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डॉ० सुनील कुमार मानस

संपादक

डॉ० योगेश कुमार तिवारी

प्रबंध-संपादक

श्री सुधीर कुमार तिवारी

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Growing Service Sector in India

Dr. Satish Ashinath Gonde*

Abstract :- The national income and per capita income of a country is an indicator of its economic development. Three regions are usually measured to measure the income of each country. The first area to measure gross domestic product is agriculture and allied sectors, they are called primary sector. The second sector is the industrial sector which includes various industries and businesses and the third sector is the service sector which includes various services. Agriculture plays an important role in the early stages of development of any country. But after the completion of the development of the country concerned, the service sector gets an important place in the gross domestic product of that nation. That area becomes the main source of income

Key Words :- Service Sector, Role of Service Sector, Growth of Service Sector, Indian Economy.

Introduction :- The third of the primary, secondary and tertiary sectors of the economy is also called the service sector. Financial services are generally any services rendered or received by one person or organization to another person or organization. Services are financial forms that do not produce goods themselves but help in the production of goods produced in the primary and secondary sectors. Transportation, storage, banking, trade are some of the important services. The service sector includes services that do not indirectly help in the production of goods. For example, personal services like doctor, teacher's services, laundress, barber, carpenter, lawyer, administrative and accounting services etc. Recently some new services based on information technology have been created for example internet cafes, ATM services, call centers, software services etc. The service sector is thus a broad sector, ranging from advanced IT services to personal services such as barber-plumbers provided by the unorganized sector.

Objective and Method of Study :- This Study is an attempt to highlight meaning, Features and Significance of service area, growing importance of the service sector in Indian Economy, Growth of the service sector in the Indian economy. This Study is of descriptive method. Secondary data collected from Internet, Government Documents, newspaper, books, Research paper and Research report.

Analysis & Conclusion

Features of the service area :-

1. The service sector includes ideal services of trade, transportation, communication, finance, commercial nature.
2. The feature of the service sector is to meet the needs of the customers quickly and at the lowest possible cost.
3. With the use of information and telecommunication technology in the service sector, with the help of minimum manpower, the best and minimum 24 hours service is easily achieved.
4. People use their knowledge and time to improve productivity, usefulness, capacity, durability and potential.
5. Production and supply of services is a feature of the service sector 6. Everyone in the service sector has to focus on knowledge based economy
6. January 1, 1995 The World Trade Organization (WTO) came into being with the inclusion of the General Trade Agreement (GATS) in the services sector.
7. The growing trade in services is benefiting developed countries like USA, UK, Germany, Japan as well as developing countries like India, China, Brazil.
8. Many new services based on information and communication technology have been growing rapidly since 1991.
9. Many foreign consumer companies have shown interest in exporting services from India as India has a large supply of labor at very low cost. Therefore, outsourcing IT companies are giving priority to the

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Indian service sector.

Significance of the service area :- Over the last decade, the importance of service sector as a major and driving force in the Indian economy has been increasing. In any country, hospitals, educational institutions, post telegraph services, police stations, courts, village administrative offices, city councils, defense, transportation, banks, insurance companies, etc., need a variety of services, they can be considered as basic services. In developing countries the government has to take responsibility for the provision of these services. As the economy grows, so does the need for services. Along with agricultural and industrial development, services like transportation, trade storage are also developed. As the primary and secondary sectors develop, so does the demand for these and other sectors. With the increase in the level of income, people in the higher income group start demanding various services. For example - hotels, tourism, shopping, private hospitals, private schools, vocational training, etc., such services are specially developed in big cities. Since 1991, there has been a rapid growth of many new services based on information and communication technology.

Growing importance of the service sector in Indian Economy :- The service sector is called the third sector. Primary and secondary are two areas. The service sector is an important part of the economy. The service sector supplies services rather than the production of physical goods. Service sector activities include retail, banking, hotels, education, health, social work, computer services, entertainment, transportation, electricity, gas and water supply. The service sector is the part of the economy that produces intangibles. The services sector plays a significant role in the Indian economy, accounting for 54 per cent of GDP growth. The dominance of the service sector in three sectors of the economy has been increasing in recent years. The role of the service sector in the Indian economy can be summarized as follows

Growing share in GDP :- The role of a sector in the development of the economy depends on its contribution to the gross domestic product (GDP) of that sector. In 1999-2000, agriculture and allied sectors accounted for 55.9 per cent, industry 14.9 per cent and services 19.2 per cent of India's GDP in 1950-51. During the economic planning period, mainly after 1990-91, new economic policies were adopted in the Indian economy. As a result of this policy, the share of agriculture and allied sectors in the gross domestic product of paddy has been steadily declining and the share of industry and services sector has been increasing. The share of service sector grew faster than that of industry. In 1990-91, the share of primary sector in India's gross domestic product was 32.2 per cent, second sector was 27.2 per cent and third sector was 40.6 per cent. In 2018-19, the share of agriculture in India's GDP declined to 15.87 per cent, while the share of industry increased to 29.73 per cent and the share of services increased to 54.40 per cent. More than half of India's gross domestic product comes from the service sector. The share of service sector in China's GDP is 44.00 per cent which is less than the share of service sector in India. From this, the role of the service sector in the Indian economy is crucial in terms of revenue generation. Of course, the service sector accounts for more than 70 per cent of the gross national product of the developed world. India has yet to reach this stage.

Share in job creation :- In terms of employment generation in India, the rate of job creation in the agricultural sector is declining while the rate of job creation in the service sector is increasing. Trade, Hotels, Transportation, Storage, Transportation, Banking, Insurance, Real Estate, Community & Personal Services As well as Construction Sector, Education, Health, Tourism, Marketing, Film Business, Advertising, Sports, Legal Advice, Publishing Industry, Astrology, Media etc. There is a lot of scope for increasing employment generation in the region. India still has the highest employment opportunities in the primary sector, mainly in the agricultural sector, but in recent times, employment in the agricultural sector has been declining and employment in the service sector has been increasing rapidly. In the year 1993-94, the employment in agriculture sector was 93.9 per cent and in the service sector it was 21.2 per cent. In 2018, the proportion of workers in the agricultural sector has declined by 44 per cent, while employment in the service sector has increased by 31 per cent. While employment opportunities in the agricultural sector are declining, new employment opportunities in the service sector are expected to increase by 70 per cent in the near future. The service sector is the second largest employer in the Indian economy after agriculture.

Export growth :- Due to the rapid growth of the service sector, the share of service sector exports in India's total exports has been steadily increasing. India exports a large number of software services. In 2017, India earned between 185 to 190 Trillion dollars in foreign exchange from software services exports. India supplies

skilled workers for IT to various countries of the world. The Government of India has lifted a number of restrictions on service sector exports. The Indian government has given a package of Rs . 5,000 crore for the export of 12 best services. It mainly covers information technology, tourism, hospitality services. India is one of the world's leading exporters of services. India ranks sixth in the world in service exports. In 2013-14, India received 152 Trillion dollars from service sector exports. Of this, software sector exports accounted for 46 per cent of total services sector exports. On March 28, 2019, India's exports of goods and services were valued at 40 540 million. The value of the service centre's export was 200 Trillion dollars. The value of exports of services sector accounted for 37 per cent of the total export value of goods and services in the financial year 2018-19.

Foreign Investment :- After the adoption of the new economic policy in 1991 and the adoption of the triad of privatization, liberalization and globalization, the inflow of foreign investment in industry and services increased significantly. Due to the rapid growth of foreign investment in the services sector, the growth rate of the services sector has increased and the share of the services sector in the gross national product has increased. From April 2000 to March 2019, 18 per cent of the total FDI inflows into India were in the FDI sector. The development of computer software and hardware, trade, automobile industry and chemicals was driven. Foreign direct investment in the services sector was Rs 19,945 crore in 2009-10. Foreign direct investment increased to Rs 21,431 crore in 2011-12. However, the last six years have seen a decline in foreign direct investment in the services sector. Foreign investment in the services sector in 2017-18 was 7 6.7 million. In the year 2018-19, FDI inflows to service centres increased by 36.5 per cent to 15 9.15 crore. The investments were made in the financial sector, banking, insurance, external resources, research and development, courier services, technology testing and analysis. The inflow of foreign investment has improved the balance sheet. Rupee strengthens against US dollar

Income to the government :- The service tax is a direct tax and through this tax the central government gets a large amount of revenue. The tax was introduced in 1994 under section 65 of the Finance Act 1994. This tax is levied on individuals and companies. This tax is first paid by the service provider to the government and the service tax is levied on the customers who purchase the service. This tax is levied on restaurant guest house cable service providers. Initially, the service tax rate was 14 per cent. From June 1, 2016, the service tax rate has been reduced to 15 per cent. Government revenue has increased by 20.2 per cent in 2016-17. In the financial year 2017-18, the central government received revenue of Rs 81,222 crore from service tax. The government uses this income to implement development plans.

Growth of the service sector in the Indian economy

The service sector plays an important role in the Indian economy. The service sector in India has grown exponentially in the post-independence period. The growth of the service sector in the Indian economy can be explained on the basis of the growth rate of gross domestic product of services in India, the share of service sector in gross national product, the share of service sector in total employment in the country, contribution of service sector in international trade, etc.

1. Growth rate of gross domestic product of services :- In the planning period, there has been a rapid increase in the gross domestic product of services in the country. The growth rate from 1950-51 to 1991-92 during the pre-reform period averaged 4.96 per cent per annum, which is less than five per cent. However, the subsequent growth rate has been consistently higher than this and has been steadily increasing till 2007-08. Although it fluctuated between 2007-08 and 2011-12, it is between 8.9 and 10.5 per cent. The growth rate of the service sector in India was nine per cent in 2015.

2. Share in Gross national product :- The service sector accounts for a large share of India's GDP. The service sector is making a significant contribution to the gross national product. From 1950-51 to 2011-12, the share of service sector in India's gross national product has been steadily increasing. The share of India's national manufacturing services sector was 30.3 per cent in 1950-51 and 59 per cent in 2011-12. The service sector accounted for 61.5 per cent of India's GDP in 2016. The share of service centers in India's national income has more than doubled during the planning period.

3. India's gross inflation in the service sector :- India's gross domestic product (GDP) grew by 8.1 per cent in 2017-18, compared to a provisional estimate of 7.5 per cent in 2018-19. From 2016-17 to 2017-18, the growth

rate in terms of gross value added of total services has declined. However, the growth rate of services other than financial real estate and business services increased during this period. Compared to 2016-17, 2018-19 shows a declining trend in all types of services.

4. Import- Export Trade in the service sector :- The service sector accounted for 37 per cent of India's total exports in 2007 and 38 per cent in 2017. India's share of exports of world trade services was 2.7 per cent in 2007 and 3.5 per cent in 2017. In 2017, India ranked seventh in the world in merchandise exports. The compound annual growth rate of India's merchandise exports was 7.3 per cent in 2010-11. In the world, it was 5.2 percent.

Computers and information and communication technology sub-sectors accounted for the largest share of total services exports in India in 2007 and 2017. This is followed by professional service. The business services sub-sector accounted for the largest share of India's total imports in 2007. This is followed by transport and travel. The sub-sector has the highest amount of business services in India in total service imports in 2017. This is followed by the Travel and Transport sub-sector. Compared to 2007, the share of computer and information and communication technology (ICT), transport insurance and pension business services exports in 2017 has decreased. So the share of this sub-sector of travel has increased. Compared to 2007, the share of transport, insurance and pension, financial services, business services in service imports has decreased in 2017. The share of travel, computer and information and communication technology (ICT) sub-sectors has increased. In 2017, India was ranked eighth among the top 10 exporters in the world in terms of trade services exports. In 2017, India was ranked 10th among the top 10 importers in the world in terms of trade services imports. India's share in world trade services exports was 2.7 per cent in 2007 and 3.5 per cent in 2017. Between 2007 and 2017, India's share of the world's trade services exports increased. However, during this period U.S. The share of K, Germany and Japan has decreased. India's share of world trade services was 2.5 per cent in 2007 and 3 per cent in 2017. From 2007 to 2017, India's share in world trade services increased, but USA, UK, Germany and Japan declined.

Job creation :- The growth rate of employment in the service sector is lower than that of increasing investment in the service sector in terms of job creation. From 1994 to 2018, employment opportunities in the agricultural sector have declined from 63 per cent to 44 per cent, while employment opportunities in the service sector have increased from 21 per cent to a total of 40 per cent in the last 25 years. There is ample scope for increasing employment opportunities in the areas of transport and tourism information and telecommunications, social and personal services

Foreign direct investment :- In India, more than 60 per cent of FDI inflows come in the form of equity investments in the service sector. Foreign direct investment in the form of participation in the services sector in the year 2018-19 was 6 696 million. The direct investment in shares of India was, 44,857 million. Foreign direct investment in the services sector from 2000 to 2018 was. 70.90 Crore.

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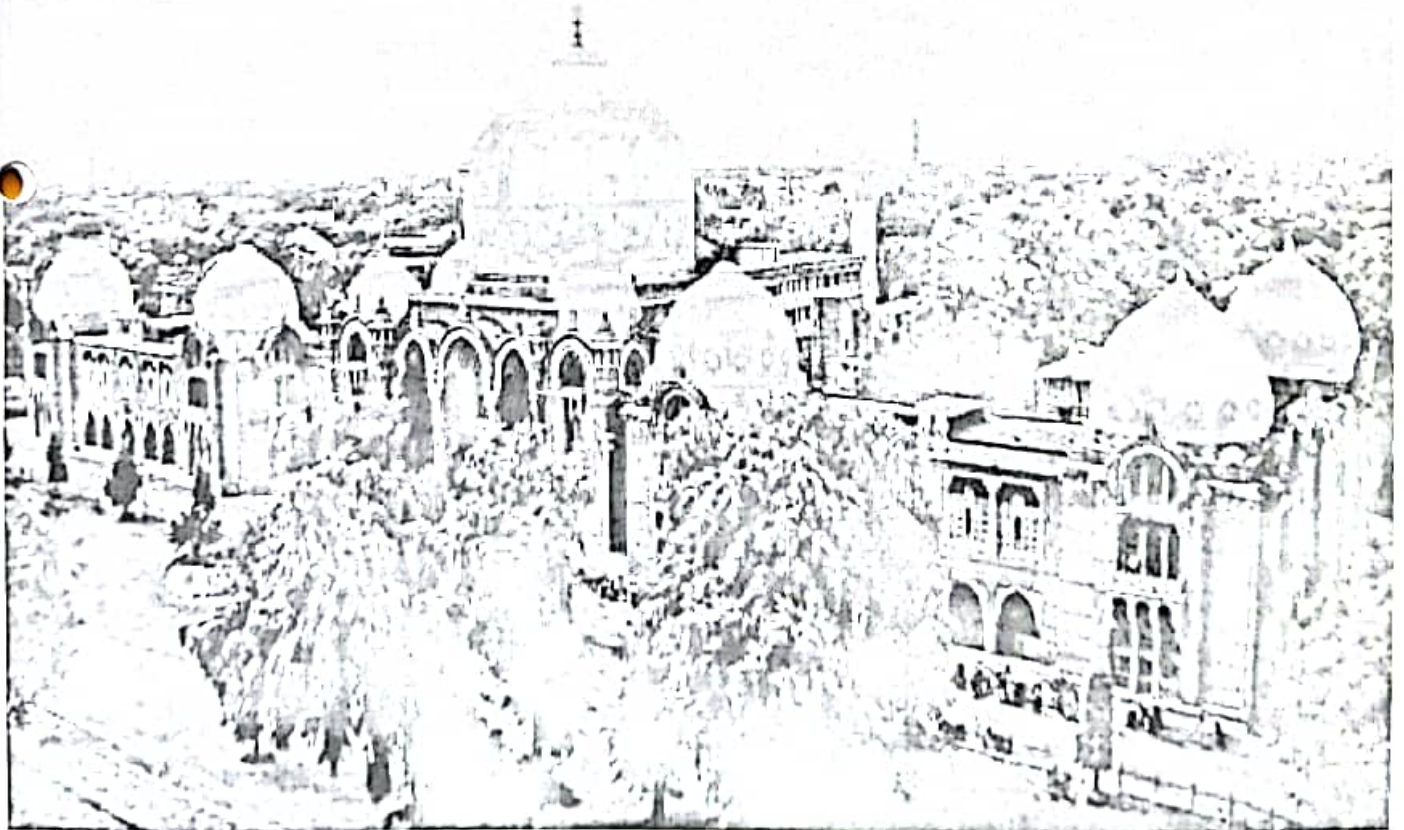
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AN EVALUATION STUDY OF FISCAL REFORMS AND GST

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Abstract:

The present paper shows that the Goods and Services Tax or GST were announced and implemented in July 2017 and is noteworthy tax reform in the Indian economy. It has carried transparency further more simplicity in business. Macroeconomic set aside of Goods and Service Tax is lower inflation and higher economic growth in the country. Goods and Service Tax is an excellent thing as it carries honesty in the economy and Black money has been removed. So Good and Service Tax will put the Republic of India in the ranks of sophisticated economies of the planet in terms of trade approach and culture and excellent leadership. GST is strong Database Tech system as well as elasticity of wide coverage indirect taxes at the government level are being changed.

