times is called repetitive DNA.

They can be separated as satellite from the bulk DNA during density gradient centrifugation and hence called satellite DNA. In satellite DNA, repetition of bases is in tandem. Depending upon length, base composition and numbers of tandemly repetitive units, satellite DNAs have subcategories like microsatellites and mini-satellites. Satellite DNAs show polymorphism. The term polymorphism is used when a variant at a locus is present with a frequency of more than 0.01 population.

Variations occur due to mutations. While mutations in genes produce alleles with different expressions, mutations in noncoding repetitive DNA have no immediate impact.

These mutations in the noncoding sequences have piled up with time and form the basis of DNA polymorphism (variation at genetic level arises due to mutations). DNA polymorphism is the basis of genetic mapping of human genome as well as DNA finger printing.

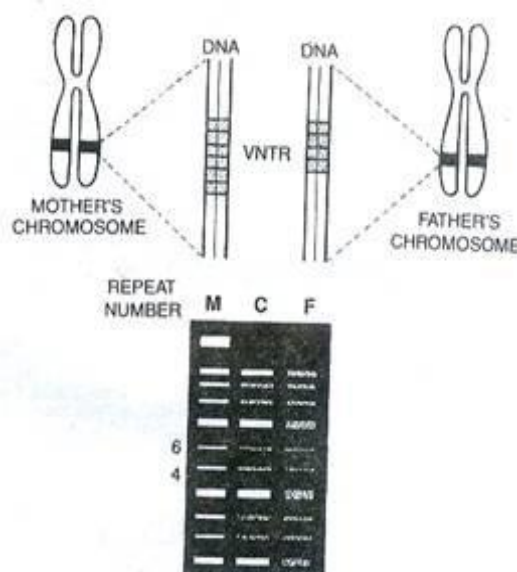


Fig. 6.39. Variable Number Tandem Repeats (M = mother, F = father; C = child)

Short nucleotide repeats in the DNA are very specific in each individual and vary in number from person to person but are inherited. These are the ‘Variable Number Tandem Repeats’ (VNTRs). These are also called ‘minisatellites’. Each individual inherits these repeats from his/her parents which are used as genetic markers in a personal identity test.

For example (Fig. 6.39), a child might inherit a chromosome with six tandem repeats from the mother and the same tandem repeated four times in the homologous chromosome inherited from the father. One half of VNTR alleles of the child resemble that of the mother and other half with that of the father.

➤ **Technique for DNA Fingerprinting**

- The DNA is extracted from the nuclei of white blood cells or of spermatozoa or of the hair follicle cells that cling to the roots of hairs that have fallen, or been pulled out.

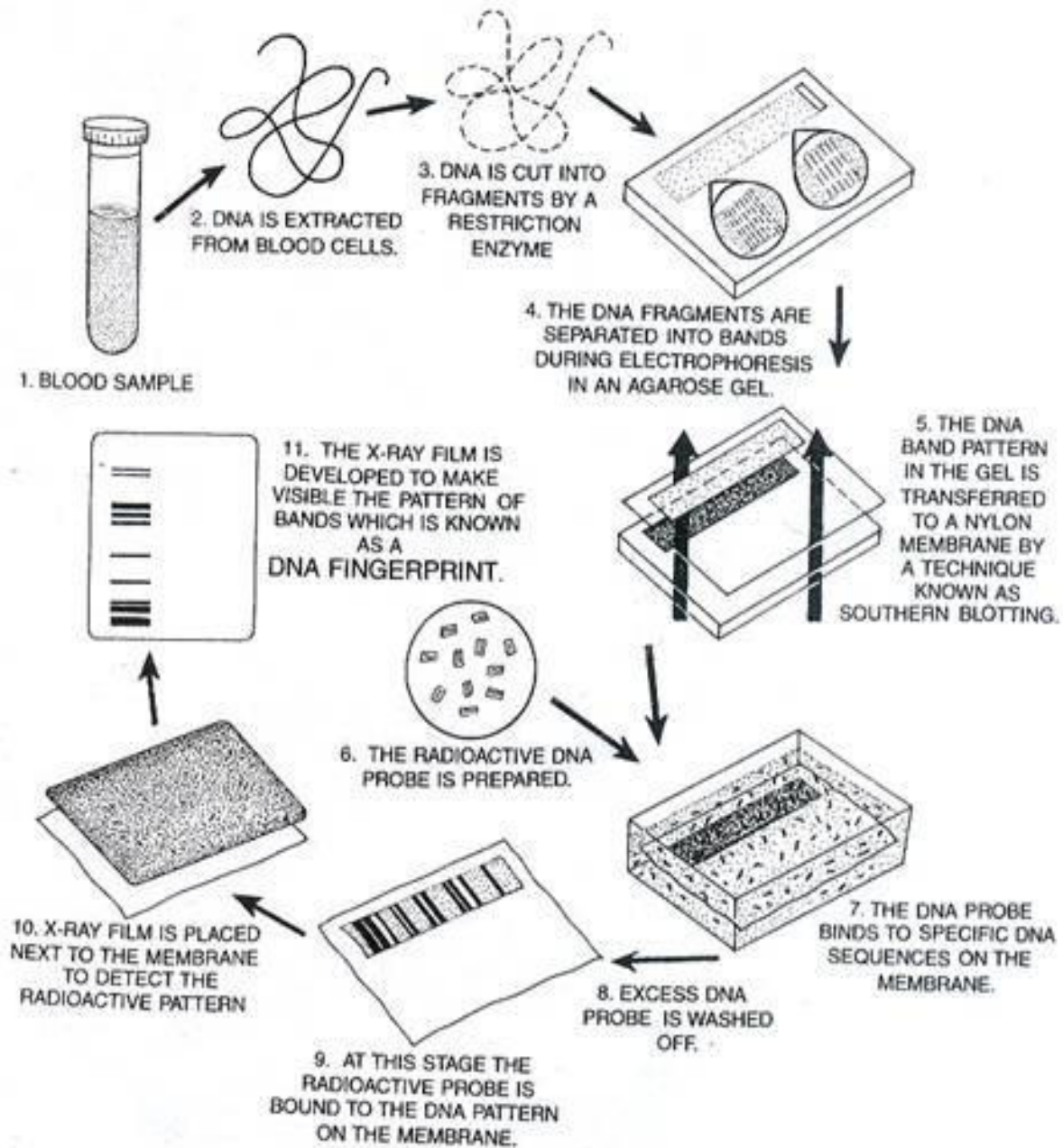
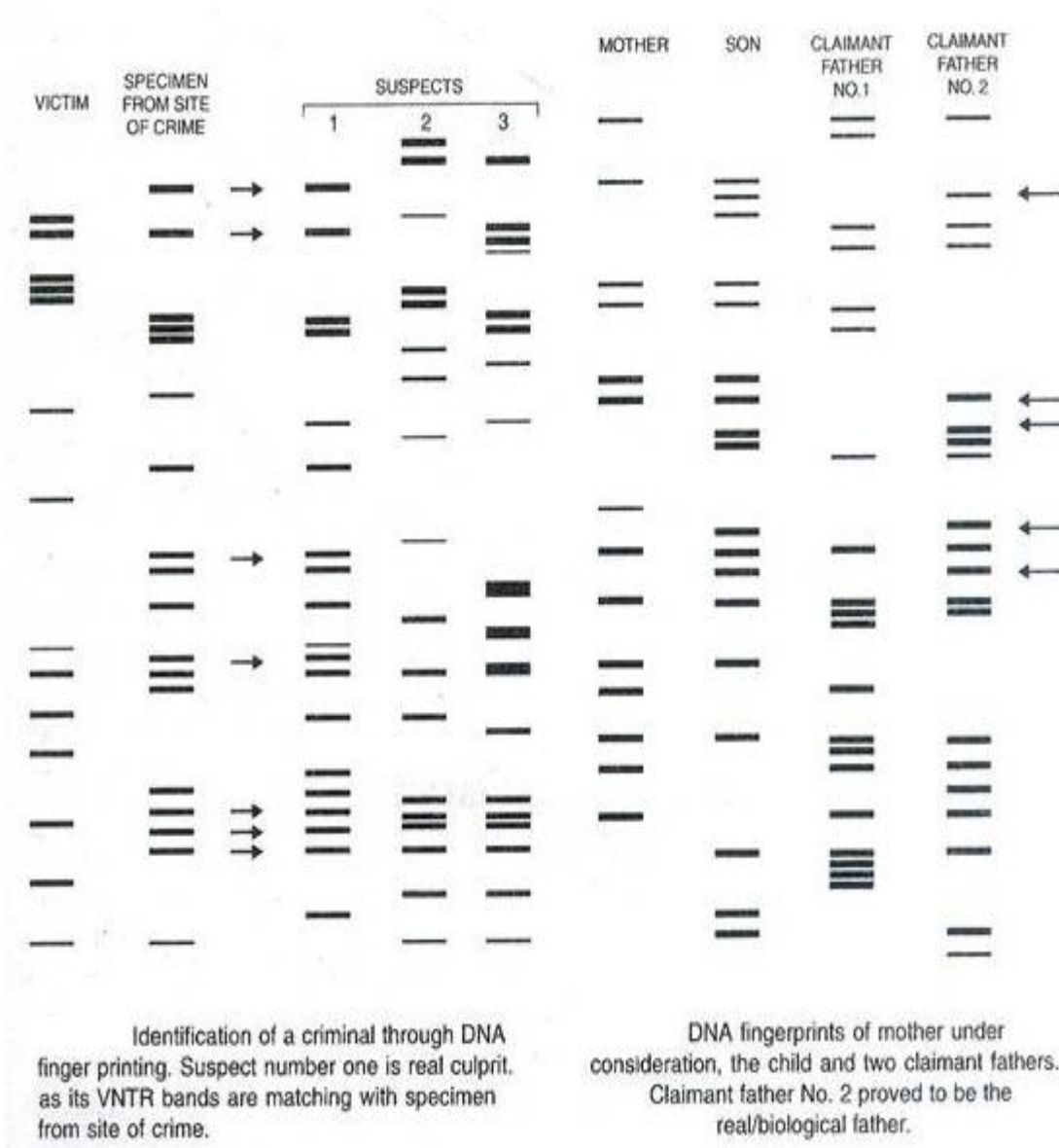


Fig. 6.40. The DNA Fingerprinting Process.

- ii. The DNA molecules are first broken with the help of enzyme restriction endonuclease (called chemical knife) that cuts them into fragments. The fragments of DNA also contain the VNTRs.
- iii. The fragments are separated according to size by gel electrophoresis.
- iv. Fragments of a particular size having VNTRs are multiplied through PCR technique. They are treated with alkaline chemicals to split them into single stranded DNAs.
- v. The separated fragments of single stranded DNA are transferred onto a nylon membrane.
- vi. Radioactive DNA probes having repeated base sequences complementary to possible VNTRs are poured over the nylon membrane. Some of them will bind to the single stranded VNTRs. The method of hybridization of DNA with probes is called Southern Blotting, after the name of the inventor, E.M. Southern (1975). The nylon membrane is washed to remove extra probes.
- vii. An X-ray film is exposed to the nylon membrane to mark the places where the radioactive DNA probes have bound to the DNA fragments. These places are marked as dark bands when X-ray film is developed. This is known as autoradiography.
- viii. The dark bands on X-ray film represent the DNA fingerprints (= DNA profiles).



➤ **Applications of DNA Fingerprinting**

(i) **Individuality**:-Like skin finger printing (der- matoglyphics), DNA finger printing can help to distinguish one human being from another with exception of monozygotic twins,

(ii) **Paternity/Maternity Disputes**:-DNA finger printing can identify the real genetic mother, father and the offspring,

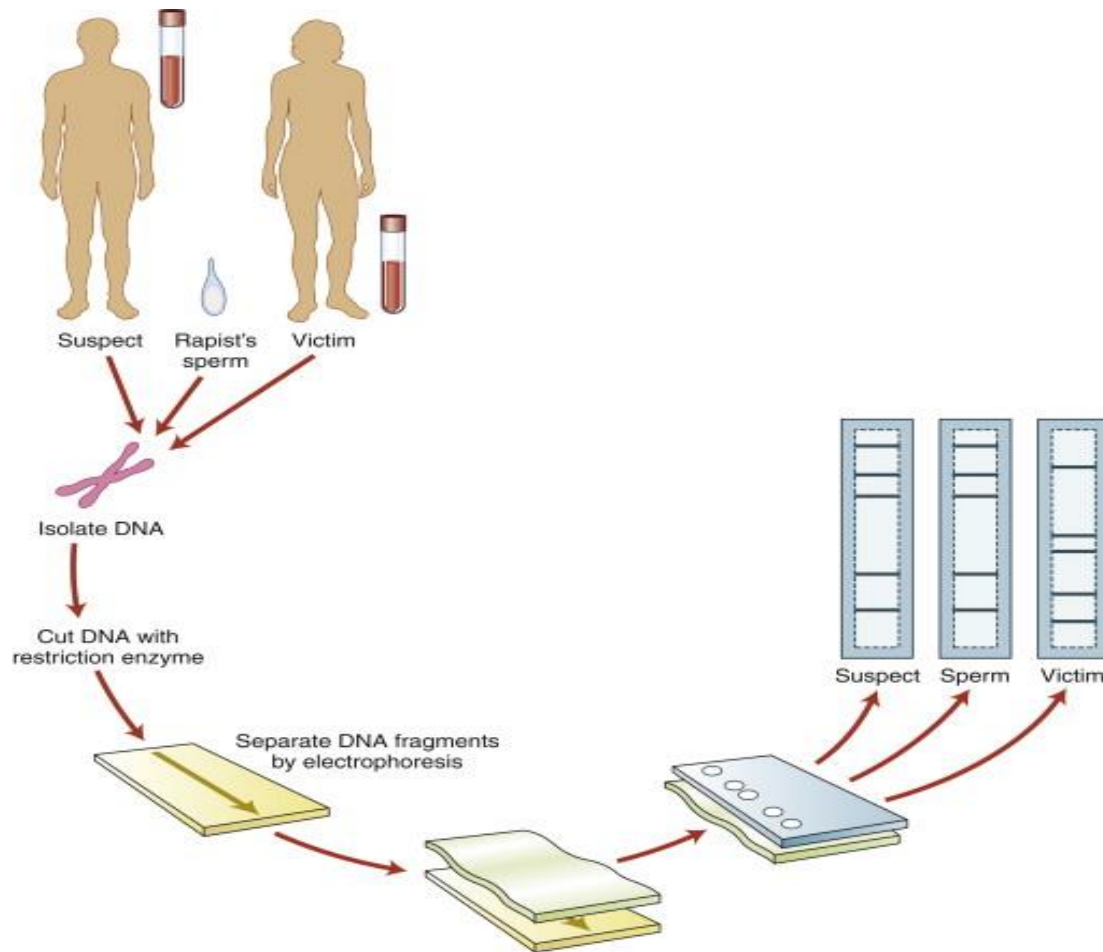
(iii) **Human Lineage**:-DNA from various probables is being studied to find out human lineage,

(iv) **Hereditary Diseases**:-The technique is being used to identify genes connected with hereditary diseases,

(v) **Forensics**:-DNA finger printing is very useful in the detection of crime and legal pursuits. DNA fingerprinting has proved that Dhanu, the human bomb, was the real murderer of Shri Rajiv Gandhi, the former Prime Minister of India,

➤ **Uses of DNA profiling**

- Establish the probative link between evidentiary DNA and that of the possible offender's DNA
- Identify whether the DNA in question is human or non-human
- Identify the potential number of contributors to a DNA sample
- Identify the gender of the contributor to a DNA sample
- Establish the genetic relatedness of an unknown profile to known samples (paternity and maternity testing)
- If the DNA is non-human, identify the species of the DNA



➤ **The beginning time of DNA science to a criminal investigation- 1986**

The first application of DNA science to a criminal investigation was conducted in England by Dr. Alec Jeffreys, a British geneticist who developed the techniques for DNA fingerprinting and DNA profiling, which are now used worldwide in forensic science.

The first use of DNA profiling in America took place in Orange County, Florida during a rape case.

In 1987, Tommy Lee Andrews was convicted of rape after DNA tests matched his DNA from a blood sample with that of semen traces found in a rape victim.

➤ **DNA evidence has become a crucial tool in cases like**

1. Crime investigation: In murder or man-slaughter, sexual offences, assaults, robbery, house breaking and burglary, hoax crime and kidnapping etc.
2. Establishment of paternity and maternity: In case of adultery, lost child and exchange of babies in the Hospitals.
3. Natural & man-made disasters
4. Wild life conservation
5. Sex determination

➤ **Use of DNA Information in the Legal System**

To produce biological evidence that is admissible in court in criminal cases, forensic investigators must be well trained in the collection and handling of biological samples for DNA analysis. They should take care to minimize the risk of contamination and ensure that possible sources of DNA are well preserved and properly identified. As in any forensic work, they must attend to the essentials of preserving specimens, labeling, and the chain of custody and to any constitutional or statutory requirements that regulate the collection and handling of samples.

All materials relied on by prosecution experts must be available to defense experts, and vice versa. The laboratories used for analysis must be reliable and should be willing to meet recognized standards of disclosure.

FEW EXAMPLES ARE DISCUSSED BELOW WHICH ARE BASED ON DNA EVIDENCE-

1. **Tandoor Murder Case-State vs Sushil Sharma dated 19 February, 2007 (2007 CriLJ 4008)**- Sushil Sharma had on the night of July 2, 1995, in a fit of anger, murdered his wife Naina Sahni, chopped her body to pieces and dumped them into the tandoor of a popular restaurant. The Delhi High Court had sentenced him to death for murdering his wife Naina Sahni. Supreme Court commutes death sentence of Sushil Sharma to life imprisonment

- This is the first case in India where DNA fingerprinting was used for investigation.
- Former Congress worker Mrs. Naina Sahni was shot dead by her husband Sushil Sharma.
- The body was tried to burn in the Tandoor at Bagiya Restaurant New Delhi on 2nd July 1995, with the help of restaurant manager Keshar Kumar
- Charred remains of a body in the tandoor kitchen were seized
- DNA from muscle pieces attached to her charred bone were compared with that of her parents and sister.

Naina Sahni Sharma (circa 1966- 2 July 1995) was the victim of Tandoor murder case. On 2 July 1995, she was killed by her husband Sushil Sharma, a Congress youth leader and MLA. Naina herself was a worker in the Congress party. Sushil Sharma was convicted for the murder by the Trial Court, Delhi High Court and Supreme Court. On 8 October 2018, Sharma was sentenced to life imprisonment by the Supreme Court.

2. **Rajiv Gandhi Assassination Case** -reported in *AIR* 1999 SC 2640

- Establishing the identity of Dhanu, the suicide bomber who killed former prime minister Rajiv Gandhi
- The DNA found in the skull, charred muscle pieces on the suicide bombers belt showed identical patterns, which proved that Dhanu was the bomber

3. **Neeraj Grover Case- Neeraj Grover** was a television executive working for Synergy Adlabs, a Mumbai based production house. He was found dead in May 2008, a crime for which actress Maria Susairaj and her boyfriend Lieutenant Emile Jerome Mathew were arrested. Mathew was eventually found guilty of culpable homicide not amounting to murder and for destroying evidence. Susairaj was acquitted of the killing itself, but found guilty of destroying evidence. The killing and subsequent trial received significant press coverage in India.

- In the absence of any eyewitnesses, forensic evidence played a key role in cracking the sensational Neeraj Grover murder case.
- The door latch with blood stains on it was cleaned by the accused to destroy evidence, the forensic experts managed to collect DNA samples from it.
- The blood stains also collected from the curtains television with that of the deceased
- The police recovered charred bones of the victim from Manor, which was impossible for identification.
- The forensic experts collected three teeth, femur bones and some other residue so as to extract the DNA sample from it.
- The collected DNA sample was then matched with that of his parents to establish whether the charred bones and teeth were indeed that of Grover.

4. **Sheena Bora Case– Sheena Bora**, an executive working for Mumbai Metro One based in Mumbai, went missing on 24 April 2012. In August 2015 Mumbai Police arrested her mother Indrani Mukerjea, her stepfather Sanjeev Khanna, and her mother's driver, Shyamvar Pinturam Rai, for allegedly abducting and killing her and subsequently burning her corpse. Khanna and Rai confessed to the crime, and Mukerjea has said that Sheena Bora is living in the United States.

FOUR STEPS FOR DNA TESTING

- Part of Femur (thigh bone) of the skeletal remains was crushed. Bone cells were separated by chemically treating them to remove calcium. Calcium interferes with DNA testing (takes 24 hours)
- Nuclear DNA was extracted separately from bone and blood cells of Indrani Mukerjea (takes 24 hours)

- Fifteen DNA markers for the bone and blood samples were compared.
- Fifteen universally specified DNA markers on the bone of the unknown sample and the blood sample of Indrani matched.
- The sixteenth marker is Amelogenin, which determines the sex of the sample
- 5. **Nirbhaya Rape Case-** Nirbhaya Case or it's also known as 2012 Delhi Gang Case. Since Indian law does not allow the press to publish a rape victim's name, the victim has become widely known as Nirbhaya, meaning "fearless", and her struggle and death have become a symbol of women's resistance to rape in the world. All the accused were arrested and charged with sexual assault and murder.
- DNA investigation of bloodstained clothes and body swabs linked all 5 men and a juvenile accused of the gang rape and murder of Nirbhaya
- DNA tests on bloodstains from undergarments worn by the main accused, Ram Singh, matched Nirbhaya's DNA
- A swab taken from Nirbhaya's body showed Ram Singh DNA signature,
- The DNA samples were taken from bloodstains on clothes of all five accused, curtains and seats on the bus.
- Samples were also taken from bloodstained dried leaves by the side of the highway where the pair said they were dumped.
- Nirbhaya's DNA profile showed up in bloodstains on the undergarments and flip-flops of Vinay Sharma
- Blood found on Vinay Sharma jacket matched with the woman's friend, who fought with the men before he was hit with an iron rod.
- ❖ **Questionnaire** -Before consider DNA as important evidence which support and strengthen our justice delivery system of the country various questions arises in our mind which are following-

➤ **How to spot differences at DNA level?**

Even though DNA is a large molecule it is not visible to the naked eye or it cannot be observed using an electron microscope with the highest available resolution. Therefore, one might wonder how these minute differences can be spotted.

Under laboratory conditions targeted DNA regions can be copied using a technique called PCR (polymerase chain reaction). Here, a targeted region of the extracted DNA will be copied in to millions using a machine. These copies will be profiled based on the characteristic pattern they produce, which is called the DNA fingerprint/DNA profile of an individual. Each sample (DNA of the forensic sample and that of the suspects) will generate a different profile and the profiles can be compared to see if they match or not.

➤ **How accurate is DNA testing?**

Based on the scientific basis discussed so far, theoretically the probability of error is very minimal. Therefore, DNA testing is generally accepted as an accurate and reproducible type of evidence. Given that we wish to bring our readers' attention to the practical limitations that are often associated with DNA testing procedures.

➤ **Why target 13 STR regions?**

When one STR region is considered, there is a limit to the number of changes in the number of repeats that can be in a population. For example the STR region D21S11 of humans can exist in 22 different repeat numbers. These alternative forms of the same region are called allele. So if, for example, only the D21S11 STR was used for fingerprinting in a population there can be many individuals carrying the same alleles. The probability of carrying the same allele for a particular STR region has been estimated as 5-20 percent. Thus, focusing on one STR region alone will not make a unique fingerprint profile of a person.

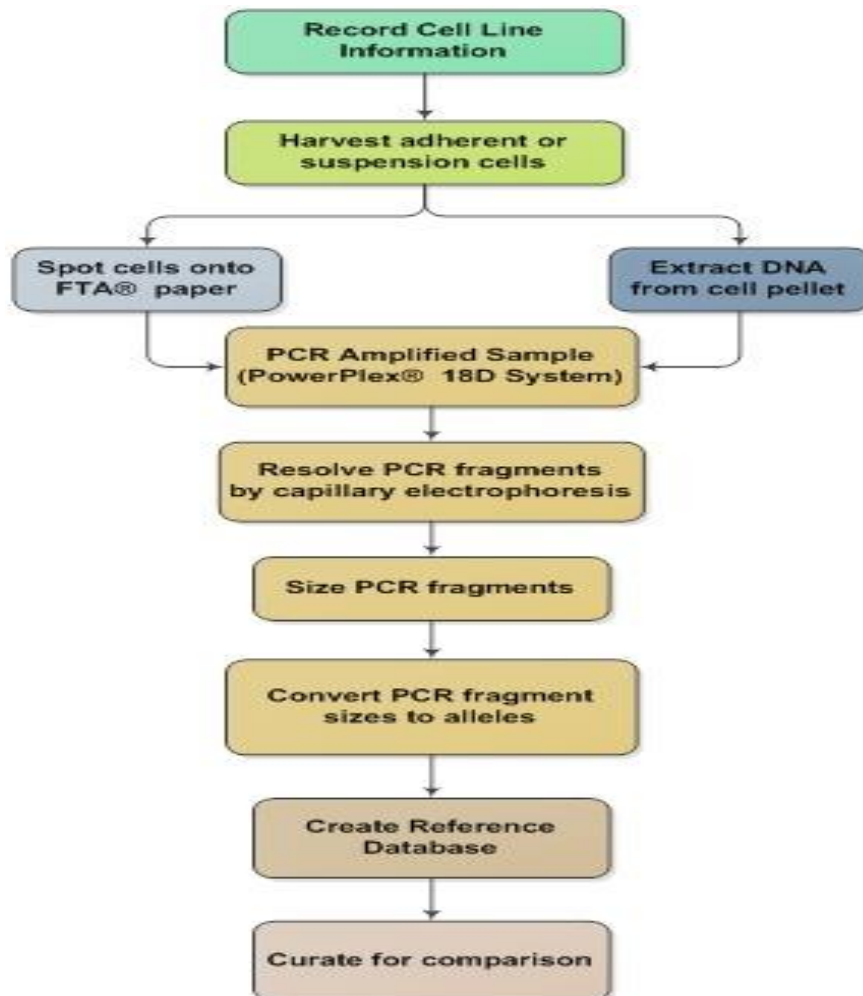
Following a research conducted in the US using a systematic sample of Americans, the researchers have recommended to target 13 STR regions in a criminal investigation to present a DNA fingerprinting profile as credible evidence to support a conviction without reasonable doubt. The probability of coming across two individuals with the same profile when targeted all 13 STR sites was found to be one in a quadrillion. However, the probability calculation depends on the number of alleles found at each STR site. Though no scientific survey has been conducted to assess the allele variation among Sri Lankans, the population in Sri Lanka is smaller

compared to that of the US. Therefore, it is still not wrong to assume that the probability mentioned above will be applicable to Sri Lanka as well.

➤ **How to determine the number of repeats in an STR region?**

Once the copies of the target STR regions are made using PCR technology, the copies are visualized using a technology called electrophoresis, where the amplified copies are separated according to the length. When the number of repeats varies between two individuals, the length of the copied fragment changes. Thus, when separated using electrophoresis a clear difference in the profile can be observed if the two samples under question carry STR regions with different number of repeats.

➤ **STR DNA Analysis for Human Cell Line Authentication**



➤ **How to collect samples from a crime scene?**

- The crime scene should not be tampered with.
- The samples need to be collected by a specialised officer with specialised training.
- Collected samples need to be handled according to accepted procedures until the samples reach the testing laboratory.
- Laboratory testing
- Testing should be carried out in a laboratory certified to carry out such testing.
- Personnel handling the samples in the lab should be a scientist or a technician specifically trained to work with such samples and techniques.
- The technique used for the profiling needs to be in accordance with international standards with high precision and resolution power (especially the electrophoresis technique used for separation of the copies).
- The DNA fingerprinting profile needs to be analysed by an expert analyst.
- An ultraviolet light may be helpful to scan the body and clothing to locate signs of semen

➤ **Is DNA fingerprinting strong enough evidence?**

According to Sir Alec Jeffries, the scientist who developed the DNA fingerprinting technique, it is not a technique that can be used as sole evidence to determine whether a person is guilty of committing a crime. Therefore, DNA fingerprinting needs to be considered only as one piece of evidence and should not be used as the deciding piece of evidence in the court room.

➤ **Can a DNA finger-printing profile be wrong?**

Even though DNA fingerprint profiles have been used as a strong piece of evidence in many cases, there are instances where DNA fingerprinting profiles led to wrong convictions. However, it is important to state that in these cases it was not the DNA fingerprinting as a technology that compromised the case, but was the result of the shortcomings that occurred at sample collection. Some of the common flaws associated with the method are:

- Mixed DNA samples of more than one individual.
- DNA sample collected from the crime scene can be in trace quantities and could often be degraded. Such could lead to an incomplete fingerprinting profile.
- Presence of inhibitors in the samples that will disrupt the downstream processes such as DNA extraction and PCR amplification.

➤ **Is DNA admissible in court?**

To produce biological evidence that is admissible in court in criminal cases, forensic investigators must be well trained in the collection and handling of biological samples for DNA analysis.

