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A Study On Profitability Analysis of selected BSE – 30 Companies

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Abstract:

The main object of this study is to measure the financial performance of BSE – 30 Companies through profitability analysis. In this present research paper, the analysis of profitability of selected BSE – 30 Companies is undertaken including corporate sectors and service sectors. For this purpose, the profitability ratios like gross profit ratio, net profit ratio and return on capital employed are calculated. In addition to that the ANOVA has been used for testing hypothesis. The result reveals that the profitability of HDFC, Coal India and Hindustan Unilever Companies Ltd performing well among all units listed in BSE – 30 Companies during the study period. Furthermore it also found that there is significance difference between companies in gross profit ratio, net profit ratio and return on capital employed and between years there is significant difference in only return on capital employed during the study period.

Keywords: - Profitability Ratios, Gross Profit Ratio, Net Profit Ratio, Return on Capital Employed.

INTRODUCTION OF PROFIT AND PROFITABILITY

The term profit is the difference between in total revenues in excess of associated expenses for a working activity over a period of time it is main goal for establishing any business enterprise. 'Profitability' means the profit earning ability of the enterprise and the capacity of management to generate surplus in the process of business operations. It is overall measure of efficiency. The constant existence of any business enterprise depends upon its earning capacity. Thus if any venture fails to earn profit capital invested is tough and if this situation put off, the project ultimately ceases to exist. In fact profit is the soul of business without which any business can't run. Abstractly it is to be sure that the efficiency of any business concern is measured by the amount of profits earned during the year.

LITERATURE REVIEW

- **Dr. Ajmera, Butalal C.** has done his dissertation "Interpretation and analysis of financial statement of two selected units of Birla group", in the year 2001 by using conceptual framework of financial statement, Research plan, profile of the cement industry. Birla group of companies a bird eye view, liquidity position, financial structure and suggestion, the period of 1994-95 to 1998-99. The study reveals the course of profitability.
- **Singh and Pandey (2008)** suggested that, for the successful working of any business organization, fixed and current assets play a vital role, and that the management of working capital is essential as it has a direct impact on profitability and liquidity. They studied the working capital components and found a significant impact of working capital management on profitability for Hindalco Industries Limited.
- **Burja, Camelia (2011).** The information about company performance, especially about its profitability, is useful in substantiating managerial decisions regarding potential changes in the economic resources that the company will be able to control in the future. This study has resulted to increase the company's competitiveness and will satisfy the shareholders' interests.
- **Aggarwal, Priyanka (2013).** In this study was taken Indian companies as sample of 50 which is listed on Nifty 50 Index - S&P CNX. Researcher was found that the authority rating has a optimistic but irrelevant impact on corporate profitability of firm. Furthermore researcher also found out that corporate profitability also has an irrelevant positive impact on authority rating of firm.

RESEARCH METHODOLOGY

The main objective of the study is to know the Profitability of selected BSE – 30 Companies.

HYPOTHESIS OF THE STUDY

H₀: There is no significant difference in Profitability of selected BSE – 30 Companies during the study period.

SAMPLE DESIGN

The total no. of corporate sector units is the universe of the study. The population of the study consists of all the corporate sector units which are listed in BSE. At this stage researcher has decided to take sample of BSE – 30 units as on 24th August 2015 for the proposed study. Conventional sampling technique has been used.

PERIOD OF THE STUDY

The researcher has undertaken the study is for five years from 2012-13 to 2016-17.

SOURCE OF DATA

This research paper mainly depends on the secondary data; researcher collected the data from Annual reports of the company and other printed media.

TOOLS AND TECHNIQUES

For the analysis of data in the form of various profitability ratios, the statistical tools like Average mean, SD and ANOVA has been used. The following ratios have been used in this study.

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

$$\text{Net Profit Ratio} = \frac{\text{Net Profit After Tax}}{\text{Sales}} \times 100$$

$$\text{Return On Capital Employed} = \frac{\text{Net profits After Taxes}}{\text{Net Capital Employed}} \times 100$$

DATA ANALYSIS

Gross Profit Ratio:-

Table No.1 Gross Profit Ratio (%) From (2012-13 to 2016-17)