Keywords: Fiscal, Reforms, Goods and Service Tax (GST), Centre & State Governments etc.

Introduction:

The present paper shows that the Goods and Service Tax is an indirect tax that was announced and implemented in India on 1st July 2017. It is a wide range based tax that would be charged for every value addition. The Indian government implemented Goods and Service Tax as the Constitution Act 2017. Goods and Service Tax Council and Finance Minister of India govern Goods and Service Tax and its laws. The Finance Minister of India is the Chairperson. There are a total of 5, Goods and Service Tax rates. They are Zero, Five, Twelve, Eighteen and Twenty Eight percent respectively. There is a special tax rate of 0.25 percent on semi-precious stones and rough precious stones while there is a three percent on gold, luxury cars, aerated drinks and tobacco products have additional cess of fifteen percent. Many taxes were included in Goods and Service Tax after the implementation of Goods and Service Tax. The taxes which were merged involves such as Service tax, Central Excise Duty, Surcharges, Octroi, additional customs duty and state-level value-added tax and also Goods and Service replaced levies on interstate transportation of goods. Only one tax is GST for the supply of commodities right from the producers to the customers. Tax is Compulsory a tax on the value addition for sellers and buyers.

The objective of the Study:

The present paper focuses on the Evaluation Study of Fiscal Reforms and GST.

Methodology:

The data for the present study has been collected from existing secondary literature, such as books, journals, published and unpublished annual reports, Govt. Manuals/Orders, websites etc.

Fiscal Reforms and GST:

Goods and Services Tax were introduced and implemented in July 2017 and is noteworthy tax reform in the Indian economy. It has carried transparency furthermore simplicity in business. Macroeconomic set aside of Goods and Service Tax is lower inflation and higher economic growth in the country. Goods and Service Tax is an excellent thing as it carries honesty in the economy and Black money has been removed. So Good and Service Tax will put the Republic of India in the ranks of sophisticated economies of the planet in terms of trade approach and culture and excellent leadership.

Pros of GST:

The Pros of GST are as under:

Pros of GST for Business and Industry:

- ❖ **Simple Compliance:** The wide-ranging Databases Tech is the foundation of the Goods and Service Tax regime in India. In this connection services of all taxpayer would be available to online platform.
- ❖ **Similarity:** Goods and Service Tax will sure tax slabs that are current across the country. It increases the certainty of business.
- ❖ **Declined of cascading:** It is additionally declines hidden costs of business as well as the scheme of would make sure that over there are minimal cascading of taxes.
- ❖ **Competition and competitiveness:** To enhance competitiveness for the trade and industry would eventually lead to Decline in transaction costs of commerce.
- ❖ **Growing Pattern:** The uniformity in tax rates and procedures across the nation will additionally assist to lop the compliance price tag in the extensive run.

Pros of GST for Consumers:

- ❖ **One Tax and Transparent Tax:** In before GST scheme of indirect tax burden on taxpayer over there were wide indirect taxes being levied by the centre and the progressive levels of value addition were not available input tax credits. As a result, the sum of the vast majority of goods and services in the nation were doubled due to countless hidden taxes. Only one tax is GST for the producers to the customers, transparency of taxes paid by the final consumer.
- ❖ **Exemption of Tax Burden:** Due to the effective growth and prevention of leakages, the total tax burden on the vast majority of commodities will come over here down, which pros consumers.

Pros of GST for the Governments:

- ❖ **Administer:** GST is strong Database Tech system as well as elasticity of wide coverage indirect taxes at the government level are being changed.
- ❖ **Controls and Efficiency:** This indicates better controls on leakage in Goods and Service Tax, as well as the positively increased revenue efficiency from Goods and Services Tax.

Conclusion:

We observed that only one tax is GST for the producers to the customers, transparency of taxes paid by the final consumer. Due to the effective growth and prevention of leakages, the total tax burden on the vast majority of commodities will come over here down, which pros consumers. GST is strong

Database Tech system as well as elasticity of wide coverage indirect taxes at the government level are being changed.

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economic development. In the future, prioritizing foreign direct investment (FDI) in Northeast India as well as in Jammu and Kashmir and other backward states will be necessary and important to achieve the goal of balanced regional development.

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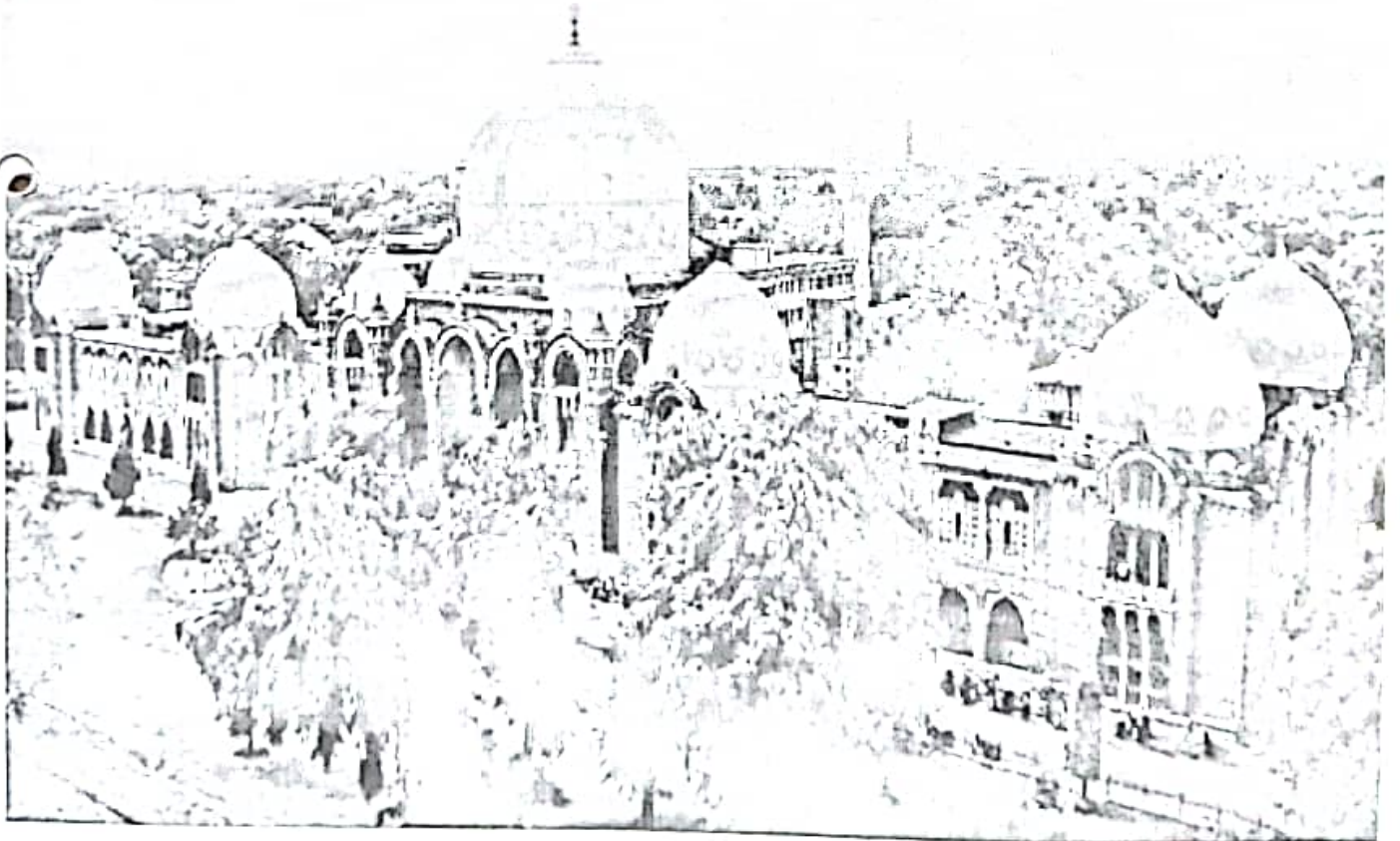
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2022



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ROLE OF FDI IN INDIAN ECONOMY

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Abstract:

Foreign direct investment is the investment made by foreigners in the form of setting up an industry body for a direct product. Foreign direct investment has a direct relationship between an institution or company in a developing country and a foreign institution or company. This type of investment is a form of investment in the primary capital market. Investment made by multinational companies is a form of foreign direct investment. Foreign direct investment (FDI) boosts the industrial development of the country, helps in building infrastructure and large scale industries in the country, increases the quality and quantity of goods, increases wage rates, provides various facilities to employees, increases foreign exchange due to increase in exports.

Kay Words: Foreign direct investment, FDI, Indian Economy

1. Introduction:

When large and multinational companies in developed countries acquire management by purchasing shares of companies in developing and underdeveloped countries or make long term capital investments by starting a new company, it is called foreign direct investment. In any country of the world, when a company is newly established, expanding the company, modernizing the company's securities, diversifying its production, it sells new shares, debentures in the primary securities market to raise capital, foreign big and multinational companies buy new shares, debentures. Directly invest capital by buying. This investment leads to a long-term transfer of ownership. There was a net increase in capital assets in the country. The gift is made by buying securities like foreign investment. Similarly, long-term capital investment is made by partnering with companies in developing and underdeveloped countries, establishing new companies, subsidiaries through technical cooperation agreements. This investment is private and it is driven by profit.

2. Objective and Method of Study

This Study is an attempt on highlight meaning and objectives of Foreign Direct Investment, Significance of FDI, India's Foreign Direct Investment Policy & FDI inflows into India. This Study is of descriptive method. Secondary data collected form Internet, Government Documents, newspaper, books, Research paper and Research report.

3. Analysis & Conclusion

3.1. Foreign Direct Investment Objectives

(FDI) have a purpose when investing in large, developing and underdeveloped countries. They are as follows:

1) Management and Ownership: Companies from developing and underdeveloped countries purchase more than 26% stake in the company and go to the Board of Directors, acquire ownership of the company by purchasing more than 51% stake, FDI for the purpose of acquiring the company is done.

2) Expanding the company: MNCs invest in FDI to expand their company, to capture the global market, to enter the market of a country, to expand the company and gain notoriety.

3) Maximizing Profits: The main purpose of private investment is to make a profit. Investments are made with the aim of maximizing profits by setting up branches in different countries of the world, setting up sub-companies, partnering, acquiring company ownership and maximizing production with the help of modern machinery and technology.

4) Diversification of Risks: Some big companies take the form of multinational companies by investing in different products in different countries instead of investing heavily in a single product in their own country. The purpose behind this is to diversify the risks in production, distribution, etc., investing in the same country and in the same business is risky in times of crisis. Multinational corporations diversify risk by investing in agriculture, industry, trade, transport and transportation, mining and quarrying, research and development, power generation and distribution, banking and insurance business, defence equipment manufacturing, etc.

3.2 Significance of FDI

The benefits or importance of FDI in developing and underdeveloped countries can be summarized as follows.

1) Capital scarcity is eliminated: Developing and underdeveloped countries have low national income and per capita income, saving tendency is ever present. Lack of savings slows down the pace of capital formation. - Lack of capital slows down the economic growth of the country, these countries invite foreign capital to accelerate economic growth. Foreign direct investment helps to alleviate the scarcity of capital.

2) Development of infrastructure: Industrial development of any country depends on the development of infrastructure. A huge amount of capital is required to develop infrastructure such as roads, railways, ports, airports, power generation, telecommunications, banking and insurance. This need of developing countries is met through foreign direct investment. Foreign direct investment in the infrastructure sector accelerates the industrial and economic development of the country.

3) Use of Advanced Technology: Developing countries face difficulties in implementing research and development programs due to lack of capital. Due to lack of research and development, the technology used in production is backward, its productivity is low. Multinational companies bring up-to-date technology with them when investing in gift capital, with huge financial potential, developing research and development programs in developing countries. It benefits other companies in the country. This increases the industrial momentum of the country.

4) Efficient use of resources: Underdeveloped and developing countries have abundant manpower and some natural resources. But due to lack of capital and technology, it is not used enough. Too many tools remain untapped. Foreign direct investment accelerates the industrialization of the country. As a result, the demand for productive resources increases and it becomes more efficient. This leads to an increase in production.

5) Increase in Exports: Some FDI industries are required by the government to export, increase exports and maintain it. Multinational companies strive for export growth. This provides valuable foreign exchange to the country and helps in reducing the trade deficit.

6) Increase in foreign exchange reserves: Foreign exchange arrives in the country through foreign direct investment. Is exchanged for foreign currency. An increase in foreign exchange reserves increases a country's credit in the international market. Necessary machinery, technology, raw materials can be imported with the help of foreign currency.

8) Economic Development: Through foreign direct investment, competition between foreign and domestic companies starts in the country, waste of monopoly is avoided, and the quality of production and productivity is enhanced through competition. An increase in investment leads to an increase in component demand, an increase in employment, an increase in the income of the people of the country. An increase in income increases demand raises living standards and accelerates the country's economic growth.

9) Increase in government revenue: Multinational companies try to increase production, sales and profits by investing directly. The government can increase its revenue by levying excise duty on products of multinational companies, sales tax on sales and tax on profits

10) Balance of transactions: Foreign direct investment is the key to growth in the infrastructure sector. Industrial growth is accelerating. Import substitution is gaining momentum. The combined effect of all this is a reduction in imports and an increase in exports, reducing the trade deficit.

11) Encouragement of Indigenous Entrepreneurs: Some companies in the country provide technical assistance to multinational companies. Partner with them. Indigenous entrepreneurs come in contact with new technologies, machinery, skilled workers and technicians, skilled managers. As a result, their entrepreneurship grows. A generation of new entrepreneurs is coming forward to provide goods and services to the multinational companies, such as raw materials, semi-finished goods, spare parts, means of transportation and transportation, packaging materials, etc. Some multinational companies run education and training programs in the host country along with research and development programs, which helps in creating a generation of new entrepreneurs in the country.

11) Encouragement of capital investment abroad: Investment strategy of multinational companies, product growth and sales growth strategies, huge profits, reputation, etc., motivates companies in the host country. They also have a latent desire to make their company a multinational company and are encouraged to invest in another country.

3.3 India's Foreign Direct Investment Policy:

The Government of India has recently set different ceiling for different sectors in line with its policy on foreign direct investment. Telecom Retail Bullet Train Courier Services Tea Field Orchards Vegetable Closed Goat Farm Medicine Power Generation Transport Airlines Transport Mineral Oil

Extraction Petroleum Sales Pollution Control Roads Highways Ports Special Economic Zone Transport Infrastructure Services Non-banking Institutions Cable Networks etc. Hoto status organization information and broadcasting coal lignite mining private security agency defence materials manufacturing etc. are allowed 74 per cent foreign investment in the sector while multi-brand retail is allowed 51 per cent foreign investment in the sector. Civil Transport Petroleum Purification Energy Exchange Part Market and Depository Private Banks TV Channels FM etc. 49% News Channel Newspapers 26% and Nationalized Banks State Bank of India and State Bank Group BP 20% Foreign Investment Limits

3.4 FDI inflows into India:

According to the Global Investment Report 2020 presented at the United Nations Conference on Trade and Development, India was the new largest importer of foreign capital in 2019. This year, India received 51.51 billion in foreign direct investment, up from 45.45 billion in 2018. According to the Marathi report, global foreign investment will be 40 per cent lower in 2020 than in 2019. On the background of covid-19, it was estimated that in the year 2019-20, India had the highest FDI inflows in the services sector. Of this, 7.67 billion was invested in computer software and hardware, 4.44 billion in telecommunications and 44.57 billion in trade.

1. **Year wise FDI in India:** Foreign direct investment (FDI) figures for the current decade stood at USD 5,09,104 million in the last decade. Looking at the inflow of FDI year-on-year, it can be seen that the huge increase in FDI in 2011-12 was 34 per cent as compared to 2010-11. However, in 2012-13, it had dropped by a whopping 26 per cent. It then continued to grow until 2015-16. However, 2016-17 to 2018-19 shows steady growth. But in 2019-20, it has increased to 18 per cent.
2. **FDI in India by various countries:** Between April 2010 and March 2020, 166 countries of the world have invested Rs 2731910.98 crore in India. Mauritius (30.36%), Singapore (20.78%), Netherlands (7.20%), Japan (7.13%), USA (6.34%), England (6.00%), Germany (2.59%), Cyprus (2.29%), France (1.60 %) the top 10 investors with a total investment of Rs 22, 59,809.53 crore. This investment accounted for 82.71 per cent of the total investment. Mauritius and Singapore accounted for 51.17 per cent of the total investment, indicating that only a handful of countries have invested heavily in India.
3. **Industry-wise FDI:** A total of 63 FDI inflows have been made in various sectors. In the last two decades, from 2000 to 2020, the investment was Rs 273910.98 crore. Out of this, a total of Rs. 1797165.08 crore has been invested in the top ten industries. This means that 65.51 per cent of the total industry-wise investment was in these ten industries and only FDI in services sector banks, insurance, non-financial institutions, R&D, courier, technology testing and analysis and outsourcing was 17.45 per cent. It is clear from this that foreign investment is concentrated in certain sectors and there is a huge opportunity for growth in many sectors
4. **State-wise FDI:** From October 2019 to March 2020, the total investment was Rs 175,158.77 crore. Out of this, according to the highest investment rank, the total FDI in ten states was Rs. 163985.33 crores. This proportion was 95.57 per cent. The four states of Maharashtra, Karnataka, Delhi and Gujarat accounted for 75.92 per cent of the total FDI, of which Maharashtra alone accounted for 30.35 per cent. This reflects the regional disparity in

economic development. In the future, prioritizing foreign direct investment (FDI) in Northeast India as well as in Jammu and Kashmir and other backward states will be necessary and important to achieve the goal of balanced regional development.