➤ **How can DNA be used as evidence?**

DNA can be used to identify criminals with incredible accuracy when biological evidence exists. DNA is generally used to solve crimes in one of two ways. In cases where a suspect is identified, a sample of that person's DNA can be compared to evidence from the crime scene

How long does DNA evidence last?

Last year, researchers estimated that the half-life of DNA — the point at which half the bonds in a DNA molecule backbone would be broken — is 521 years. That means that, under ideal conditions, DNA would last about 6.8 million years, after which all the bonds would be broken

➤ **How long after a crime can DNA evidence be collected?**

In most cases, DNA evidence needs to be collected within 72 hours in order to be analyzed by a crime lab—but a sexual assault forensic exam can reveal other forms of evidence beyond this time frame that can be useful if you decide to report.

➤ **How do you collect DNA evidence?**

Use disposable instruments or clean them thoroughly before and after handling each sample. Avoid touching the area where you believe DNA may exist. Avoid talking, sneezing, and coughing over evidence. Avoid touching your face, nose, and mouth when collecting and packaging evidence.

➤ **Can two people have the same DNA?**

Identical Twins have Identical DNA. It is a basic tenet of human biology, taught in grade schools everywhere: Identical twins come from the same fertilized egg and, thus, share identical genetic profiles. But according to new research, though identical twins share very similar genes, identical they are not.

➤ **What factors affect DNA evidence?**

Forensically valuable DNA can be found on evidence that is decades old. However, several factors can affect the DNA left at a crime scene, including environmental factors (e.g., heat, sunlight, moisture, bacteria, and mold). Therefore, not all DNA evidence will result in a usable DNA profile.

➤ **Is DNA or fingerprints more trustworthy?**

DNA fingerprinting is extremely accurate. **Most** countries now keep DNA records on file in much the same way police keep copies of actual fingerprints. It also has medical uses.

➤ **How long does it take for police to match DNA?**

Most genetic tests take 24-72 hours but the time taken for DNA to go from crime scene to identification can span as long as 14 days. By the time that the results are back, the suspects often have been released.

➤ **What are the basic essentials for a forensic DNA testing laboratory?**

Laboratory requirements - For the past two decades, the standard tool for electrophoresis has been capillary electrophoresis. Conventional polyacrylamide gel electrophoresis (PAGE) is now considered as an outdated technology due to poor resolution, practical limitations, and labour and time inefficiency. State-of-the-art DNA testing laboratories have moved forward to an automated robotic system to minimize errors. Quality assurance (QA)

Quality assurance needs to be maintained at different stages of the DNA testing process,

- i. Pre-laboratory QA – during case assessment
- ii. Laboratory QA – from DNA extraction to DNA fingerprint profiling
- iii. Post-laboratory QA – interpretation of results, databasing and statement reporting

At all the above stages contamination of samples and smooth transition should be assured.

❖ **TESTING LABORATORIES**

Other chapters have indicated appropriate standards for the operation of testing laboratories and the collection and analysis of DNA samples. Uniformity in reporting, completeness of reporting (including laboratory protocols and written criteria for interpretation), and stringent quality assurance of laboratories are essential. The court and the jury should have no reason to doubt the accuracy of the processing of information. Laboratories and experts have a particular responsibility to ensure that they are open and candid with the courts. Any reservations about inadequacies or errors should be promptly revealed, and failure to do that should be dealt with seriously. The court should not hesitate to exercise contempt powers and exclude experts who have misled deliberately in the past. Private trade associations and other appropriate groups should also apply pressure to ensure accuracy and candor.

❖ **DNA Technology Regulation Bill 2018 –**

Cabinet approves DNA Technology (Use and Application) Regulation Bill, 2018 on 04-July-2018 The Union Cabinet chaired by Prime Minister Shri Narendra Modi has approved The DNA Technology (Use and Application) Regulation Bill 2018.

- Lok Sabha has passed **DNA Technology Regulation Bill 2018** to establish the identity of persons in criminal matters listed and civil matters.
- The Bill provides the regulation and application of DNA technology for establishing the identity of persons indulged in several crimes and also includes offenders, victims, suspects and under trials etc.
- The idea for a DNA Bill was first advanced by the Department of Biotechnology (DBT) in 2003 at the time of Atal Behari Vajpayee as Prime Minister.
- Also, four years later, a DNA Profiling Advisory Committee put together by DBT had drafted the Human DNA profiling Bill and series of changes took place till 2012.
- Then in January 2013, the government had created a committee to examine the 2012 draft. This draft finished in 2014 and circulated it within the Ministry of Science and Technology.
- In January 2015 it was further sent to the Legislative Department of the Ministry of Law and Justice.

❖ **Purpose of DNA Technology Regulation Bill 2018 –**

The primary intended purpose for enactment of "The DNA Technology (Use and Application) Regulation Bill" is for expanding the application of DNA-based forensic technologies to support and strengthen the justice delivery system of the country.

❖ **Utility of DNA Technology Regulation Bill 201**

The utility of DNA based technologies for solving crimes, and to identify missing persons, is well recognized across the world.

By providing for the mandatory accreditation and regulation of DNA laboratories, the Bill seeks to ensure that with the proposed expanded use of this technology in the country, there is also the assurance that the DNA test results are reliable and the data remain protected from misuse or abuse in terms of the privacy rights of our citizens.

- i. Speedier justice delivery.
- ii. Increased conviction rate.

iii. Bill's provisions will enable the cross-matching between persons who have been reported missing on the one hand and unidentified dead bodies found in various parts of the country on the other, and also for establishing the identity of victims in mass disasters.

❖ **Comparison of fingerprints and DNA profiling**

Currently fingerprinting is used for the purpose of establishing the identity of a person charged with a criminal offence. However, the regulations governing the use of fingerprinting and the provisions related to DNA profiling under the Bill are different. For example, fingerprints can be taken for offences with punishment of rigorous imprisonment of at least one year or more, while there is no minimum threshold of offences for collecting DNA samples. Table 2 below compares the regulations related to fingerprinting with the provisions of the Bill.

COMPARISON OF FINGERPRINT LAW WITH THE BILL

Provision	Fingerprinting law	DNA Bill, 2018
Consent of the individual	<ul style="list-style-type: none"> No provision 	<ul style="list-style-type: none"> Written consent is required for collecting DNA samples for offences punishable with up to seven years of imprisonment. Consent not required for offences with punishment higher than seven years. In case consent is not given, a magistrate can order the collection of DNA samples.
Offences for which collection is permitted	<ul style="list-style-type: none"> Anyone convicted of or arrested for an offence punishable with imprisonment of at least one year or more. 	<ul style="list-style-type: none"> Anyone arrested for an offence under the Indian Penal Code, 1860. No minimum threshold of offence specified.
Destruction or removal	<ul style="list-style-type: none"> Fingerprints of an individual are to be destroyed if they are discharged or acquitted by any court. 	<ul style="list-style-type: none"> DNA profiles of suspects or undertrials will be removed following a court order or police report. Profiles in the crime scene or missing persons' index will be removed on a written request.

Sources: -The Identification of Prisoners Act, 1920; The DNA Technology (Use and

APPLICATION) REGULATION BILL, 2018; PRS

❖ **India must increase use of DNA testing in solving crimes: Experts**

The experts from law enforcement, judiciary, forensics and academia also recommended amendments in Code of Criminal Procedure, 1973, and Indian Evidence Act, 1872, to include scientific investigation in crimes. They said that though DNA testing is done in criminal cases in India, the instances were very low compared to other countries. "Approximately, DNA testing is done only in 7,500 cases in India annually," said Tim Schellberg, President of GTH-GA, a consultant agency.

➤ **Identifying DNA Evidence**

Since only a few cells can be sufficient to obtain useful DNA information to help your case, the list below identifies some common items of evidence that you may need to collect, the possible location of the DNA on the evidence, and the biological source containing the cells. Remember that just because you cannot see a stain does not mean there are not enough cells for DNA typing. Further, DNA does more than just identify the source of the sample; it can place a known individual at a crime scene, in a home, or in a room where the suspect claimed not to have been. It can refute a claim of self-defense and put a weapon in the suspect's hand. It can change a story from an alibi to one of consent. The more officers know how to use DNA, the more powerful a tool it becomes.

Evidence	Possible Location of DNA on the Evidence	Source of DNA
baseball bat or similar weapon	handle, end	sweat, skin, blood, tissue
hat, bandanna, or mask	inside	sweat, hair, dandruff
eyeglasses	nose or ear pieces, lens	sweat, skin
facial tissue, cotton swab	surface area	mucus, blood, sweat, semen, ear wax
dirty laundry	surface area	blood, sweat, semen
toothpick	tips	saliva
used cigarette	cigarette butt	saliva

stamp or envelope	licked area	saliva
tape or ligature	inside/outside surface	skin, sweat
bottle, can, or glass	sides, mouthpiece	saliva, sweat
used condom	inside/outside surface	semen, vaginal or rectal cells
blanket, pillow, sheet	surface area	sweat, hair, semen, urine, saliva
"through and through" bullet	outside surface	blood, tissue
bite mark	person's skin or clothing	saliva
fingernail, partial fingernail	scrapings	blood, sweat, tissue

- **Touch DNA**-The touch DNA method was named for the fact that it analyzes skin cells left behind when assailants touch victims, weapons or anything else at a crime scene. Humans shed tens of thousands of skin cells each day. These cells are transferred to every surface our skin contacts, i.e. gun grips, eating utensils, steering wheels, etc. If a perpetrator deposits a sufficient number of skin cells on an item at the scene, there may be touch DNA. Touch DNA is not low copy number DNA, which allows a very small amount of DNA to be analyzed, from as little as 5 to 20 cells. The small amount of starting DNA in LCN samples requires many more cycles of amplification.
- **Crime Scene Integrity**-Protection of the crime scene is essential to the protection of evidence. Safeguarding and preserving evidence is fundamental to the successful solution of a crime.
- **Contamination**-The risk of contamination of any crime scene can be reduced by limiting incidental activity. It is important for all law enforcement personnel at the crime scene to make a conscious effort to refrain from smoking, eating, drinking, littering or any other actions which could compromise the crime scene. Because DNA evidence is more sensitive than other types of evidence, law enforcement personnel should be especially aware of their actions at the scene to prevent inadvertent contamination of evidence.
- ❖ **To avoid contamination of evidence that may contain DNA, always take the following precautions:**
 - Wear gloves. Change them often.
 - Use disposable instruments or clean them thoroughly before and after handling each sample.
 - Avoid touching the area where you believe DNA may exist.
 - Avoid talking, sneezing, and coughing over evidence.
 - Avoid touching your face, nose, and mouth when collecting and packaging evidence.
 - Air-dry evidence thoroughly before packaging.
 - Put evidence into new paper bags or envelopes, not into plastic bags. Do not use staples.
- ❖ **Types DNA Evidence Analysis**
 - **Polymerase Chain Reaction (PCR)**
 - **Short Tandem Repeats (STR)**
 - **Y-Chromosome**
 - **Mitochondrial DNA**
 - **DNA Typing — Polymerase Chain Reaction (PCR)**

The evolution of DNA testing advanced significantly when Dr. Kary Mullis discovered that DNA could be copied in the laboratory much as it is in the natural world.

The copying process, known as polymerase chain reaction (PCR), uses an enzyme (polymerase) to replicate DNA regions in a test tube. By repeating the copying process, a small number of DNA molecules can be reliably increased up to billions within several hours.

RFLP analysis requires a biological sample about the size of a quarter, but PCR can be used to reproduce millions of copies of the DNA contained in a few skin cells. Since PCR analysis requires only a minute quantity of DNA, it can enable the laboratory to analyze highly degraded evidence for DNA. On the other hand, because the sensitive PCR technique replicates any and all of the DNA contained in an evidence sample, greater attention to contamination issues is necessary when identifying, collecting, and preserving DNA evidence.

These factors may be particularly important in the evaluation of unsolved cases in which evidence might have been improperly collected or stored.

- **DNA Typing — Short Tandem Repeat (STR) Analysis**

Short tandem repeat (STR) technology is a forensic analysis that evaluates specific regions (loci) that are found on nuclear DNA. The variable (polymorphic) nature of the STR regions that are analyzed for forensic testing intensifies the discrimination between one DNA profile and another. For example, the likelihood that any two individuals (except identical twins) will have the same 13-loci DNA profile can be as high as 1 in 1 billion or greater.

The Federal Bureau of Investigation (FBI) has chosen 13 specific STR loci to serve as the standard for CODIS. The purpose of establishing a core set of STR loci is to ensure that all forensic laboratories can establish uniform DNA databases and, more importantly, share valuable forensic information. If the forensic or convicted offender CODIS index is to be used in the investigative stages of unsolved cases, DNA profiles must be generated by using STR technology and the specific 13 core STR loci selected by the FBI.

- **DNA Typing — Y-Chromosome Analysis**

Several genetic markers have been identified on the Y chromosome that can be used in forensic applications. Y-chromosome markers target only the male fraction of a biological sample. Therefore, this technique can be very valuable if the laboratory detects complex mixtures (multiple male contributors) within a biological evidence sample. Because the Y chromosome is transmitted directly from a father to all of his sons, it can also be used to trace family relationships among males. Advancements in Y-chromosome testing may eventually eliminate the need for laboratories to extract and separate semen and vaginal cells (for example, from a vaginal swab of a rape kit) prior to analysis.

- **DNA Typing — Mitochondrial Analysis**

Mitochondrial DNA (mtDNA) analysis allows forensic laboratories to develop DNA profiles from evidence that may not be suitable for RFLP or STR analysis. While RFLP and PCR techniques analyze DNA extracted from the nucleus of a cell, mtDNA technology analyzes DNA found in a different part of the cell, the mitochondrion (see exhibit 1). Old remains and evidence lacking nucleated cells — such as hair shafts, bones, and teeth — that are unamenable to STR and RFLP testing may yield results if mtDNA analysis is performed. For this reason, mtDNA testing can be very valuable to the investigation of an unsolved case. For example, a cold case log may show that biological evidence in the form of blood, semen, and hair was collected in a particular case, but that all were improperly stored for a long period of time.

Although PCR analysis sometimes enables the crime laboratory to generate a DNA profile from much degraded evidence, it is possible that the blood and semen would be so highly degraded that nuclear DNA analysis would not yield a DNA profile. However, the hair shaft could be subjected to mtDNA analysis and thus be the key to solving the case. Finally, it is important to note that all maternal relatives (for example, a person's mother or maternal grandmother) have identical mtDNA. This enables unidentified remains to be analyzed and compared to the mtDNA profile of any maternal relative for the purpose of aiding missing persons or unidentified remains investigations. Although mtDNA analysis can be very valuable to the investigation of criminal cases, laboratory personnel should always be involved in the process.

- ❖ **SUGGESTIONS FOR DNA EVIDENCE**

Whatever statute or rule of evidence is applicable, some standards for admissibility seem sound to the committee. In view of the importance of DNA typing in both civil and criminal cases, the judge should determine, before allowing DNA evidence to be introduced, that appropriate standards have been followed, that tests were adequately performed by a reliable laboratory, and that the appropriate protocols for DNA typing and formulation of an opinion were fully complied with. In states without relevant statutes, the committee recommends that the court judicially notice the appropriateness of the theoretical basis of DNA typing by using this report, similar reports, and case law. As new methods are used, the courts will have to assure themselves of their validity.

- ❖ **RECOMMENDATIONS**

Having carefully reviewed the issues; the committee offers the following recommendations:

- Courts should take judicial notice of three scientific underpinnings of DNA typing:
- The study of DNA polymorphisms can, in principle, provide a reliable method for comparing samples.

- Each person's DNA is unique (with the exception of identical twins), although the actual discriminatory power of any particular DNA test will depend on the sites of DNA variation examined.
- The current laboratory procedure for detecting DNA variation (specifically, single-locus probes analyzed on Southern blots without evidence of band shifting) is fundamentally sound, although the validity of any particular implementation of the basic procedure will depend on proper characterization of the reproducibility of the system (e.g., measurement variation) and the inclusion of all necessary scientific controls.
- The adequacy of the method used to acquire and analyze samples in a given case bears on the admissibility of the evidence and should, unless stipulated, be adjudicated case by case. In this adjudication, the accreditation and certification status of the laboratory performing the analysis should be taken into account.
- Because of the potential power of DNA evidence, authorities must make funds available to pay for expert witnesses, and the appropriate parties must be informed of the use of DNA evidence as soon as possible.
- DNA samples (and evidence likely to contain DNA) should be preserved whenever that is possible.
- All data and laboratory records generated by analysis of DNA samples should be made freely available to all parties. Such access is essential for evaluating the analysis.
- Protective orders should be used only to protect the privacy of the persons involved.

CONCLUSION

DNA technology is persistently evolving through new applications and innovations. Forensic scientists are combining advances in efficient and microchip technologies with well-established techniques of forensic DNA analysis. The fusion of these technologies could revolutionize DNA typing.

The effectiveness and power of DNA as a tool to convict criminals or acquit suspects has been greatly supported by careful legal reviews and stringent quality assurance guidelines that have been developed over the last 30 years.

As a general matter, so long as the safeguards we discuss in this present paper are followed, admissibility of DNA typing should be encouraged. There is no substantial dispute about the underlying scientific principles. However, the adequacy of laboratory procedures and of the competence of the experts who testify should remain open to inquiry. Ultimately, DNA typing evidence should be used without any greater inconvenience than traditional fingerprint evidence.

Forensic DNA profiling is of confirmed value in solving cases involving offences that are categorized as affecting the human body (such as murder, rape, human trafficking, or grievous hurt), and those against property (including theft, burglary, and dacoity). The aggregate incidence of such crimes in the country, as per the statistics of the National Crime Records Bureau (NCRB) for 2016, is in excess of 3 lakhs per year. Of these, only a very small proportion is being subjected to DNA testing at present.

It is anticipated that the expanded use of this technology in these categories of cases would result not only in speedier justice delivery but also in increased conviction rates, which at present is only around 30% (NCRB Statistics for 2016).

Recent advances in almost all aspects of DNA analysis – which include sample collection, storage, and pretreatment, DNA extraction, DNA quantization, quality assurance of DNA testing, and DNA databases are discussed. New developments now enable new kinds of forensically relevant information to be extracted from limited quantities of biological samples, and offer unprecedented potential for high-throughput DNA analysis.

REFERENCES

- *Frye v. United States*, 293 F.2d 1013, 104 (D.C. Cir. 1923).
- *Frye v. United States*, 293 F.2d 1013, at 104 (D.C. Cir. 1923).
- Gianelli PC. The admissibility of novel scientific evidence: *Frye v. United States*, a half-century later, *Colum L Rev*, 811
- *State v. Joon Kyu Kim*, 398 N.W.2d 544 (Minn. 1987).
- *United States v. Downing*, 753 F.2d 1224, 1237 (3d Cir. 1985).
- *United States v. Hendershot*, 614 F.2d 648 (9th Cir. 1980).

-
- U.S. v. Porter, Superior Court of District of Columbia, Criminal Division, FO6277-89 (1991).
 - Spencer v. Commonwealth, 238 Va. 295, 384 S. E. 2d 785 (1989).
 - 1989 WL 167430 at 11 (Del. Super. Ct. Nov. 6, 1989) (Gebelein, J.).
 - Report of the Joint Subcommittee Studying Creation of a DNA Test Data Exchange to the Governor and the General Assembly of Virginia. Senate Document No. 29, Commonwealth of Virginia, Richmond, 1990, p.11.
 - Lawrence R. Jones, et al. v. Edward W. Murray, Director of The Department of Corrections, et al. W.D. Virginia, Civil No. 90-0572-R. Order for Summary Judgment, March 4, 1991.
 - <https://economictimes.indiatimes.com/news/science/india-must-increase-use-of-dna-testing-in-solving-crimes-experts>
 - “DNA Technology in Forensic Science”, Committee on DNA Technology in Forensic Science, United States of America, 1992.
 - “Report No. 271: Human DNA Profiling- A draft Bill for the Use and Regulation of DNA-Based Technology”, Law Commission of India, July 2017, <http://lawcommissionofindia.nic.in/reports/Report271.pdf>.
 - “Nothing to Hide, nothing to fear?”, Human Genetics Commissions, United Kingdom, November 2009.
 - Statement of Objects and Reasons, DNA Technology (Use and Application) Regulation Bill, 2018.
 - Long Title, DNA Technology (Use and Application) Regulation Bill, 2018, <http://www.prsindia.org/uploads/media/DNA/DNA%20Bill,%202018.pdf>.
 - Justice K. S. Puttaswamy and Ors. vs Union of India and Ors, AIR 2017 SC 4161.
 - Maryland vs King, Supreme Court of the United States, October 2012.
 - Section 164, Code of Criminal Procedure, 1973.
 - "Associate creative head of Synergy Adlabs goes missing". *Expressindia*. Mumbai: *The Indian Express Limited*. 10 May 2008. Retrieved 18 July 2011.
 - *IANS* (22 May 2008). "Neeraj Grover – creative head of Synergy Adlabs found murdered – starlet Maria and boyfriend arrested". *Parinda.com*. Mumbai: *VMC Infotech*. Retrieved 18 July 2011.
 - "Neeraj Grover sentence: Maria will leave jail, 7 more years for Jerome". *NDTV.com*. Mumbai. 1 July 2011. Retrieved 18 July 2011.
 - "Sheena Bora that friends knew". NDTV.
 - "Who's who". *The Huffington Post*.
 - "Sheena Bora murder saga". Firstpost.
 - "Sheena Bora murder: Cast and plot of a real-life soap opera". *The Hindu*.
 - "Sheena and Rahul relationship". *Hindustan Times*.
 - "Sheena Bora killed in Mumbai bylane". *Hindustan Times*.
 - "Sheena Bora murder case: Sanjeev Khanna confesses to role in crime". *NDTV*. Retrieved 4 September 2015.
 - "Sheena is live; claims Indrani". NDTV. 1 September 2015. Retrieved 5 September 2015.
 - "Sheena Bora murder: 100% DNA match buries Indrani's claim, strengthens murder case". *Timesofindia.indiatimes.com*. Retrieved 19 January 2016.
 - <https://www.prsindia.org/billtrack/dna-technology-use-and-application-regulation-bill-2018>
 - *ncrb.gov.in* > *StatPublications* > *CII* > *CII2016* > *cii2016*
 - <https://economictimes.indiatimes.com> > News > Science ,Oct 31, 2017
 - <https://www.justice.gov/archives/ag/advancing-justice-through-dna-technology-using-dna-solve-crimes>
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IS GENETIC ENGINEERING A QUESTIONABLE ISSUE?

Rakhi Sarraf¹, Geetika² and U. C Gupta³¹Mahrishi Arvind University, Mundiaramsar, Jaipur²Dolphin P G College of Life Sciences, Fategarh Shib, Punjab³Matasya P.G College, Bansur, Alwar, Rajasthan**ABSTRACT**

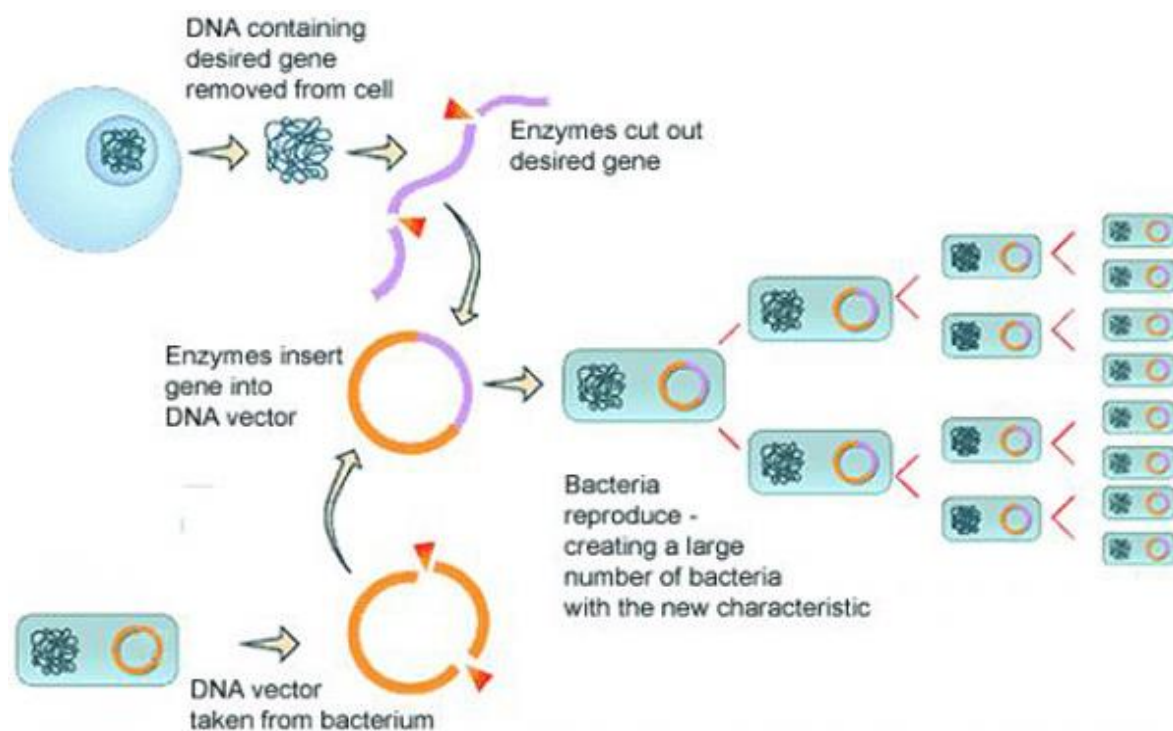
This paper spells out how genetic engineering is a questionable issue. The process of genetic engineering is a deliberate modification which occurs through the direct manipulation of the genetic material of an organism. DNA is either added or subtracted to produce one or more new traits that were not found in that organism before. However, these terms should not be confused with cloning because genetic engineering involves the production of new set of genes while the latter only involves the production of the same copies of genes in the organism.

Genetic engineering has no similitude to the natural process of breeding. This is for the reason that in the process, a different gene is forced to unite to the genes of an organism. The “sharing” of genetic material among living organisms is known to be a natural event. Bacteria are called “nature’s own genetic engineer”. Actually the process of genetic engineering is somewhat disrupting the natural way and complexity of life. In addition to this, critics fear the misuse and abuse of genetic engineering.

Keywords: Genetic engineering, DNA , Genes, Cloning, Transformation, Genocidal.

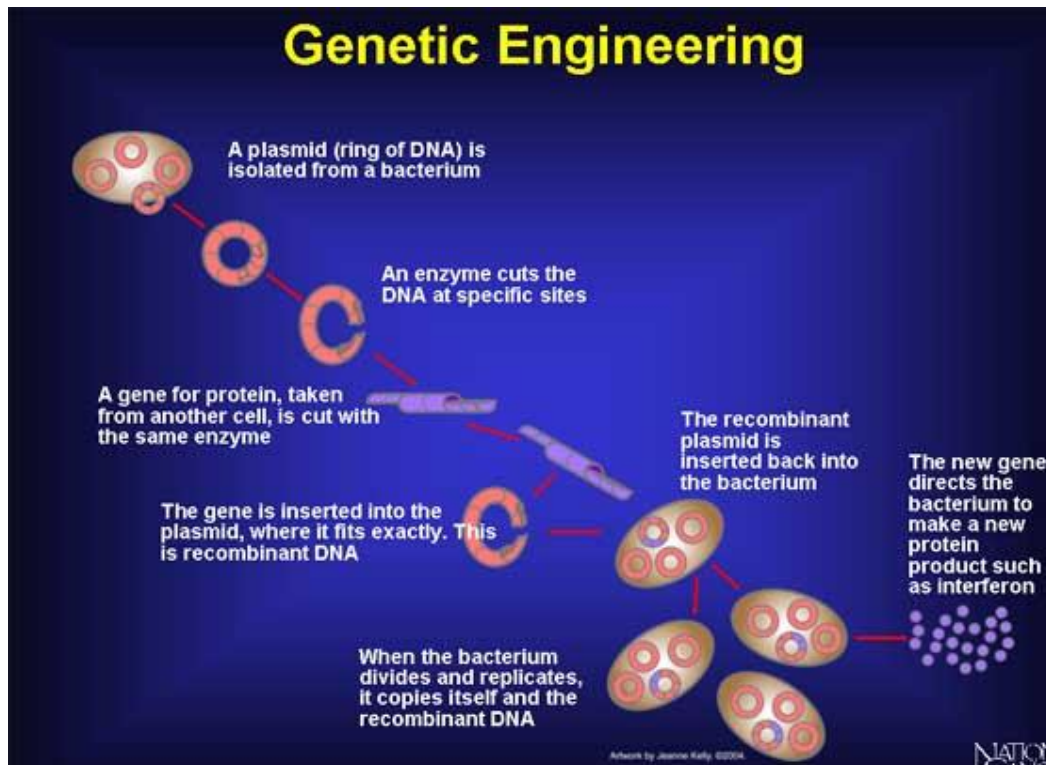
INTRODUCTION

Genetic engineering’ is the process to alter the structure and nature of genes in human beings, animals or foods using techniques like molecular cloning and transformation. In other terms, it is the process of adding or modifying DNA in an organism to bring about great deal of transformation.