Companies	Years					Mean	S.D.
	2016-17	2015-16	2014-15	2013-14	2012-13		
Axis Bank Ltd	-17.98	-2.8	-2.83	-3.87	-5.04	-6.5	6.481
Bajaj Auto Ltd.	24.51	23.73	20.5	22.99	21.33	22.61	1.666
Bharti Airtel Ltd.	18.74	23.67	30.74	19.87	17.87	22.18	5.274
BHEL	3.31	-5.63	7.42	13.17	19.73	7.6	9.639
Cipla Ltd.	11.17	15.55	16.54	20.74	24.93	17.79	5.246
Coal India Ltd.	-4.11	-2.91	-1.69	-2.5	-3.27	-2.9	0.898
Dr. Reddy Lab. Ltd	16.47	19.59	21.21	26.03	21.51	20.96	3.468
GAIL India Ltd.	12.85	7.34	8.07	11.16	13.15	10.51	2.687
HDFC Bank Ltd.	3.25	2.56	2.51	1.35	-0.36	1.86	1.417
HDFC Ltd	95.5	95.39	97.07	97.21	96.92	96.42	0.895
Hero Motocorp. Ltd.	16.38	15.37	12.66	11.39	10.69	13.3	2.482
Hindalco Ltd.	11.88	9.05	10.02	10.02	9.52	10.1	1.075
HUL	19.36	18.47	17.98	17.25	16.94	18	0.969
ICICI Bank Ltd.	-17.91	-10.61	-2.03	-1.39	-0.05	-6.4	7.66
Infosys Ltd.	31.94	32.7	34.64	31.57	33.38	32.85	1.222
ITC Ltd.	38.72	40.73	38.49	38.09	36.02	38.41	1.681
L & T Ltd.	10.92	12.67	13.61	13.7	12.22	12.62	1.14
Lupin Ltd.	32.99	34.75	32.98	35.35	24.66	32.15	4.316
Mahindra&Mahindraltd.	10.92	10.55	10.39	11.29	11.24	10.88	0.403
Maruti SuzukiIndia Ltd.	14.74	11.45	10.15	8.77	7.29	10.48	2.842
NTPC Ltd.	20.99	18.55	17.68	22.66	25.56	21.09	3.183
ONGC Ltd.	34.02	33.83	32.51	38.05	36.86	35.05	2.306
Reliance Industries Ltd.	17.97	16.36	9.67	7.95	8.13	12.02	4.782
SBI Bank Ltd.	-14.23	-11.12	-6.21	-5.61	-1.61	-7.76	4.95

Sun Pharmaceutical Ltd.	2.48	-6.13	-12.56	3.28	27.27	2.87	15.123
Tata Motors Ltd.	-1.67	4.7	-5.39	2.48	4.42	0.91	4.344
Tata Steel Ltd.	18.22	23.99	20.56	27.99	27.19	23.59	4.198
TCS Ltd.	32.45	33.92	32.75	36.44	32.49	33.61	1.691
Vedanta Ltd.	36.46	38.61	17.3	9.19	24.49	25.21	12.508
Wipro Ltd.	24.06	24.63	26.49	25.75	22.74	24.73	1.463

(Source: Computed and compiled from published annual reports and BSE Database website)

From the above table no. 1 shows that the gross ratio of selected BSE – 30 Companies during the study period. It is found that the highest average value of the gross profit ratio of HDFC Company Ltd was 96.42 percentage, which shows that sound profitability among all the units listed in BSE – 30 companies during the study period and lowest value of this ratio of SBI Bank Ltd was found at -7.76 percentage which shows that not a good sign for the bank among all the units listed in BSE – 30 companies during the study period.

Testing Of Hypotheses

H_0 = There is no significant difference in the gross profit ratio of selected BSE – 30 Companies during the study period

H_1 = There is significant difference in the gross profit ratio of selected BSE – 30 Companies during the study period.

Table No. 2 Two - Way ANOVA Table on Gross Profit Ratio

Source of Variation	SS	df	MS	Fcal	F tab
SS Between Companies	56017.66	29	1931.644	72.20284	1.565322
SS Between Years	115.6754	4	28.91884	1.080957	2.44988
Error	3103.35	116	26.75301		
Total	59236.69	149			

From the above mention table no. 5.2 shows two - way ANOVA of gross profit ratio which depicts that 'F' Calculated value (72.20) of SS between companies is greater than 'F' Table value (1.56) so null hypothesis is rejected and alternate hypothesis is accepted which shows that there is significant difference in gross profit ratio between companies. So far as concern to years 'F' calculated value (1.08) of SS between years is less than the 'F' Table value (2.44) so null hypothesis is accepted and alternate hypothesis got rejected which shows that there is no significant difference in gross profit ratio during the study period.

Net Profit Ratio

Table No. 3 Net Profit Ratio (%) From 2012-13 to 2016-17

Companies	Years					Mean	S.D.
	2016-17	2015-16	2014-15	2013-14	2012-13		
Axis Bank Ltd	8.26	20.06	20.73	20.29	19.05	17.68	5.301
Bajaj Auto Ltd.	17.58	16.09	13.01	16.09	15.21	15.60	1.678
Bharti Airtel Ltd.	-15.93	12.51	23.78	13.22	11.23	8.96	14.791
BHEL	1.68	-3.56	4.7	8.84	13.65	5.06	6.594
Cipla Ltd.	8.88	11.61	11.65	14.8	18.37	13.06	3.633
Coal India Ltd.	94.8	94.51	92.1	91.49	85.61	91.70	3.701
Dr. Reddy Lab. Ltd	14.24	13.35	16.64	19.7	14.88	15.76	2.510
GAIL India Ltd.	7.27	4.42	5.35	7.6	8.46	6.62	1.675
HDFC Bank Ltd.	20.99	20.41	21.07	20.61	19.18	20.45	0.761
HDFC Ltd	22.47	22.95	21.86	22.53	22.96	22.55	0.450
Hero Motocorp. Ltd.	11.85	10.95	8.64	8.34	8.91	9.74	1.563
Hindalco Ltd.	4.21	1.76	2.67	5.07	6.52	4.05	1.892