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A STUDY OF RESEARCH SUPPORT SERVICES IN PRAVARA INSTITUTE OF RESEARCH AND EDUCATION IN NATURAL AND SOCIAL SCIENCE (PIRENS) LONI (BK) TAL- RAHATA DIST-AHMED NAGAR"

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Abstract:-

The focus of academic libraries is to support teaching, learning and research in their research centre institutions. Academic libraries support research by providing research collections, services, resources and research support services this research support services facilities needs and important for researchers because in national and international level research Libraries Plays a central role in research and Digital services has changed the relationship between researchers and libraries Procures research material (journals, books etc) and facilitates easy access and finding of research material. Provides and promotes access to external research material. Assists with research tasks particularly in finding hard to get resources and information gathering and Provides information and advice –online and face-to-face on topics such as publishing your work, without copyright, open access, citations. Libraries offer space for students to learn and provide excellent environment for research. Libraries have staff that can help students in locating the information that a researcher might need. If all research libraries provides above national and international level quality research support services to research then outcome of research will be total quality and useful to national and international level for industrial and social sector.

This study examined academic libraries research support services and to know which

National and international level research support services such as online and offline support services provides to researchers , Initiatives taken for researcher support , Provision of research support staff for research support for technical issue , reference management tools awareness, plagiarism awareness, Citation style awareness , available e resources awareness ,search strategy awareness available and given services are as per researcher needs in the paper we should know the quality of services given by Pravara Institute of Research and Education in Natural and Social Science (PIRENS) Loni Tal- Rahata, Dist- Ahmednagar. In finding PIRENS loni institute gives quality services to researcher as per researchers need but There should be need to provide Plagiarism check, research advisory desk services to researcher for quality library sources and services for 100% use from users . The study recommends the managements to increased Library Orientation for Maximum use and provides Plagiarism software.

Keywords: Information Sources, Research Support Services,

Introduction:

Libraries are built and maintained to provide information resources for a specific and defined community. The main purpose of this study was to improve the library services and satisfy researcher. Pravara Institute of Research and Education in Natural and Social Science

(PIRENS) is management Institute Located in Loni Tal- Rahata, Dist-Ahmednagar established in 1993 affiliated to Savitribai Phule Pune university, Pune to promote teaching and research activities. Library Of (PIRENS) was established in 1993 library has a well Wi-Fi system along with sufficient Central number computers for free access and has their separate Departmental libraries. The PIRENS Library has resources more than 30038 books, 34 journals and 33 PhD theses in 2012 PIRENS established Research centre to undertake Fundamental, applied and Adaptive Research in Rural Development

RESEARCH SUPPORT SERVICES :-

According Sharma, (2005) the values and services supported by libraries for centuries will continue. These include ownership, assistance to users, and of some collection, access to others, the originations of resources and assistance to users, including response to specific information need and questions, information guidance and formal instruction. These services call for the capabilities of an array of professionals.

Researcher:- Researcher mean a persons who doing the research i.e. to find out new thing or phenomenon having designation like Assistant Professor, Associate Professor, Professor, research scientist and a registered Ph. D students

Objectives of the Study:

- To examine the research support services provided by the central Library.
- To find out given Research support services are quality and sufficient as per given Norms
- To find out defects and suggest some remedies

Methodology

The study is based on the primary data collected from the librarian of Pravara Institute of Research and Education in Natural and Social Science (PIRENS) Loni Tal- Rahata Dist- Ahmednagar.

Review of Literature:-

The review of literature is so much required as it guides the researcher in the correct path of his journey. To say in simple words, it is a stepping stone for the process of research. The main purpose of review of literature would be to avoid duplication of research. Chaube Ajay and Manglik Deepak (2017) "Use of Library Facilities and Resources by Research Scholar at Guru Ghasidas University, Bilaspur, Chhattisgarh: A case study" in his research researcher explain availability of library services and use of provided services by researcher in university library Krishnamurthy P and Muthusamy c(2018) "Information Access by Research Scholars in R.M.K. Engineering College Library: A Study" in this research researcher explain which information access by researcher in R.M.K. Engineering College Library. Gowda and Shivalingaiah, (2009) in his study entitled "Awareness Use of Library Facilities and Services by the Research Scholars in Universities in Karnataka: An Analytical Study".

Data Analysis:-

The study was carried out to the questionnaire from Pravara Institute of Research and Education in Natural and Social Science (PIRENS) Loni Tal- Rahata Dist- Ahmednagar.

Que No -1 which of the following services and facilities provide to the Researchers from your library?

Table No- 1

Sr.No	Services and facilities	Yes	No
1)	Referral service	Yes	
2)	Internet Section/Internet Browsing	Yes	
3)	CAS & SDI services	Yes	
4)	Wi-fi facility	Yes	
5)	Indexing and Abstracting Services		No
6)	Printing/Scanning	Yes	
7)	Reprographic service	Yes	
8)	New arrivals	Yes	
9)	Reference service	Yes	
10)	Audio video aids	Yes	
11)	Library Portal/Website	Yes	
12)	Research carrels (separate space for Researchers)	Yes	

The table No. 1 shows that Referral Service Internet Browsing, CAS and SDI Service Reprography, Printing, Reference & library Portal Service all above services & facilities Provided to research except Indexing and Abstracting service. It is observed that mostly services and facilities provide to the Researchers.

Que.No.2 which online resources facility ready by you for research support.

Table No 2

Sr. No	Ready online resources facility	Yes	No
1	Access to HEC digital library		No
2	Access to online databases other than HEC digital library	Yes	
3	Access to E-Books collection	Yes	
4	Online research support tutorials	Yes	
5	Wi-Fi connectivity	Yes	
6	Online Public Access Catalogue	Yes	
7	Provision of Subscribed e-journals	Yes	

The table No. 2 shows that for research support Online resources provision planed by Library i.e. Access to online database other than HEC digital library, access to eBooks collection, Online tutorial, Wi-Fi Connectivity, OPAC and Subscribed e Journals, except Access to HEC digital Library . It is observed that Library has various online resources facilities.

Que.No.3 which printed resources facility ready by you for research support.

Table No 3

Sr. No	Initiatives taken	Yes	No
1	Printed newspapers	Yes	
2	Access to public and private sectors research reports	Yes	
3	Indexes and abstracts for researchers		No
4	Access to reference books	Yes	
5	Access to subscribed printed journals	Yes	
6	Manuals for research guidance	Yes	
7	Research pamphlet and brochures	Yes	

The table No. 3 shows that for research support Online resources provision planed by Library i.e. Access to online database other than HEC digital library, access to eBooks collection, Online tutorial, Wi-Fi Connectivity, OPAC and Subscribed e Journals, except Access to HEC digital Library . It is observed that Library has provided various online resources facilities.

Que.No.4 which support Provision of research support staff in the library for assistance of researchers.

The table No. 4 shows that Provision of research support staff in the library for assistance of researchers is provided as Shelves reading and

Table 4.

Sr. No	Provision of research support staff	Yes	No
1.	Shelves reading and management services	Yes	
2.	Library attendants are working as supporting	Yes	
3.	Reprographic and binding service	Yes	
4.	Allocation of professional staff to answer research queries		No
5.	Computer assistant is on duty as per routine working day		No
6.	Allocation of library assistants to support search facilities	Yes	
7.	Provision of helpdesk for reference services	Yes	

management services, Library attendants are working as supporting, Reprographic and binding service, Allocation of library assistants to support search facilities, Provision of helpdesk for reference services except Allocation of professional staff to answer research queries, Computer assistant is on duty as per routine working day. It is observed that Library has provided research support staff for assistance of researchers.

Que.No.5 In orientation which e-resources Information or e resources use explains by you for research work?

Sr.No	Initiatives taken	Yes	No
1	e-books	Yes	
2	e-journals	Yes	
3	Google search	Yes	
4	Research gate	Yes	
5	Web OPAC	Yes	
6	Shodhganga database	Yes	
7	Institutional Repositories	Yes	
8	Academic, research and government websites	Yes	
9	Indian National Digital Library(NDL)	Yes	
10	Various free e resources sites	Yes	

The table No. 5 shows that in orientation for researcher Librarian oriented e resources information about e books, e journals, Google search, Web OPAC, Institutional Repositories, Academic research and government websites, various free e resources., It is observed that in orientation Librarian has explain all e resources information and techniques to researcher,

Que.No.6. Have you suggested a reference management tools for researcher?

Table 6

Sr.No	Initiatives taken	Yes	No
1	EndNote		No
2	EasyBib.com		No
3	CiteULike		No
4	RefWorks		No
5	Mendeley	Yes	
6	Zotero	Yes	

The table No. 6 shows that Librarian suggested only Mendeley and Zotero reference management software tools for researcher except EndNote, EasyBib.com, CiteULike, Refworks etc.

Que.No.7. which of the initiatives are taken by you as a librarian in teaching, learning and research?

Table 7

Sr. No	Initiatives taken	Yes	No
1.	Provide reference materials	Yes	
2.	Publication ethics	Yes	
3.	OPAC, Databases search	Yes	
4.	Literature Search	Yes	
5.	New Arrivals alerts	Yes	
6.	CAS and SDI Services	Yes	
7.	Research advisory desk		No
8.	Plagiarism check		No
9.	Reference citation styles	Yes	
10.	Reference management tools	Yes	

11.	Copyright Awareness	Yes	
12.	Information Searching strategies	Yes	
13.	Use of e-resources	Yes	
14.	Library Orientations	Yes	
15.	Research support training	Yes	
16.	Discussion activities for researchers	Yes	
17.	Trainings of data analysis software	Yes	
18.	Reference and citation trainings	Yes	
19.	Avoiding plagiarism techniques	Yes	

The table No. 7 shows that librarian has taken initiatives in teaching, learning and research.

Provide reference materials, Publication ethics, OPAC, Databases search, Literature Search, Reference citation styles, Copyright Awareness, Discussion activities for researchers, Avoiding plagiarism techniques, Reference and citation trainings, Use of e-resources etc. Except Research advisory desk, Plagiarism checks. It is observed that in teaching, learning and research Librarian has taken initiatives in all needed fields.

Que.No.8. You have suggested reference management/citation style ?

Table 8

Sr. No	Reference management/citation	Yes	No
1.	MLA	Yes	
2.	APA	Yes	
3.	Harward		No
4.	Nature		No
5.	Bib Text		No
6.	Chicago		No
7.	AMS		No
8.	Bluebook		No
9.	AMA		No

The table No. 8 shows that Librarian Suggested Only MLA and APA reference management/citation style for citation and Bibliography in research center as per subject rules. It is observed that Librarian gives awareness reference management/citation style by orientation.

Que.No.9. Which Challenges and difficulties faced for provide quality Services to Researchers by you working in the library?

Table 8

Sr. No	challenges and difficulties	Yes	No
1.	Insufficient space		No
2.	Lack of skilled staff		No
3.	Lack of standard library software		No
4.	Lack of financial resources		No
5.	Insufficient staff/manpower		No
6.	Lack of electricity supply		No
7.	Lack of ICT equipment		No
8.	Lack of quality study material		No

The table No. 9 shows that no any Challenges and difficulties faced for provide quality Services to Researchers by you working in the library. It is observed that Library is equipped with quality LMS software, electricity supply, ICT equipment, quality study material, skilled staff, and Full space.

Recommendations and future work:

While doing A study of research support services in Pravara Institute of Research and Education in Natural and Social Science (PIRENS) Loni (Bk) Dist-Ahmednagarsome suggestions and recommendations for improving the situation are made:

➤ There should be need to provide Plagiarism check, research advisory desk services to researcher for quality library sources and services for 100% use from users.

- The study recommends the managements to increased Library Orientation for Maximum use and provides Plagiarism software.

Conclusion

The main purpose of this survey is to find out status of quality of research support services of Pravara Institute of Research and Education in Natural and Social Science (PIRENS) Loni (Bk) Dist- A study . PIRENS institute provides all needed and important quality research support services to researcher also this study helps to understand the problems and difficulties of Libraries to provide quality research support services to researcher and also know the difficulties and problems of libraries after this survey the managements to provide Plagiarism check, research advisory desk services to researcher for quality library sources and services for 100% use from users.

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**INFORMATION NEEDS AND INFORMATION SEEKING BEHAVIOUR OF
COMPETITIVE EXAMINATION ASPIRANTS IN PRAVARA RURAL EDUCATION
SOCIETY'S NON-TECHNICAL COLLEGES LIBRARY IN AHMEDNAGAR DISTRICT: A
STUDY***

BY

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Abstract: In All the Savitribai Phule Pune University Affiliated Colleges a Separate section as Civil Services and Competitive Exam Section. The survey conducted on some selected Libraries have brought to fore some very important facts which will go a long way in building collection of these Libraries in future. Some commonly sought in formations by the students while preparing for competitive exams have been taken as Indicator questions in order to assess the Library collection and services with respect to them. This section provides specialized resources for the competitive examination Present study is undertaken to study How the aspirants Fulfilled their Information Needs and which library services provides to aspirants and what is the status of Competitive exam Centre for Background and quality how the information resources was utilized by the competitive exam aspirants in the Competitive exam section

Keywords: Competitive Examination, Information Seeking Behaviour, Information Needs

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Introduction : Colleges form the integral part of Higher education and libraries in colleges are the primary source for learning process. The college library is a connecting link between teaching and learning as well as place which supplements its resources what is beyond scope of class room. College libraries play an important role in the educational history of both the students as well as the faculty members. It serves the user by providing specific information to the user. But how far the college libraries are successful in implementing their goals into its reality is a big question. There must be some agency to have a proper vigilance on the functioning of college libraries and also to suggest certain measures to rectify the emerging needs, and for this kind of purpose NAAC was established for maintaining quality education of the institutions. (Ahemad & Pal, 2012)

Definition:

Competitive Exams: Competitive examinations are used as gateways in many countries for university and college admissions or admissions to secondary schools (entrance examination) or for positions in the civil service (Civil service examination). They are considered an egalitarian way of choosing

worthy aspirants without risking influence peddling, favoritism or other concerns. Competitive Services give payment, pension, perquisite, standard of living, job security, job satisfaction, transfer, opportunity to success.

College Library: A college library means "A library which is associated or attached with any educational institution to support its educational programmes". Academic library is an integral part of formal education system which provides time bound education from primary school level to university level. An academic library works as a base for teaching, learning, research, etc.

III. Objectives of the Study:

- How the aspirants fulfilled their Information Needs.
- Which library services provides to applicant.
- What is the status of Competitive exam Centre for Background and quality?
- How the information resources was utilized by the competitive exam aspirants in the Competitive exam section.

IV. Methodology

The study is based on the primary data collected from the selected Libraries of Pravara Rural education Society's Non-Technical Colleges affiliated to Savitribai Phule Pune University . A Simple questionnaire was distributed to all respective librarians of concern libraries for obtaining the information

Table 1. List of Pravara Group of Non-technical Institution Colleges and Details of College Libraries

Sr.No.	College Name	Total Books	Total Students	Non-teaching and Teaching Staff	Abbreviation
1.	Padmshri Vikhe Patil College ,Pravaranagar	99454	2860	284	PVPCP
2.	Arts Commerce and Science College , Satral	22568	825	70	ACSCS
3.	Arts Science and Commerce College , Kolhar	19981	750	46	ASCCK
4.	Arts Science and Commerce College , Alkuti	5630	970	42	ASCCA
5.	Arts science , commerce and BCS College Ashvi	10679	675	41	ASBCA
6.	Pravara Rural College of Education ,Loni	16499	150	37	PRCEL

7.	Home Science and BCA College for Women .Loni	6345	210	27	HSBCLW
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V. Review of Literature- The review of literature is so much required as it guides the researcher in the correct path of his journey. To say in simple words, it is a stepping stone for the process of research. The main purpose of review of literature would be to avoid duplication of research. Sunil, Tyagi (2012) This study sought to study the user experience and perception of using different types of electronic information sources by the users. Parvez, Akhtar (2012) a study of Information needs of managers in Indian financial Institutions and concluded that the information providers should focus on providing customized information solutions to the information seekers. Gupta and Sharma (2015) described the study on use, awareness, frequency, importance, purpose, and satisfaction in the use of Digital Information Resources and services among the students of IIT Mumbai Central Library. Nnadozie (2012) had conducted a study on use and non-use of information resources by the junior staff of industries in Nigeria. Katabalwa (2016) had emphasized the usage of electronic journal resources at University of Dares Salaam. Adjoa and Dzokotoe (2017) had analysed the use of electronic resources by the lecturers of the University for Development studies at the Wa Campus in the Upper West Region of Ghana.