There are various assumptions of the deficit thinking regarding genetic engineering which makes it a questionable issue. The some assumptions are:-

- The public is ignorant of science.
- The public has negative attitudes towards science and technology.
- The ignorance is at the root of these negative attitudes.
- The public’s knowledge deficit can be remedied by one-way science communication from scientists to citizens.



In fact there are many terms known for “genetic engineering” like genetic modification, genome manipulation, genetic enhancement, and many more.

BASICS OF GENETIC ENGINEERING

- Different terms used for genetic engineering :
 - 1) Gene manipulation
 - 2) Gene cloning
 - 3) Recombinant DNA technology
 - 4) Genetic modification
 - 5) New genetics

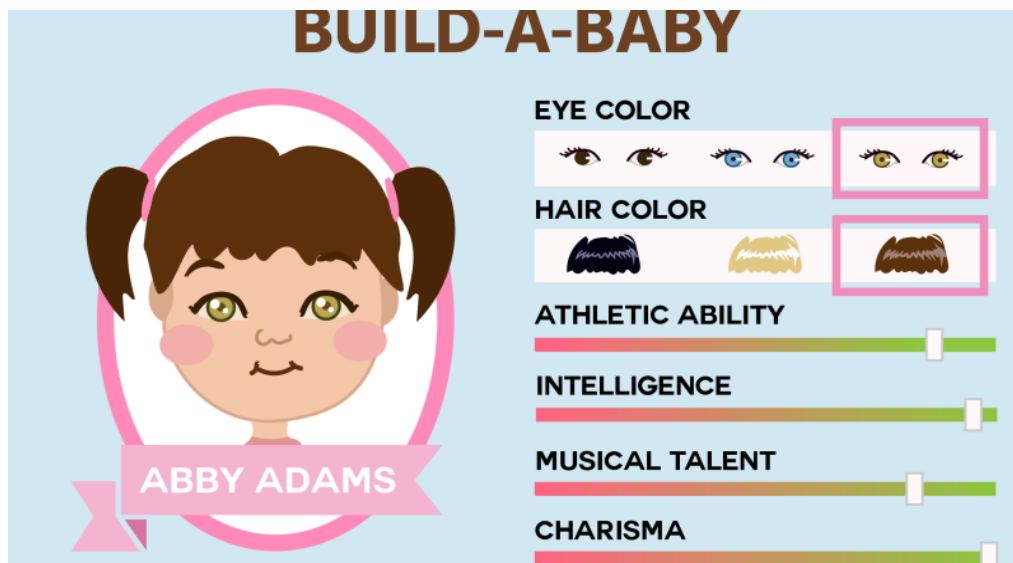
Questionnaire: - Genetic engineering is one of the topics that cause a lot of controversy per se. Modifications in the DNA of organisms has certainly raised many questions. It may work wonders but who knows if playing with the nature is “really safe”? This paper focuses on awareness of all aspects of genetic engineering. Genetic engineering raises lot of questions per se. Let it be discussed one by one:-

- Do this is a God sports?
- Is genetic engineering nature’s intervention?
- Is it alarming for the rise of “invasive species”?
- Is it lead to Genetic Defects?
- Is it Limit genetic diversity?
- Does it play with or improving nature?
- What are the hopes, hypes, and realities of genetic engineering?
- What sort of moral demands arise from recognizing human dignity with respect to genetic engineering?

Do this is a god sports? :- In genetic engineering, peoples’ first reactions were to immediately question whether it was ‘right’. Many religions believe that genetic engineering, after all, synonymous to playing God, and expressly forbid that it is performed on their children, for illustration.

Besides the religious arguments, however, there are a number of ethics or moral objections. These diseases, after all, exist for a reason and have persisted throughout history for a reason. At the same time as we should be fighting against them, we do need at least a few illnesses, otherwise we would soon become overpopulated. In fact, living longer is already causing social problems in the world today, so to unnaturally extend everybody’s time on Earth might cause even more problems further down the line, problems that we cannot possibly forecast.

Is genetic engineering interfering nature? :-‘Genetic engineering’ was consideration to be a real problem just a few years ago. We feared that soon we would be interfering with nature, trying to play God and deceive him out of his chance to decide whether we were blonde or dark haired, whether we had blue or bright green eyes or even how intelligent we were.

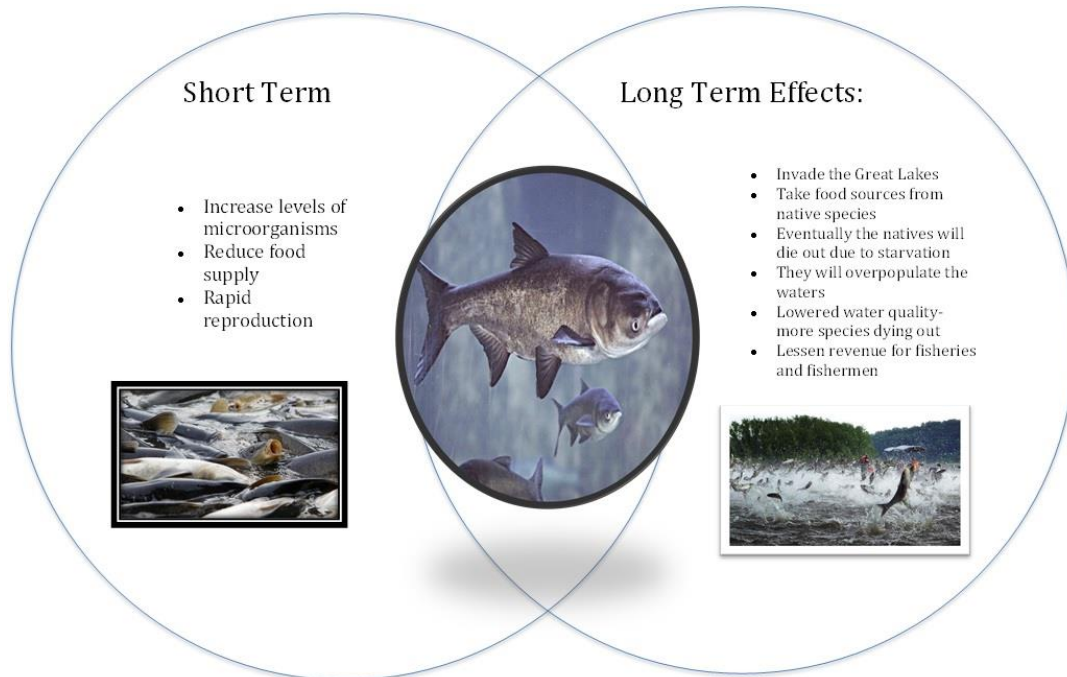


Striking of biodiversity:-According to a study published in the Graduate School of Arts and Sciences at Harvard University, one principal problem regarding the rise of Genetically Modified Organisms(GMO) is that they can cause a reduction in the biodiversity(the difference in the traits of organisms) of plants and animals in the environment. It means that the DNA in the environment will be more similar between individuals. So what did we say? Loss of biodiversity in the environment means lower chances of adaptation and survival of organisms to changing environment.

The alarming rise of “invasive species”:-The increase in the production of GMO (genetically modified organisms) may lead to the rise of invasive species.



Because GM organisms are often better adapted to the environments that they were modified for, they out-compete naturally occurring plants and animals. Such organisms are termed as “invasive species”. They are basically organisms with uncontrollable growth of populations up to a degree that already harms organisms and the environment.



It May Lead to Genetic Defects: - One more real problem in genetic engineering is the safety of making changes at the cellular level. Scientists do not yet know entirely everything about the way that the human body works.

- How can they possibly understand the ramifications of slight changes made at the smallest level?
- What if we manage to wipe out one disease only to introduce something brand new and even more dangerous?

Additionally, if scientists genetically engineer babies still in the womb, there is a very real and present danger that this could lead to complications, including miscarriage, premature birth or even stillbirth, all of which are ridiculous. The success rate of genetic experiments leaves a lot to be desired, in any case. The human body is so complex that scientists have to be able to forecast what sort of affects their actions will have, and they simply cannot responsible for everything that could go wrong.

It Limits Genetic Diversity: - We need diversity in all species of animals. By genetically engineering species, on the other hand, will be having an injurious effect on genetic diversity in the same way as something like cloning would. Gene therapy is available only to the very rich and privileged, which means that traits that tend to make people earn less money would eventually die out. One critical question and issue with genetic engineering that has been around for years and years is whether it could end up going too far. There are many thousands of scientists with honest intentions who would like to bring an end to the worst diseases and illnesses of the existing century by using genetic engineering. However,

- What is to stop just a handful of people taking the research too far?
- What if we start demanding ‘designer babies’, children whose hair color, eye color, height and intelligence? Don’t you think we are dictating ourselves?
- What if we end up engineering the sex of the baby, for instance in China, where is it much more preferable to have a boy? Is it fair?

DISCUSSION

As everything depend on ourselves how we interpret a thing .Similarly Genetic engineering has both blessing and a curse, as though we set to benefit as well as losing from growing this area of science even more. It appears that genetic engineering is highly beneficial. But, like each and every technology, it also has pros and cons.

PROS OF GENETIC ENGINEERING

- To overcome food scarcity
- Enhanced research
- Large scale production at low price.
- Tackling and Defeating Diseases
- Getting Rid of All Illnesses in Young and Unborn Children
- Potential to Live Longer

CONS OF GENETIC ENGINEERING

- Demolition of natural characters
- Loss of regeneration ability
- Decline in natural strength and resistance.
- Misuse for financial benefits.

Recent researches show how genetic engineering has been advanced and how it has been helping in various fields as studied below

1. Hiroshima University December 2, 2014:-Using a novel gene knock-in technique, effective insertion of an exogenous gene was demonstrated in human cells and in animal models, including silkworms and frogs. This strategy universally enables gene knock-in not only in cultured cells, but also in various organisms. This technique will enhance the usefulness of genome editing techniques in a variety of cells and organisms, especially in those in which gene knock-in is hindered by low homologous recombination efficiency.
2. The technique, published in Jan. 20, 2017 on *Nature Communications*, allows scientists to precisely regulate how much protein is produced from a particular gene. The process is simple yet innovative and, so far, works in everything from bacteria to plants to human cells.
3. Researchers from University of Chicago Medical Center in (April 11, 2018) have developed a genetic screening tool that identified two key factors that allow the influenza virus to infect human lung cells. The technique uses new gene editing tools to create a library of modified cells, each missing a different gene, allowing scientists to see which changes impact their response to flu. This in turn could identify potential targets for antiviral drugs.
4. The scientists from The Hebrew University of Jerusalem (April 23, 2018), have generated an atlas of the human genome that illuminates the roles our genes play in health and disease. The gene atlas, created using a state-of-the-art gene editing technology and human embryonic stem cells, enables a new functional view on how we study the human genome, and provides a tool that will change how we study and treat cancer and genetic disorders.

CONCLUSION

Genetic engineering in humans is being used to treat specific disorders that threaten the health or well-being of individuals. In time, the approach in humans could be like what is already being done with plants and animals. Genetic engineering can change specific traits, which could create human outcomes that are ethically questionable.

Indeed, genetic engineering will always have two opposite sides. While the possibilities of what science can create are endless, and the harmful effects also. At present, it is important to know that the real risks and benefits of genetic engineering lie in how science is interpreted and used. But there's really no doubt that with the rapid advancements in technology, the creation of GM organisms are also increasing.

BIBLIOGRAPHY

- i. Patra SAA (2015) Effects of Genetic Engineering - The Ethical and Social Implications. *Annals of Clinical and Laboratory Research*.
- ii. Fischer A, Hacein-Bey S, Cavazzana-Calvo M (2002) Gene therapy of severe combined immunodeficiencies. *Nat Rev Immunol* 2: 615-621.

-
- iii. Naz RK (2009) Development of genetically engineered human sperm immunocontraceptives. *J reprodimmunol*, 83:145-150.
 - iv. Smith JM (2003) *Seeds of Deception: Exposing Industry and Government Lies About the Safety of the Genetically Engineered Foods You're Eating*.
 - v. Powledge TM (2002) Will they throw the bath water out with the baby?: The US Congress is still debating whether to outlaw cloning humans. *EMBO Reports* 3:209-211.
 - vi. Sayler GS, Ripp S (2000) Field applications of genetically engineered microorganisms for bioremediation processes. *Curropin in biotechnol* 11:286-289.
 - vii. Powledge TM (2002) Will they throw the bath water out with the baby? The US Congress is still debating whether to outlaw cloning humans. *EMBO Rep* 3:209-211.
 - viii. Laura L. Arthur, Joyce J. Chung, Preetam Jankirama, Kathryn M. Keefer, Igor Kolotilin, Slavica Pavlovic-Djuranovic, Douglas L. Chalker, Vojislava Grbic, Rachel Green, Rima Menassa, Heather L. True, James B. Skeath, Sergej Djuranovic. **Rapid generation of hypomorphic mutations.** *Nature Communications*, 2017; 8: 14112 DOI: 10.1038/NCOMMS14112
 - ix. Atilgan Yilmaz, Mordecai Peretz, Aviram Aharoni, Ido Sagi, Nissim Benvenisty. **Defining essential genes for human pluripotent stem cells by CRISPR–Cas9 screening in haploid cells.** *Nature Cell Biology*, 2018; DOI: 10.1038/s41556-018-0088-1
 - x. Julianna Han, Jasmine T. Perez, Cindy Chen, Yan Li, Asiel Benitez, Matheswaran Kandasamy, Yoontae Lee, Jorge Andrade, Benjamin tenOever, Balaji Manicassamy. **Genome-wide CRISPR/Cas9 Screen Identifies Host Factors Essential for Influenza Virus Replication.** *Cell Reports*, 2018; 23 (2): 596 DOI: 10.1016/j.celrep.2018.03.045
 - xi. Shota Nakade, Takuya Tsubota, Yuto Sakane, Satoshi Kume, Naoaki Sakamoto, Masanobu Obara, Takaaki Daimon, Hideki Sezutsu, Takashi Yamamoto, Tetsushi Sakuma, Ken-ichi T. Suzuki. **Microhomology-mediated end-joining-dependent integration of donor DNA in cells and animals using TALENs and CRISPR/Cas9.** *Nature Communications*, 2014; 5: 5560 DOI: 10.1038/ncomms6560
 - xii. *Designing Babies: Morally Permissible Ways to Modify the Human Genome*. Nicholas Agar - 1995 - *Bioethics* 9 (1):1-15.
 - xiii. *The Hope, Hype and Reality of Genetic Engineering: Remarkable Stories from Agriculture, Industry, Medicine, and the Environment (Review)*. Eric Baack & Loren Rieseberg - 2006 - *Perspectives in Biology and Medicine* 49 (1):150-152.
 - xiv. *Improving Nature? The Science and Ethics of Genetic Engineering*, by Michael J. Reiss and Roger Straughan; *Birth to Death: Science and Bioethics*, Edited by David C. Thomasma and Thomasine Kushner. [REVIEW] Brian Balmer - 1999 - *Minerva* 37 (1):95-97.
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**PLASTIC POLLUTION - ROLE OF VARIOUS COUNTRIES IN FIGHTING PLASTIC
TERRORISM**

**Rakhi Sarraf¹, NeetuYadav², Geetika³, Shiv. K. Singh⁴, Iti Shri Bhati⁵, Sangeeta Chauhan⁶ and Uttam
Chand Gupta⁷**

^{1&4}Mahrishi Arvind University, Mundiamarsar, Jaipur

²Lords University, Chikani, Alwar

³Dolphin P G College of Life Sciences, Fategarh Shib, Punjab

⁵S.S Jain Subodh P .G Autonomous, College, Jaipur

⁶Sadguru Institute for Professional Education, Muhana, Jaipur

⁷Matsya P.G College, Bansur, Alwar

ABSTRACT

The use of plastic materials in present human life is increasingly widespread and cannot be avoided, and this results in plastic production globally increasing annually from various industries and households. Plastic materials have rewards such as its light weight, transparency, strong and cheap manufacturing process. Used plastics will be discharged into an environment that ends in the land fill or ocean. Plastic pollution is the accumulation of plastic objects and particles (plastic bottles and much more) in the Earth's environment that adversely affects wildlife, wildlife habitat, and humans. This review article highlights on how plastic pollution drastically harm not only to human beings but also whole community of plants and animals or we can say whole environment. The present review also highlights how various countries are taking steps to reduce plastic use.

Keywords: Plastics waste, fuel, SUP, environment, plastic pollution, marine, plasticizers.

INTRODUCTION

The first synthetic plastic Bakelite was produced in 1907, and is supposed to mark the beginning of the global plastics industry. However, rapid growth in global plastic production was not realized until the 1950s.

While plastic has many valuable uses, we have become addicted to single-use or disposable plastic with severe environmental consequences. Around the world, one million plastic drinking bottles are purchased every minute, while up to 5 trillion single-uses plastic bags are used worldwide every year. In total, half of all plastic produced is designed to be used only once and then thrown away. Plastic waste is now present everywhere in the natural environment that scientists have even suggested it could serve as a geological indicator of the Anthropocene era. And it's serious issue to overcome from this drastic era.

- From the 1950s to the 70s, only a small amount of plastic was produced, so plastic waste was relatively controllable.
- By the 1990s, plastic waste generation had more than tripled in two decades, following a similar rise in plastic production.
- In the early 2000s, our output of plastic waste rose more in a single decade than it had in the previous 40 years. Today, we produce about 300 million tons of plastic waste every year. That's nearly equivalent to the weight of the entire human population.

Researchers estimate that more than 8.3 billion tons of plastic has been produced since the early 1950s. About 60% of that plastic has ended up in either a landfill or the natural environment. Since the 1950s, the rate of plastic production has grown faster than that of any other material. People have also seen a shift away from the production of long-lasting plastic, and towards plastics that are meant to be thrown away after a single use. More than 99% of plastics are produced from chemicals derived from oil, natural gas and coal all of which are dirty, non-renewable resources. If current trends continue, by 2050 the plastic industry could account for 20% of the world's total oil consumption.

In 1950, the world's population of 2.5 billion produced 1.5 million tons of plastic; in 2016, a global population of more than 7 billion people produced over 320 million tons of plastic. This is set to double by 2034. Every day approximately 8 million pieces of plastic pollution find their way into our oceans.



Plastic continues to fill the world's oceans at an astonishing rate, inflicting major environmental damage. The cost is not merely to the natural world though, as the economic impact of this man-made dilemma is also huge.

As you would have thought, all this plastic is having a direct impact on marine life. As recent reports indicate, creatures both large and small are ingesting plastic materials, believing them to be food, and starving in the process. They also act as poisons in the gut, while their very presence can cause severe digestive problems that lead to death.

In addition to the deeply detrimental impact that plastic pollution is having on marine life, there are other underlying costs too, particularly with regards to both marine and coastal activities, and in turn the economic benefits that local communities and nations derive from them. The fishing industry is an obvious economic victim in the declining health of our oceans. As well as obstructing motors, plastic debris can also cause the loss of or damage to fishing equipment; the result is the need to repair or replace gear, or even entire vessels. Even the time taken to clean litter from propellers and nets adds to the cost for fishers. Collectively, these factors can weigh heavily on the industry as a whole, as well as on the individuals whose livelihoods depend on the seas.

Another crucial industry that is now suffering first hand from marine litter is the tourism industry. Many popular destinations rely heavily on the lure of pristine beaches, sparklingly clean waters and beach-fronted hotels. But as many tourists have witnessed in recent years, the reality has become a far cry from depictions online and in glossy magazines.

The economic cost to the tourism industry as a result of a loss in aesthetic value, Countries that largely depend on coastal tourism or the fishing industry are more vulnerable to the economic consequences of marine plastic pollution.

Overall, the costs of marine plastic pollution are not necessarily borne by the polluters. Marine plastic pollution hence involves equity concerns. In addition, coastal municipalities, governments and local communities often have to bear high costs for clean-up operations, awareness-raising activities and education.

Marine plastic debris affects multiple industries, our global economy, and it could well be affecting our health too.

Uses of plastics become integral part of our daily lives. Like-

- i. **Polyethylene terephthalate (PET)**:-Water bottles, dispensing containers, biscuit trays
- ii. **High-density polyethylene (HDPE)**:-Shampoo bottles, milk bottles, freezer bags, ice cream containers
- iii. **Low-density polyethylene (LDPE)**:-Bags, trays, containers, food packaging film
- iv. **Polypropylene (PP)**:-Potato chip bags, microwave dishes, ice cream tubs, bottle caps
- v. **Polystyrene (PS)**:-Cutlery, plates, cups

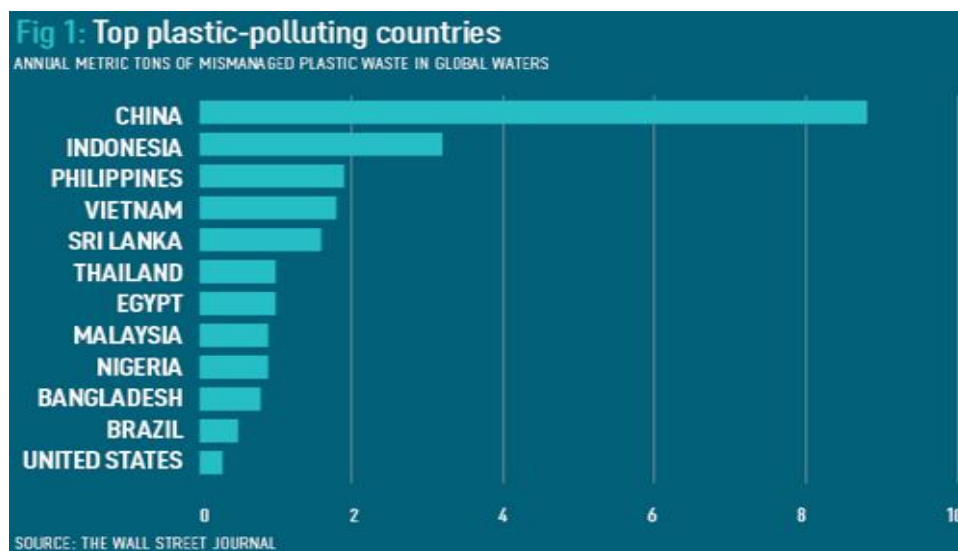
vi. **Expanded polystyrene (EPS)**:-Protective packaging, hot drink cups

Harmful effects on Humans:-Plastic affects human health. Toxic chemicals seep out of plastic and are found in the blood and tissue of nearly all of us. Exposure to them is linked to cancers, birth defects, impaired immunity, endocrine disruption and other ailments. The three most commonly cited plastic additives that have been linked to such diseases are:

1. **BPA or Bisphenol A**- often used in food and beverages containers, such as water bottles. The EU has taken steps to ban the use of BPA in baby bottles and some EU member states have taken restrictions further. BPA is an endocrine disruptor, which means that it disrupts the human endocrine system from working properly. A disrupting chemical like BPA can mimic a hormone or block a receptor or do any number of things to disrupt the proper functioning of any of the endocrine glands.
2. **Plasticisers or Phthalates**- primarily used in PVC to make it flexible, these additives can be used in children's toys, flooring, clothes and a myriad of other everyday items. Phthalates are linked to: reproductive malformations, developmental disorders ,pulmonary system effects including asthma and allergies etc. When plastics deteriorate, they release their hazardous chemicals like BPA and phthalates and a host of other toxic components including lead, mercury, cadmium and dioxin into the sea.
3. **Flame retardants**- used in electric and electronic equipment, upholstery and other items to provide fire safety benefits. Some of these substances have been banned by the UN due to the detrimental effects they had to the environment and human health.

MUTUAL RESPONSIBILITY

While certain countries are impacted more than others and some nations are better equipped to tackle the challenge, marine plastic debris is a problem we all share. It affects multiple industries and, in turn, our global economy, and it could well be affecting our health too. Aside from such direct costs, there are, of course, also those to marine life causing animals to suffer and die as a result of our reckless use and disposal of plastics.



The existing problem is alarming, but the first step is to stop it from becoming worse.

In order to reduce their impact, companies should be conscious of, and take responsibility for, the whole life cycle of their products, including disposal. They can redefine their business models and overcome the phenomenon of planned and perceived obsolescence, which pushes consumers to constantly renew their belongings by artificially limiting the service life of the products or telling that they are outdated.

Governments also have a vital role to play, as they can start the necessary legal requirements, as well as incentives and disincentives, to control marine plastic pollution.

A big reorganize of our disposable approach is essential, but as considerable as this change is, it can start today, with each individual. For now is the time for action, we can no longer stand by and watch the ruin of our oceans without them, we too will depart this life.

If we stand by and simply continue our current habits will be astonishingly worse than it is at present. We have to act quickly not for future generations, but for the present.



PREVENTIVE MEASURES FOR CONTROLLING PLASTICS USE

Plastic waste has become a pandemic on land as well as in the world's oceans, by taking some simple steps we can participate in this movement. Doing this not only is one reducing the plastic use, but also sending a powerful message to the society,

- i. **Avoid buying items packaged in plastic.** Try to buy food in glass jars rather than plastic ones, and detergents in boxes rather than bottles. By this you are reducing the plastic you use and will send a powerful message to the makers of those products that you don't like plastic packaging.
- ii. **Use cloth shopping bags.** We should say no to plastic bags because they are 'non-biodegradable' material. Plastic bags are not only harmful for our health but also for the health of our environment. They are one of the major causes of environmental pollution. Keep reusable bags somewhere handy when you go to the market, grocery store or mall.
- iii. **Think of new uses for old items rather than discarding them or buying new ones.**
- iv. **Affirm "No straw, please."** Straws are one of the top 10 items found on beaches. In most cases, drinking out of a straw is simply unnecessary.
- v. **Wear clothing made from natural (not synthetic) materials.**
- vi. **Don't just discard electronics.** Aim to repair or upgrade your devices instead of buying new ones. Sell gadgets and computer parts, or find a facility where you can turn them in for recycling.

METHODS TO REDUCE PLASTIC WASTE

The process of plastic degradation in nature is divided into several categories i.e. physical, biological, and chemical processes. The physical degradation processes in nature occur through pressure, humidity and heat from the sun. Based on their chemical compounds, in plastics composed of hydrocarbon chain polymers derived from petroleum refining, the bonds between the hydrocarbon monomers are so strong, making the degradation process difficult at ambient temperature (32 °C). As a result, it is very difficult to be biologically degraded by enzymes and bacteria, therefore, takes a very long time for the degradation process.

Its time not only to slow the flow of plastic at its source, but also to improve the system we handle our plastic waste. Only 9% of all plastic waste ever produced has been recycled. About 12% has been incinerated, while the rest 79% has accumulated in landfills, dumps or the natural environment.

Cigarette butts whose filters contain tiny plastic fibres were the most common type of plastic waste found in the environment in a recent global survey.

Drink bottles, bottle caps, food wrappers, grocery bags, drink lids, straws and stirrers were the next most common items.

Many of us use these products every day, without even idea about where they might end up A staggering 8 million tonnes of plastic end up in the world's oceans every year.

A lot of it comes from the world's rivers like Niger, Nile, Indus, Meghna, Brahmaputra, Ganges, Mekong, Zhujiang, Chang, Jiang, Huang He, Hai He, Amur , which serve as direct channels of trash from the world's cities to the marine environment.

These 10 rivers alone carry more than 90% of the plastic waste that ends up in the oceans-

- i. Chang Jiang (Yangtze River) 1,469,481tons
- ii. Indus 164,332tons
- iii. Huang He (Yellow River) 124,249tons
- iv. Hai He 91,858tons
- v. Nile 84,792tons
- vi. Meghna, Brahmaputra, Ganges 72,845tons
- vii. Zhujiang (Pearl River) 52,958tons
- viii. Amur 38,267tons
- ix. Niger 35,196tons
- x. Mekong 33,431tons

The properties that make plastics so beneficial due to their durability and resistance to degradation also make them nearly impossible for nature to completely break down. Most plastic items never fully disappear; they just get smaller and smaller. Many of these tiny plastic particles are swallowed by farm animals or fish that mistake them for food, and thus can find their way onto our dinner plates. They've also been found in a majority of the world's tap water. By blockage sewers and providing breeding grounds for mosquitoes and pests, plastic waste especially plastic bags can increase the transmission of vector-borne diseases like malaria.

If current trends continue, our oceans could contain more plastic than fish by 2050.

While the United States, Japan and many European countries generate significant amounts of plastic waste, they're also relatively good at managing it.

About half of all of the plastic waste that ends up in the oceans comes from just five countries: China, Indonesia, the Philippines, Thailand and Viet Nam. These countries are experiencing rapid economic growth, which is reducing poverty rates and improving the quality of life for hundreds of millions of people. But as these economies grow, consumption booms and so does the use of plastic goods.

The global volume of plastic waste continues to grow, and some of the biggest producers don't manage their waste effectively. But now the world has to wake up to the problem and governments have to start to act.

There are a number of things that governments can do from running public awareness campaigns, to offer incentives for recycling, to introduce levies or even ban certain products out-and-out.

An impressive and growing number of national and local governments have taken action against plastic pollution by-

- ❖ Pressure food suppliers to use non-plastic packaging
- ❖ Bring your own shopping bags to the supermarket
- ❖ Refuse plastic cutlery and straws
- ❖ Pick up any plastic you see when you're out walking
- ❖ Carry a refillable water bottle
- ❖ Tell your local officials that you support a ban on single-use plastic bags

We must join the global movement to ban the use of plastics so that we can be able to live healthy life

Movement against use of plastics in India- Modi government set to impose nationwide ban on plastic bags, cups and straws on October 2. Prime Minister Narendra Modi, who is leading efforts to scrap such plastics by 2022, is set to launch the campaign with a ban on as many as six items on Oct. 2 (the birth anniversary of independence leader Mahatma Gandhi).

In an Independence Day speech on Aug. 15, Modi urged people and government agencies to "take the first big step" on Oct. 2 towards freeing India of single-use plastic. India lacks a system for management of plastic waste, but environmentalists have hailed Modi's move, saying it will help combat plastic waste that chokes rivers and drains.

Plastic Ban in India – the Business Impact:-India's plastic ban across more than half of its states has businesses scrambling for cost effective responses.

A ban on certain plastics from Oct. 2, however, will come just weeks ahead of big Hindu festivals for which business plans are laid out far in advance because they typically see a sharp rise in consumer purchases.

There is no forthcoming ban on the use of single-use plastic (SUP) in India, according to Union Environment Minister Prakash Javadekar. He explained Prime Minister Narendra Modi didn't say 'ban', but said 'goodbye' to SUP (single use plastics) waste. "From October 2, we will begin an attempt to collect all that waste. Nearly 10,000 tonnes of plastic waste remains uncollected," he pointed out.

Mr. Javadekar was referring to Mr. Modi's address at the United Nations Conference on Desertification, where he said, "I think the time has come for the world to say goodbye to single use plastic. The government has announced that India will put an end to single-use plastic in the coming years."

In recent weeks, executives from Coca-Cola Co, PepsiCo and consumer goods seller Hindustan Unilever have been part of industry delegations that met government officials to express concerns and discuss alternate packaging solutions, according to a person with direct knowledge.

Businesses in food, drink, retail, and e-commerce industries are set to be the most affected by the changes in legislation regarding single-use plastics due to their heavy use in packaging.

For the food processing industry, leaving plastic, or switching to alternatives, also runs the risk of worsening other ills such as food spoilage. To minimize the impact of the ban on businesses, most states in India currently offer exemptions. However, exemptions vary by state, and as more states in the country are likely to adopt plastic ban, companies need to prepare for a regulatory environment that will likely entail tighter legislation and enforcement, impacting production, packaging, and supply chains in the future.

Coca-Cola said in a statement that all its primary packaging does not consist of single-use plastic. Pepsi said its target was to make 100 percent of its packaging recyclable, compostable, or biodegradable by 2025. Hindustan Unilever did not respond to a request for comment.

Amazon did not respond, but has previously said that it plans to replace single-use plastic in its packaging by June 2020.

"The ban has ramifications for all sectors like food processing, dairy, garments, toys," said Jayesh Rambhia of All India Plastic Manufacturers Association, which has 22,000 companies as members.

At this time, we look at the rules, exemptions, penalties and other details about the plastic ban introduced in India's major states.

- In 2009, Himachal Pradesh became the first state to ban plastic and polythene shopping bags in India. In intervening years, over 25 states have instituted similar measures – restricting the use of one form of plastic or another.
- The capital city, Delhi, banned all forms of disposable plastics including bags, cutlery, cups, plates and other single-use items in 2017, whereas the southern state of Karnataka imposed a complete ban on single-use plastic items in 2016.
- Some states such as Goa and Gujarat have also introduced partial bans in areas surrounding religious, historic or nature sites.
- Joining these states, Bihar, Maharashtra, Odisha, Tamil Nadu, and Uttarakhand are the latest to announce a ban on certain types of plastic this year.

ACTION AGAINST USE OF PLASTICS TAKEN BY VARIOUS COUNTRIES

- The Ministry of Drinking Water and Sanitation, Government of India, has requested various governmental departments to avoid the use of plastic bottles to provide drinking water during governmental meetings, etc., and to instead make arrangements for providing drinking water that do not generate plastic waste. The state of Sikkim has restricted the custom of plastic water bottles (in government functions and meetings) and Styrofoam products. The state of Bihar has banned the usage of plastic water bottles in governmental meetings.
- The 2015 National Games of India, organised in Thiruvananthapuram, was associated with green protocols. This was initiated by Suchitwa Mission that aimed for "zero-waste" venues. To make the event "disposable-free", there was ban on the usage of disposable water bottles. The event witnessed the usage of reusable tableware and stainless steel tumblers. Athletes were provided with refillable steel flasks. It is estimated that these green practices stopped the generation of 120 metric tonnes of disposable waste.
- The city of Bangalore in 2016 banned the plastic for all purpose other than for few special cases like milk delivery etc.
- The state of Maharashtra, India effected the Maharashtra Plastic and Thermocol Products ban 23 June 2018, subjecting plastic users to fines and potential imprisonment for repeat offenders.
- In July 2018, Albania became the first country in Europe to ban lightweight plastic bags.^{[102][103][104]} Albania's environment minister Blendi Klosi said that businesses importing, producing or trading plastic bags less than 35 microns in thickness risk facing fines between 1 million to 1.5 million lek (€7,900 to €11,800).
- In January 2019, the Iceland supermarket chain, which specializes in frozen foods, pledged to "eliminate or drastically reduce all plastic packaging for its store-brand products by 2023."
- In Bali, a pair of two sisters, Melati and Isabel Wijsen, have gone through efforts to ban plastic bags in 2019. Their organization Bye Bye Plastic Bags has spread to 28 locations around the world.
- In 2019 The New York (state) banned single use plastic bags and introduced a 5 cent fee for using single use paper bags. The ban will enter into force in 2020. This will not only reduce plastic bag usage in New York state (23,000,000,000 every year until now), but also eliminate 12 million barrels of oil used to make plastic bags used by the state each year.
- In 2019, The House of Representatives of Nigeria banned the production, import and usage of plastic bags in the country.
- In Israel, 2 cities: Eilat and Herzliya, decided to ban the usage of single use plastic bags and cutlery on the beaches.
- The government of India decided to ban single use plastics and take a number of measures to recycle and reuse plastic, from 2 October 2019

CONCLUSION

In order to reduce the plastic waste management problem, we need to adopt the principles of waste prevention. The use of durable plastics need not be reduced, but we need to promote judicious use and reuse of single-use plastics. If plastic compounds are made more durable and if the general perception of consumers regarding the reuse of plastic and reduced disposal is changed, then the waste plastic problem can be sorted out. However, there are several constraints for proper plastic waste management such as proper collection, segregation, and transportation of the discarded plastic material. Increase in public awareness coupled with changes in individual behavior can be an effective way to reduce the environmental repercussions of waste plastics. And various countries are making different laws to fight with plastic terrorism.

It has been concluded that how various countries including India participated in the reduction of single use plastics. And trying to protect earth from plastic pollution which not only degrading our environment but also our life. In last I would like to conclude by sensitivity that our planet is drowning in plastic pollution. Now it's time for a change.

REFERENCES

1. Hannah Leung (21 April 2018). "Five Asian Countries Dump More Plastic Into Oceans Than Anyone Else Combined: How You Can Help". Forbes. Retrieved 23 June 2019.

2. "Avoiding use of bottled water" (PDF). Retrieved 2 September 2016.
3. "Avoiding use of bottled water" (PDF). Retrieved 2 September 2016.
4. "Ban on Styrofoam Products and Packaged Water Bottles". Retrieved 2 September 2016.
5. "Bihar bans plastic packaged water bottles". Retrieved 2 September 2016.
6. "Green rules of the National Games". *The Hindu*.
7. "National Games: Green Panel Recommends Ban on Plastic". *The New Indian Express*.
8. "Kochi a 'Museum City' Too". *The New Indian Express*. 8 February 2016. Archived from the original on 2 April 2015. Retrieved 27 April 2016.
9. "National Games 2015: Simple Steps To Keep Games Green". *yentha.com*.
10. "Setting a New Precedent". *The New Indian Express*.
11. "Plastic ban in Bangalore" (PDF).
12. "Plastic ban in Maharashtra: What is allowed, what is banned". *The Indian Express*. 27 June 2018. Retrieved 29 December 2018.
13. "Plastic Waste Management in Maharashtra". *Maharashtra Pollution Control Board*. 23 June 2018. Retrieved 29 December 2018.
14. "Rama: Albania the first country in Europe to ban plastic bags lawfully | Radio Tirana International". *rti.rti.sh.al*. 13 June 2018. Retrieved 29 July 2018.
15. Pettipas, Shauna; Bernier, Meagan; Walker, Tony R. (2016). "A Canadian policy framework to mitigate plastic marine pollution". *Marine Policy*. **68**: 117–122. doi:10.1016/j.marpol.2016.02.025.
16. "Albania bans non-biodegradable plastic bags". *Tirana Times*. 4 July 2018. Retrieved 21 July 2018.
17. "Balkans bans the bag". *makersourcescount.eu*. 3 July 2017. Retrieved 23 July 2018.
18. *Martinko, Katherine (17 January 2018)*. "UK supermarket promises to go plastic-free by 2023". *TreeHugger*. Retrieved 26 January 2019.
19. "How Teenage Sisters Pushed Bali To Say 'Bye-Bye' To Plastic Bags". *NPR.org*. Retrieved 3 February 2019.
20. *Nace, Trevor (23 April 2019)*. "New York Officially Bans Plastic Bags". *Forbes*. Retrieved 12 May 2019.
21. *Gold, Michael (22 April 2019)*. "Paper or Plastic? Time to Bring Your Own Bag". *The New York Times*. Retrieved 12 May 2019.
22. *Opara, George (21 May 2019)*. "Reps pass bill banning plastic bags, prescribe fines against offenders". *Daily Post*. Retrieved 27 May 2019.
23. *Ben Zikri, Almog; Rinat, Zafrir (3 June 2019)*. "In First for Israel, Two Seaside Cities Ban Plastic Disposables on Beaches". *Haaretz*. Retrieved 4 June 2019.
24. *Mathew, Liz (5 September 2019)*. "From October 2, Govt to crack down on single-use plastic". *The Indian Express*. Retrieved 5 September 2019.
25. "The garbage patch territory turns into a new state - United Nations Educational, Scientific and Cultural Organization". *unesco.org*.
26. "Archived copy". Archived from the original on 14 July 2014. Retrieved 3 November 2014.
27. Earth Day 2019
28. "Banning single-use plastic: lessons and experiences from countries" UN Environment report (2018)w
29. "Plastic pollution". *Encyclopedia Britannica*. Retrieved 1 August 2013.
30. Laura Parker (June 2018). "We Depend on Plastic. Now We're Drowning in It". *National Geographic.com*. Retrieved 25 June 2018.

PLASTICS TO FUEL – A COMBAT JOURNEY

Rakhi Sarraf¹, Neetu Yadav², Geetika³, Shiv K. Singh⁴, Iti Shri Bhati⁵, Sangeeta Chauhan⁶ and Uttam Chand Gupta⁷

^{1&4}Mahrishi Arvind University, Mundiaramsar, Jaipur

²Lords University, Alwar Chikani, Alwar

³Dolphin P G College of Life Sciences, Fategarh Shib, Punjab

⁵S.S Jain Subodh P .G Autonomous, College, Jaipur

⁶Sadguru Institute for Professional Education, Muhana, Jaipur

⁷Matsya P.G College, Bansur, Alwar

ABSTRACT

Plastics provide many benefits that make modern life possible. They help in keeping our foods fresh for longer time, reduce the weight of our vehicles so we use less fuel, insulate our homes so we use less energy, and keep countless medical supplies safe and sterile. Even though some plastics are recycled, and many are not that end up by burring in landfills or littered where they can enter flimsy marine ecosystems. But new technologies that can control the fuel content in non-recycled plastics could help this. The present review encompasses the various ways to overcome the problems of degradation of plastics, world is facing in recent time. And also highlights advantages and disadvantages of plastics degradation.

Keywords: Plastics, SUV, fuel, pyrolysis, hydrocarbons, recycle, polymerization, Plastic crude oil.

INTRODUCTION

Economics will likely drive adoption of this technology. For example, by tapping the potential of non-recycled plastics, the U.S. could support up to 600 plastics-to-fuel facilities and generate nearly 39,000 jobs, resulting in nearly \$9 billion in economic output from plastics-to-fuel operations. And that doesn't even include the \$18 billion of economic output during the build-out phase.

Plastics-to-fuel technologies are increasingly scalable and can be customized to meet the needs of various economies and geographies, so they do not require huge machines.

The promise of plastics-to-fuel is particularly exciting as an option to recover materials that today may be buried, or in some regions, illegally dumped or burned in open pits due to inadequate waste management infrastructure. The new facilities could create local revenue for communities in parts of the world where trash has become a hazard and a large source of marine litter.

Disposal of Plastic Waste causes some Environmental issues- Indiscriminate littering of unskilled recycling/reprocessing and non-biodegradability of plastic waste raises the following environmental issues: -

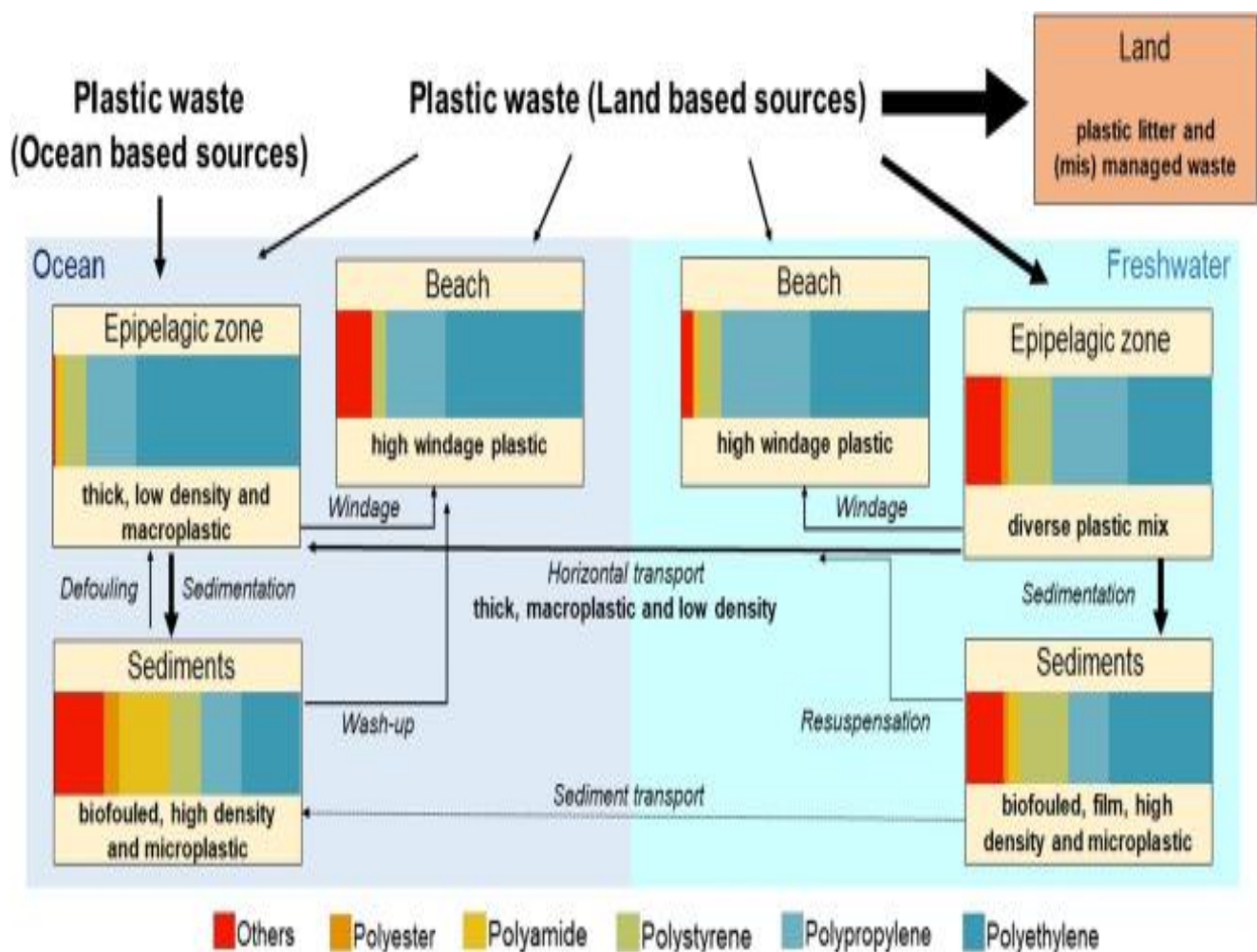
- During polymerization process fugitive emissions are released.
- During product manufacturing various types of gases are released.
- Indiscriminate dumping of plastic waste on land makes the land infertile due to its barrier properties.
- Burning of plastics generates toxic emissions such as Carbon Monoxide, Chlorine, Hydrochloric Acid, Dioxin, Furans, Amines, Nitrides, Styrene, Benzene, 1, 3- butadiene, CCl₄, and Acetaldehyde.
- Lead and Cadmium pigments, commonly used in LDPE, HDPE and PP as additives are toxic and are known to leach out.
- Non-recyclable plastic waste such as multilayer, metalized pouches and other thermoset plastic poses disposal problems.
- Sub-standard plastic carry bags, packaging films etc. pose problem in collection and recycling.
- Littered plastics give unaesthetic look in the city, choke the drain and may cause flood during monsoon.
- Garbage mixed with plastics interferes in waste processing facilities and also cause problems in landfill operations.
- Recycling industries operating in non-conforming areas are posing threat to environment to unsound recycling practices.

GETTING FUEL FROM USED PLASTICS

A new set of emerging technologies is helping to convert non-recycled plastics into an array of fuels, crude oil and industrial feedstock's. Processes vary, but these technologies, known as "plastics-to-fuel," involve similar steps.

1. Plastics are collected and sorted for recycling. Then the non-recycled plastics (or residuals) are shipped to a plastics-to-fuel facility, where they are heated in an oxygen-free environment, melted and vaporized into gases. The gases are then cooled and condensed into a variety of useful products. Plastics-to-fuel technologies do not involve combustion.
2. Depending on the specific technology, products can include synthetic crude or refined fuels for home heating; ingredients for diesel, gasoline or kerosene; or fuel for industrial combined heat and power.
3. Companies sell the petroleum products to manufacturers and industrial users, while fuels can help power cars, buses, ships and planes.

Plastics recycling, continues to progress with a wide range of old and new technologies. Many research projects have been undertaken on chemical recycling of waste plastics to fuel.



EARNING REVENUE FROM WASTE

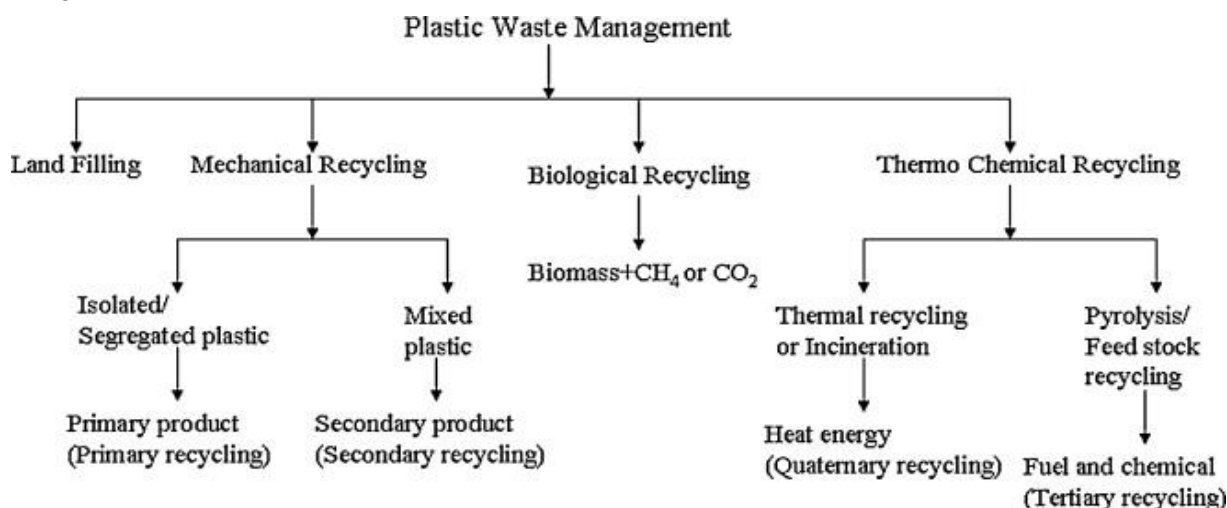
One of the biggest profits to this move toward is that it helps everyone from businesses to consumers to government initiate to value materials that used to be "waste." And when people realize materials have value, everyone starts to think about how this value can be captured and put to work for communities.

Plastics are created primarily from energy feedstock, typically natural gas or oil (mostly natural gas in the United States). The hydrocarbons that make up plastics are embodied in the material itself, essentially making plastics a form of stored energy, which can be turned into a liquid fuel source.

One way, of course, is to recycle plastics whenever one can. Today, recycling technologies reprocess many common types of plastics: bottles, containers, cups, caps, lids and so on. Even many flexible plastics, such as bags and wraps, can be recycled at major grocery stores across the United States.



Turning waste into power: - Plastics recycling, continues to progress with a wide range of old and new technologies.



Several alternatives have therefore been developed to conduct an efficient process of recycling plastic waste, and such methods include through physical and chemical processes. The process of plastic degradation in nature is divided into several categories i.e.

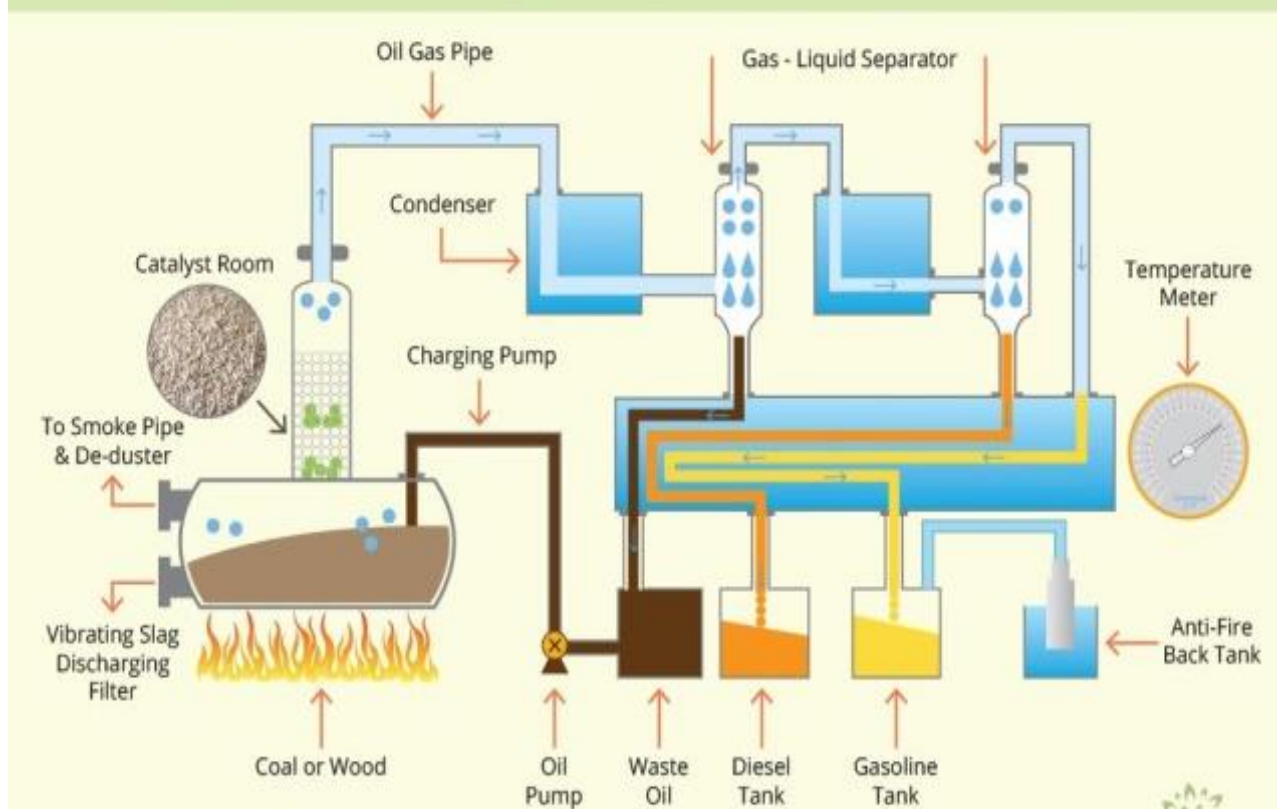
1. **Physical-** The physical degradation processes in nature occur through pressure, humidity and heat from the sun. Based on their chemical compounds, plastics composed of hydrocarbon chain polymers derived from petroleum refining, the bonds between the hydrocarbon monomers are so strong, making the degradation process difficult at ambient temperature (32°C). As a result, it is very difficult to be biologically degraded by enzymes and bacteria, therefore, takes a very long time for the degradation process.

Physical methods are commonly referred to as “three R” i.e. reduction, reuse and recycling. This method is inappropriate because plastic waste returns to the environment and will later on end up as waste plastic. In addition, it requires high labour costs for the separation process, thereby reducing the sustainability of the process

2. **Chemical:-** Many research projects have been undertaken on chemical recycling of waste plastics to fuel. However, the chemical process through the pyrolysis method is a more efficient and economical method of recycling, because it can restore the energy contained in plastic.

Pyrolysis is a thermo-chemical treatment, which can be applied to any organic (carbon-based) product. It can be done on pure products as well as mixtures. In this treatment, material is exposed to high temperature, and **in the absence of oxygen** goes through chemical and physical separation into different molecules. The chemical bonds of materials undergoing pyrolysis have less stability thus are easily disintegrated on heating.

Plastic Pyrolysis Process



The pyrolysis process is conducted under very low oxygen concentrations, at pyrolysis temperatures ranging from 300 to 1100°C, using variable residence times (seconds to hours). Low oxygen levels are necessary for carbonization to occur while minimizing CO₂ and NO_x production.

The pyrolysis process has different modes of processing including slow/fast pyrolysis, flash pyrolysis, and gasification. Slow pyrolysis, such as with traditional kilns, exposes feedstock's in a batch thermal mode for days to a week. Fast pyrolysis uses a traditional method of advancing the feedstock through a retort/oven for several minutes using a continuous feed system. In the flash pyrolysis procedure, feed stocks are exposed to a burst of thermal energy, usually from 1 to 5 seconds. Finally, gasification exposes the feedstock to high temperatures up to 1100°C to maximize conversion into syngas materials. Final product recovery under these modes includes bio-oil, bio char, and gases.

In general, flash pyrolysis yields 60% bio char and 40% bio-oil and syngas, while fast pyrolysis yields higher bio-oil recoveries with minimal bio char leftovers. Slow pyrolysis produces almost equal yields of bio-oil, bio char, and syngas (Laird et al., 2009). Bio chars produced for agronomic purposes prefer a slow pyrolysis mode to maximize biochar yields (Song and Guo, 2012).

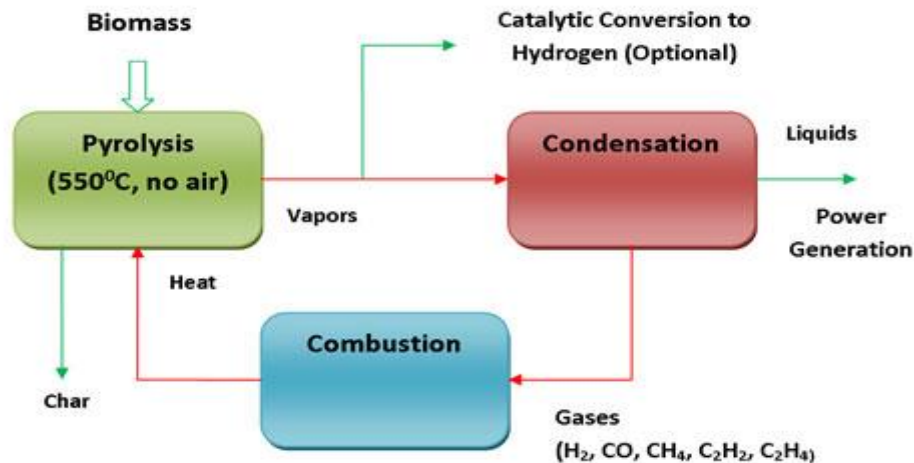
Thermal decomposition leads to the formation of new molecules. This allows receiving products with a different, often more superior character than original residue. Thanks to this feature, pyrolysis becomes increasingly important process for today's industry as it allows bringing far greater value to common materials and waste.