VI. Data Analysis

The study was carried out in selected seven colleges Librarians of Pravara Rural education Society's Non-Technical Colleges Libraries.

Table 2. Information needs of aspirants

S R. N O.	Information needs of aspirants	College name						
		PVPC P	ACSC S	ASCC K	ASCC A	ASCB CA	PRC EL	HSBC LW
1	Study material preparing for Comp. Exams.	Yes	Yes	Yes	Yes	Yes	No	No
2	To search advertisements	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	For previous question papers	Yes	Yes	Yes	Yes	Yes	No	Yes
4	For understanding syllabus	Yes	Yes	Yes	Yes	Yes	No	No

The table No. 2 shows that 5 (71.42 %) respondent stated 'Yes' for Information needs of aspirants It was observed that a maximum aspirant needs Information from library.

Table 3. what kind of reading material you recommend to purchase or subscribe

SR N O.	Reading material recommend to purchase	College name						
		PVP CP	ACS CS	ASCC K	ASC CA	ASC BCA	PRC EL	HSB CL W
1	Quality publishers reference books	Yes	Yes	Yes	Yes	Yes	No	No

2	Popular Comp. Exams Journals	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Quality newspaper for current affairs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Necessary text books for preparing Comp. Exams.	Yes	Yes	Yes	Yes	Yes	No	No

The table No. 3 shows that 5 (71.42 %) respondent stated 100% 'Yes' for recommend to purchase reading Materials. It was observed that a maximum Librarians recommends for purchase of Needy materials for aspirants from library.

Table -4 Libraries helps aspirants to satisfy their information needs

SR. NO.	library helps aspirants to satisfy their information needs	College name						
		PVP CP	ACS CS	ASCC K	ASCC A	ASCB CA	PRC EL	HSB CL W
1	By given study material available	Yes	Yes	Yes	Yes	Yes	No	Yes
2	By Subscribing needy journals/ magazines	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	By library services	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	By reading room availability	Yes	Yes	Yes	Yes	Yes	No	Yes
5	By lecturers	Yes	Yes	Yes	Yes	Yes	No	Yes
6	By organized seminars regularly	Yes	Yes	Yes	Yes	Yes	No	Yes
7	By provided internet facility	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The table No. 4 shows that 5 (71.42 %) respondent stated 100% 'Yes' for aspirants to satisfy their information needs from Library. It was observed that a maximum Librarians helps aspirants to satisfy their information needs from library.

Table-5 which services are being provided to the Aspirants

SR. NO.	which services are being provided to the Aspirants	College name						
		PVP CP	ACS CS	ASCC K	ASCC A	ASCB CA	PRC EL	HSBC LW
1	Reference Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Abstracting Services	No	No	No	No	No	No	No
3	Circulation Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Indexing Services	Yes	No	No	No	No	No	No

5	Current Awareness Service	Yes	Yes	Yes	Yes	Yes	No	No
6	Photocopy (Xerox) Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	Inter library loan Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Translation Service	No	No	No	No	No	No	No

The table No. 5 shows that all respondent stated 100% 'Yes' reference service, circulation services, CAS, Photocopy services and Interlibrary loan Services for Provided to the aspirants from library.

Table 6 - which Social Media platform is used for this service?

SR N O.		College name						
		PVPCP	ACS CS	ASCC K	ASCC A	ASCB CA	PRCE L	HSBC LW
1	E-mail	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	WhatsApp	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Telegram	Yes	Yes	No	No	No	No	No
4	SMS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Others	No	Yes	No	No	No	Yes	Yes

The table No. 6 shows that all respondent stated 100% 'Yes' for Using Social Media Platform – Email, Whatsapp, SMS except Telegram

Table – 7 Does college establish Competitive Exams Centre

SR. NO	Does college establish Competitive Exams Centre	College name						
		PVPCP	ACSC S	ASCC K	ASC CA	ASCB CA	PRC EL	HS BC LW
1	Yes /No	Yes	Yes	Yes	Yes	Yes	No	No

The table No. 3 shows that 5 (71.42 %) respondent stated 100% 'Yes' for college establish Competitive Exams Centre. It was observed that a maximum colleges established Competitive Exam center.

Table-8 which facilities do you provide to the students in the Competitive Exam centre?

SR N O.	Facilities provide to the students in the Competitive Exam Centre	College name						
		PVPCP	ACSC S	ASCC K	ASC CA	ASCB CA	PRC EL	HSBC LW
1	Reading hall facility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Career guidance to aspirants	Yes	Yes	Yes	Yes	Yes	No	Yes
3	Internet availability	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4	Sufficient study material	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Regular lectures on competitive exams.	Yes	Yes	Yes	Yes	Yes	No	Yes
6	Regular test series	Yes	Yes	Yes	Yes	Yes	No	Yes
7	Library services	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Pure drinking water	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Continues electricity	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The table No. 8 shows that 6 (85.71 %) respondent stated 100% 'Yes' for all Facilities provide to the students in the Competitive Exam Centre from Library. It was observed that a maximum respondent Provide all Facilities to the students in the Competitive Exam Centre.

Table-9 Any difficulties/problems to face while running the Competitive Exam Centre?

SR N O.	Any difficulties/problems to face while running the Competitive Exam Centre	College name						
		PVPCP	ACS CS	ASCC K	ASC CA	ASCB CA	PRC EL	HSBC LW
1	Lack of quality lectures	No	No	Yes	Yes	Yes	Yes	Yes
2	Lack of quality study material	No	No	Yes	Yes	Yes	Yes	Yes
3	Library hours	No	Yes	No	Yes	No	Yes	No
4	Electricity problem	No	Yes	No	Yes	No	Yes	No
5	Insufficient fund	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Lack of sufficient place	Yes	Yes	No	Yes	No	Yes	Yes
7	Insufficient reading hall capacity	No	No	Yes	No	Yes	Yes	No
8	Disinterest of library staff	No	No	No	No	No	Yes	Yes

The table No. 9 shows that Maximum respondent stated 'Yes' for difficulties/problems to face while running the Competitive Exam Centre i.e. Lack of quality lectures, Lack of quality study material, Library hours, electricity problem, Insufficient fund. It was observed that a maximum colleges libraries faced difficulties/problems to face while running the Competitive Exam Centre.

VII. Recommendations and future work:

While doing Information Needs and Information Seeking Behaviour of Competitive Examination aspirants in Pravara Rural Education Society's Non-technical Colleges Library in Ahmednagar District :A Study some suggestions and recommendations for improving the situation are made:

- There should be need to provide all Information needs of aspirants.

- Purchase recommended reading materials to aspirants for information needs.
- Provide Abstract, Translation, Indexing service facilities to aspirants
- The study recommends the managements to increased Quality lecture, Study materials, reading hall capacity.

Conclusion

The main purpose of this survey is to find out status of Information Needs and Information Seeking Behaviour of Competitive Examination aspirants in academic libraries of Pravara Rural Education Society's Non-technical Colleges Library in Ahmednagar District. Also this study helps to understand the problems and difficulties of Libraries to provide quality services to aspirants and also know the difficulties and problems of Competitive exam center and libraries after this survey the managements to increased Quality lecture, Study materials, reading hall capacity and purchased quality books and study materials as per needs of aspirants.

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**INFORMATION SOURCES AND SERVICES OF PRAVARA RURAL EDUCATION
SOCIETY'S TECHNICAL COLLEGES IN AHMEDNAGAR DISTRICT: A STUDY"**

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Abstract:

This paper highlights the concept of Information Sources and Services and to know which services Provides to Users as per AICTE Norms and Users are satisfied or not in the provide services in the library. in this paper we have taken all Library services with staff, resources, services, as per given in AICTE end of the paper we should know the quality of services given by Pravara Rural education Society's Technical Colleges in Ahmednagar District: A study.

Keywords: Information Sources, Library Services

Introduction :

The main aim of a library is to provide service to the reader's. The AICTE has laid-down certain norms for the libraries to enable there to provide better service to the readers. Hence, main objective of the present study is to trace whether or not the pharmacy college libraries affiliated to Pune University are following the norms of AICTE while dealing with the readers.

In view of the growing importance of the libraries in shaping up the teachers and students tomorrow, the library should be equipped with not only educational CDs and reference books & Periodicals but also with better service to the reader's efficiency of the libraries certainly contributes to the enhancement of the knowledge of the readers. Therefore an attempt is going to be made to trace to what extent, the norms of AICTE are followed by the various college libraries affiliated to Pune University libraries.

The researchers will also suggest certain improvements in regards to place of library Number of books, educational CDs, online databases and other services. Moreover the researchers will justify that planning for providing information related to the library is vital for the effective functioning of any library

INFORMATION SOURCES

According to Kumari, (2011) information sources collection, i.e. Handbook, Bibliographies, dictionaries, encyclopaedias, biographies, directories, yearbook, geographical sources, Reference collection, which is an important collection of library. The libraries should also evolve a collection development policy with regard to acquisition on reference sources.

INFORMATION SERVICES

According to Sharma, (2005) the values and services supported by libraries for centuries will continue. These include ownership, assistance to users, and of some collection, access to others, the originations of resources and assistance to users, including response to specific information need and questions, information guidance and formal instruction. These services call for the capabilities of an array of professionals.

Objectives of the Study:

- To examine the services and facilities provided by the Libraries.
- To find out whether reader are satisfied or not in the provided services in the Libraries.
- To find out defects and suggest some remedies

IV. Methodology

The study is based on the primary data collected from the selected Library Users of Pravara Rural education Society's Technical Colleges in Ahmednagar District . A Simple questionnaire was distributed to all respective librarians of concern libraries for obtaining the information from Users.

Table 1. List of Pravara Group of technical Institution Colleges and Details of College Libraries

Sr.No.	College Name
1.	Pravara Rural Engineering College ,Loni
2.	sir visvesvaraya Institute of Technology , Nashik
3.	Pravara Rural College of Architecture ,Loni
4.	Padmashri Dr. vitthalrao Vikhe Patil Institute of Technology and engineering (Polytechnic) Pravaranagar
5.	Pravara Rural College of Pharmacy, Pravaranagar(B.Pharm, M.Pharm)
6.	Pravara Rural College of Pharmacy (Diploma) Pravaranagar
7.	College of Pharmacy (for Women) Chincholi ,
8.	College of Pharmacy (D.Pharm) Chincholi Mohu
9.	Institute Of Pharmacy ,Loni

V. Review of Literature- The review of literature is so much required as it guides the researcher in the correct path of his journey. To say in simple words, it is a stepping stone for the process of research. The main purpose of review of literature would be to avoid duplication of research. Mulla and Chandrahekara, (2006) in his study entitled "E-Resources and Services in Engineering College Libraries-A Case study it is found that collection and service infrastructure of the libraries in sampled regions were not up to the mark and libraries were struggling to build digital collection. Naushed Ali and Hasan, (2006) in his study entitled "Library and Information Services in Central Library of Aligarh Muslim University form the Teacher's Point of View: A Sruvey". Singh R.K.J. and Devi T.M., (2009) in his study entitled "Use of internet Based E- Resources at Manipur university: A Survey" . Kumari H. and Talawar, (2009) in his study entitled "Use of Reference Sources in University Libraries of Karnataka: A Study" Sami and iffat, (2009) in his study entitled "Use of Information Sources and Service in Library of Agriculture Science College, Shimoga: A Case Study".

VI. Data Analysis

The study was carried out in selected 100 students responded to the questionnaire from Pravara Rural education Society's Technical Colleges in Ahmednagar District.

Table No- 2 Frequency of Visit to Libraries:

Sr. No.	Frequency of Visit to Library	No. of Respondent	Percentage
1.	Daily	35	35 %
2.	Once in a Week	13	13 %

3.	2-3 times a Week	48	48 %
4.	Rarely	04	4 %
	Total	100	100%

The table No. 2 shows that 35 (35%) respondent were visiting Libraries Daily. 13(13%) respondent were visiting Libraries Once in a Week. 48(48%) respondents and 4 (4%) respondents were visiting libraries 2-3 times a Week and Rarely respectively. It is observed that mostly respondents have visited libraries in a Week.

Table 3 Types of Documents use

Sr. No.	Types of Document Use	No. of Respondent	Percentage
1.	Text books/E books (prescribed in syllabus)	80	80%
2.	General books on respective subject	52	52%
3.	Reference books(Dictionaries, Encyclopedia)	56	56%
4.	E journals /Journals in respective subjects	62	62%
5.	General periodicals/Magazines	45	45%
6.	Back volumes of Journals	17	17%
7.	News papers	56	56%
8.	Audio-visual material (CDs)	07	07%
9.	Dissertations	02	2%
10.	Any Others	39	39%

The table No. 3 shows that 80(80%) respondent users stated 'Yes' for text Books use. 52(52%), 56(56%),62(62%) respondent users stated 'Yes' for General books on respective subjects, Reference Books, Journals in respective subjects respectively. It is observed that mostly users use only text book in various documents of library.

Table 4. Satisfaction with the documents

Sr. No.	Types of Documents	Satisfied	Partially Satisfied	Not Satisfied	Percentage
1.	Text Books	67 (67%)	24 (24%)	9 (9%)	100 (100%)
2.	Reference Books	55 (55%)	36 (36%)	9 (9%)	100 (100%)
3.	Journals in Respective Subjects	52 (52 %)	29 (29%)	19 (19%)	100 (100%)
4.	News Papers	78 (78%)	17 (17%)	5 (5%)	100 (100%)
5.	Audio-visual material	35 (35%)	49 (49%)	16 (16%)	100 (100%)
6.	Any other material	32 (30%)	40 (40%)	28 (30%)	100 (100%)

The table No. 3 shows that 67(67%),55 (55%),52 (52%),78 (78%) respondent , users were stated 'Yes' for the use of Text Books, reference book , Journals in respective subject and Newspapers document

satisfaction. It is observed that mostly users are satisfied about available resources in the library

Table 5. Services used in Library

Sr. No.	Services use in Library by Users	No. of Respondent	Percentage
1.	Circulation	81	81%
2.	Reference	57	57%
3.	OPAC	74	74%
4.	Inter-Library Loan	13	13%
5.	CAS/SDI	59	59%
6.	E-mail	51	51%
7.	Reprography	73	73%
8.	Internet	65	65%
9.	E books	53	53%
10.	E journals	67	67%
11.	Indexing	7	7%
12.	Open Access	93	93%
13.	User Education	80	80%
14.	Printing	32	32%
15.	Scanning	38	38%
16.	Reading Hall	76	76%
17.	Online Services	65	65%
18.	Any Other	64	64%

The table No. 5 shows that 81(81%), 74(74%), 73(73%), 93 (93%), 80 (80%)respondent users stated 'Yes' for the Circulation , OPAC, reprography, Open Access and User education respectively .It was observed that mostly daily important services/facilities were used by users provided by library

Table 6 Library Services

Sr. No.	Library Services	Satisfied	Partially Satisfied	Not Satisfied	No Response
1.	Circulation	67 (67%)	27 (27%)	3 (3%)	3 (3%)
2.	Reference Service	52 (52%)	29 (29%)	12 (12%)	7 (7%)
3.	OPAC	68 (68%)	24 (24%)	5 (5%)	3 (3%)
4.	Inter Library Loan	8 (8%)	36 (36%)	18 (18%)	38 (38%)
5.	CAS/SDI	54 (54%)	36 (36%)	6 (6%)	4 (4%)
7.	E-mail	46 (46%)	34 (34%)	8 (8%)	12 (12%)

8.	Reprographic	64 (64%)	31 (31%)	1 (1%)	4 (4%)
9.	Internet	63 (63%)	25 (25%)	12 (12%)	0 (0%)
10.	E books	48 (48%)	39 (39%)	5 (5%)	8 (8%)
11	E journals	61 (61%)	31 (31%)	4 (4%)	4 (4%)
12	User Education	63 (63%)	30 (30%)	4 (4%)	3 (4%)
13	Open Access	79 (79%)	11 (11%)	5 (5%)	5 (5%)
14	Printing	38 (38)	50 (50%)	3 (3%)	9 (9%)
15	Scanning	42 (42%)	52 (52%)	1 (1%)	5 (5%)
16	Reading Hall	63 (63%)	36 (36%)	1 (1%)	0 (0%)
17	Online Services	72 (72%)	24 (24%)	2 (2%)	2 (2%)
18	Any Other	68 (68%)	27 (27%)	3 (3%)	5 (5%)

The table No. 6 shows that 67(67%), 52(52.27%), 68(68%), 79 (79%) 72 (72%) respondent users were satisfied with the services/ facilities provided by the library. circulation, service, OPAC, Open Access and online service respectively. It was observed that mostly user were satisfied with the facilities/services provided by libraries.