Pyrolysis is frequently associated with thermal treatment. But in contrary to combustion and gasification processes, which involve entire or partial oxidation of material, pyrolysis is based on heating in the absence of air. This makes it mostly endothermic process that ensure high energy content in the products received.

Pyrolysis products always produce solid (charcoal, bio char), liquid and non-condensable gases (H₂, CH₄, C_nH_{2n}, CO, CO₂ and N₂).

During the pyrolysis, a particle of material is heated up from the ambient to defined temperature. The material remains inside the pyrolysis unit and is transported by screw conveyor at defined speed, until the completion of the process. Chosen temperature of pyrolysis defines the composition and yields of products (pyrolysis oil, syngas and char).

BIOMASS LIQUEFACTION via PYROLYSIS



Plastic-derived fuels are also capable of producing a cleaner burning fuel than traditional sources due to their low sulphur content, considering the majority of developing nations use sulphur-heavy diesel.

I. Plastic to hydrogen-Most recently, researchers from Swansea University have discovered a means of converting plastic waste into hydrogen fuel, which they considered as alternate fuels for vehicles one day.

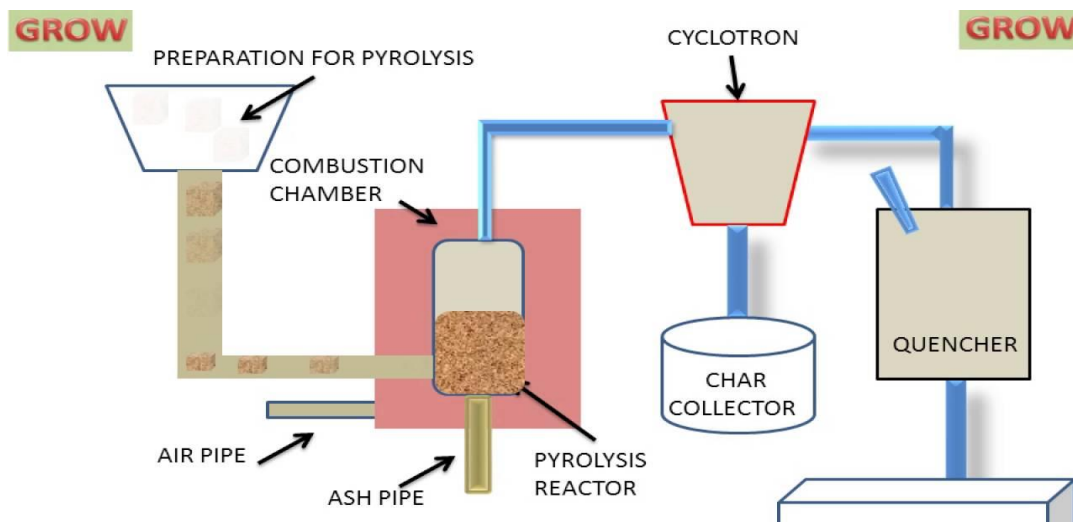
The researchers also gave an idea of photo reforming in which a light absorbing photo catalyst is added to plastic products, this catalyst absorbs sunlight being a photo catalyst and transforms it into chemical energy. The plastic and catalyst combination was then left in an alkaline solution exposed to sunlight, breaking down the material and producing bubbles of hydrogen gas in the process.

The new method would be a cheaper than current recycling options, as any plastic can be used without needing to be cleaned.

II. Plastic to diesel-Chemists from the University of California, Irvine (UC), in collaboration with researchers from the Shanghai Institute of Organic Chemistry, have devised a plastic recycling method that allows them to dissolve the bonds of polyethylene plastic to create petroleum and other fuel products.

While untreated polyethylene can be broken down, it requires either a significant amount of heat or reactive, toxic chemicals, and results in the atomic bonds breaking in an unusable way. By contrast, the process developed by the researchers uses far less heat and allows the final product to be transformed into a new fuel source.

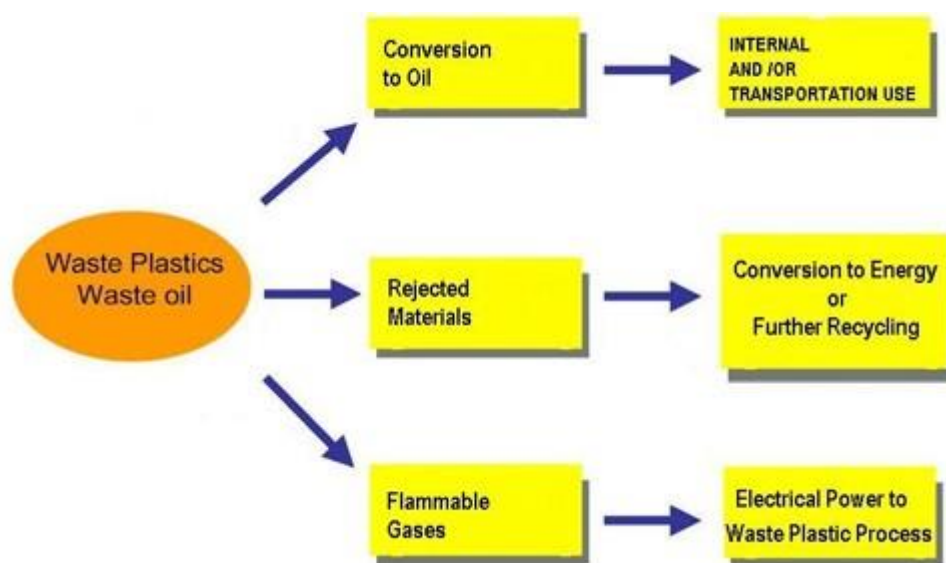
III. Plastic to crude oil- Sharma et.al,2014 successfully converted plastic bags into fuel.They used high-density polyethylene bags sourced from local retailers and fed them into a pyrolysis unit, creating plastic crude oil (PCO) in the process. They then distilled the plastic crude oil to make gasoline and two types of diesel. Following the addition of antioxidants, the resulting materials proved superior to conventional diesel fuels in terms of lubricity and derived cetane number, which demonstrates ignition quality.



Fuel derived from pyrolysis is very similar to crude oil, and therefore cannot be directly used as fuel or other sources of energy, given that it must meet certain standard specifications to ensure the performance of the combustion engine. Plastic pyrolysis products are considered to be sources of hydrocarbons from petroleum in the form of naphtha products. As a result, the fuel characteristics of these products are modified to standard fuel products. The liquid fuel obtained from the pyrolysis process cannot be directly used as fuel, due to the presence of impurities (ash) and wax from the feedstock, hence, the pyrolysis product is used in reducing the ash and wax content in fuel products. The purification of the pyrolysis products was conducted using distillation bubble cap tray column which reduces the ash and wax content in fuel products.

Advantage of plastics-derived fuels- A Prospective environmental benefit of plastics-derived fuels is that they can deliver a cleaner-burning fuel, due to the low sulfur content of plastics.

The main product of fuel from plastic, when refined properly, is a diesel with greatly reduced sulfur content. Using this lower sulfur content fuel for boats, machinery, generators and vehicles can help decrease sulfur-related impacts while reducing non-recycled materials along the way.



HOW CAN WE REDUCE PLASTIC POLLUTION?

1. **Byusing less plastic-**The market is run by supply and demand and if consumers are not demanding plastic products, there will be no profit in making them. But you don't have to wait for the market to catch up. Start your own trend. For example, it has become trendy to refuse plastic straws.
2. **Spreading awareness-**If people truly understood the environmental and health costs of using plastic bags, perhaps they would not use them so thoughtlessly.
3. **Ensuring that plastic to be recycled gets to its end destination rather than ending up in the environment.**

CONCLUSION

Plastics even used plastics are valuable materials that can be used to create new products or fuels and energy. But not if we bury them in landfills or dump them in our waterways. Plastics-to-fuel is one of several technologies that can play a role in converting non-recycled plastics into valuable energy (gasification and refuse-derived fuel are two others). Because no two communities are the same, it is important for individual regions or municipalities to understand which technology is likely to work best for them.

It has been concluded from the present review that how plastics can be reused after recycling plastic to fuels. As several alternatives have been discussed above for an efficient process of **recycling plastic** waste, and which includes physical and chemical processes. Thus we can protect our earth in a safer way from plastic pollution, which not only degrading our environment but also our life.

REFERENCES

1. "Export of Plastic Debris by Rivers into the Sea" by Christian Schmidt, Tobias Krauth, and Stephan Wagner, published in Environmental Science & Technology (2017)
2. Hester, Ronald E.; Harrison, R. M. (editors) (2011). Marine Pollution and Human Health. Royal Society of Chemistry. pp. 84-85. ISBN 184973240X

3. Data from "Plastic waste inputs from land into the ocean" by Jenna Jambeck and others, published in Science (2015)
4. <https://www.india-briefing.com/news/plastic-ban-india-business-impact-state-specific-regulations-18145.html/>
5. Le Guern, Claire (March 2018). "When The Mermaids Cry: The Great Plastic Tide". Coastal Care. Archived from the original on 5 April 2018. Retrieved 10 November 2018.
6. Jambeck, Jenna R.; Geyer, Roland; Wilcox, Chris; et al. (2015). "Plastic waste inputs from land into the ocean" (PDF). *Science*. 347 (6223): 768 - 71. Bibcode:2015Sci...347..768J. doi:10.1126/science.1260352. PMID 25678662. Retrieved 7 January 2019.
7. <https://www.thehindu.com/news/national/no-imminent-ban-on-single-use-plastic>
8. "The known unknowns of plastic pollution". *The Economist*. 3 March 2018. Retrieved 17 June 2018.
9. Nomadic, Global (29 February 2016). "Turning rubbish into money – environmental innovation leads the way".
10. Mathieu-Denoncourt, Justine; Wallace, Sarah J.; de Solla, Shane R.; Langlois, Valerie S. (November 2014). "Plasticizer endocrine disruption: Highlighting developmental and reproductive effects in mammals and non-mammalian aquatic species". *General and Comparative Endocrinology*. **219**: 74–88.
11. <https://www.livemint.com/news/india/>
12. Walker, Tony R.; Xanthos, Dirk (2018). "A call for Canada to move toward zero plastic waste by reducing and recycling single-use plastics". *Resources, Conservation and Recycling*. **133**: 99–100. doi:10.1016/j.resconrec.2018.02.014.
13. Sutter, John D. (12 December 2016). "How to stop the sixth mass extinction". CNN. Retrieved 18 September 2017.
14. Walker, T.R.; Reid, K.; Arnould, J.P.Y.; Croxall, J.P. (1997). "Marine debris surveys at Bird Island, South Georgia 1990–1995". *Marine Pollution Bulletin*. **34**: 61–65. doi:10.1016/S0025-326X(96)00053-7.
15. Barnes, D. K. A.; Galgani, F.; Thompson, R. C.; Barlaz, M. (14 June 2009). "Accumulation and fragmentation of plastic debris in global environments". *Philosophical Transactions of the Royal Society B: Biological Sciences*. **364** (1526)
16. <https://www.power-technology.com/comment/plastic-to-fuel>
17. Anuar et al., 2016 Anuar S., Shafferina D., Abnisa F., Wan Daud W.M.A., Aroua M.K.A review on pyrolysis of plastic wastes
18. *Energy Convers. Manag.*, 115 (2016), pp. 308-326, 10.1016/j.enconman.2016.02.037
19. Arena and Mastellone, 2006, Arena U., Mastellone M.L.
20. Scheirs J. (Ed.), *Fluidized Bed Pyrolysis of Plastic Wastes*, 0-470-02152-7, John Wiley & Sons, Ltd, Canada (2006), 10.1002/0470021543.ch16
21. ASTM Standards, 2008 ASTM Standards D396-17 - Standard Specification for Diesel Fuel Oils, ASTM International, United States (2008), 10.1520/D0396-17Chem. Eng. Trans., 43 (2015), pp. 2029-2034, 10.3303/CET1543339
22. Blazso, 2006 Blazso M. Composition of liquid fuels derived from the pyrolysis of plastics Feed. *Recycl. Pyrolysis Waste Plast.* (2006), pp. 315-344, Cataluña and Da Silva, 2012 Cataluña R., Da Silva R. Effect of cetane number on specific fuel consumption and particulate matter and unburned hydrocarbon emissions from diesel engines
23. Chemstations, 2004 Chemstations Physical Properties User's Guide Chemstations, Inc., Suite 305 Houston, Texas 77042 USA (2004)
24. Koç, 2013 Koç A Studying the utilization of plastic waste by chemical recycling method *Sci. Res.*, 3 (2013), pp. 413-420, 10.4236/ojapps.2013.37051 Lee, 2006 Lee K.-H. Thermal and catalytic degradation of waste HDPE

25. Wiley John (Ed.), *Feeds Stock Recycling and Pyrolysis S of Waste Plastics*, John Wiley & Sons, Ltd, Canada (2006), 10.1002/0470021543.ch5
26. Lopez et al., 2017Lopez G., Artetxe M., Amutio M., Bilbao J., Olazar M. Thermochemical routes for the valorization of waste polyolefinic plastics to produce fuels and chemicals
27. Mabood et al., 2010Mabood F., Jan M.R., Shah J., Jabeen F., Hussain Z. Catalytic conversion of waste low density polyethylene into fuel oil
28. MaXiaolong et al. 2017MaXiaolong, Ridner D., Zhang Z., Li X., Li H., Sui H., Gao X. Study on vacuum pyrolysis of oil sands by comparison with retorting and nitrogen sweeping pyrolysis
29. *Fuel Process. Technol.*, 163 (2017), pp. 51-59, 10.1016/j.fuproc.2017.04.011
30. Mburu et al., 2016Mburu J.N., Mwangi P.N., Muthengia J.W. Pyrolysis process studies for post consumer polyethylene waste conversion and upgrading of the pyrolysis oil (2016), pp. 101-105
31. Miskolczi and Ateş, 2015Miskolczi N., Ateş F. Thermo-catalytic co-pyrolysis of recovered heavy oil and municipal plastic wastes
32. *J. Anal. Appl. Pyrolysis*, 117 (2015), pp. 273-281, 10.1016/j.jaap.2015.11.005
33. Moinuddin S., Mamunor Mohammad, Rashid Mohammed M., Muhammad S.R. A new technology proposed to recycle waste plastics into hydrocarbon fuel in USA
34. Naima and Liazid, 2013Naima K., Liazid A. Waste oils as alternative fuel for diesel engine: A review
35. ASTM Product Specification Diesel Fuel ASTM Product Specification (Unleaded Gasoline for Italy) (2000), pp. 1-4 Agip Pet. Sp.A
36. Scheirs, 2006Scheirs, J., 2006. Overview of commercial pyrolysis processes for waste plastics. In: Scheirs, J. (Ed.), *Feedstock Recycling and Pyrolysis of Waste Plastics: Converting Waste Plastics into Diesel and Other Fuels*. Canada <https://doi.org/10.1002/0470021543.ch15>.
37. Sharma B.K., Moser B.R., Vermillion K.E., Doll K.M., Rajagopalan N. Production, characterization and fuel properties of alternative diesel fuel from pyrolysis of waste plastic grocery bags *Fuel Process. Technol.* (2014), p. 122
38. Velghe et al., 2011Velghe I., Carleer R., Yperman J., Schreurs S. Study of the pyrolysis of municipal solid waste for the production of valuable products
39. Wong et al., 2017Wong S.L., Ngadi N., Abdullah T.A.T., Inuwa I.M. Conversion of low density polyethylene (LDPE) over ZSM-5 zeolite to liquid fuel
40. Yuliansyah et al., 2015Yuliansyah T.A., Agus P., Ramadhan A.A.M., Laksono R. Pyrolysis of plastic waste to produce pyrolytic oil as an alternative fuel.

DISCUSSION

City of Hope, a renowned Cancer Centre, devote a lot of time in the study and treatment of Diabetes, because many people struggle with both Diabetes and cancer at the same time. People with Diabetes type 2 (the most common form) are likely to develop Liver or pancreatic cancer and are at the risk of developing colon, bladder and breast cancer.

Diabetic woman with breast cancer have a higher mortality rate than woman with breast cancer alone whereas oddly men run a lower risk of developing prostate cancer. Studies revealed that cancer and diabetes are related in more than one way.

According to Debbie Thurmond, Ph.D. Chair to the department of Molecular and Cellular Endocrinology at the City of Hope's Diabetes and Metabolism Research Institute "Cancer and Diabetes are two sides of the same coin and there are disruptions of the body's normal Metabolism. That is why Obesity, which increases inflammation, a known trigger for diabetes as well as the cancer".



Excess fat which surrounds internal organs secretes chemicals which send signals which in turn makes the cells more aggressive, initiating tumor growth and also creates insulin resistance, leading to type 2 diabetes. High level of Insulin, typical to type 2 diabetes, can cause cancer and at some point, of time, the buildup of blood sugar can make the cancer cells develop from the dormancy of Diabetic Complications and Metabolism.

Cancer cells love Glucose it is their primary fuel" (1930, Warburg Effect) Nobel Laureate Otto Warburg demonstrated that Cancer cells consume and metabolize glucose at 200 times the normal rate. PET scans are in fact designed to detect the presence of cancer cells in the body by locating areas of high glucose consumption.

In Theory, a medication that lowers blood sugar in diabetes could also potentially fight cancer by starving malignant cells to death. That's why, cancer researchers are looking closely at Metformin.

IN THE YEAR 1910, MAYNARD REPORTED THE FOLLOWING:

- Cancer and Diabetes have very much the same age distribution. Cancer and Diabetes are diagnosed within the same individuals more frequently than that would be expected by chance even after adjusting for age.
- Approximately 8-18% of people with cancer have concurrent diabetes, probably because of the shared risk factors between disease and their increasing global prevalence.
- Recent Pune based study by Sinha et al observed that in a given population, there is an increase in the occurrence of a certain cancer types under diabetic condition. This study emphasizes that the interplay between diabetic and cancer in Indian population may be complex.
- Epidemiological studies suggest that the patients with diabetes have a higher risk of developing several types of cancer including Liver, Pancreatic, Colorectal, gynecologic and breast cancer.
- Growing evidence suggests that glucose metabolic abnormalities can represent an independent risk factor for the development of specific cancers and can affect their prognoses.
- Increase in the risk of pancreatic cancer in individuals with diabetes relative to those without diabetes has shown by several studies and meta-analysis.
- Diabetes was associated with an increased rise in pancreatic cancer among individuals who have cancer for at least 5 years, implies that there is a cause for concern of pancreatic cancer in diabetic patients. Therefore, this is an epidemiological evidence supporting a biological link between several types of cancer and type 2 diabetes and there is significantly higher cancer related mortality in those with diabetes.

- Insulin is best known for its role as a homeostatic regulation of blood glucose, gluconeogenesis and fatty acid metabolism in metabolically active tissues, such as the liver, muscle and adipose tissues.
- Analysis of other physiological effects of Insulin also suggests a highly conserved role of insulin as an important regulator of protein synthesis, cell growth and proliferation.
- Hyperinsulinemia, which is also a hallmark of type2 diabetes is considered as main culprit that connects Hyperinsulinemia and glucose intolerance may persist for prolonged periods prior to the development of Hyperinsulinemia and overt type 2 diabetes.

A recent study has shown association of serum C-peptide concentration with cancer

MORTALITY RISK IN PRE-DIABETIC OR UNDIAGNOSED DIABETES

Hyperinsulinemia could potentially impact cancer progression by several mechanisms that might include the impact and highly sensitive IR/Insulin growth factors(GFs)IR signaling system.

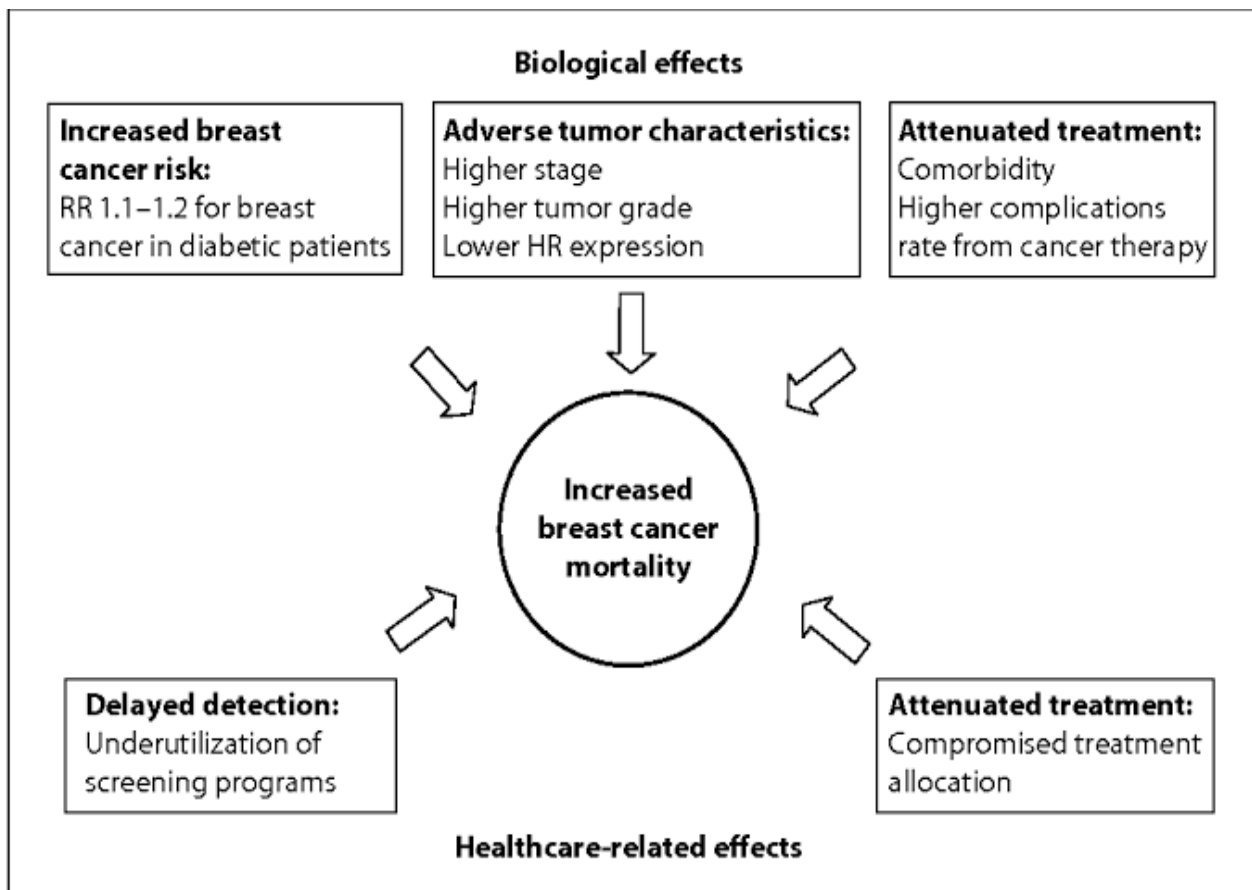
Insulin has a high affinity for IR –A and could thus act as a stream mitogenic signal and promote cell proliferation as through its cognate receptor.

Hyperinsulinemia has been demonstrated to increase IGF-1 bioavailability by both increasing hepatic growth hormone reception expression and which leads to the growth hormone mediated increase in igF1 production.

Hyperinsulinemia also reduce hepatic secretion of sex hormones binding Globulin (SHBG), which leads to elevated circulation of free estrogen, which in turn can act as a potential mitogen for estrogen dependent cancer of breast and endometrial origin.

Department of Medical Oncology and Clinical Biochemistry, Sher-i-kashmir Institute of Medical Sciences made a study with 50 healthy women both pre-andpost-menopausal as controls. The found that the Metabolic Syndrome(MS) ,also called as Insulin resistance syndrome, consists of a constellation of metabolic abnormalities which include central obesity, hypoglycemia , hypertension Hypertriglyceridemia , Low High Lypotension (HBL),Hyperuricemia , and increased levels of fibrogen that confer increased risk of cardiovascular disease and diabetes mellitus .

Metabolism has recently been prepared to play a part in breast carcinogens in number of interrelated hormonal pathways including these involving insulin, estrogens m cytokine and growth factors



Clinical and investigational evidences suggest that the increased risk of breast cancer is associated with greater abdominal visceral obesity may be related.

Diabetes ad cancer consensus report by Edward Giovannucci, MD, SCP, David M. Harlan, MD and Douglas Yee MD, states that Epidemiologic evidence suggest that people with diabetes are at significantly high risk for may cancers. Type2 Diabetes and cancer share many risk factors. But potential biologic links between the two diseases through observational studies suggests that some medications used to treat hyperglycemia are associated with either increased or reduced risks of cancer.

Both diabetes and cancer are prevalent disease whose incidence is increasing globally. In 2008 there were estimated 12.4 million new cancer cases diagnosed. The most commonly diagnoses cancers are Lungs/Broncho, breast and colon/rectum in men and added breast cancer in women. Of the world population between the ages of 20-79 years an estimated 205 people or 6.6a% have diabetes.

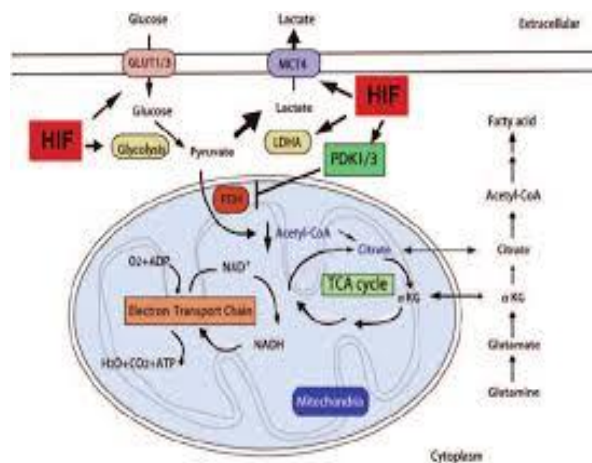
IN 2007, Diabetes prevalence in US 10.7 % pf population between the age of 20years and older with an estimated 1.6 million new cases every year. Type 2 diabetes is the most common of all accounting to 95%.

Worldwide cancer is the 2nd and diabetes is the 12th leading cause of death. Both diseases are complex and with multi subtypes.

Since Insulin is produced by pancreatic cells and then transported via the portal vein to the liver, both the liver and pancreas are exposed too high concentration of endogenously produced insulin. Diabetes related factors including, fatty liver disease and cirrhosis may enhance susceptibility to cancer.

With regard to pancreatic cancer interpretation of the causal nature of the association or complicated by the fact that abnormal glucose metabolism may be a consequence of pancreatic cancer so called “reverse causality “. However, the association between diabetes and pancreatic cancer risk has been found that precedes the diagnosis of pancreatic cancer by at least 5 years.

Result of some but not al epidemiological studies suggest that diabetes may significantly increase mortality in patients with cancer. For example, in one study 5year mortality rate were significantly higher (with a ratio of 1:39) against patients with diabetes.



Carcinogenesis is a complex process. Normal cells must undergo multiple genetic “list” before the full neoplastic phenomenon of growth invasion and metastasis occur. This process of malignant formation can be divided into multiple steps.

- Initiation: Irreversible first step towards Cancer
- Promotion: Stimulation of Growth of the initiated cells
- Progression: Development of a more aggressive Phenotype of promoted cells

Factors that affect one or more of the above steps of the pathway could be associated with cancer incidence or immortality.

Diabetes may influence the neoplastic process of several mechanisms including hyperinsulinemia (either endogenous due to insulin resistance or exogenous due to administered insulin or spectrologies) or hyperglycemia, chronic inflammation.

Apart from direct effects of insulin on cancer cells it is possible that hyperinsulinemia could promote carcinogenesis indirectly through its effect on IGF. It has been found in other cancers insulin receptors are frequently expressed by breast compared with the Ligand (insulin) hyper levels of insulin receptors have been associated with favorable breast cancer prognosis in some studies. While these findings may seem to be contradictory but they are consistent with hormone development pathway in Breast cancer.

But ER insulin receptors may be marker of breast cancer cells differentiation and identify breast cancer cells with a potentially less aggressive phenotype.

Since growth factors may downregulate the expression of their cognate receptors, it is possible that tumors with low insulin receptor levels are the most insulin stimulated cells.

There are biologically plausible models and correlative human clinical studies, suggest that insulin acting through insulin receptors might affect breast cancer risk and progression.