VII. Recommendations and future work:

While doing Information sources and services of Pravara Rural education Society's Technical Colleges in Ahmednagar District: A study some suggestions and recommendations for improving the situation are made:

- There should be need to provide all quality library sources and services for 100% use from users
- The study recommends the managements to increased Library Orientation for Maximum use of E books and E journals.

Conclusion

The main purpose of this survey is to find out status of satisfaction of Information sources and services of Pravara Rural education Society's Technical Colleges in Ahmednagar District: A study also this study helps to understand the problems and difficulties of Libraries to provide quality Information sources and services to Users and also know the difficulties and problems of libraries after this survey the managements to increased Library Orientation for Maximum use of E books and E journals.

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THE INDIAN CONCEPTS OF LIFESTYLE AND MENTAL HEALTH IN OLD AGE

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Abstract

Lifestyle is a healthier life can boost both the physical and mental state. Healthy eating and regular physical activities are the primary solutions for good health at any age. But with more refined tips and a little more care, older adults can improve their living, leading a healthier lifestyle. Indian lifestyle is not about eating curry or doing yoga everyday nor is it about getting a regular Ayurvedic massage. In fact, this lifestyle is talked about as a sophisticated way of living a fulfilled life. It is quite a time-tested lifestyle and has been around for at least 10,000 years. Yoga, in such cases, is a great way to activate your mind and body, consciously steering clear of any negative thoughts or feelings and relaxing the body. The rich heritage of India, one of the world's oldest civilizations, is an all-embracing confluence of religions, traditions and customs. The highlights of Indian heritage lie in the treasure of its art, architecture, classical dance, music, flora and fauna, and the innate secular philosophy of its people. The Indian model of the society has excellent concepts regarding the all round development of an individual with proper stress on the importance of caring for the ageing members of the family.

Keywords: Mental Health, Lifestyle, Healthier Life, Indian Heritage

INTRODUCTION :

India, one of the oldest civilizations around the world, is the country with a long history of almost 5000 years and extremely complex social structure. Leading a healthier life can boost both the physical and mental state. Healthy eating and regular physical activities are the primary solutions for good health at any age. But with more refined tips and a little more care, older adults can improve their living, leading a healthier lifestyle.

INDIAN CONCEPTS OF LIFESTYLE

Everybody wants to live a life that makes them happy. Most people would agree that having a little more happiness in their life would be amazing. Being fulfilled is an awesome feeling, but unfortunately, it is a feeling that many have trouble finding. Fulfillment is an easy concept on the surface, yet it is so elusive.

Indian lifestyle is not about eating curry or doing yoga everyday nor is it about getting a regular Ayurvedic massage. In fact, this lifestyle is talked about as a sophisticated way of living a fulfilled life. It is quite a time-tested lifestyle and has been around for at least 10,000 years. Though it is ancient, it is said to be relevant for any era, applies to anybody, living anywhere - be it the USA, India, the UK, Australia or New Zealand. It is essentially a model for desire management. Want to know more about this great Indian lifestyle?

In fact, if happiness is what we seek in life, India suggests a time-tested lifestyle that has helped many in achieving lasting happiness. This model continues from ancient times, when India left no stone unturned in the quest to achieving joy, completeness and balance in life. It also serves as a self-help life-coach that helps with the objectives of human life.

THE INDIAN LIFESTYLE AND ITS BASIS

Indian culture is the heritage of social norms, ethical values, traditional customs, belief systems, political systems, artifacts and technologies that originated in or are associated with the ethno-

linguistically diverse Indian subcontinent. The term also applies beyond India to countries and cultures whose histories are strongly connected to India by immigration, colonization, or influence, particularly in South Asia and Southeast Asia. India's languages, religions, dance, music, architecture, food and customs differ from place to place within the country.

Indian culture, often labelled as a combination of several cultures, has been influenced by a history that is several millennia old, beginning with the Indus Valley Civilization and other early cultural areas. Many elements of Indian culture, such as Indian religions, mathematics, philosophy, cuisine, languages, dance, music and movies have had a profound impact across the Indosphere, Greater India and the world. Specifically Southeast Asian and Himalayan influence on early India, had lasting impacts on the formation of Hinduism and Indian mythology. Hinduism itself formed from various distinct folk religions, which merged during the Vedic period and following periods. Especially Austroasiatic groups, such as early Munda and Mon Khmer, but also Tibetic and other Tibeto-Burmese groups, left noteworthy influence on local Indian peoples and culture. Several scholars, such as Professor Przyluski, Jules Bloch, among others, concluded that there is a significant cultural, linguistic, and political Mon-Khmer (Austroasiatic) influence on early India, which can also be observed by Austroasiatic loanwords within Indo-Aryan languages and rice cultivation, which was introduced by East/Southeast Asian rice-agriculturalists using a route from Southeast Asia through Northeast India into the Indian subcontinent.

INDIAN LIFESTYLE VIS A VIS NEEDS AND ACTIVITIES

Cultural awareness among kids is a must from a very young age. If they grow up to accept and appreciate their own, unique, distinct culture, it will make their transition into adulthood better. There are many ways in which parents can teach their kids to value the tenets of Indian culture and seek to know more about other world cultures.

1. Make Them Follow Their Own Culture

Let your child celebrate Indian festivals in the true spirit by following the customs, traditions, and rituals. This will give them a true glimpse of the Indian culture. If children grow up seeing it as part of their upbringing, it will seep into their routine and remain everlasting. Tell them the stories too behind a particular festival. For instance, tell them why we celebrate Diwali, this will help them learn about Indian mythology.

2. Teach Them About Indian Culture by Giving Examples

The best mode of teaching is by giving appropriate examples. Giving examples of your roots will have a better and deeper impact on children. When they see the positive aspect of their own unique culture, they will be able to create a lifelong bond with it.

3. Make Them Attend Cultural Programmes

Indian cultural programmes depict the basic attributes of its culture. If there is any suitable opportunity, children should be taken to see cultural functions. If children attend cultural programmes, like folk dances or songs, they will catch a glimpse of the undiluted and purest form of Indian art.

4. Show Them the Diversity of Indian Culture

Children will not understand the diversity of Indian culture until and unless they are exposed to it. They should get an opportunity to see the customs and traditions followed across different states of India to understand the essence of 'unity in diversity'. They might forget what they read, but the imprints of whatever they see will remain in their minds forever. Therefore, take your kids to different states of India. Let them hear different languages, try traditional foods of a state, and see how people dress. The more the kids explore the more curious they will be to learn.

5. Narrate Stories of the Past

In your free time, narrate stories highlighting Indian values and culture to your kids. If they understand the morals of the stories and different characters, they will be able to relate with them. Our country has rich and vivid history, so you will have many stories to help them understand more about India.

6. Teach Indian Values

One of the most distinctive features of Indian culture is the abundance of values ingrained in a person right from his birth. Polite behaviour and respect for all is taught in every household. Being respectful to older and younger persons is a very important Indian value practised in every home. Similarly talking politely is another major value which is practised always. Children should be taught not to compromise on the values. This will change their behaviour for the good.

7. Take Them to the Different Parts of the Country

Go on a vacation with your kids to the different regions of India. The natural appeal, the scenic beauty, the geographical, political, topographical differences can be well understood when seen. Every holiday, go to a new place, this way they will learn about our culture and that tourists come to our country attracted by the key features of our culture.

8. Encourage Traditional Food and Clothing

Children should develop a sense of respect for ethnic clothing right from their childhood. A get together can be planned during weekends and you can eat traditional foods and wear ethnic outfits to promote Indian tradition.

9. Teach Kids to Respect Indian Culture

Children should take pride in their own culture. They should understand that people from other cultures come here to see this renowned culture. Only when kids develop respect for their own culture will they pass it on to the next generation.

As a parent, you should try to teach your kids about the various aspects of our culture and celebrate differences. To preserve our rich heritage, it is important that our kids know about it and pass it to the coming generations. So, have patience and teach your child about our rich history and culture.

INDIAN LIFESTYLE AND MENTAL HEALTH IN OLD AGE

We couldn't possibly put it in better words! The importance of staying physically, mentally and spiritually active is undeniable; more so in the later stages of life. And while exercising and indulging in sports is something that we highly recommend, it might not be possible for senior citizens to do so on a regular basis. Yoga, in such cases, is a great way to activate your mind and body, consciously steering clear of any negative thoughts or feelings and relaxing the body.

YOGA THERAPY FOR MENTAL HEALTH PATIENTS

Yoga has been a widely-acknowledged means of helping humans relax their mind and body. A dynamic Indian form, yoga has been closely associated with connecting the mind, body and soul. And if you have had any doubts about the effectiveness of yoga, let us take a look at some of the unarguable benefits of practicing yoga :

- Improving balance and stability
- Dealing with health problems
- Augmenting respiratory function
- Slowing down the ageing process
- Elevating the mood (especially for seniors)
- Improving focus and concentration
- Enhancing motor skills
- Driving fatigue away

- Improving the functioning of vital organs
- Increasing an individual's cognitive abilities
- Reducing stress and depression
- Improving bone health
- Relaxing the body and delivering peace of mind
- Regulating the blood flow
- Improving flexibility and strength

We point out myriad health benefits of practicing Yoga on a regular basis: **physical health benefits:** Yoga encompasses various poses/asanas which involve a gradual stretch of muscles that helps to improve flexibility of the various muscle groups of our body. Most Yoga postures are meant to strengthen one's body from the inside out. Apart from enhancing your muscle flexibility, strength and toning your body, Yoga can also help you in weight loss, protection from injuries, improving your body posture, vitality and metabolism. Various studies conducted across the world have shown that regular Yoga practice drastically optimizes body functions like respiration, heart rate, etc., lowers blood pressure, keeps cardiovascular health problems at bay and helps in reducing chronic back pain or joint pain, among other key physical benefits.

Mental health benefits: Practicing Yoga can positively affect your mood, behaviour and overall mental health in various ways. For students or working professionals, daily Yoga practice brings increased concentration, relaxation and peace of mind, helps to relieve symptoms of anxiety, stress, and so on. One can get amazing levels of mental clarity and calmness only by doing a combination of meditation and Yoga consistently. In the long run, Yoga can even aid anyone to fight depression, maintain a positive self-image and positive outlook towards life in general, and help in developing high willpower and tolerance (towards self and others).

Psychological health benefits: Yoga is a psychology in itself. Regular Yoga practice makes us feel better and enhances our sense of gratitude and well-being. Besides, Yoga is becoming increasingly accepted as an adjacent therapy to improve quality of life for individuals, as it offers an excellent opportunity to enter into the 'flow state'. Doing regular yoga helps people in achieving mindfulness, develops greater self awareness and tranquility, and catapults our ability to focus and remain happy throughout the day. Needless to say, Yoga is the gateway to better spiritual and emotional health as well!

CONCLUSION

The rich heritage of India, one of the world's oldest civilizations, is an all-embracing confluence of religions, traditions and customs. The highlights of Indian heritage lie in the treasure of its art, architecture, classical dance, music, flora and fauna, and the innate secular philosophy of its people. A visit to the heritage sites is like a walk through history, changing lanes with every dynasty that ruled Indian soils. The finesse of Indian handiwork, the richness of silk and cotton textiles, the ethnicity of jewellery, everything has come down as a heritage from ancient times and is being kept alive generation after generation. Even food in India is a legacy and part of Indian heritage, differing in look and taste in every state of India.

The Indian model of the society has excellent concepts regarding the all round development of an individual with proper stress on the importance of caring for the ageing members of the family. Wisdom through the ages and ancient concepts has survived because of their sheer practicality and because they are capable of transforming society into something it should ideally be. The old age deserves the recognition and attention they have been deprived of. And going back to our Indian roots is the only way, which goes down deep enough to tackle every single issue regarding elderly.

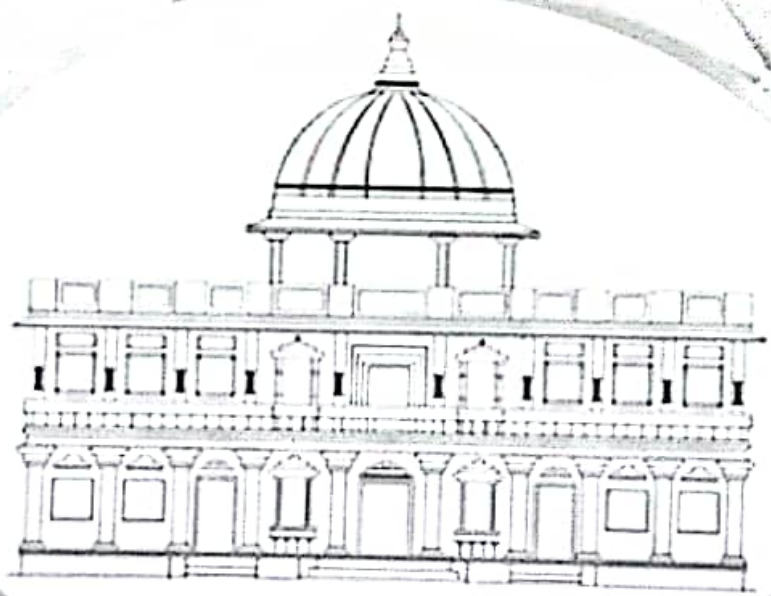
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EFFECT OF YOUTH GAMES IN EMERGING INDIA : SPECIAL REFERENCES TO KHELO INDIA

- Mr. Rahul Ubale, Kolhar

Abstract :

Khelo India has also brought major changes in the minds of people with regard to their perception of sports. It provides assistance to players during their school life and is a big motivation to bring them to the field of sports. The Khelo India programme has been introduced to revive the sports culture in India at the grass-root level. National sports competition players not only get an opportunity to show their passion, but they also get familiar with the culture of other states. It also shed some light on the fighting spirit of some participants of the Kelo India youth games and participation has increased over the years but in just three years

Introduction :

There are a growing sports and fitness culture across all sections of the society and therefore every new school, residential community, club, hotel, even offices etc., absolutely wants a suitable sports infrastructure. It was just a "nice-to-have" until recently.

There are many challenges this throws up. It is impossible that everyone will like the same sport; therefore the challenge is to provide a multi-sport facility. And with space and budget always a constraint, there is also a compelling need to use the same facility for non-sports usage as well. Any customer is always looking at using such surfaces in more than one way, thereby deriving multi-dimensional ROI.

Over the years we always had a product range to cater from amateur to professional levels. To tackle this new trend, we have further enhanced this by offering multi-sport and multi-purpose products. In



fact, some of these are portable as well, so that the investment is protected in case of future change of locations etc.

One very popular choice is our next-generation artificial turf. We have over 3,200 installations in India today spanning every type of facility. Customers love it because of its versatility of usage and no-maintenance aspects. Another innovation is inter-locking modular sports tiles meant for pretty much every sport - indoors or outdoors, and absolutely suitable for any non-sports activity on them. These last over 20 years; can be re-located; thereby providing the best ROI.

There is no doubt that with the growing economy, a growing sport & fitness culture, and the increase in infrastructure in general, the growth prospects for the industry are terrific. We are seeing 50%-100% growth in the recent few years and the trend should continue.

Bolstering the Sports Infrastructure in India :

In Past days, emerging India has hit all areas of life and sports is no exception. In India, a large proportion of the population is shared by the youth, which can be considered as the building blocks of a much potential market of India. Amid such a potential market of India, there is a dire need that the government of India takes some initiative to beckon more young entrepreneurs to start investing in the Indian sports section. By calling these Young Turks on board, the government can open new gates for some non-conventional business format and let them contribute to India's GDP. The governments can take some handy initiative in order to enrich the Indian sports sector along with its infrastructure:

- a. Graduating sports sector as an industry
- b. Promotion of Sports sector education program
- c. Monetary assistance to the sports-based firms
- d. Giving a boost to R & D in the sports sector



Khelo India :

Khelo India has also brought major changes in the minds of people with regard to their perception of sports. It provides assistance to players during their school life and is a big motivation to bring them to the field of sports. It provides a scholarship of 5 lakh rupees per annum for a stint of 8 years which will help players to develop their skills from a very young age. It is providing major assistance to our future heroes.

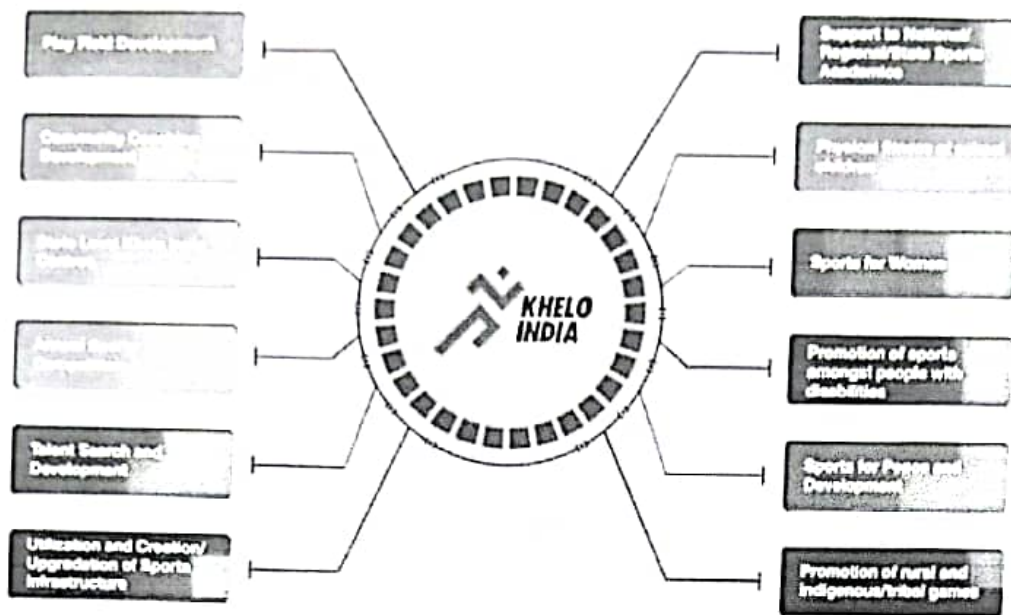
The importance of sports and fitness in one's life is invaluable. Playing sports inculcates team spirit, develops strategic & analytical thinking, leadership skills, goal setting and risk taking. A fit and healthy individual leads to an equally healthy society and strong nation.

Sports is an extremely important component for the overall development of our nation. India, in the last few years has made steady progress in the field of sports. This tremendous potential needs to be showcased at a global platform. It's time we inspire young talent, give them top-notch infrastructure and training of the highest level. We need to inculcate a strong spirit of participation in sports that enables players to demonstrate their true potential. Only then can India realise its dream of becoming a sports super power.

The Khelo India programme has been introduced to revive the sports culture in India at the grass-root level by building a strong framework for all sports played in our country and establish India as a great sporting nation.

Talented players identified in priority sports disciplines at various levels by the High-Powered Committee will be provided annual financial assistance of INR 5 lakh per annum for 8 years.

Khelo India School Games, which are a part of the Khelo India programme, are being held from 31st January to 8th February, 2018 in New Delhi. Under-17 athletes have been invited to participate across 16 disciplines, which are as follows: Archery, Athletics, Badminton,



Basketball, Boxing, Football, Gymnastics, Hockey, Judo, Kabaddi, Kho-Kho, Shooting, Swimming, Volleyball, Weightlifting, and Wrestling.

The government of India :

Over the past three years, Indian youngsters have had a new platform to showcase their sporting talent - the Khelo India initiative. Khelo India, which translates to 'Let's play India', was proposed by the government of India in 2017 to revive India's sporting culture by engaging with children at the grassroots level.

The aim of Khelo India :

The revamped Khelo India Scheme was launched during the financial year 2017-18 with a view to achieving the twin objectives of mass participation and promotion of excellence in sports. The vision of the revamped Khelo India is to infuse sports culture and achieve sporting excellence in the country.

Main Objectives of Khelo India in Future :

Khelo India has four objectives: Conduct structured annual sports competition and encourage Mass participation of youth. Identify talent through these competitions. Guidance and nurturing of the talent through



the existing and new infrastructure

Advantage :

- 1) Constant determination makes an individual's future bright.
- 2) Makes proud to Self-generation, locality, state, country.
- 3) Individuals will be trending.
- 4) Updated physical fitness.
- 5) Exemplary individuals.

Disadvantages :

- 1) Career spoil who does not have a plan b.
- 2) Physical disability or maybe even mental who is not under good mentorship.
- 3) Fail in every step who doesn't apply 100 afford particular sports (means only who think their work done is over by offering a glass of water).

The importance of physical education to everyone? :

Physical education explicitly teaches the necessary knowledge and skills for working with and relating to others, and provides the learning opportunities to develop these skills. It enables the development of leadership and teamwork skills and encourages students to transfer knowledge to other learning areas.

Emerging Trends in Sports Facility Design :

From high school and college gridirons to gymnasiums, and from ice rinks to arenas, athletic facilities serve as an anchor for many communities-a place to congregate and participate in or cheer on games of friendly competition. COVID-19 put a pause to those social gatherings but only temporarily, as the world now begins to emerge from the lockdowns of the pandemic.

Meanwhile, expectations that communities have about their sports facilities are getting higher all the time, observed Gudmundur Jonsson, senior architect and principal with Populous, a global design firm with



American headquarters in Kansas City, Mo. "There are a lot of crossovers happening. Things have changed over the past 10 years, and the gap between a municipal sports facility and a collegiate venue is getting narrower, in terms of the kind of facilities people are looking for," Jonsson said.

Colleges already have taken on many of the "wow" aspects of the professionals, he said. And now, some municipalities and high schools are picking up on these collegiate stadium and sports facility ideas.

"At the non-professional, non-collegiate level," Jonsson added, "we're also seeing facilities that cater to the future college athlete. These facilities contain training opportunities that will catapult a user to a level that can differentiate them from other athletes."

5 trends in the Indian e-sports industry that we expect :

- " Livestreaming propelling rise in viewership.
- " Increase in prize pools.
- " Collegiate e-sports kick off.
- " More eyeballs, more financial bloom for e-sports.
- " Deep-tech embraces gaming.

Technological boost has put India on cusp of sporting revolution:

A wholly unexpected chain of events has put India on the cusp of a sporting revolution. It has taken a long time coming. But the signs that scream out the nudging of the population from certified couch potatoes to active sports-pursuing practitioners, are all out there.

Digitalization, individualization and sustainability are certainly three of the most important trends in the sports industry - and they also require a fundamental change in sports marketing. "The world is undergoing extreme change and digitalization is accelerating it," said Daniel Macaulay, summarizing the situation.

The rise of sports in Indian Ecosystem :

The Google dictionary defines Industrialization as "development

of Industries in the country or a region on a wide scale". All developing countries like India are focusing on developing their Industries and one industry that has immense growth potential in our country is the sports industry. The sports industry sector may include several different segments such as sporting goods (in manufacturing and retail), sporting garments, sports tourism and the available opportunities in sporting management and sponsorship. Sport is regarded as one of the largest industries worldwide in terms of generating employment and revenue. Sports is a multi-billion dollar global industry propelled by enormous consumer demand. The global sports industry is estimated to be around \$600 billion contributing around 0.5 per cent of the world GDP (it ranges to even 5 per cent in some countries) whereas in India it contributes only 0.1 per cent of the GDP.

There has been a non-sporting culture in India with cricket being an exception and the only major sport in India which thwarted the growth of this much deserving industry. In last 3 to 5 years this trend has seen a drift. The Indian sports scene is making its path beyond the game of cricket towards a plethora of sports, resulting in the growth of participation, viewership and sports-related industries. India's improving economic climate, rising disposable incomes, and changing outlook towards fitness is fueling the increase in demand for sports-related goods and services. Investment prospects range from the manufacturing and retail of equipment and apparel to advertising, talent management, and training.

Conclusion :

National sports competition players not only get an opportunity to show their passion, but they also get familiar with the culture of other states and therefore, the government has decided to organize 'Khelo India University Games' every year on the lines of 'Khelo India Youth Games.' It also shed some light on the fighting spirit of some participants



of the Kelo India youth games who overcame several obstacles to make their parents proud. It is happy to see that not the participation has increased over the years but in just three years, through the 'Khelo India Competition', thirty-two hundred talented children have emerged and many of these children those who grew up amidst poverty.

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Natural surfactants assisted an efficient synthesis of tetrahydro- β -carbolines

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ABSTRACT

An expeditious protocol for the synthesis of structurally diversified β -carboline derivatives has been reported using a readily available natural surfactant medium. The synthesis of β -carboline derivatives in good yields under optimized conditions was carried out by the reaction of tryptamine with aldehydes in an aqueous extract of *Acacia Concinna* pods. The use of an aqueous medium, ease of purification, good yield and cost-effective reaction suggest for bulk scale production β -carboline derivatives.

Introduction

Nowadays there are continuous efforts in the development of Green chemistry the main focus of which is the replacement of the toxic or hazardous and expensive catalysts with the greener alternative. Water being safer, non-toxic, inexpensive and accessible is found to be a unique medium for conducting organic chemistry reactions[1–6]. Catalyst is the soul of organic reactions, hence its design, construction and utility is a great challenge before researchers. Numerous reaction transformations have been developed including the use of supercritical solvent[7], clays [8], enzymes[9], animal bone[10], surfactants[11] etc. as reaction medium or catalyst. These materials are found to be convenient to some extent for solving certain incredible synthetic issues. Some serious issues are occurring by use of catalyst in reaction like environmental hazardous nature of the catalyst, expensive, handling problems, use elevated temperature etc. To overcome these problems, use natural feedstocks in organic synthesis has found to be the best remedy. Nature gives an unbelievable collection of biochemicals that can act as biocatalysts for conducting organic transformations[12–15]. The natural material like soaked *Phaseolus Aureus*, the plant cell culture of *Daucus carota* root and coconut juice has been effectively used as a catalyst for conducting organic reactions[16]. The natural surfactants of *Acacia concinna* have been efficiently used for Knoevenagel condensation reaction[13], acylation of amines[17] and synthesis of aryl-hydrazones[16].

β -carbolines are natural products possessing various bioactivities due to their extraordinary chemical structure[18–20]. Reserpine (A) is used to treat high blood pressure and to treat mental disorder patients[21].

(-)-Suaveoline (B) has nutritional and medicinal applications[22,23]. Moreover, β -carboline derivatives possesses antimalarial[24], anti-tumor, anti HIV[25] and antibacterial activities[26], Tadalafil (C) is used to treat male sexual function problems[27]. Strictosidine (D) is important precursors to medicinally important compounds such as anticancer drugs[28]. Kumujian C (D) plays important role as anti-inflammatory agent[29]. 6-oxofascaplysin (F) shows weak cytotoxic activity[30]. Evodiamine (G) shows anticancer activity[31] (Fig. 1).

Considering the pharmacological potential of β -carboline core, its synthesis using the green chemistry technique is the major concern of the present work. Generally, the synthesis of β -carboline is Pictet-Spengler reaction tryptamine or tryptophan with carbonyl compound in an organic solvent under reflux condition. Trifluoroacetic acid (TFA) and hydrochloric acid were found to be appropriate Bronsted acids for the synthesis of β -carboline derivatives[32]. The use of strong acids as a catalyst and harsh conditions with lacking substrate scope are the major disadvantages of reported methods[33]. Recently, molecular iodine and TFA/H₂O[34–36], zeolites[37,38], microwave irradiation(MWI)[39], aqueous molecular iodine in DMSO[40] has been studied to reduce reaction time and to improve yields of the products[41–43]. β -carboline derivatives are recently synthesized using diphenylphosphoric acid as a catalyst[44]. Pyridyl-phosphine ruthenium(II) catalyzed Pictet-Spengler reaction for the synthesis tetrahydro- β -carbolines is also reported[45]. Trifluoroacetic anhydride (TFAA) and 1,4-diazabicyclo[2.2.2]octane (DABCO) promoted and dimethylacetamide (DMA) mediated Pictet-Spengler reaction is also reported[46]. Unfortunately, each method reported in the literature has disadvantages. Therefore, there is still a need.

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to develop a more efficient method for the construction of the β -carboline core by utilizing natural, renewable and less hazardous reaction.

Acacia concinna known as Shikakai in India belongs to the family Leguminosae. Due to the cleansing activity of *Acacia concinna*, it has a traditional application as shampoo and detergent. The saponins, acacia acid present in *Acacia concinna* fruit which was found to be 10–11.5% [47] resulted in the acidic nature of its aqueous extract ($pH = 4.1$) [48,49]. Also wetting and spreading property of surfactant solution promoted us to use surfactant type catalytic medium for synthesis of β -carboline derivatives. The aqueous extract of *Acacia concinna* is rich in saponins content. Saponins are triglycosides of acacia acid that contain glucose, arabinose and xylose as sugar cores [49,50]. Being amphiphilic, saponin has an existence of both polar and non-polar part as Glycone and Aglycone part respectively. Due to these polar and non-polar parts of saponin, reactant molecules solubilize in an aqueous extract of *Acacia concinna* and preceding the chemical reaction to the product side.

Result and discussion

To the extension of our current research for the development of novel methodologies for the synthesis of essential bioactive molecules [51–54], herein we have reported the use of natural surfactant type catalyst for the synthesis of tetrahydro- β -carboline derivatives (Scheme 1). Tetrahydro- β -carboline derivatives were synthesized using aqueous extracts of different natural surfactants like *Acacia concinna*, *Balanites aegyptiaca*, *Jatropha*, *Sapindus mukorossi*. Normally, the drastic reaction condition (5–6 hrs) is required the synthesis of tetrahydro- β -carbolines. To assess the catalytic effect of all the above natural surfactant on the

rate of reaction and yield of the product we performed a model reaction of tryptamine (1) (1 mmol) and benzaldehyde (2) (1 mmol) in 10 mL aqueous extract giving product 3a was carried out in respective aqueous solutions (Scheme 1). The use of natural surfactants showed variation in the rate of reaction and yield of product, results are summarised as in Table 1.

Hence, *Acacia Concinna* pods are applied effectively for the synthesis of tetrahydro- β -carbolines derivatives from tryptamine and benzaldehyde. The effect of other natural surfactants like *Balanites aegyptiaca*, *Jatropha*, *Sapindus mukorossi* for the synthesis of β -carboline derivatives has been studied shows less efficiency than *Acacia Concinna* pods. So for the synthesis of β -carboline analogues, aqueous extract of *Acacia Concinna* pods are applied.

For the optimization of reaction, the reaction of tryptamine (1) (1 mmol) and benzaldehyde (2) (1 mmol) in 5 mL aqueous extract of *Acacia concinna* pods (10% W/V) was conducted by varying temperature from 25 to 98 °C. It was found that 80% of compound 3a was formed after 5.4 h at 98 °C temperature. The same reaction was conducted in different concentrations of aqueous extract of *Acacia concinna* pods as 20, 30, 40, and 50% to study the effect of catalyst concentration on yield. The result obtained suggested that 20% of the aqueous extract was adequate to get the maximum yield of the product 3a (82%) in 5.2 h. However, an increase in the concentration of *Acacia concinna* pods (30%, 40%, and 50%) did not show much difference in the yields of the final product (Table 1) (see Table 2).

Similarly, the surface tension of the aqueous extract of *Acacia concinna* pods also plays important role in the determination of the rate of reaction. It was found that the addition of surfactant in water reduces

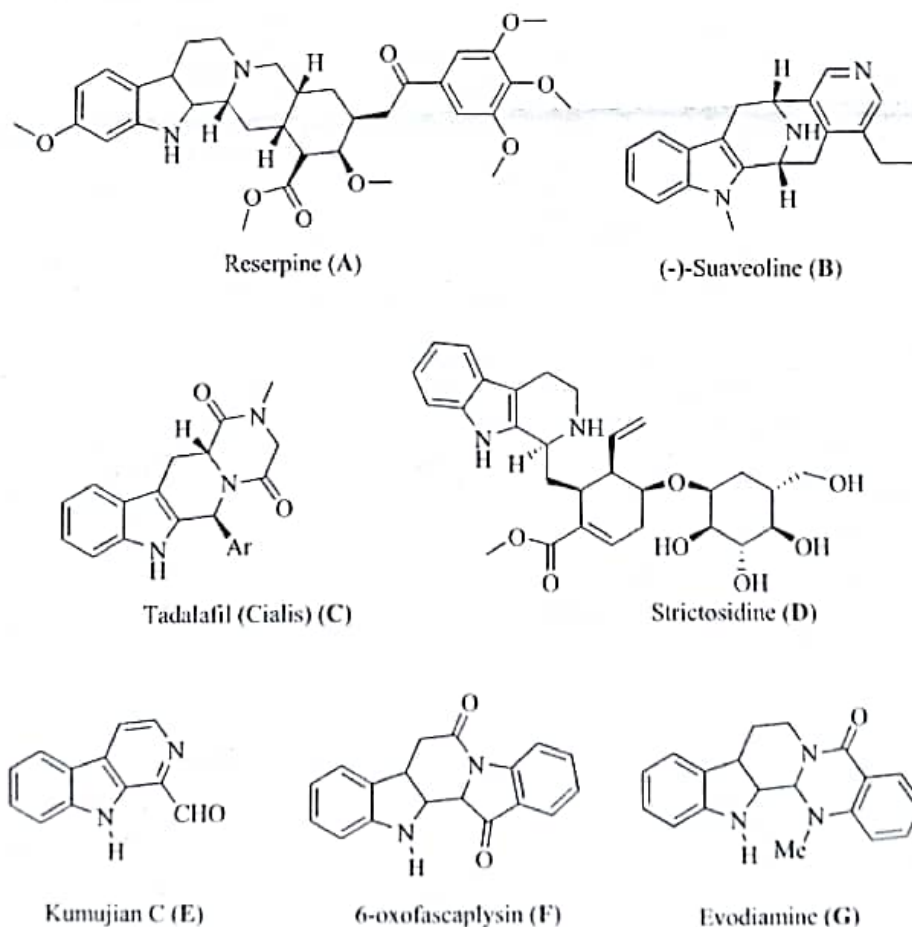
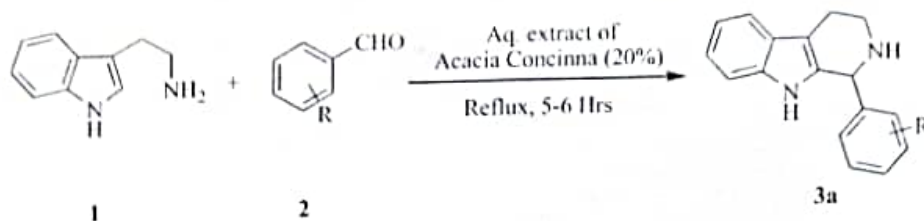


Fig. 1. Some of the potentially active β -carboline derivatives.