SITE SPECIFIC CANCER RISK IN DIABETES



Liver: Hepatic cellular carcinoma (HCC) is the 2nd frequent cause of death in men worldwide. Recently conducted studies indicated that diabetes mellitus is associated with significantly increased risk of HCC as compared to other subjects without diabetes.

Pancreas: Recent studies addressed diabetes as a risk factor for pancreatic cancer with independent of geographic locations, gender, alcohol consumption, BMI and smoking status.

Studies linked diabetes with modest increase in risk of colorectal cancer (CRC) the most common cancer of digestive system. Several studies show that increased levels of IGF-1, insulin and elevated HbA_{1c} (>7.5%) were all associated with “higher occurrence”.

It was suggested that slower bowel transit and constipation which are more common among diabetes may lead to prolonged exposure to colon mucosa and potential carcinogenesis.

OTHER ORGANS

Analysis of trials, evaluating risk of colon carcinoma (CC) in diabetic includes intra and extra hepatic locations. CC may be mediated by increased formation of biliary stones, a known risk factor for CC.

Diabetes is also associated with modest increase of esophageal carcinoma. Studies were included in the meta-analysis assessing kidney cancer risk in diabetes showed that risk of kidney cancer in diabetes were 1:42.

The association was stronger in women. Frequent comorbidities of diabetes such as hypertension and end stage renal disease (ESRD) may mediate its risk for kidney malignancy.

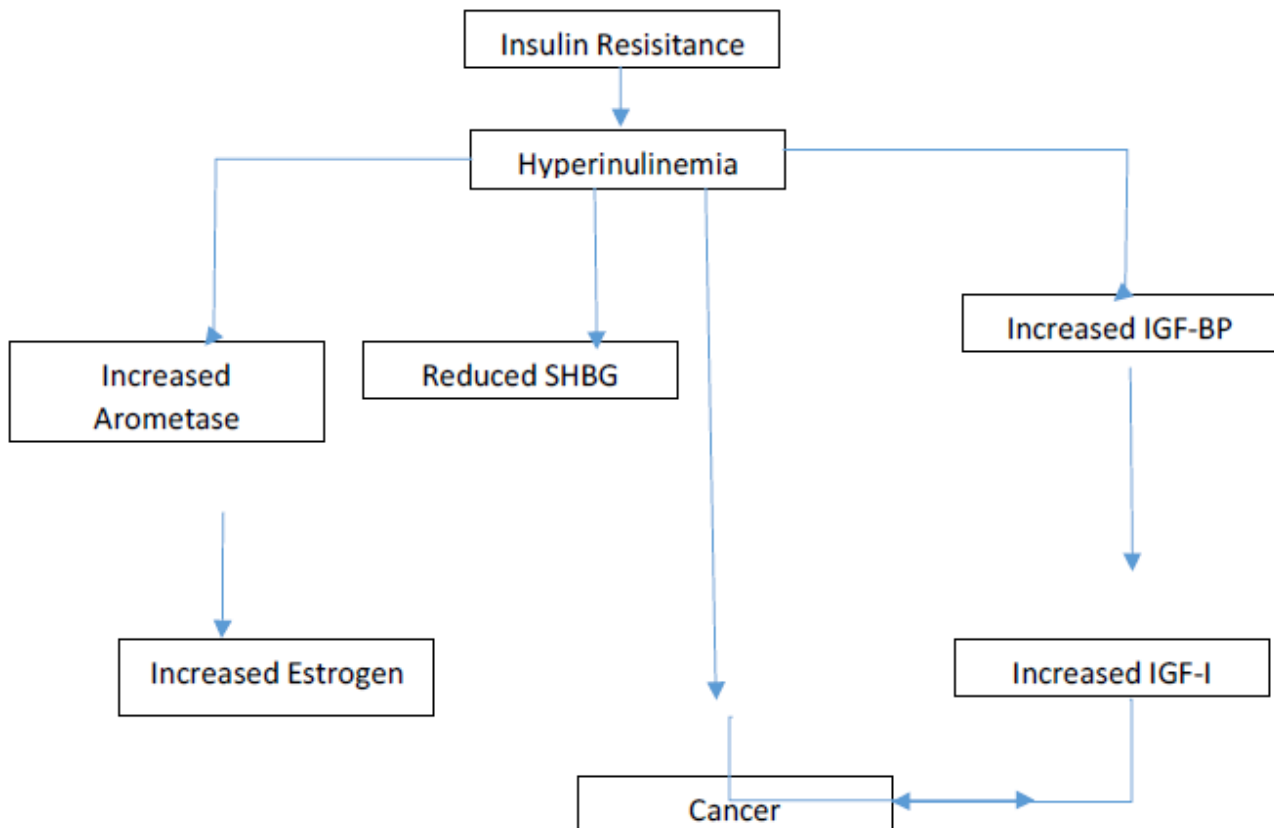
Moreover, recent association between chronic kidney disease (CKD) the lesser stage of CKD and cancer was established diabetes remain the most common cause of CKD 13.5 % and 25.4% of kidney cancer patients have diabetic conditions, considering a number of variables including ethnicity, age and severity of the disease, the timing of diagnosis, Risk of urinary tract infection is elevated in diabetic patients and is also linked to bladder cancer risk, Hematologic analysis is also seem to be somehow associated with diabetes, reported higher risk for non-Hodgkin Lymphoma, Lymphoma Leukemia and myeloid leukemia but not Hodgkin Lymphoma among diabetics.

The diagnosis of diabetes appears to increase mortality amongst patients with breast cancer. Hazardous for 5 years mortality amongst patient with diabetes was 1:39 compared to non-diabetic women with breast cancer.

Similar report in colorectal cancer with a 32% increase all-cause mortality. Meta-analysis suggest that diabetes is associated with an increased mortality compared with normoglycemic individuals across all cancers of the endometrium, breasts and colorectal.

There is evidence that poor glycaemia control can lead to poorer outcomes in cancer therapy.

In meta-analysis studies, pre-existing diabetes was associated with increased odds of postoperative mortality across all cancer types, when controlled compared with non-diabetic patients undergoing post-operative treatment for cancer.



The Possible Link between insulin resistance and Breast Cancer

HYPERGLYCEMIA PATIENTS WITH CANCER

Managing pre-existing or newly diagnosed diabetes in patients with cancer can be challenging. Many patients undergoing treatment are unwell with multiple co-morbidities, and are battling with significant side effects of their cancer therapy. Nevertheless, it appears to be important to manage hyperglycemia in patients with cancer, as poorer glycemic control appears to increase morbidity and mortality in patients with cancer. In vitro studies also show that hyperglycemia reduces efficacy of chemotherapy on breast cancer cells.

The cyclical nature of chemotherapy often needs a flexible approach to hyperglycemia management. There is little published data in this area, but in the authors' experience, use of intermittent oral or injectable hyperglycemic therapy is not infrequently required.

Careful self monitoring of glucose levels, close liaison with the diabetes clinical team and education of the patient to anticipate commencement or escalation of therapy during chemotherapy is helpful in managing such patients. Equally, withdrawal of frequent monitoring or hyperglycemic therapy in patients with advanced or incurable cancer undergoing palliative care can be challenging, although can come as a relief to patients and their families in later stages of life.

CONCLUSION-

Diabetes is a high-risk state for several diseases, with cancer now added to the list. In the context of globally exploding diabetes incidence, elucidating the diabetes and cancer association is an essential task.

Given the complexity of reciprocal interaction of patho physiological pathways under lying diabetes, risk of cancer may be increased by number of direct and in direct mechanisms.

Further mechanistic studies are warranted to establish biological pathways linking both diseases and thereafter formulate efficient clinical preventive strategies and public health policies to avoid overlapping burden of both diseases that already have tremendous impact on public health and economy.

Recently the American and European Diabetes and Oncology associations published a consensus report on diabetes and cancer. The present paper agreed that most observational evidence suggests a strong link between diabetes and breast, colorectal, endometrial, liver and pancreatic cancers, and that the likely pathogenesis of the link is due to hyperinsulinemia, hyperglycemia, inflammation and possibly diabetes therapies.

This review article concluded that metformin is likely to decrease and insulin likely to increase the risk of cancer in diabetic patients, although they suggested that cancer risk could not be a major factor currently in choosing between available therapies for diabetes.

Finally, this review paper suggested that significant research funding should be directed into this important area, as basic science research into the link may prove fruitful for treatment and prevention of both diabetes and related cancers.

REFERENCES-

1. Riste L, Khan F, Cruickshank K. High prevalence of type 2 diabetes in all ethnic groups, including Europeans in a British Inner City. Relative poverty, history, inactivity or 21st century Europe? *Diabetes Care* 2001; 24:1377–83.
2. 912 T.A. Chowdhury
3. Downloaded from <https://academic.oup.com/qjmed/article-abstract/103/12/905/1583680> by guest on 03 October 2019
4. Stumvoll M, Goldstein BJ, van Haeften TW. Type 2 diabetes: principles of pathogenesis and therapy. *Lancet* 2005; 365:1333–46.
5. Roglic G, Unwin N, Bennett PH, Mathers C, Tuomilehto J, Nag S, et al. The burden of mortality attributable to diabetes: realistic estimates for the year 2000. *Diabetes Care* 2005; 28:2130–5.
6. Wilson EB, Maher HC. Cancer and tuberculosis with some comments on cancer and other diseases. *Am J Cancer* 1932; 16:227–50.
7. Inoue M, Iwasaki M, Otani T, Sasazuki S, Noda M, Tsugane S. Diabetes mellitus and the risk of cancer: results from a large-scale population-based cohort study in Japan. *Arch Intern Med* 2006; 166:1871–7.
8. Jee SH, Ohrr H, Sull JW, Yun JE, Ji M, Samet JM. Fasting serum glucose level and cancer risk in Korean men and women. *JAMA* 2005; 293:194–202.
9. Stattin P, Björk O, Ferrari P, Lukanova A, Lenner P, Lindahl B, et al. Prospective study of hyperglycemia and cancer risk. *Diabetes Care* 2007; 30:561–7.
10. Rousseau MC, Parent ME, Pollak MN, Siemiatycki J. Diabetes mellitus and cancer risk in a population-based case-control study among men from Montreal, Canada. *Int. J Cancer* 2006; 118:2105–9.
11. Hemminki K, Li X, Sundquist J, Sundquist K. Risk of cancer following hospitalization for type 2 diabetes. *Oncologist* 2010; 15:548–55.
12. Wideroff L, Gridley G, Møller L, Chow WH, Linet M, Keehn S, et al. Cancer incidence in a population-based cohort of patients hospitalized with diabetes mellitus in Denmark. *J Natl Cancer Inst* 1997; 89:1360–5.
13. Atchison EA, Gridley G, Carreon JD, Leitzmann MF, McGlynn KA. Risk of cancer in a large cohort of U.S. veterans with diabetes. *Int J Cancer* 5 April 2010. [Epub ahead of print].
14. Coughlin SS, Calle EE, Teras LR, Petrelli J, Thun MJ. Diabetes mellitus as a predictor of cancer mortality in a large cohort of US adults. *Am J Epidemiol* 2004; 159:11607.
15. International Diabetes Federation (IDF)) 6th ed, Brussels, Belgium: IDF;2013
16. Article Information- *Indian J Med Res.*2014 Jul; 140(1): 15-18

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17. Indian Journal of Medical and Paediatric Oncology- Year- 2017 Volume- 38 Burhan Wani, Shiek Aejaaz Aziz Ashraf Ganaie, Mohammad Hussain Mir Department of Medical Oncology, Sher-i-Kashmir Institute of Medical Sciences, Srinagar, Jammu and Kashmir, India
 18. Arthur Riggs, Debbie Thurmond, Rama Natarajan, Wanek Project, cancer, diabetes, diabetes and cancer link
 19. <https://m.economictimes.com>- Scientist identify why people with diabetes are at higher risk of cancer 26 August 2019
 20. <https://care.diabetesjournals.org.com>- Diabetes Cancer/ Diabetic Care By E Giovannucci 2010 cited by 2019
 21. <https://healthline.com>- DNA Damage Is The Latest Theory On Why Diabetes Increase Cancer Risk 26 August 2019
 22. <https://www.medicalnewstoday.com>- Can Diabetic Influence Cancer's spread? 8 May 2019

PEROXIDASE AND ISOPEROXIDASE CHANGES IN RELATION TO GROWTH AND DIFFERENTIATION OF PSORALEA CORYLIFOLIA L. IN VITRO

Shiv Kumar Singh, **ItiShri Bhati, ***Rakhi Sarraf and *Raaz K. Maheshwari**

*and ***Maharishi Arvind University, Mundiaramsar, Jaipur, Rajasthan

**S.S. Jain Subodh P.G. Autonomous College, Jaipur, Rajasthan

****Department of Chemistry, SBRM Govt. College, Nagaur, Rajasthan

ABSTRACT

Peroxidases are widely distributed in plant tissues and are of immense importance as they are associated with numerous catalytic functions. Isoenzymes analysis in cultured tissues offers a reasonable and promising tool to understand the biochemical basis of differentiation in vitro. Induction of callus and shoot buds from leaf and stem segments of Psoralea corylifolia was achieved within 40 days of culture on Murashige and Skoog's (1962) medium supplemented with 3 mg/l (KN) and 0.5 mg/l (NAA) and 3% (w/v) sucrose. The maximum percentage of shoots was obtained when incubated in continuous light for 4 weeks before transfer to the rooting media. Peroxidase activity increased considerably during shoot buds initiation suggesting that peroxidase activity might be involved in shoot buds initiation of Psoralea corylifolia in vitro.

Keywords: In vitro, Tissue culture, endangered, Murashige and Skoog's.

INTRODUCTION

Psoralea corylifolia Linn (Fabaceae) is a rare and endangered herbaceous medicinal plant, distributed throughout the tropical and subtropical regions of the world (Jain, 1994). It is used as a laxative, aphrodisiac, anthelmintic, diuretic and diaphoretic in febrile conditions. It has been specially recommended for the treatment of leucoderma, leprosy, psoriasis and inflammatory diseases of the skin and prescribed both for oral administration and external application in the form of a paste or ointment (Anonymous, 1988). Pharmaceutical companies largely depend upon material procured from naturally occurring stands, but these are being depleted rapidly, raising concern about possible extinction and providing justification for development of in vitro propagation techniques for this species. Plant regeneration via meristem and callus culture of Psoralea corylifolia have been reported previously (Saxena et al., 1987, 1988). Peroxidases are widely distributed in plant tissues and are of immense importance as they are associated with numerous catalytic functions. Plant peroxidases are have containing monomeric glycoproteins involved in many processes plant growth and development (Rigueleme and Cordemil, 1993). Peroxidases may have significant role in regulation of cell and differentiation (Christensen et al., 1998) Plant peroxidases are among the most studied but least understood of all plant proteins (Gaspar et al., 1992 and Syros et al., 2004, 2005). Their universal nature and availability of many sensitive colorimeter assays have made peroxidases as convenient enzyme marker in genetic and physiological studies (Greppin et al., 1986; VanHuystee, 1987). Isoenzymes analysis in cultured tissues offers a reasonable and promising tool to understand the biochemical basis of differentiation in vitro (Soni and Swarnkar, 1998). Peroxidase isozymes are widely distributed among higher plants (Scandalios, 1974; Grison and Pilet, 1978 and Šimonovičová, 2004) and are frequently organ and / or tissue specific (Asins et al., 1982; Siegel, 1993 and Smith and Walker, 1996). Due to this characteristic, different organs from the some plant may show different peroxidase patterns. Another characteristic of isoperoxidase is the change of electrophoretic patterns in the same tissue or organ, depending upon age, developmental stage or environmental conditions during germination (Kruger and Laberge, 1974; Thorpe et al., 1978, Mäder and Füssl, 1982).

In the present communication, we report the change in the activities of peroxidase and isozyme pattern of peroxidases during growth and differentiation of shoot buds from callus obtained from leaf and stem explants of Psoralea corylifolia.

MATERIAL AND METHODS

Wide range of culture experiments were carried out and once a reproducible protocol for callus and shoot buds induction from leaf and stem explants had been developed, the changes in Peroxidase activity and isozyme patterns of peroxidases occurring during growth and differentiation under in vitro conditions were studied.

The changes were recorded after the inoculation of an explant on nutrient medium till callus and shoot buds induction. Cultures were raised from leaf and stem segments of Psoralea corylifolia on Murashige and Skoog's medium (1962) supplemented with different concentrations of Auxins and Cytokinins individually as well as in combinations. (Table 1 & 2, Fig. 3.1-3.6). All the culture were incubated

under fluorescent tubes in culture room maintained at 26 ± 2 OC. Changes in peroxidase activity and Isoperoxidases were studied from the day of inoculation Zero day till 40th day (the day of shoot buds induction) at a intervals of five days (Fig. 2.1-2.6).

Enzyme Assay: - Material was homogenized in 0.1 M phosphate buffer, PH 7.0, (10 ml of buffer g-1 fresh weight) in a pre-chilled mortar and pestle. The homogenate was centrifuged at $10,000 \times g$ for 20 min in high-speed refrigerated centrifuge KR 20000 T, KUBOTA; the supernatant was used for the enzyme assay and after further centrifugation at $20,000 \times g$ for 15 min for polyacrylamide gel electrophoresis. The peroxidase activity was assayed by guaiacol and hydrogen peroxide (Racusen and Foote, 1965). To a clean cuvette with 1.0 cm light path, 2.0 ml of 0.05 m phosphate buffer, pH 7.0,

1.0 ml of 1% guaiacol and 0.2 ml of enzyme extract was added and the absorbance was set zero at 470 nm, 0.2 ml of 0.3% hydrogen peroxide was quickly mixed to start the reaction and changes in absorbance were recorded for every 15 seconds up to 5 minutes. Increase in absorbance per unit time was calculated from the linear phase of enzyme velocity. Enzyme activity was calculated in terms of change of absorbance per sec per mg protein.

Electrophoresis:- Isozymes of peroxidase were separated by slab gel on polyacrylamide gel electrophoresis PAGE (Davis, 1964) Running Gel (10 %) and Stacking Gel (4.5%) were prepared and a vertical slab gel apparatus as described by Studier (1973), Desatronic 3000/200 power supply and Frigostat, West Germany were used in all electrophoretic work. Peroxidase bands were observed by immersing the gel in equal volume of 1.0 M acetate buffer, pH 4.8 and 1.0 percent guaiacol solution for half an hour. This solution was drained off and the gel transferred to 0.3% hydrogen peroxide solution until the appearance of brown bands (Siegel and Galston, 1967).

RESULTS

Peroxidase activity remained very low in both leaf and stems explants till shoot buds initiation occurred (Fig.1) Enhancement in the enzyme activity was noticed during initiation of shoot buds in both leaf and stem explants.

Isoperoxidases when separated on Polyacrylamide gel electrophoresis showed a varied pattern. Eighteen isoperoxidases were detected throughout the culture period of *Psoralea corylifolia* (Fig. 2.1- 2.6). The number of isozymes was low during the early days of culture. This increased with the culture age. Isozyme I exhibited high intensity during initial days of culture and was present throughout the culture period (Fig. 2.1 & 2.2). Isozyme II appeared newly during shoot buds initiation in both the explants and persisted till shoot bud proliferation stage (Fig. 2.5 & 2.6). Isozyme III showed its appearance during callus formation and callus proliferation stage (15-25 DAI). Isozymes V, VII, VIII, X were absent during earlier days of inoculation in both leaf and stem explants except on day Zero, on which isozyme VIII was present (Fig. 2.1 & 2.2). Isozyme XI disappeared on day 15 and continued its disappearance till last day of culture (Fig. 2.3-2.6). Isozyme XI showed high intensity in leaf explants at day 5 & 10 (Fig. 2.1 & 2.2). Isozymes XII, XIII, XIV, XV and XVI were absent in both leaf and stem explants during early days of culture (Fig. 2.1 & 2.2). Isozyme XVII appeared only during callus initiation in both leaf and stem explants (Fig. 2.1 & 2.2). While Isozyme XVIII was present only during first ten days of culture (Fig. 2.1 & 2.2).

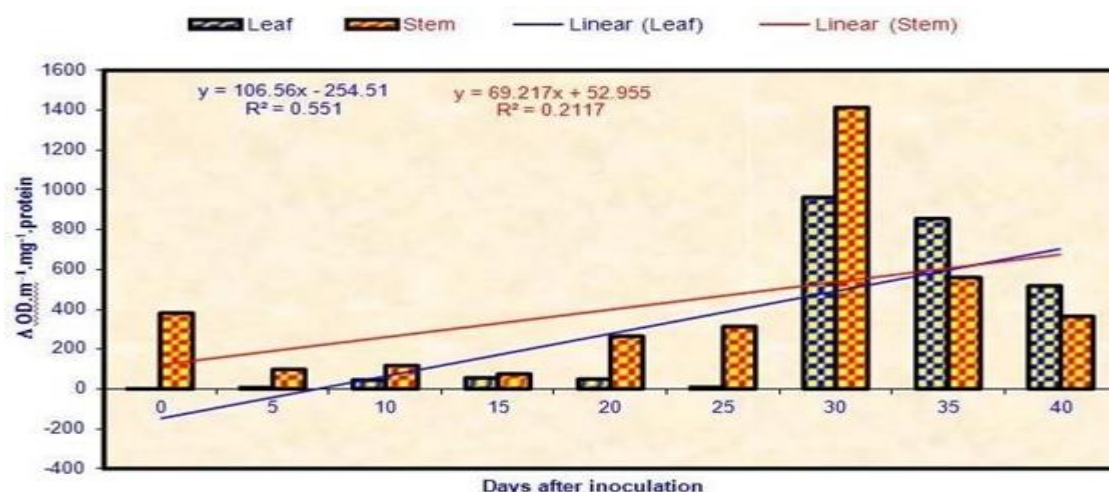


Figure-1: Peroxidase activity in leaf and stem cultures of *Psoralea corylifolia* at different days (0-40) after inoculation.

DISCUSSION

A significant increase in peroxidase activity was observed during initiation of shoot buds in leaf and stem explants of *Psoralea corylifolia* suggesting that peroxidase might be involved in shoot bud initiation. Although increase in peroxidase activity prior to shoot bud formation has also been observed in callus cultures (Thorpe and Gaspar, 1978 Hatzilazarou et al., 2006), epidermal explants of tobacco (Thorpe et al., 1978) and cotyledon explant of *Pinus radiata* (Patel and Thorpe, 1984). The rise in specific activity of peroxidase despite the low soluble protein content in shoot buds forming calli of *Psoralea corylifolia* indicates the involvement of the enzyme in the process of organogenesis. These results were in accordance to Gaspar et al., 1985, 1992.

The isozyme patterns of the leaf and stem explants of the plant studied here was not similar. This was supported by the view that different organs from the same plant may show different peroxidase patterns as for instance, the leaves and roots of *Citrus* (Button et al., 1976; Essen and Sost, 1976), endosperm, leaf, root and coleoptile of *Zea Mays* (Hamill and Brewbaker, 1969) different organs of *Lycopersicon esculentum* (Evans and Albridge, 1965) and stem and root of *Solanum surattense* (Swarnkar et al., 1986) *Solanum nigrum* (Hassanein, 1999).

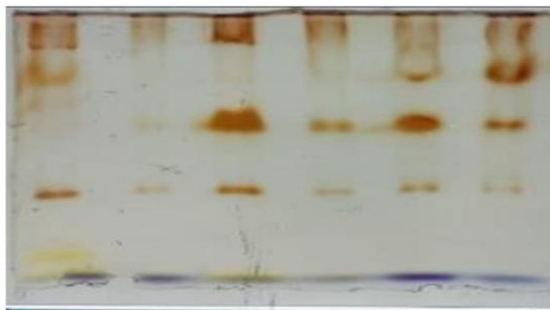


Fig. 2.1. Isoperoxidases in leaf and stem cultures of *P. corylifolia* at 0,5 and 10 days after inoculation.

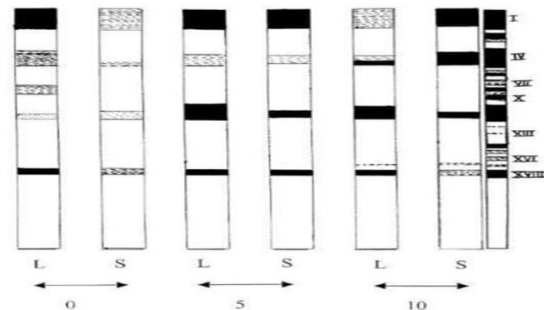


Fig. 2.2. Zymograms representing isozymic variations in leaf and stem cultures of *P. corylifolia* at 0,5 and 10 days after inoculation.



Fig. 2.3 Isoperoxidases in leaf and stem cultures of *P. corylifolia* at 15,20 and 25 days after inoculation.

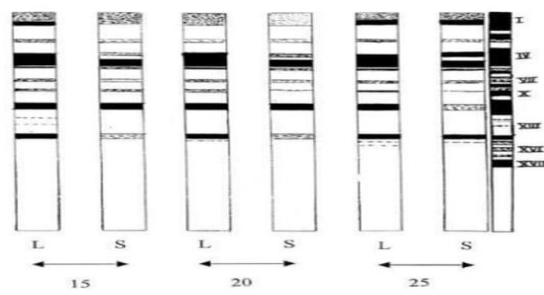


Fig. 2.4. Zymograms representing isozymic variations in leaf and stem cultures of *P. corylifolia* at 15,20 and 25 days after inoculation.

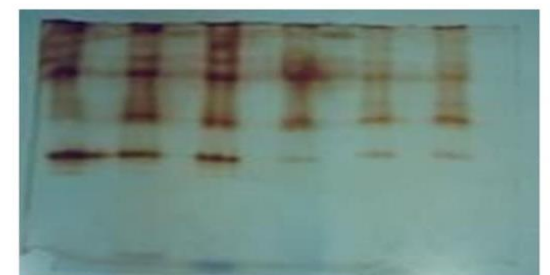


Fig. 2.5. Isoperoxidases in leaf and stem cultures of *P. corylifolia* at 30,35 and 40 days after inoculation.

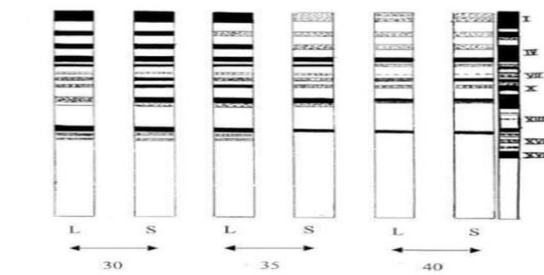


Fig. 2.6 Zymograms representing isozymic variations in leaf and stem cultures of *P. corylifolia* at 30,35 and 40 days after inoculation.

Figure-2.1-2.6. Showing Isoperoxidases and Zymograms of leaf and stem cultures of *Psoralea corylifolia* at different days after inoculation.

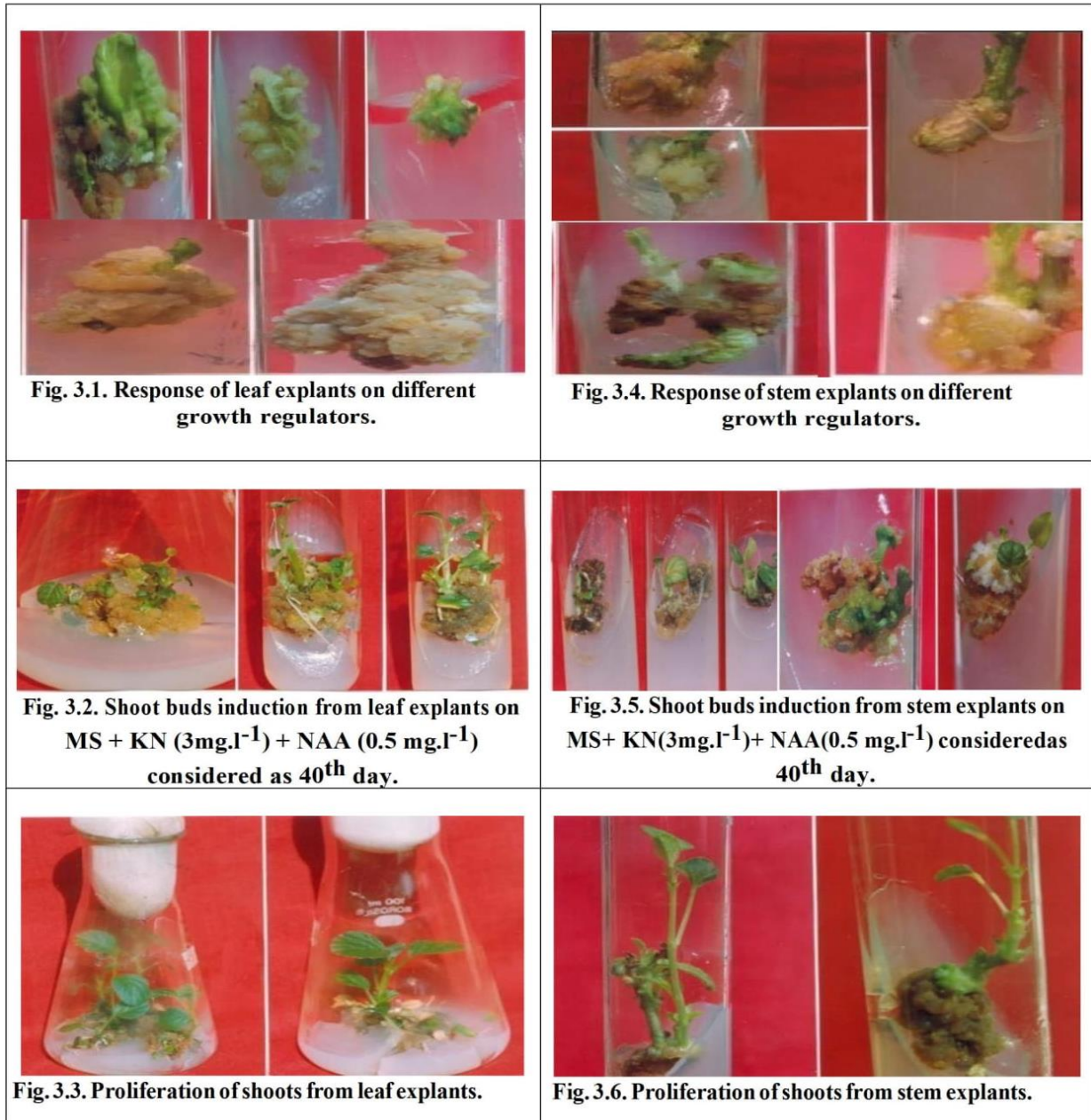


Figure-3.1-3.6. Response of leaf and stem explants of *Psoralea corylifolia* on different concentrations of Auxins and Cytokinins individually as well as in combination being mentioned in Table 1&2 using MS basal medium.

Table-1: Effect of plant growth regulators (PGR) on leaf explants of *Psoralea corylifolia* under in vitro conditions.

S. No.	PGR in MS medium	Callus Induction			Organogenesis			
		Colour	DAI	Callus Amount	Caulogenesis		Rhizogenesis	
					Direct	Indirect	Direct	Indirect
1.	IAA (2 mg.l ⁻¹)	Cottony White	19	C ⁺⁺	-	-	-	-
2.	IBA (2mg.l ⁻¹)	Creamish	21	C ⁺⁺	-	-	-	-
3.	2,4-D (2mg.l ⁻¹)	Whitish brown	16	C ⁺⁺⁺	-	-	-	-
4.	NAA (2mg.l ⁻¹)	Brown	7	C ⁺	-	-	-	+++
5.	Kn (2mg.l ⁻¹)	Light brown	9	C ⁺⁺⁺	-	-	-	-

6.	BAP (2mg.l ⁻¹)	Greenish white	9	C ⁺⁺	-	-	-	-
7.	BAP (2mg.l ⁻¹) + 2, 4-D (0.5 mg. l ⁻¹)	White	9	C ⁺	-	+	-	-
8.	Kn (1MG.l ⁻¹) + NAA (0.5mg.l ⁻¹)	Yellow	10	C ⁺⁺⁺	-	+	-	-
9.	Kn (2 mg.l ⁻¹) + NAA (0.5mg.l ⁻¹)	Yellow	9	C ⁺⁺⁺	-	++	-	+
10.	Kn (3mg.l ⁻¹) + NAA (0.5mg.l ⁻¹)	Yellow	11	C ⁺⁺⁺	-	+++	-	+

+ Poor ++ Moderate +++ Best

Transient and specific isoperoxidases have been reported by Swarnkar (1985) during callus initiation in stem segments of *Solanum surattense*. Isozyme XVIII appearing only during callus initiation in both leaf and stem segment of *Psoralea corylifolia* can be considered as marker for callus initiation. Similarly new isozymes appeared during callus induction of *Phaseolus vulgaris* (Arnison and Boll, 1974) and *Sinapsis alba* (Bajaj et al., 1973) tobacco (Faivre-Rampant et al., 1998) and during rooting in *Nothofagus nervosa* and *Nothofagus antarctica*. (Calderón-Baltierra et al., 1998) and *Petunia hybrida* (Kotis et al., 2009). Though it is not possible to attribute any specific role to these new isozymes, yet it can be said that the new transient and persistent forms might be responsible for induction of callus.

The conflicting role of peroxidase in organogenesis is probably due to the occurrence of this enzyme in multi molecular forms. As isozyme II which appeared newly during shoot bud initiation from callus of both the explant, can be considered as marker for shoot bud initiation. Similar isoperoxidases have been used as biochemical markers in leaf and root morphogenesis in barley. (Moncousin and Gaspar, 1983; Coppens and Dewitte, 1990 and Rout et al., 2000). The present investigation has also envisaged that changes in peroxidase activity and Isoperoxidase could be used as biochemical markers to understand the growth and differentiation under in vitro conditions.

Table-2: Effect of plant growth regulators (PGR) on stem explants of *Psoralea corylifolia* under in vitro conditions.

S. No.	PGR in MS medium	Callus Induction			Organogenesis			
		Colour	DAI	Callus amount	Caulogenesis		Rhizogenesis	
					Direct	Indirect	Direct	Indirect
1	IAA (2 mg.l ⁻¹)	Light yellow	9	C ⁺⁺	-	-	-	-
2.	IBA (2mg.l ⁻¹)	White	11	C ⁺⁺	-	-	-	-
3.	NAA (2 mg.l ⁻¹)	-	-	-	-	-	++	-
4	2,4-D (2 mg.l ⁻¹)	White	14	C ⁺	-	-	-	-
5.	Kn (2 mg.l ⁻¹)	Brown	13	C ⁺	-	+	-	-
6	BAP (2 mg.l ⁻¹)	Brown	8	C ⁺	+	-	-	-
7.	BAP (2 mg.l ⁻¹) + 2,4-D (0.5 mg.l ⁻¹)	Pale yellow	13	C ⁺⁺	-	+	+	-
8.	Kn (2 mg.l ⁻¹) + 2,4-D (0.5 mg.l ⁻¹)	Light brown	11	C ⁺	-	+	+	-
9.	BAP (1 mg.l ⁻¹) + NAA (0.5 mg.l ⁻¹)	Dark brown	24	C ⁺⁺	-	+	-	-

10.	BAP (2 mg.l ⁻¹) + NAA (0.5 mg.l ⁻¹)	Dark brown	19	C ⁺	-	++	-	-
11.	BAP (3 mg.l ⁻¹) + NAA (0.5 mg.l ⁻¹)	Dark brown	17	C ⁺	-	++	-	-
12.	Kn (1 mg.l ⁻¹) + NAA (0.5 mg.l ⁻¹)	Brown	15	C ⁺⁺⁺	-	+	-	-
13.	Kn (2 mg.l ⁻¹) + NAA (0.5 mg.l ⁻¹)	Whitish brown	14	C ⁺⁺⁺	-	+	-	-
14.	Kn (3 mg.l ⁻¹) + NAA (0.5 mg.l ⁻¹)	Light brown	13	C ⁺⁺	-	+++	-	-
15.	Kn (4 mg.l ⁻¹) + NAA (0.5 mg.l ⁻¹)	Light brown	15	C ⁺⁺⁺	-	++	-	-

+ Poor ++ Moderate +++ Best

REFERENCES

- Anonymous (1988). The Wealth of India: A Dictionary of Indian Raw Materials and Industrial Products, Vol.II, CSIR, New Delhi, India. pp. 116–118.
- Arnison, P.G. and Boll, W.G. (1974). Isoenzyme in cell cultures of bush bean (*Phaseolus vulgaris*) Isoenzymatic changes during the callus culture cycle and differences between stock cultures. Canadian Journal of Botany, 52: 2621-2629.
- Asins, M. J. Benito, C. and Porezde-la-vega, M. (1982). Changes and chromosomal location of peroxidase isozyme during hexaploid wheat kernel maturation. Z. Pflanzen Zuchtg. 89: 235- 241.
- Bajaj, Y.P.S., Bopp, M. and Bajaj, S. (1973). Pattern of Peroxidases and differentiation in *Sinapis alba*. Phytomorphology 23:43-52.
- Button, J., Vardi, A. and Spiegel, P.R. (1976). Rootperoxidase isozymes asanaid in culturebreeding and taxonomy. Theory of Applied Genetics 47: 119-123.
- Calderón-Baltierra, X., Martínez-Pastur, G.M., Jofre, M.P. and Arena, M.E. (1998). Activity variation of peroxidase during in vitro rooting of *Nothofagus nervosa* and *Nothofagus antarctica*. Phyton 62: 137–144.
- Christensen, J., Bauw, G., Welinder, K., Montagu, M. and Boerjan, W. (1998). Purification and characterization of peroxidases correlated with lignification in poplar xylem. Plant Physiol. 118: 125–135.
- Coppens, L. and Dewitte, D. (1990). Esterases and peroxidase Zymograms from barley(*Hordeum vulgare* L.) callus as a biochemical marker system of embryogenesis and Morphogenesis. Plant Science. 67:97-105.
- Davis, B.J. (1964). Disc electrophoresis.II. Methods and application to human serum proteins. Ann. N.Y. Acad. Sci. 121: 404-427.
- Essen, A. and Sost, R.K. (1976). Peroxidase polymorphism in Citrus. Journal of Hereditary 67:199-203
- Evans, J.J. and Albridge, N.A. 1965 The distribution of peroxidase in extreme dwarf and normal tomato (*Lycopersicon esculentum*). Phytochemistry 4: 499-503.
- Faivre-Rampant, O., Kevers, C., Bellini, C. and Gaspar, T. (1998). Peroxidase activity, ethylene production, lignification and growth limitation in shoots of a non-rooting mutant of tobacco. Plant Physiol. Biochem. 36: 873–877.
- Gaspar, T., Kevers, C., Hausman, J.F., Berthon, J.Y. and Ripetti, V. (1992). Practical use of peroxidase activity as a predictive marker of rooting performance of micropropagated shoots. — Agronomie 12: 757–765.

-
- Gaspar, T., Penel, C., Castillo, F. and Greppin, H. (1985). A two-step control of basic and acidic peroxidases and its significance for growth and development. — *Physiol. Plant.* 64: 418–423.
 - Greppin, H., Penel, L. and Gaspar, T. (1986). Molecular and physiological aspects of plant peroxidases (Geneva, Switzerland: University of Geneva).
 - Grison, R. and Pilet, P.E. (1978). Analyse critique des peroxydases de la racine de maïs. *Plant Science letters.* 13: 213-218.
 - Hamill, A.E. and Brewbaker, J.L. (1969). Isozyme polymorphism in flowering plants IV. The peroxidase isozyme of maize (*Zea mays*). *Physiology Plantarum* 22: 945-958.
 - Hassanein, A.M., Ahmed, A.M., Abed-el-Hafez, A.I. and Soltan, D.M. (1999). Isozyme expression during root and shoot formation in *Solanum nigrum*. — *Biol. Plant.* 42: 341–347.
 - Hatzilazarou, S.P., Syros, T.D., Yupsanis, T.A., Bosabalidis, A.M. and Economou, A.S. (2006). Peroxidases, lignin and anatomy during in vitro and ex vitro rooting of gardenia (*Gardenia jasminoides* Ellis) microshoots. — *J. Plant Physiol.* 163: 827–836.
 - Jain, S.K. (1994). Ethnobotany and research in medicinal plants in India. *Ethnobotanical Search New Drugs* 185: 153–168.
 - Kotis, M. Yupsanis, T. A., Syros, T. D. and Economou, A. S. (2009). Peroxidase, acid phosphatase, RNase and DNase activity and isoform patterns during in vitro rooting of *Petunia × hybrida* microshoots, *Biologia Plantarum* 53:530-534.
 - Kruger, J.E. and Labarge, D.E. (1974). Changes in peroxidase activity and peroxidase isozyme patterns during kernel growth and maturation. *Cereal Chemistry* 51:345-354.
 - Mäder, M. and Füssli, R. (1982). Role of peroxidase in lignification of tobacco cells. II. Regulation by phenolic compounds. — *Plant Physiol.* 70: 1132–1134.
 - Moncousin, C. and Gaspar, T. (1983). Peroxidase as a marker of rooting improvement of *Cynara scolymus* L. cultured in vitro. — *Biochem. Physiol. Pflanzen* 178: 263–271.
 - Murashige, T. and Skoog, F. (1962). A revised medium for rapid growth and bioassays with tobacco tissue cultures. — *Physiol. Plant.* 15: 473–479.
 - Patel, K.R. and Thorpe, T.A. (1984). Histochemical examination of shoot initiation in culture cotyledon explants of *Radiata* pine. *Botanical Gazzete* 145: 312-322.
 - Racusen, D. and Foote, M. (1965). Protein synthesis grown bean leaves. *Canadian Journal of Botany.* 43: 817-824.
 - Rigueule, A. and Cardemil, L. (1993). Peroxidase in the cell wall of seeds and seedlings of *Araucaria araucana*. *Phytomorphology.* 32: 15-20.
 - Rout, G.R., Samantaray, S. and Das, P. (2000). In vitro rooting of *Psoralea corylifolia* Linn: peroxidase activity as a marker. — *Plant Growth Regul.* 305: 215– 219.
 - Saxena, C., Palai, S.K., Samantaray, S., Rout, G.R. and Das, P. (1997). Plant regeneration from callus cultures of *Psoralea corylifolia* Linn. *Plant Growth Regul* 22: 13–17.
 - Saxena, C., Rout, G.R. and Das, P. (1998). Micropropagation of *Psoralea corylifolia*. *Jour. Medicinal and Aromatic Plant Sci.* 20: 15–18.
 - Scandalios, J.G. (1974). Isoenzymes in development and differentiation. *Annual. Review of Plant Physiology.* 25: 252-258.
 - Siegel, B.Z. (1993). Plant peroxidases — An organismic perspective. — *Plant Growth Regul.* 12: 303–312.
 - Siegel, B.Z. and Galston, A.W. (1967). The Isoperoxidases of *Pisum sativum*. *Plant Physiology.* 42:221-226.
 - Šimonovičová, M., Huttová, J., Mistrik, I., Šíroká, B. and Tamás, L. (2004). Peroxidase mediated hydrogen peroxide production in barley roots grown under salt stress conditions. — *Plant Growth Regul.* 44: 267–275.
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- Smith, R.D. and Walker, J.C. (1996). Plant protein phosphatases. — *Annu. Rev. Plant Physiol. Plant mol. Biol.* 47: 101–125.
- Soni, J. and Swarnkar, P.L. (1998). Organ specific peroxidases in *Vigna aconitifolia* under stress condition. *Indian J. Plant Physiology.* 3(4): 296-299.
- Studier, F.W. (1973). Analysis of bacteriophage T7 early RNAs and proteins on slab gels. *Journal of Molecular Biology.* 79: 237-249.
- Swarnkar, P.L. (1985). Biochemical studies on morphogenesis and differentiation in tissue cultures. Ph.D. Thesis, University of Rajasthan, Jaipur.
- Swarnkar, P.L., Bohra, S.P. and Chandra, N. (1986). Biochemical changes during growth and differentiation of the callus of *Solanum Surattense*. *Journal of Plant Physiology* 126: 75-81.
- Syros, T.D., Yupsanis, T.A., Zafiriadis, H. and Economou, A.S. (2004). Activity and isoforms of peroxidases, lignin and anatomy, during adventitious rooting in cuttings of *Ebenus cretica* L. — *J. Plant Physiol.* 161: 69–77.
- Syros, T.D., Yupsanis, T.A. and Economou, A.S. (2005). Expression of peroxidases during seedling growth in *Ebenus cretica* L. as affected by light and temperature treatments. — *Plant Growth Regul.* 46: 143–151.
- Thorpe. T.A., Tran Thanh Van, M. and Gaspar, T. (1978). Isoperoxidases in epidermal layers of tobacco and changes during organ formation in vitro. *Physiology. Plant.* 44:388-394.
- Thorpe. T.A. and Gaspar, T. (1978). Changes in isoperoxidases during shoot formation in tobacco callus. *In Vitro* 14: 522-526.
- Van Huystee, R.B. (1987). Some molecular aspects of plant peroxidase biosynthetic studies. *Annual. Review of Plant Physiology.* 38: 205-217.

PERFORMANCE APPRAISAL OF EMPLOYEES (A CASE STUDY OF EMPLOYEES IN APSFC)**S. Salomi**

Research Scholar, Dravidian University, Kuppam, A.P.

ABSTRACT

The appraisal is a ceaseless procedure and done every year as a formal exercise before a finish of the money related year. Appraisal in APSFC has the enormous motivational effect on individuals through significant input and is an intense instrument for acknowledgment. This undertaking clarifies performance appraisal system and tries to discover how productively Performance Appraisal is led Performance Appraisal assumes an essential part in the improvement of a great job and hierarchical states of mind and upgrades inspiration to build performance. Of all the appraisal In APSFC responses, the fulfillment of performance appraisal system has been the most every now and again considered. Despite the fact that performance appraisal has numerous useful uses to the association, there is by all accounts a negative state of mind and significant disappointment with the appraisal systems from the two employees and directors Worker performance assessment is intended to evaluate every individual's commitment to the association. The essential targets of performance assessments are two-crease: right off the bat to remunerate employees for meeting authoritative destinations and also to distinguish which goals are not met and to create activity intends to guarantee they are accomplished in future. Final the calculated value of X_2 (11.9704) is greater than the critical (tabulated) value of X_2 (5.99), we therefore reject the null hypotheses (H_0) and it is conclude that there is there is positive impact of performance appraisal on employees of APSFC.

Keywords: Performance Appraisal, APSFC, Appraisal Methods

INTRODUCTION

The procedure by which a manager or specialist (1) looks at and assesses a representative's work conduct by contrasting it and preset measures, (2) archives the consequences of the examination, and (3) utilizes the outcomes to give input to the worker to indicate where enhancements are required and why. Performance appraisals are utilized to figure out who needs what training, and will's identity advanced, downgraded, held, or let go.

Performance appraisals, otherwise called performance reviews and employee appraisals are forms intended to assess and enhance job performance. They shape some portion of profession improvement, especially when future training needs are considered amid the procedure. Employee performance appraisal In APSFC has been polished by various associations since hundreds of years. In spite of the fact that performance appraisal system has been discussed by some, be that as it may, generally speaking, it is seen that performance appraisal is an spite of the fact that performance appraisal system has been discussed by some, be that as it may, generally speaking, it is seen that performance appraisal is an indistinguishable piece of hierarchical life. a few reasons that formal performance appraisals are to remain in associations.

As indicated by them, formal appraisals are required to legitimize an extensive variety of human asset choices, for example, salary increases, promotions, demotions, terminations, and so forth. It is likewise required to decide employees' preparation require. The creators referred to a current report on elite associations that the act of performance appraisal was referred to as one of the best 10 vehicles creating competitive advantage. Be that as it may, adequate alert ought to be seen in actualizing appraisal system. Inadequate appraisal system can bring numerous issues including low resolve, diminished worker profitability, a decreasing of a representative's energy and support for the association. These are appropriately conveyed to all employees. They are legitimately guided and 87 prepared at work for giving better performance. At whatever point they confront issues at work they are helped by their supervisors and managers. Further, it winds up plainly important to gauge their performance amid the year. When it is estimated it can be overseen likewise legitimately. The administrator should direct performance appraisal in mid and end of the year. The quality, amount, cost engaged with generation, level of inclusion appeared, capabilities uncovered, activities taken for issue arrangement and authority quality appeared in controlling or helping the others and issues looked amid the work. All these are to be estimated.



Figure-1: Performance Appraisal Measures of Performance Appraisal

There are numerous approaches to assess performance In APSFC When all is said in done, performance information can be classified into two gatherings: subjective or judgmental measures and objective or non-judgmental measures. Albeit subjective or judgmental measures are all the more generally utilized, target performance files (e.g. creation yield and time to finish an undertaking) have been helpful measures of performance for have gotten reestablished consideration in the course of the most recent 30 years. Both goal and subjective measures of performance have likewise been utilized as a part of investigations of the 53 determinants of performance out in the public division associations.

1. Objective and Subjective Measures

Target measures are commonly viewed as "the ideal markers of open segment performance since they are accepted to mirror the 'genuine' world precisely and limit circumspection". A target measure ought to accordingly be unbiased, autonomous and disconnected from the unit of investigation.

2. Team-based Measures

Experimental research on factors impacting team performance is huge. Also, group based measures as the level of investigation of performance evaluation

3. Rewards and Pay-for-Performance

A system of performance administration won't prevail with regards to realizing superior against goals unless employees deliberately act in courses seen as being well on the way to accomplish the targets. Anticipation hypothesis determines the need to attach performance results to rewards which are esteemed by employees. As pointed out before, anticipation hypothesis distinguishes three instruments that businesses should use in mix to expand a representative's inspiration: (I) expanding the subjective desires that more noteworthy exertion will prompt higher amounts of performance (hope E), (ii) reinforcing the apparent connection amongst performance and prizes (instrumentality I), and (iii) guaranteeing that employees esteem the prizes given for elite (valence-V).

Methods of Performance Appraisal of Employees

Various Indian associations still incline toward traditional appraisal technique rather than the modern approaches

Table-1: Employer Rating Scale

TRADITIONAL METHOD	MODERN METHOD
Ranking method	Management By Objectives (MBO)
Graphic rating scales	Behaviourally Anchored rating Scales (BARS)
Critical incident method	Human Resource Accounting
Narrative essays	Assessment Centers
Check list method	360 Degree
Forced distribution method	720 Degree
Confidential report system	

1. Graphic rating scale which rates employees in view of a rating scale that rundown various qualities and a scope of performance that ought to be refined by the people.
2. Ranking technique rank employees from the best to the most noticeably awful in view of specific characteristics or criteria. This is one of the most established means of appraisal which rank employees from performing. This technique is reasonable to compensate a little gathering representative normally organizations offering protection or marketing at multilevel (MLM).
3. Check list technique depends on a progression of articulation that contains an incentive in relationship to their significance. The better is asked than select "yes" or "no" on every announcement. Once the check list is finished, it is send to the HRD to set up the last scores of the appraisal
4. Force distribution technique is an extremely old strategy that is broadly utilized by huge organization in India, for example, Infosys, ICICI Bank, Aditya Birla Group. As indicated by Indian circumstances, 75 per cent to 80 per cent organizations in India utilize this chime bend melded PA system to rank their employees into three classifications which is brilliant, great and poor in a constrained dispersion arrange. Top positioned employees are viewed as "high potential" and regularly held by the administration for quick vocation and authority improvement programs.
5. Essay appraisal strategy or known as story paper is a "free form technique" referred to ordinarily utilize for proficient positions in Indian associations. The better is required than give in composing an educated and

legitimate record of the worker's quality, shortcoming, possibilities which frequently incorporates cases and confirmations to help the assessment procedure.

6. Critical Incidents Method created by Flanagan and Burns requires recognizing basic job necessities which are imperative for the achievement of a job. This basic episode speaks to the extraordinary (positive) or poor (negative) conduct of employees on the occupation. For example, for client benefit work force the accompanying occurrences could be identified:
8. BARS (Behaviourally based scales) is a cutting edge appraisal instrument that grapples a numerical rating scale with particular cases of good or poor performance. The PA procedure in APSFC itself ought to be precisely planned by coordinating associations target and objectives since it is too utilized as methods for giving input to additionally propel and expand the performance of the employees to accomplish the normal outcomes. The worker's inspiration and engagement has been a noteworthy concern and there are numerous explorations do on this part. As far back as globalization and exchange receptiveness, India has urged outside IT firms to wander into Indian economy and in the meantime has permit to certain degree have nation social impacts in Indian economy.

Procedure in Performance Appraisal in APSFC

- Identify the particular performance appraisal objectives
- Establish job expectations (job examination)
- Examine work performed
- Appraise performance
- Discuss appraisal with employee

REVIEW OF LITERATURE

Roberts (2003)¹ has featured the significance of employee contribution in the appraisal procedure. In his article, he has compressed the reasonable establishment of support including its inborn motivational esteem, the extension of accessible data, and the chance to add employee voice. He contends that if employees are positive about the decency of the appraisal procedure, they will probably acknowledge performance evaluations, even unfriendly ones, on the off chance that they see reasonable basic leadership process. Regardless, if the employees see the procedure as out of line improbable that they will acknowledge the result of the appraisal works out.

Suwignjo et al. (2000)² have created Quantitative Models for Performance

Measurement Systems (QMPMS), a model for estimating performance as for a factor. The model uses subjective maps and scientific chain of command procedure to recognize factors influencing performance and their connections, measure the impact of the elements on performance, and express them quantitatively. Be that as it may, the model has the impediment to be utilized as an assessment device.

Meyer (1995) depicts the employee assessment method received by a nursing home. The criteria considered are: employee's job demeanor, relational abilities, and clinical aptitudes. The evaluators utilized the scoring key for every model: Excellent = 4, Good = 3, Fair = 2 and Poor = 1. Be that as it may, the creator did not expand on how the evaluations on different criteria were blended and changed over into a rate score.

McCarthy (2000)³ this is required to determine employees' general complaint "Our appraisal procedure does not consider any evaluation I might at any rate want to share my contemplations on what I have achieved and where I may move forward" Self-assessment gives employees a chance to systematically survey their performance. Studies have shown that self-assessment expands employees' apparent reasonableness on the appraisal procedure. Employees can assess themselves by finishing their own appraisal shape and showing the draft for dialog with the evaluator. Remarks that employees who have a chance to survey their own performance regularly think of inventive arrangements that would not have surfaced in the uneven administrative assessment Pam Perry, VP of HR for CB Richard Ellis says

Bart, et al. (2001)⁴ followed the linkage between hierarchical mission and monetary performance and distinguished that how much an association adjusts its inside structure, approaches and methodology with its main goal relates emphatically with employee conduct, which, thusly, has the most direct relationship with organizational performance.

Robertson and Stewart (2006)⁵ found that administrators giving both tenable and exact input were seen as more procedurally and educationally reasonable. They likewise found an enhanced positive connection amongst reasonableness and inspiration, in a roundabout way connecting decency and performance. Ittner, et al. (2003)⁶ examined how subjective performance measures were utilized as a part of a main universal financial services supplier. They found that leaving space for subjectivity enabled managers to disregard numerous performance measures, and here and now budgetary measures frequently turn into the accepted determinants of bonus awards.

Piggot-Irvine (2003)⁷ characterized key highlights of viable appraisal drawing from the discoveries of her 3 focalizing and broad investigations. In any case, these three looks into were unmistakable from each other and they were done from 1996 to 2001. As indicated by Piggot Irvine's terms, viability alludes to when performance appraisal associations are non-controlling, non-protective, supportive, educative but classified. Powerful appraisal, in this manner, is bolstered by a relationship of regard and has come about straightforwardly connected to enhanced work performance. Additionally, data of appraisals process ought to be clear, objective, and have high honesty and extreme objective of profound improvement.

Saunders et al (2009)⁸ contended that the information assembled by such system has a tendency to be not as wide-ranging as those accumulated by different kinds of techniques. Be that as it may, the analyst still trusts that the information gathered by her self-controlled questionnaire can create exact and more engaged.

Denisi and Pritchard (2006)⁹ proposed that 'a definitive objective of performance appraisal ought to be to give data that will best empower administrators to enhance employee performance'. In any case, administrators will never have the capacity to satisfy this objective without an investment of employee. At the point when the system isn't serving their advantage, employees are probably not going to take part in the process genuinely and completely. Brown colored et al (2010) contended that if an employee's past encounters with a performance audit process have been of a low quality, it might adversely influence the ability of the employee to completely participate in a resulting PA cycle.

OBJECTIVES OF THE STUDY

- To study the established performance standards.
- To evaluate & understand the level of performance achieved through communication standards
- To measure & compare actual performance with standards.
- To analyze the problems related with performance appraisal & offer suggestions.

Research Hypothesis

The main purpose of this research is to determine the impact of Performance Appraisal on employment generation in APSFC. Therefore the following hypotheses are tested in this study using 5% level of significance:

H₀₁: There is no significant impact of Performance Appraisal on employments of APSFC.

RESEARCH METHODOLOGY

Research approach

The researcher chose to embrace deductive way to deal with this examination. For the reasons that are the research expects that there is precise measure of concentrates done in the territory of performance appraisal. It is a standout amongst the most widely explored topics of Human asset administration since 1960's. These conceivable speculations and exact discoveries, hence, would precisely introduce the premise of clarification.

Research design

This paper embraces a logical research technique Explanatory examinations Explanatory investigation plans to clarify the causal connections between factors by concentrate an issue or a circumstance. Additionally, both qualitative and quantitative information can be utilized for the exploration. The study adopted survey research design. Copies of questionnaire served as an instrument for data collection, and the generated data were analysed using Chi-Square. A total of 150 respondents were deliberately selected as the sample size. The simple random sampling technique was further adopted to give equal opportunity for selection to every element of the population.