Scheme 1. Synthesis of tetrahydro-β-carboline derivatives.

Table 1
Effect of different surfactant systems in the synthesis of tetrahydro-β-carbolines.

Sr. No.	Surfactant system (Conc. 10%w/v)	Time of reaction (hr)	Yield %
1	<i>Acacia concinna</i>	5.4	80
2	<i>Balanites aegyptiaca</i>	6.0	75
3	<i>Jatropha</i>	5.2	78
4	<i>Sapindus mukorossi</i>	6.5	70

Table 2
Optimization of catalyst concentration.

Entry	Catalyst concentration % (W/V)	Time (h)	Yield (%) ^a
1.	10	5.4	80
2.	20	5.2	82
3.	30	5.8	80
4.	40	5.6	78
5.	50	5.4	75
6.	Water	12	NR ^b

^aIsolated yield of 3a. ^bNo reaction

the surface tension as compared to water (Table 3). Wetting and spreading property of surfactant solution increase reaction rate. The surface tension and structure of surfactant affects the wetting and spreading property of surfactant solution [55,56]. Hence, several reactions like photochemical, redox, Diels-Alder, enzymatic reactions are found to have an increase in the rate of reactions by use of surfactant [57]. In addition, the hydrophobic groups of surfactant are sequestered in the micelle core [58], which helps in intimate contact with reacting species.

To assess the catalytic efficacy of the aqueous extract of the *Acacia concinna* pods, a model reaction of tryptamine (1) and benzaldehyde (2) was carried out in aqueous solutions of various cationic, anionic, and non-ionic surfactants such as sodium dodecyl sulphonic acid (SDS), Triton X-100, cetyl ammonium bromide (CTAB) and CPB. The results obtained suggested that aqueous extract of the *Acacia concinna* pods was an excellent medium for the synthesis of '3a' over other commercial phase transfer catalysts (Table 4).

The superiority of the aqueous extract of *Acacia concinna* pods over other surfactants inspired us for further investigation of the present method for other aldehydes possessing a wide range of substituent (Table 5). The appreciable acidity ($pH = 4.1$) and surfactant properties of the aqueous extract of *Acacia concinna* increase the rate of reaction. The saponins present in aqueous extract accelerate the solubility of reactant

Table 3
Effect of surface tension of surfactant solution on rate of reaction.

Entry	Catalyst concentration % (W/V)	Surface Tension 'T' (dyne/cm)	Time (h)
1.	50	14.22	5.4
2.	40	19.14	5.6
3.	30	33.52	5.8
4.	20	41.01	5.2
5.	10	47.21	5.4
6.	Water	66.55	-

Table 4
Effect of surfactant for the formation of '3a'

Entry	Surfactant ^a	Time (hr)	Yield (%) ^b
1.	None	12	NR ^c
2.	SDS	6.4	66
3.	Triton X-100	5.6	55
4.	CTAB	6.2	50
5.	CPB	6.4	58
6.	<i>Acacia concinna</i> extract 20% (W/V).	5.2	82

^aReaction condition: Tryptamine (1 mmol), benzaldehyde (1 mmol), *Acacia concinna* extract (5 mL), 98 °C. ^bIsolated yield. ^cNo reaction.

species. This will result in an increased collision between reactant molecules. Due to this reactant molecules are encapsulated into the micellar cage which drives the equilibrium to the product side by giving out water molecule of the hydrophobic interior of the micelle (Fig. 2) [59]. The projected mechanism for the synthesis of the β-carboline derivatives can involve the iminium-catalysed formation of *N*-benzylidene-2-(1*H*-indol-3-yl)ethanamine (I), activation by catalyst and ring closure giving a six-member ring (II) (Scheme 2) [60].

Conclusion

In conclusion, a greener methodology mediated by an aqueous solution of *Acacia concinna* pods has been reported for the synthesis of tetrahydro-β-carbolines in good to excellent yields via Pictet-Spengler reaction. The water as reaction medium, short reaction time, high purity of the products, biocompatible catalyst, mild reaction conditions and a simple workup procedure are features of the present method.

Experimental

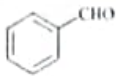
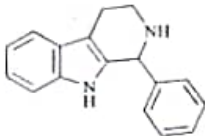
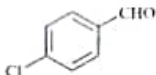
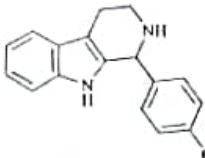
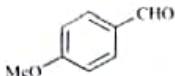
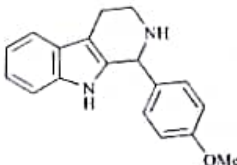
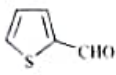
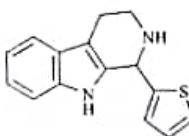
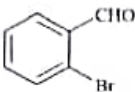
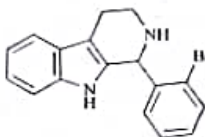
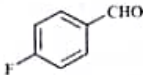
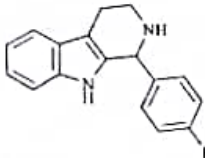
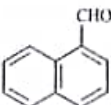
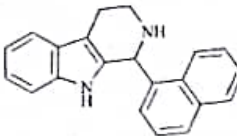
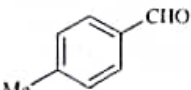
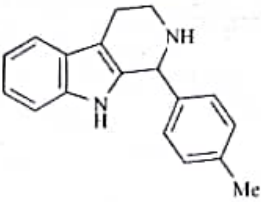
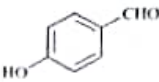
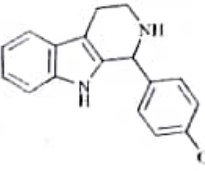
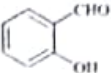

General

Melting points were recorded on Digital Electro thermal Melting point apparatus (VEEGO, VMP-DS) and are uncorrected. The reaction monitoring was conducted using Thin Layer Chromatography (TLC) using pre-coated Silica gel 60 F₂₅₄ plates with layer thickness 0.25 mm purchased from Merck Ltd. TLC plates and were visualized under ultraviolet light. ¹H NMR was recorded on Varian-NMR mercury 400 MHz spectrometer using CDCl₃ as a solvent. The chemical shifts values (δ) are expressed parts per million (ppm). *Acacia concinna* pods which were purchased from the local market were dried well and seeds were removed. The fine powder was obtained of *Acacia concinna* by using mortar and pestle.

General procedure for the preparation of the catalyst

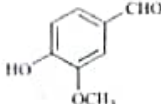
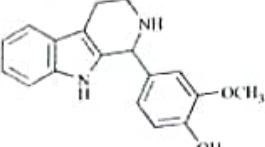
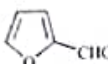
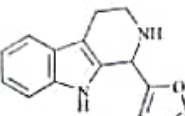
A mixture of fine powder of *Acacia concinna* pods (20 g) in water (100 mL) in a 250 mL conical flask was heated at 100 °C for 20 min. The solid material was separated by filtration and the aqueous extract was collected as a brown coloured solution having a concentration 20% w/v.

Table 5
Synthesis of tetrahydro- β -Carboline derivatives.

Entry	Aldehyde	Product		Time (Hr)	Yield (%) ^a	M.P. (°C)	M.P. (°C) ^b
1.			3a	5.2	82	163–164	162–163[61]
2.			3b	5	86	205–207	206–207[61]
3.			3d	5.4	78	202–204	203–204[61]
4.			3e	5.6	76	168–170	169–170[61]
5.			3f	4.8	88	196–198	198–199[62]
6.			3g	5.4	84	185–187	183–188[62]
7.			3h	5.6	78	166–167	167–168[61]
8.			3i	5	88	134–136	136–138[63]
9.			3j	5.6	78	191–193	192–193[63]
10.			3k	5.8	74	211–213	212–213[63]

(continued on next page)

Table 5 (continued)

Entry	Aldehyde	Product	Time (hr)	Yield (%) ^a	M.P. (°C)	M.P. (°C) ^b	
11.			3l	5.2	80	184–186	185–186 [61]
12.			3m	5.4	78	208–210	209–210 [63]

^aIsolated yield. ^bProducts were confirmed by using physical methods for characterization and by comparison with that of reported in literature

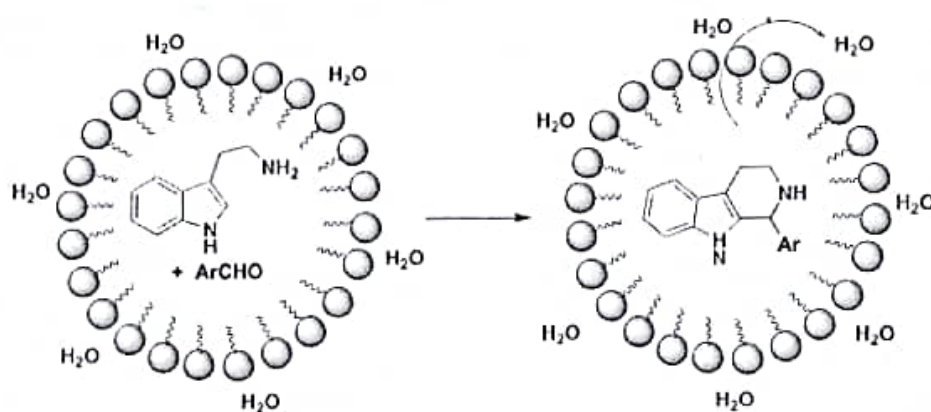
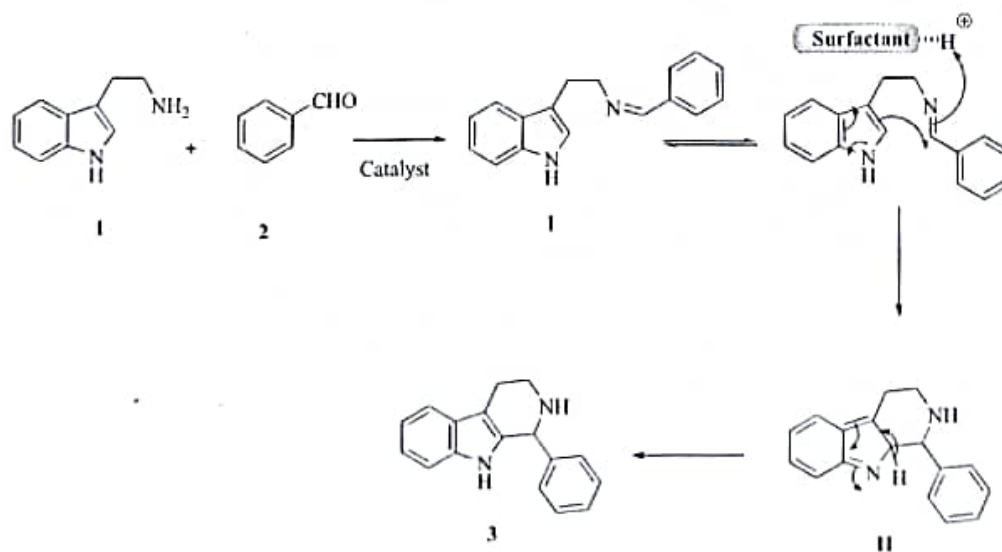


Fig. 2. Micelle-promoted synthesis of tetrahydro-β-carboline derivatives.



Scheme 2. Proposed mechanism for formation of tetrahydro-β-carboline derivatives (3).

General procedure for the synthesis of tetrahydro- β -Carbolines (3a-m)

A mixture of tryptamine (1 mmol) and aldehyde (1 mmol) in surfactant medium (20%, 5 mL) was stirred at about 60 °C temperature for specified time (Table 5). After completion of the reaction (as indicated by TLC), a separated solid was filtered on Buchner funnel. The obtained product was washed with 100 mL cold water. The product is thus freed from the aqueous extract and further drying the product affords pure tetrahydro- β -carbolines products (3a-m) in good yields.

Spectral data of representative compound

1-(4-chlorophenyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole (3b): Yield: 86%; White solid; MP- 205–207 °C, LCMS m/z : 282(M^+), $^1\text{H NMR}$ (400 MHz, CDCl_3): δ 3.00–3.04(m, 2H), 3.79–3.87(m, 2H), 6.95–6.97(m, 1H), 7.02–7.04(m, 1H), 7.13(br s, 1H), 7.30–7.32(d, 1H), 7.49–7.51(d, 2H), 7.54–7.56(d, 1H), 7.73–7.75(d, 2H), 8.29(s, 1H), 10.78 (br s, 1H); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): δ 23.32, 43.44, 58.16, 77.67, 78.16, 78.31, 111.24, 111.77, 119.18, 120.36, 122.76, 128.15, 129.84, 130.78, 134.68, 134.84, 136.81, 141.25.

1-(4-methoxyphenyl)-2,3,4,9-tetrahydro-1H-pyrido[3,4-b]indole (3d): Yield: 78%; White solid; MP- 203–204 °C, LCMS m/z : 178(M^+), $^1\text{H NMR}$ (400 MHz, DMSO): δ 2.62–2.66 (m, 2H), 2.99–3.02 (m, 1H), 3.11–3.14 (m, 1H), 3.90 (s, 3H), 5.23 (s, 1H), 5.31 (s, 1H), 6.99–7.00 (m, 2H), 7.25–7.31 (m, 3H), 7.36–7.41 (m, 3H), 8.14 (s, 1H); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): δ 23.57, 43.93, 56.39, 58.52, 77.78, 78.10, 78.42, 111.15, 111.88, 115.18, 119.26, 120.40, 122.71, 128.47, 130.71, 134.91, 135.86, 136.88, 160.55.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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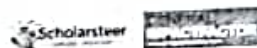
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Promotive Influence of Farm Pond Algae with Aqueous and Cow Urine extracts on Germination and Growth Traits in *Luffa cylindrica* L

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Abstract-

Agriculture sector has always remained a main contributor in GDP and a source of employment for many people across the country. However, the later effect of green revolution technologies have asked serious questions in the form of many diseases which have been introduced through food and water contamination. The alternative and reliable options for the chemical fertilizers and pesticides have been always at the center of various research studies since last few decades. Hence, an attempt was made to study the promotive role of farm pond algae on seed germination and seedling growth in *Luffa cylindrica* L. The seeds were treated in various concentrations of algal aqueous and cow urine extracts and percent seed germination and seedling growth was observed. It is found that, 15 % concentration of both algal aqueous and cow urine extract has significant effect in promotion of seed germination, root length, shoot length and overall height of *Luffa cylindrica* L. Algal cow urine extract reported significantly better growth over the algal aqueous extract.

Key words- *Luffa cylindrica* L., Farm Pond Algae, Algal Extract, Cow Urine Extract.

I. INTRODUCTION

Ever since invention, agriculture has been the mainstay of human civilization. India is known as an agriculture driven country, and agriculture being a major industry has played a vital role in gross domestic production (GDP) of the country. The agriculture sector of India contributes to around 18 % to gross domestic product and offers employment opportunities to 50 % of the country's workforce. [1] India witnessed the Green Revolution in the 1960s with an increase in food grain production and met the food demand of the millions of malnourished people across the country. Green revolution broadly represented a major change in the stakeholders focusing on increased use of chemical-based pesticides and fertilizers to increase the crop yield in multiple folds. The striking quantitative increase in food production as a result of increased chemical input in agriculture was the welcoming sign but the long term health impacts of these chemicals started drawing attention of scientific community. Chemical pesticides adversely affects skin, eyes, respiratory system, and other body organs. [2] Over the last thirty years, the indiscriminate application and ignorance towards appropriate handling of agricultural pesticides have induced various health-related morbidities in emergent nations. [3] Pesticides become a reason for congenital anomalies and affect fetal growth, and some pesticides can cause cancer in human beings. [4] Researchers across the world have reported that the detrimental agricultural habits and excessive use of the chemicals have allowed the contamination of the food chain and the environment. [5] Hence, the consumers and farmers share a strong desire for agricultural sustainability, increasing anxiety about pollution, and damage to the environment. They also have a strong desire and willingness to engage with new farming technology that can produce more nutritious and pollutants free food. An increased focus on the use of biofertilizers across the world on the environmental ground is observed in the recent past. These biofertilizers are the organisms that improve the soil quality without any effects on the agriculture system and environment. The primary source of biofertilizers includes blue-green algae, bacteria, and fungi. [6]

Hence, in present investigation an attempt was made to investigate the promotive role of farm pond algae on the percent seed germination and seedling growth using aqueous as well as cow urine extract.

II. MATERIAL AND METHODS

The experimental material used was seeds of *Luffa cylindrica* L., freshwater algae and cow urine which was collected from local sources. Two samples of algae were collected from two farm ponds at village Sawargaon Tal, Tal-Sangamner and Village Wakadi, Tal- Rahata of Ahmednagar district, Maharashtra, India. The algae was dried and powdered [7] for further preparation of algal extract. The algal extracts were prepared in the concentrations of 1 %, 5 %, 10 %, 15 %, 20 % and 25 %. The distilled water was used as control. [8] Same concentrations were prepared using cow urine for both samples and only cow urine was treated as control. The seeds of *Luffa cylindrica* L. were soaked in aqueous/cow urine algal extracts of Sample 1 and Sample 2 and control for 24 hrs. Paper Towel method was used [9] to study the effect of different algal extracts on seed germination and early seedling growth. The experiment was conducted in triplicate. The Study parameters measured are seed germination in percentage, Root length, Shoot length and total height of seedling in centimeters.

III. RESULTS AND DISCUSSION

A. Effect of Algal Extract on Seed Germination in *Luffa cylindrica* L.Table I- Effect of algal extract on percent seed germination in *Luffa cylindrica* L.

		Percent Seed Germination									
Algal Conc ^a		Algal Aqueous Extract					Algal Cow Urine Extract				
		Trial 1	Trial 2	Trial 3	Mean	SD	Trial 1	Trial 2	Trial 3	Mean	SD
Sample 1	1%	80.0	83.3	90.0	84.4	0.36	83.3	76.7	86.7	82.2	0.38
	5%	83.3	86.7	90.0	86.7	0.34	86.7	80.0	86.7	84.4	0.36
	10%	86.7	86.7	90.0	87.8	0.33	90.0	83.3	90.0	87.8	0.33
	15%	93.3	93.3	96.7	94.4	0.23	93.3	93.3	93.3	93.3	0.25
	20%	90.0	90.0	93.3	91.1	0.29	93.3	93.3	90.0	92.2	0.27
	25%	83.3	86.7	93.3	87.8	0.33	93.3	90.0	86.7	90.0	0.3
	Control	80.0	80.0	90.0	83.3	0.38	83.3	73.3	83.3	80.0	0.4
Sample 2	1%	80.0	93.3	93.3	88.9	0.32	83.3	86.7	83.3	84.4	0.36
	5%	73.3	93.3	93.3	86.7	0.34	86.7	83.3	83.3	84.4	0.36
	10%	80.0	100	93.3	91.1	0.29	93.3	86.7	86.7	88.9	0.32
	15%	83.3	100	96.7	93.3	0.25	93.3	96.7	96.7	95.6	0.21
	20%	76.7	100	93.3	90.0	0.3	90.0	86.7	90.0	88.9	0.32
	25%	76.7	96.7	93.3	88.9	0.32	90.0	90.0	90.0	90.0	0.3
	Control	76.7	96.7	90.0	87.8	0.33	80.0	90.0	80.0	83.3	0.37

The average minimum and maximum seed germination in algal aqueous extract in sample 1 was 83.3 % at control and 94.4 % at 15 % respectively, however the average minimum and maximum seed germination in algal cow urine extract was 80 % and 93.3 % at control and 15 % respectively. Sample 2 reported germination of 87.8 % at control and 93.3 % at 15 % in algal aqueous extract and 83.3 % and 95.5 % at control and 15 % algal extract in algal cow urine extract respectively. The results of percent seed germination obtained in the present investigation are in agreement with various studies conducted by the researchers across the world. Pandey *et. al.* [10] reported some promising effects in the germination percentage after treating the seeds with 5% extract of *Chroococcus* sp. Maximum seed germination in okra seeds was reported by Divya *et. al.*, [11] followed by application of 5 % of algal extract derived from sea weed.

B. Effect of Algal Extract on Shoot Length in *Luffa cylindrica* L.Table II- Effect of algal extract on shoot length in *Luffa cylindrica* L.

		Shoot Length in cm									
		Algal Aqueous Extract					Algal Cow Urine Extract				
		Trial 1	Trial 2	Trial 3	Mean	SD	Trial 1	Trial 2	Trial 3	Mean	SD
Sample 1	Algal Conc ^a										
	1%	12.31	12.32	9.42	11.29	3.43	14.12	14.84	11.91	13.57	4.17
	5%	12.68	13.26	11.95	12.62	2.87	17.1	14.28	14.25	15.24	4.31
	10%	10.61	11.52	11.24	11.13	2.49	13.86	13.68	12.66	13.39	4.27
	15%	15.89	13.57	12.86	14.09	3.03	16.21	17.59	14.57	16.12	5.72
	20%	10.98	15.27	11.73	12.65	3.08	13.81	19.41	12.87	15.4	5.2
	25%	9.85	12.81	11.29	11.34	3.11	11.18	14.59	11.69	12.48	4.92
	Control	10.94	9.88	9.9	10.23	2.75	12.28	13.05	9.58	11.58	3.2
Sample 2	1%	7.16	8.38	9.74	8.49	2.06	10.46	9.23	10.7	10.12	2.5
	5%	13.06	10.67	11.04	11.48	2.91	12.64	11.12	12.75	12.18	2.96
	10%	10.8	11.55	12.26	11.58	3.17	13.05	11.99	12.43	12.51	2.81
	15%	13.82	12.52	12.76	12.99	3.18	15.71	14.53	13.93	14.71	3.79
	20%	11.58	11.1	11.84	11.49	2.75	13.19	14.73	14.89	14.26	4.36
	25%	9.97	10.43	10.9	10.47	2.88	10.99	12.02	9.97	10.99	3.0
		Control	9.14	9.69	9.15	9.34	2.86	10.38	9.53	10.49	10.11

Algal aqueous extract of sample 1 reported average minimum shoot length 10.23 cm at control and average maximum 14.09 at 15 %. The average minimum shoot length in algal cow urine extract was 11.58 cm at control and average maximum of

16.12 cm at 15 %. However, sample 2 reported average minimum shoot length of 9.15 cm at control and average maximum 12.76 cm at 15 % in algal aqueous extract. For algal cow urine extract average minimum shoot length was 10.11 cm at control and average maximum was 14.71 cm at 15 %. Algal cow urine extract has reported to enhance the shoot length of *Luffa cylindrica* L. over the algal aqueous extract. Algal cow urine extract of sample 1 has reported 14.40 % more length in the shoot of *Luffa cylindrica* L. over algal aqueous extract. In the same way, algal cow urine extract of sample 2 has also reported 13.24 % more shoot length. Hence, cow urine extract has shown more growth potential over aqueous extract of both algal samples under study. The results of present investigations show similarity with the earlier studies on various crop plants. Basavaraja et.al., [12] reported significant increase in shoot length following application of blue green algae in maize, cucumber and ragi. Patil et.al., [13] studied the growth promoting activity of *Chlorella*, *Scenedesmus* and *Chlamydomonas* on cucumber. The research team including Arun et.al., [14] also presented that, liquid sea weed fertilizer with 60 % concentration is more effective in increasing the shoot length.

Table III- ANOVA: Two Way - *Luffa Cylindrica* L. - Shoot Length

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Algal Concentration	6443.55	6	1073.93	40.70	0.00	0.09
Extract	1155.75	1	1155.75	43.80	0.00	0.02
Algal Concentration * Extract	229.66	6	38.28	1.45	0.19	0.00
Error	66118.28	2506	26.38			
Total	367228.08	2520				

R Squared = .106 (Adjusted R Squared = .101)

For the Shoot Length of *Luffa Cylindrica* L. from the two way ANOVA it is seen that there is a significant main effect of Algal Concentration on the overall Shoot Length, $F(6, 2520) = 40.70$, $p = 0.00$, $\eta^2 = 0.09$. The Extract i.e. aqueous vs Cow Urine also had significant effect, $F(1, 2520) = 43.80$, $p = 0.00$, $\eta^2 = 0.02$. The post-hoc test for the algal concentration using Tukey HSD indicated that the 15% had the longest Shoot Length in comparison to 1%, 5%, 10%, 20%, 25% and Control which was statistically significant. Lastly, for the Extract: Cow Urine extract (Mean [CI]): (11.47 [11.18, 11.75]) was significantly better than Aqueous Extract (10.11 [9.83, 10.40]).

C. Effect of Algal Extract on Root Length in *Luffa cylindrica* L.

Table IV - Effect of algal extract on root length in *Luffa cylindrica* L.

Algal Conc ^a	Algal Aqueous Extract					Algal Cow Urine Extract					
	Trial 1	Trial 2	Trial 3	Mean	SD	Trial 1	Trial 2	Trial 3	Mean	SD	
Sample 1	1%	12.43	14.3	10.72	12.44	4.53	10.08	12.42	11.78	11.4	2.92
	5%	13.52	14.22	12.73	13.48	3.89	11.2	14.19	11.79	12.34	3.32
	10%	10.98	14.58	11.37	12.3	3.77	9.57	14.44	12.39	12.07	4.16
	15%	13.84	15.31	14.96	14.71	4.01	15.29	12.27	13.25	13.6	4.42
	20%	9.67	15.33	11.74	12.24	4.52	8.35	18.88	12.52	13.26	5.43
	25%	9.58	13.21	9.5	10.75	3.96	9.13	12.96	9.59	10.55	3.68
	Control	11.1	12.92	8.81	10.86	4.42	9.97	12.54	9.59	10.62	3.43
Sample 2	1%	11.22	8.76	9.79	9.86	3.21	8.83	7.82	9.32	8.64	2.21
	5%	11.72	9.53	11.32	10.79	3	11.78	10.91	11.34	11.35	1.99
	10%	12.9	11.32	10.79	11.6	3.24	11.06	11.92	12.18	13.2	3.6
	15%	12.06	14.0	11.89	12.69	3.25	12.62	12.5	12.67	12.59	2.85
	20%	12.7	12.77	10.51	11.97	3.73	12.57	12.74	10.01	11.76	3.04
	25%	10.74	11.23	10.21	10.73	2.94	11.42	10.23	10.83	10.82	2.46
	Control	8.43	7.12	7.93	7.78	2.58	10.48	7.76	9.15	9.07	2.58

The average root length of sample 1 of aqueous extract was presented between 10.75 cm at 25 % and 14.71 cm at 15 %, however it was between 10.55 cm at 25% 13.6 cm at 15 % in algal cow urine extract. Sample 2 presented average minimum and maximum root length between 7.78 cm at control and 12.69 cm at 15 % in aqueous extract and it was between 8.64 cm at 1 % and 12.59 at 15 % cow urine extract. Algal aqueous extract showed better results in terms of root length of *Luffa cylindrica* L. as compare to algal cow urine extract as the root length in sample 1 was 8.16 % more and in sample 2 it was 0.79 % more. Sample 1 has shown better root length as compare to sample 2. The increased root length in *Cucumis sativus* L. and *Luffa cylindrica* L. in present study is in accordance with the earlier studies. Odgerel Bumandalai and Rentsenkhand Tserennadmid,

[15] reported increased growth in the seeds of tomato and cucumber following the application of the suspension of *C. vulgaris*. The results are in agreement with Basavaraja *et al.*, [12] who reported significant increase in root length following application of blue green algae. The study confirmed significantly higher root length in maize as compare to control. The study conducted by Divya *et al.*, [11] also reported the stimulating effect of seaweed liquid fertilizer on the growth of root length in Okra.

Table V - ANOVA: Two Way - *Luffa cylindrica* L. - Root Length

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Algal Concentration	4970.23	6	828.37	33.32	0.00	0.07
Extract	36.00	1	36.00	1.45	0.23	0.00
Algal Concentration * Extract	176.62	6	29.44	1.18	0.31	0.00
Error	62297.05	2506	24.86			
Total	328548.04	2520				
R Squared = .077 (Adjusted R Squared = .072)						

For the Root Length of *Luffa cylindrica* L. from the two way ANOVA it is seen that there is a significant main effect of Algal Concentration on the overall Root Length, $F(6, 2520) = 33.32$, $p = 0.00$, $\eta^2 = 0.07$. The Extract i.e. aqueous vs Cow Urine did not have any significant effect, $F(1, 2520) = 1.45$, $p = 0.23$, $\eta^2 = 0.00$. The post-hoc test for the algal concentration using Tukey HSD indicated that the 15% had the longest root length in comparison to 1%, 5%, 10%, 20%, 25% and Control which was statistically significant.

D. Effect of Algal Extract on Total Height in *Luffa cylindrica* L.

Table VI - Effect of algal extract on total height *Luffa cylindrica* L.

	Algal Conc ^a	Algal Aqueous Extract					Algal Cow Urine Extract				
		Trial 1	Trial 2	Trial 3	Mean	SD	Trial 1	Trial 2	Trial 3	Mean	SD
Sample 1	1%	24.75	26.61	20.14	23.72	7.07	24.2	27.27	23.68	24.97	5.6
	5%	26.2	27.48	24.68	26.1	5.81	28.3	28.47	26.05	27.58	5.61
	10%	21.59	26.1	22.61	23.42	5.37	23.43	28.12	25.04	25.47	6.42
	15%	29.73	28.88	27.82	28.8	5.52	31.5	29.86	27.82	29.73	8.18
	20%	20.65	30.61	23.46	24.89	6.82	22.16	38.3	25.4	28.66	8.84
	25%	19.44	26.02	20.79	22.08	6.03	20.31	27.54	21.28	23.03	6.9
	Control	22.04	22.8	18.71	21.09	6.14	22.25	25.59	19.16	22.2	5.46
Sample 2	1%	18.38	17.14	19.52	18.35	3.83	19.28	16.76	20.02	18.66	3.85
	5%	24.79	20.2	22.36	22.27	4.45	24.42	22.03	24.09	23.53	3.87
	10%	23.7	22.87	23.05	23.18	4.64	26.52	23.05	24.36	24.69	4.11
	15%	25.88	26.51	24.66	25.68	3.92	28.33	27.02	26.6	27.31	5.14
	20%	24.29	23.86	22.35	23.46	5.06	25.76	27.47	24.9	26.02	5.98
	25%	20.72	21.67	21.11	21.2	4.25	22.41	22.25	20.79	21.82	4.41
	Control	17.57	16.81	17.07	17.12	3.96	20.87	17.29	19.63	19.18	4.02

Luffa presented average total height between 21.09 cm at control and 28.8 cm at 15 % in aqueous extract of sample 1, however the average total height was between 22.2 cm at control and 29.73 cm at 15 % in cow urine extract. In algal aqueous extract of sample 2, the average height was between 17.12 cm at control and 25.68 at 15 %, the same was 18.66 cm at 1 % and 27.31 cm at 15 % in cow urine extract. Algal cow urine extract of sample 1 showed 25.12 % more growth as compare to algal aqueous extract, similarly it was 6.86 % more in sample 2. Sample 1 has shown better growth as compare to sample 2 in both aqueous and cow urine extract. Castellanos-Barriga *et al.*, [16] also found that the application of sea weed extract to mung bean (*Vigna radiata*) had significantly increased the seed germination, shoot and root length as well as other parameter under study. Pandey *et al.*, 2013 studied the effect of different concentrations on the seedling development in Okra and reported maximum height of seedling of 11.23 ± 1.62 cm in Okra after application of *Chroococcus* sp. extract.

Table VII -ANOVA: Two Way - *Luffa cylindrica* L. - Total Height

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Algal Concentration	22584.76	6	3764.13	43.71	0.00	0.09
Extract	775.56	1	775.56	9.01	0.00	0.00
Algal Concentration * Extract	455.25	6	75.88	0.88	0.51	0.00
Error	215790.20	2506	86.11			
Total	1347056.74	2520				

R Squared = .099 (Adjusted R Squared = .095)

For the Total height of *Luffa cylindrica* L. from the two way ANOVA it is seen that there is a significant main effect of Algal Concentration on the overall Total height, $F(6, 2520) = 43.71$, $p = 0.00$, $\eta^2 = 0.09$. The Extract i.e. Aqueous vs Cow Urine had a significant effect, $F(1, 2520) = 9.01$, $p = 0.00$, $\eta^2 = 0.00$. The post-hoc test using Tukey HSD indicated that the for algal concentration 15% had the longest Total height in comparison to 1%, 5%, 10%, 20%, 25% and Control which was statistically significant. Lastly, for the Extract: Cow Urine extract (Mean [CI]): (21.52 [21.06, 22.03]) was significantly better than Aqueous Extract (20.41 [19.90, 20.92]).

IV. CONCLUSION

It is concluded that the 15 % concentration of both algal aqueous and cow urine extract shows better result in terms of percent seed germination, shoot length, root length and total height in *Luffa cylindrica* L. The algal cow urine extract has significantly better growth over algal aqueous extract in all parameters studied in both algal samples from farm pond.

V. REFERENCES

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