Chi-Square Test was used to test the hypothesis. Data were presented and analysed using simple statistical tables and percentages. The value of the Chi-Square was calculated using the formula;

$$\chi^2 = \frac{(O-E)^2}{E}$$

This investigation embraces overview system and utilized self-managed questionnaire to accumulate information. This sort of research procedure is typically connected with the deductive approach.

DATA COLLECTION AND ANALYSIS

Data has been collected from both primary and secondary sources. Primary data has been collected through different surveys and in secondary sources data has been collected through distributed books, e-diaries, web sites, articles and so on.

SAMPLE SIZE

At the point when a study is directed it isn't conceivable to cover the whole populace so some example of those no of individuals has been decided for the examination in this way, here 150 employees are chosen for study in the association

ANALYTICAL TOOLS USED

The term examination alludes to the calculation of specific measures alongside searching example of relationship that exists among data gathering. Investigation is basic for a logical report and for guaranteeing that we have every single pertinent datum for making contemplated comparison. Consequently we utilized percentages, tabulation, graphs in this paper.

DATA ANALYSIS

Table-1: No Of Employee Participated In the Survey

Male	female	total
55	95	150

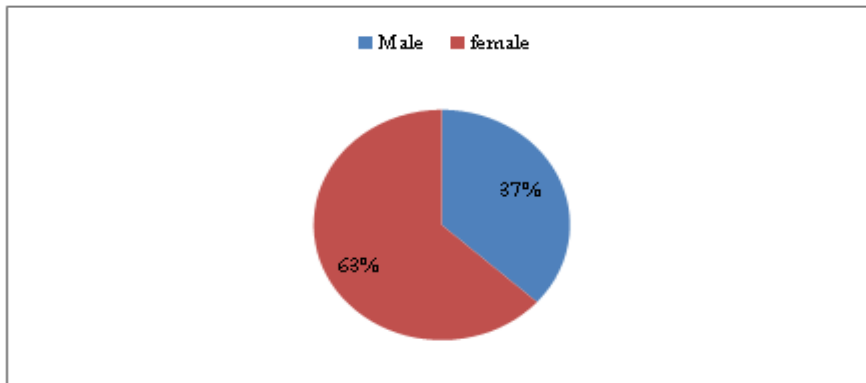
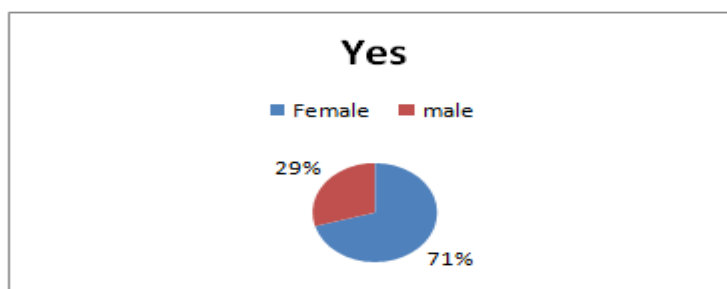


Figure-1: No Of Employee Participated In the Survey

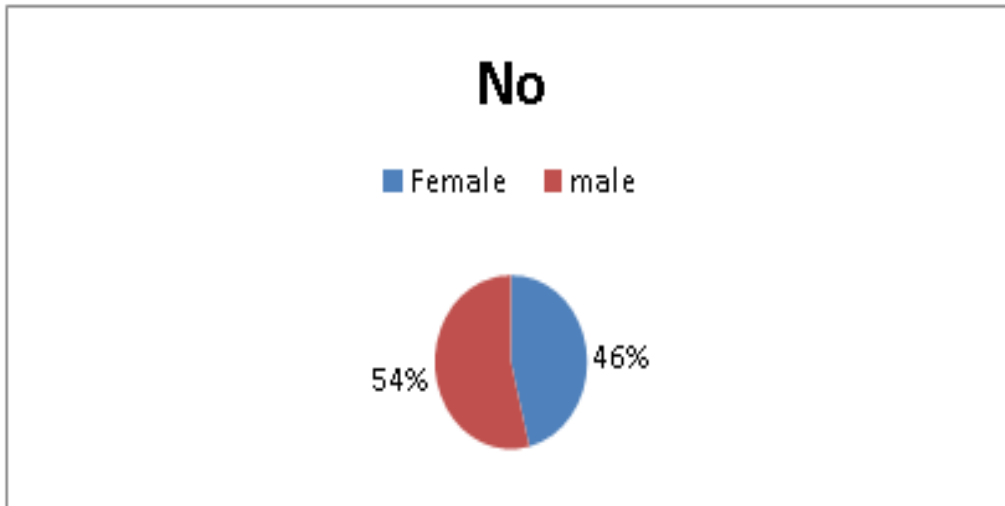
Generally there are (95 female employees or 63 per cent of all respondents) and 37% or 35 of the male employees who took an interest in the survey were 12 per cent more than male employees who reacted to the study.

Table-2: Do you feel ok about the set objectives and targets of your future performance?

Options	Female	Male	Total
Yes	60	25	85
No	30	35	65
Total	90	60	150



(a)



(b)

Figure-2: % opinion about the set objective and targets for employee's future

Contrasted with the employees, the female employees are more satisfied with their set picture. Among the 150 employees, 60 or 79% female employees are alright and 30 or 54% are not happy with this, and from the male employees, 25 or 29% administrators approve of that, however, 35 or 46% employees are most certainly not. General vast level of the general population is satisfied with their objectives and target.

Table-3: Performance Appraisal Affects the Working Efficiency of Employees

Options	Female	Male	Total
Yes	33	42	75
No	28	47	75
Total	61	89	150

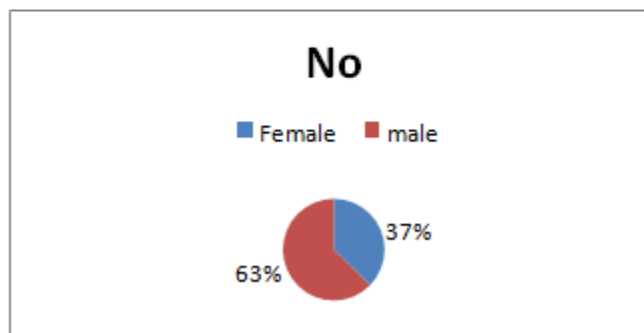
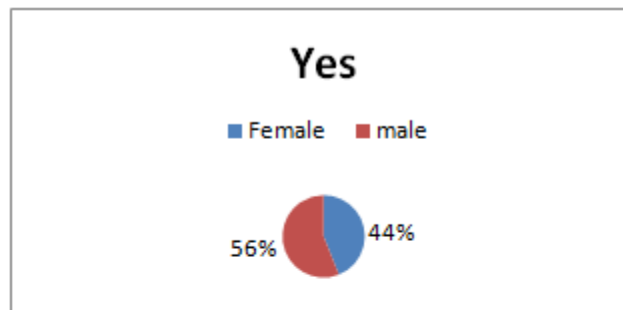


Fig-3: % of Performance Appraisal Affects the Working Efficiency of Employees

In this, 56% of the male and 44% of the female employees said yes that performance appraisal influences the working productivity of the employee. While the 37% of the female and 63% of the male employees don't concur with this statement. So, the performance appraisal influences the working efficiency on some sections.

Primary Data Analysis and Interpretation through Chi- Square Test

Data were analysed by the use of the chi-square technique to test the above hypotheses. The level of significance adopted for the test of hypothesis is 5%.

TEST OF HYPOTHESES

Table-4: Contingency Table of Observed (Fo) And Expected (Fe) Frequency

QUESTION	YES	NO	TOTAL
1	135(129)	15(19)	150
2	144(129)	6(19)	150
3	129(129)	21(19)	150
Total	408	42	450

Source: Responses of Questionnaire

From the above table, the figures in the bracket represent the expected frequency (Fe) while those figures outside the bracket represent the observed frequency (Fo)

RT-CT
GT

The expected frequency was computed using the formula: $Fe = \frac{RT \times CT}{GT}$ Where: Fe = Expected Frequencies, RT = Row Total, GT = Grand Total, CT = Column Total. As it is shown in table four.

Table-5

Row and column	Fo	Fe	Fo-Fe	(Fo-Fe) ²	(Fo-Fe) ² /Fe
R1C1	135	129	6	36	0.2790
R1C2	15	19	-4	16	0.8421
R2C1	144	129	15	225	1.7441
R2C2	6	19	13	169	8.8947
R3C1	129	129	0	0	0.0000
R3C2	21	19	2	4	0.2105
SUM					11.9704

From the above table 5, X2 calculated value =11.9704

The above statistical calculation is tested at 0.05(5%) level of significance and 2 degree of freedom (df) is used. The degree of freedom is obtained by: $df = (Row - 1)(column - 1)$ Df= (3-1) (2-1),df = (2) (1) df = 2. The critical (tabulated) value of X2 = 5.99, while the calculated value of X2 = 11.9704.

1) (column – 1) Df= (3-1) (2-1),df = (2) (1) df = 2. The critical (tabulated) value of X2 = 5.99, while the calculated value of X2 = 11.9704.

From the above statistical test, it is divulge, the calculated value of X2 (11.9704) is greater than the critical (tabulated) value of X2 (5.99), we therefore reject the null hypotheses (H0) and it is conclude that there is there is positive impact of performance appraisal on employees of APSFC.

CONCLUSION

Performance appraisal (PA) In APSFC has been a critical device in building up the abilities of a people and associations. Since the time of financial modernization and globalization in India, PA has been embraced and polished crosswise over numerous associations. Moreover, there is an extraordinary requirement for utilitarian human asset division (HRD) to screen and manage the relationship, development and advancements of people and associations for enhanced performance and job satisfaction. All the while, a sound HRD is required in each association for ideal viable use of human and hierarchical resources.

A portion of the referred to advantages of performance appraisals incorporate enhanced correspondence in the manager/employee relationship and inside groups, enhanced inspiration through re-foundation of trust and administrative endorsement and performance change through re-adjusting the employee's everyday exercises with the organization's objectives. The analyst recommended that employee performance can be produced and improved through the correct sorts of performance evaluation measures, with the correct assessment arrange upheld by motivational factors in a favourable working society. The reasonable approach for this examination depends on a wide applied system and the investigation analyzes the satisfaction of individual performance appraisals

In a perfect world in the present day situation, appraisal ought to be finished taking the perspectives of all the concerned gatherings who make them bear on the employee. Nut, since an adjustment in the system is required, it can't in the mentality of both the employees and the head is required.

REFERENCES

1. Roberts, G.E. (2003) "Employee Performance Appraisal System Participation: A Technique that Works," *Public Personnel Management*, 32(1), 89-98
2. Suwignjo, P., Bititci, U.S. and Carrie, A.S. (2000) "Qualitative Models for Performance Management System," *International Journal of Production Economics*, 64, 231-241.
3. McCarthy, J. (2000) "How to Conduct Productive Performance Appraisals," *Journal of Property Management*, 22-25.
4. (2001), 'A model of the impact of mission statements on firm performance', *Management Decision*, Vol. 39, No.1, pp.19-28.
5. Roberson, Q.M, and Stewart, M.M (2006). 'Understanding the motivational effects of procedural and informational justice in feedback processes'. *British Journal of Psychology*, 97, pp.281-298.
6. Ittner, C.D., Lacker, D.F. and Randall, T (2003) 'Performance implications of strategic performance measurement in financial services firms', *Accounting, Organizations and Society*, 28, pp. 715-741.
7. Piggot-Irvine, E. (2003) Key features of appraisal effectiveness. *The International Journal of Educational Management*. Vol. 17, Iss. 4/5, pp. 170- 177
8. Saunders, M., Lewis, P and Thornhill, A. (2009) *Research methods for business students*. 5th edition, England: Pearson Education Limited.
9. De Nisi, A.S. and Pritchard, R.D. (2006) 'Performance appraisal, performance management and improving individual performance: A motivational framework'.

TOURISM INDUSTRY IN WAYANAD DISTRICT, KERALA STATE – SWOT ANALYSIS

Dr.Riyas Kalatinkal¹, Sibi John² and Farhana Sultana²
 Lecturers¹, Shinas College of Technology, Sultanate of Oman
 Research Scholar², J. S University, Shikohabad
 Research Scholar³, Bharathidasan University

1. INTRODUCTION

Tourism is as a leisure activity which involves travelling from place to place. It is a human desire to visit the places of their interests like religious, spiritual, natural, scenic beauty, ancient sites, A tourist is apprehensive to know the and learn and study the history ancient monuments their by exploring their human skills around the global.

Kerala Tourism has a universal presence, with its clear plans and strategies for marketing their tourism sector, it has been attracting many travelers from around the globe especially form the GCC, USA, U.K, Germany and France. It is globally identified as a place of tourism because of its advantage of natural resources available, which attracts not only the tourists but also the investors thereby resulting in sustainable development for the people of the state. The state is rich in a pleasant climate, beautiful sheshores, backwaters, waterfalls to mention few. It is also famous for its Ayurveda medicines, historic monuments, the magical form of art and the festivities-which makes the state an attraction to the tourists and the investors.

2. WAYANAD

Wayanad district in Kerala is situated in Western Ghats and is full of hills, rocks and valleys which contribute to the very unique stretch of land which provide for exceptional adventure experiences. The Wayanad district shares its border with two other states which are Karnataka and Tamilnadu. There are wide range of places to visit and experience in Wayanad. The below is the list of places to visit excluding many more that are unexplored.

IMPORTANT PLACES TO VISIT

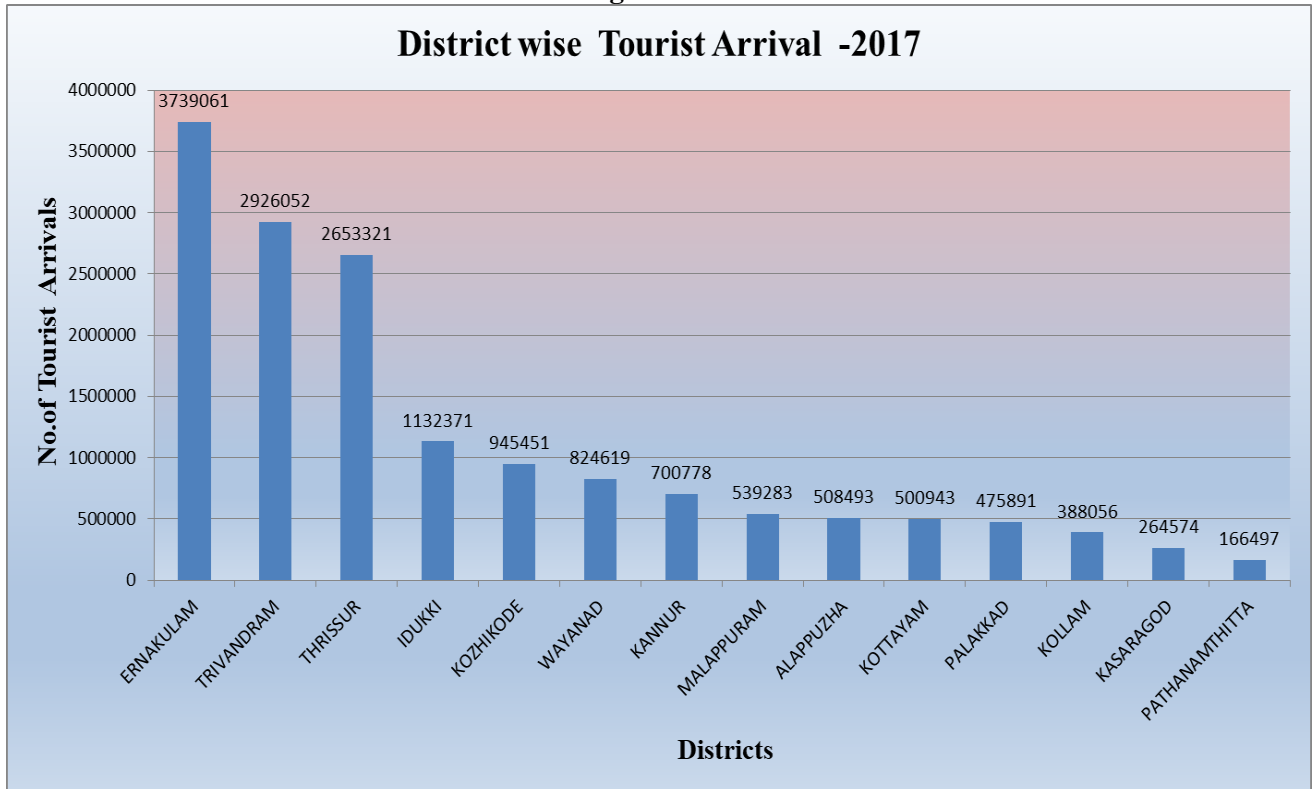
1. Banasura Hill
2. Pookode Lake
3. Chembra Peak
4. Meemutty Waterfalls
5. Kuruva Island
6. Pazhassi Tomb
7. Edakkal Caves
8. The glass Temple
9. Thirunelly Temple
10. Tholpetty Wildlife Sanctuary
11. District Wise Ranking of Tourist Arrival – 2017

Table No-1: District wise Ranking of Tourist Arrival – 2017

Domestic			Foreign			Total		
RAN K	Districts	No. of Tourist	RAN K	Districts	No. of Tourist	RANK	Districts	No. of Tourist
1	ERNAKULAM	3285088	1	ERNAKULAM	453973	1	ERNAKULAM	3739061
2	THRISSUR	2642546	2	TRIVANDRAM	420719	2	TRIVANDRAM	2926052
3	TRIVANDRAM	2505333	3	ALAPPUZHA	75037	3	THRISSUR	2653321
4	IDUKKI	1090086	4	IDUKKI	42285	4	IDUKKI	1132371
5	KOZHIKODE	932345	5	KOTTAYAM	32350	5	KOZHIKODE	945451
6	WAYANAD	815624	6	MALAPPURAM	18451	6	WAYANAD	824619
7	KANNUR	695655	7	KOZHIKODE	13106	7	KANNUR	700778
8	MALAPPURAM	520832	8	THRISSUR	10775	8	MALAPPURAM	539283
9	PALAKKAD	474180	9	WAYANAD	8995	9	ALAPPUZHA	508493
10	KOTTAYAM	468593	10	KOLLAM	6227	10	KOTTAYAM	500943
11	ALAPPUZHA	433456	11	KANNUR	5123	11	PALAKKAD	475891
12	KOLLAM	381829	12	PATHANAMTHITTA	2003	12	KOLLAM	388056
13	KASARAGOD	263459	13	PALAKKAD	1711	13	KASARAGOD	264574
14	PATHANAMTHITTA	164494	14	KASARAGOD	1115	14	PATHANAMTHITTA	166497
	Total	14673520		Total	1091870		Total	15765390

Source; keralatourism.org

Figure No-1



Source: Compiled from Table No 1

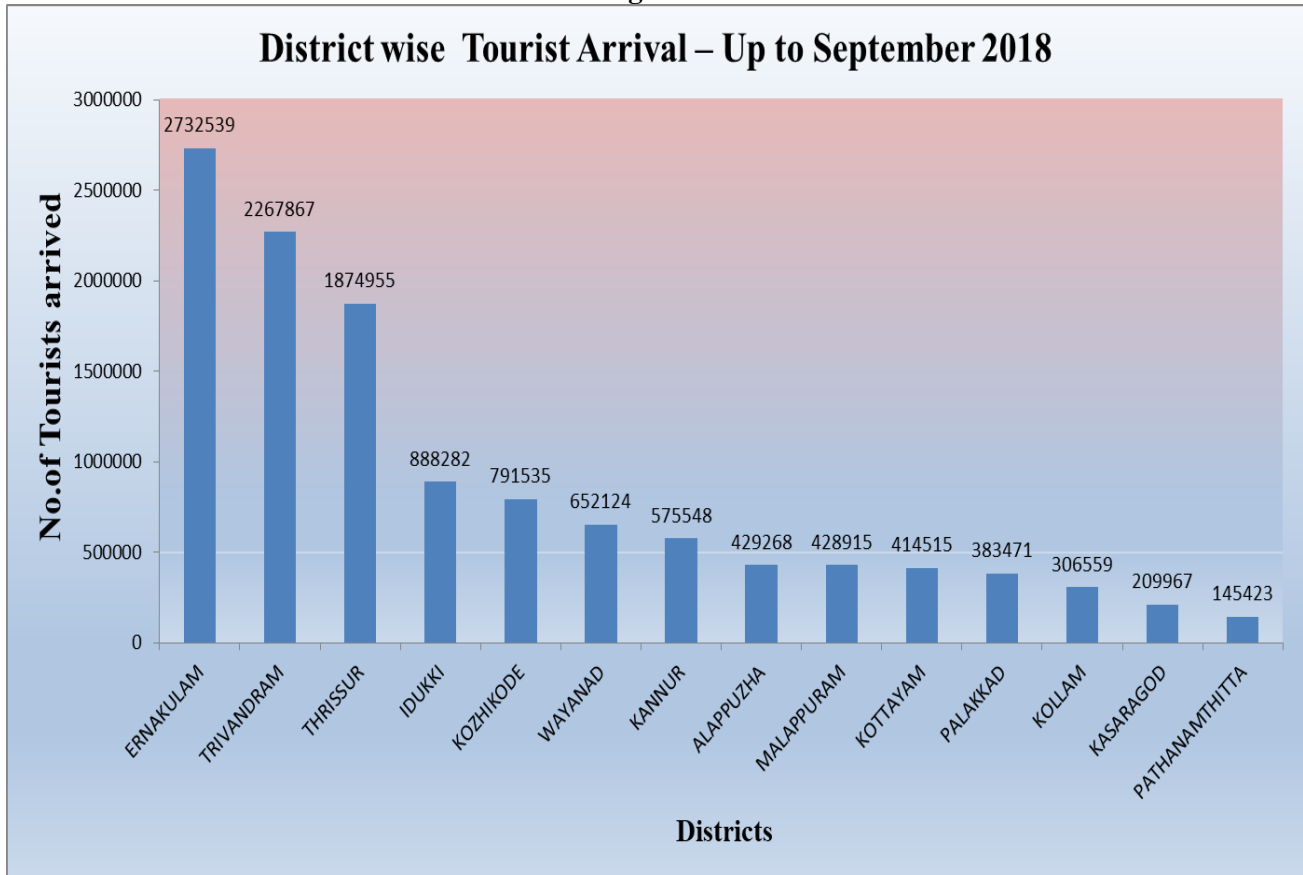
4. DISTRICT WISE RANKING OF TOURIST ARRIVAL – UP TO SEPTEMBER 2018

Table No-2: District wise Ranking of Tourist Arrival – Up to September 2018

Domestic			Foreign			Total		
		No. of			No. of		No. of	
RANK	Districts	Tourist	RANK	Districts	Tourist	RANK	Districts	Tourist
1	ERNAKULAM	2384552	1	ERNAKULAM	347987	1	ERNAKULAM	2732539
2	TRIVANDRAM	2018136	2	TRIVANDRAM	249731	2	TRIVANDRAM	2267867
3	THRISSUR	1866712	3	ALAPPUZHA	67935	3	THRISSUR	1874955
4	IDUKKI	856295	4	IDUKKI	31987	4	IDUKKI	888282
5	KOZHIKODE	779395	5	KOTTAYAM	26668	5	KOZHIKODE	791535
6	WAYANAD	643722	6	MALAPPURAM	13506	6	WAYANAD	652124
7	KANNUR	571986	7	KOZHIKODE	12140	7	KANNUR	575548
8	MALAPPURAM	415409	8	WAYANAD	8402	8	ALAPPUZHA	429268
9	KOTTAYAM	387847	9	THRISSUR	8243	9	MALAPPURAM	428915
10	PALAKKAD	382007	10	KOLLAM	6415	10	KOTTAYAM	414515
11	ALAPPUZHA	361333	11	KANNUR	3562	11	PALAKKAD	383471
12	KOLLAM	300144	12	KASARAGOD	2633	12	KOLLAM	306559
13	KASARAGOD	207334	13	PALAKKAD	1464	13	KASARAGOD	209967
14	PATHANAMTHITTA	143978	14	PATHANAMTHITTA	1445	14	PATHANAMTHITTA	145423
	Total Arrival	11318850		Total 2018	782118		Total 2018	12100968

Source; keralatourism.org

Figure-2



Source: Compiled from Table No.2

5. SWOT ANALYSIS – WAYANAD TOURISM

Figure-3

STRENGTH	WEAKNESS
1 It is an UNSCO world heritage site.	1 Lack of transportations.
2 It has a very cool weather.	2 No Airports.
3 It has the largest and biggest earth dam in world.	3 No train connectivity.
4 It has the best wild life sanctuary in the country.	4 High cost of accommodation.
5 It has many water falls.	5 Exploitation by untrained tourist guides.
6 It has the best panoramic view points.	6 Lack of proper infrastructure.
7 It has best tracing place in the India Highest peak Chemra peak.	7 There are very few good rated hotels.
8 It is a land of spices.	8 Lack of Multispecialty hospitals.
9 Easy to access and club with other tourist destination – (E.g.: Bangalore, Ooty, Mysore, Coorg, Calicut, Kannur)	9 Lack of trained guides.
10 It is only the district in the Kerala Sharing Border with two States - Karnataka and Tamilnadu.	10 Lack of proper branding of Wayanad tourism.
11 Low density district in Kerala.	11 Lack of quality tourists.
12 Plenty of Plantations and paddy lands like tea, coffee and cardamom.	12 Lack of foreign exchange institution.
13 May resorts for accommodation.	13 Lack of monitoring agencies.
14 It is home of tribes.	
15 It is filled with natural beauty.	
16 It is place for traditional medical tourism (Ayurveda).	
17 It is home of monsoon.	
18 It is a land of hills.	
19 Adventure facilities.	

OPPORTUNITIES	THREATS
<ol style="list-style-type: none"> 1. Increasing trend in domestic and foreign tourist arrivals in Kerala. 2. Government change in the priority for tourism industry. 3. Government speeding high on tourism sector especially for awareness. 4. Highest GDP contributory sector in service sectors industry in the country. 5. Cultural changes among people. 6. Highest young population in the country. 7. World in general is comprise of millennial and generation x (1964 -1978). 8. Social media platform to reach out the Genx and millennial age group. 9. Employment generation and foreign exchanges. 10. Professional know how in handling foreign tourists. 11. Revolution in telecommunication industry. 12. High development of eco-tourism in India. 13. Development of health tourism. 14. Handicraft and handlooms. 15. Forest products. 16. Home stay facility. 	<ol style="list-style-type: none"> 1. Cultural erosion. 2. Resistance from local people. 3. Ban of travel through national highway 766. 4. Arrivals of tourist and their peaceful living in forest inhabitation. 5. Frequent natural calamities affected. 6. Fear of epidemics. 7. Tough competition from other destinations. 8. Deforestation. 9. Waste management issues. 10. Unplanned constructions. 11. Restriction from government agencies. 12. Protest from environmentalists.

6. CONCLUSION

Wayanad district is blessed with attractive landscape in different forms and the exceptional culture of the place has always been wonderful. But still Wayanad has it is not ranked and positioned in appropriately in the tourism market. Monsoon Tourism, The district has various tourism like Adventure Tourism, Heritage Tourism, Indigenous Tourism and Ecotourism. All this tourism makes Wayanad district one among the best places to visit in Kerala. At present the tourism the position of Wayanad tourism is quite remarkable. The various initiatives taken up by Kerala tourism for sustainability can be applied to the district of Wayanad. The study recognized that indigenous tourism promotion contributes for the sustainable development of a region. As it is a known fact that the global demand for indigenous tourism is increasing a t a rapid speed this district of Kerala can perfectly serve as a place of tourism for the global tourist. Right now very few nations like Australia, New Zealand, and South America are using their marketing strategy effectively for marketing Indigenous tourism destinations.

A well organized, planned and sustained effort is essential with involvement of people is for the development of indigenous tourism destination. Disorganized pursuits to develop indigenous tourism sometimes may lead to unsolicited problems hurting the feelings and sentiments of the local people. Unless there is a clear policy which respect to conservation of indigenous sovereignty, stimulating indigenous tourism in its original meaning may not be concrete.

REFERENCE

1. Wayanad Tourism. Org, access on 13th October2019, <https://wayanadtourism.org>
2. Kerala Tourism. Org, access on 13th October2019, <<https://www.keralatourism.org/destination/wayanad-district/373>>
3. The state man access on 13th October2019, < <https://www.thestatesman.com/india/kerala-records-10-94-rise-tourist-arrivals-2017-1502617523.html>>
4. Mathruboomi daily newspaper, access on 10th October2019 < <https://english.mathrubhumi.com/travel/travel-news/wayanad-ranked-9th-in-world-s-best-accommodation-english-news-1.673605>>
5. The Hindu newspaper access on 10th October 2019, <<https://www.thehindu.com/news/national/kerala/domestic-tourist-arrivals-up-in-q1/article27378830.ece>>

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