HUL	14.07	12.76	14	13.8	14.7	13.87	0.704
ICICI Bank Ltd.	18.09	18.44	22.76	22.2	20.77	20.45	2.128
Infosys Ltd.	23.3	29.24	25.71	22.99	24.79	25.21	2.512
ITC Ltd.	25.44	26.72	26.31	26.43	24.8	25.94	0.796
L & T Ltd.	8.29	8.88	8.86	9.7	8.06	8.76	0.636
Lupin Ltd.	24.63	25.57	24.58	25.99	17.69	23.69	3.410
Mahindra&Mahindraltd.	9.03	7.74	8.52	9.27	8.29	8.57	0.607
Maruti Suzuki India ltd.	10.78	7.91	7.42	6.36	5.48	7.59	2.017
NTPC Ltd.	11.99	14.52	14.04	15.23	19.21	15.00	2.645
ONGC Ltd.	23.03	20.42	21.39	26.33	25.21	23.28	2.492
Reliance Industries Ltd.	12.98	11.75	6.9	5.63	5.82	8.62	3.484
SBI Bank Ltd.	5.97	6.07	8.59	7.98	11.78	8.08	2.369
Sun Pharmaceutical ltd.	-0.45	-14.09	-18.38	-99.99	21.23	-22.34	46.073
Tata Motors Ltd.	-5.59	0.55	-13.05	0.97	0.67	-3.29	6.106
Tata Steel Ltd.	7.17	12.82	15.41	15.37	13.25	12.80	3.366
TCS Ltd.	25.51	26.64	26.17	28.56	26.4	26.66	1.145
Vedanta Ltd.	30.19	18.35	5.92	3.77	5.51	12.75	11.349
Wipro Ltd.	17.72	18.12	19.88	19.06	17	18.36	1.131

(Source: Computed and compiled from published annual reports and BSE Database website)

From the above table no. 3 shows that the net profit ratio of selected BSE – 30 Companies during the study period. It is found that the highest average value of the net profit ratio of Coal India Company Ltd was 91.7 percentage, which shows that the financial performance of the company was good among all the units listed in BSE – 30 companies during the study period and lowest value of this ratio of Sun Pharmaceutical Ltd was found at -22.34 percentage which shows that not a good sign for the company among all the units listed in BSE – 30 companies during the study period.

Testing of Hypothesis

H_0 = There is no significant difference in the net profit ratio of selected BSE – 30 Companies during the study period

H_1 = There is significant difference in the net profit ratio of selected BSE – 30 Companies during the study period.

Table No. 4 Two - Way ANOVA Table on Net Profit Ratio

Source of Variation	SS	df	MS	F cal	F tab
SS Between Companies	44177.8	29	1523.373	16.67762	1.565322
SS Between Years	196.5025	4	49.12564	0.537819	2.44988
Error	10595.71	116	91.34234		
Total	54970.02	149			

Above mention table no. 4 shows two - way ANOVA of net profit ratio which depicts that 'F' Calculated value (16.67) of SS between companies is more than 'F' Table value(1.56) so null hypothesis has been rejected and alternate hypothesis has been accepted which shows that there is significant difference in net profit ratio between companies. So far as concern to years 'F' calculated value (0.53) of SS between years is less than the 'F' Table value(2.44) so null hypothesis is accepted and alternate hypothesis is rejected which shows that there is no significant difference in net profit ratio during the study period.

Return on Capital Employed

Table No. 5 Return On Capital Employed (%) From 2012-13 to 2016-17

Companies	Years	Mean	S.D.
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	2016-17	2015-16	2014-15	2013-14	2012-13		
Axis Bank Ltd	6.25	14.98	16.09	15.88	15.2	13.68	4.179
Bajaj Auto Ltd.	21.74	28.71	25.38	32.37	36.47	28.93	5.767
Bharti Airtel Ltd.	-6.36	5.62	12.76	8.34	7.44	5.56	7.162
BHEL	1.2	-1.99	3.06	7.32	15.63	5.04	6.809
Cipla Ltd.	7.47	10.8	10.17	13.21	16.33	11.60	3.343
Coal India Ltd.	82.47	86.55	67.35	78.36	40.98	71.14	18.316
Dr. Reddy Lab. Ltd	11.35	10.61	14.25	18.59	15.98	14.16	3.296
GAIL India Ltd.	7.31	5.45	7.08	10.84	11.26	8.39	2.538
HDFC Bank Ltd.	15.53	15.68	17.82	20.54	20.63	18.04	2.494
HDFC Ltd	3.78	4.79	4.51	4.59	4.11	4.36	0.406
Hero Motocorp. Ltd.	31.85	37.77	35.93	37.16	38.71	36.28	2.676
Hindalco Ltd.	2.29	0.95	1.47	2.3	2.98	2.00	0.793
HUL	59.47	81.16	88.95	88	98.44	83.20	14.626
ICICI Bank Ltd.	5.13	6.27	8.52	8.76	8.63	7.46	1.660
Infosys Ltd.	20.29	27.58	25.29	24.01	25.15	24.46	2.669
ITC Ltd.	21.52	28.18	29.54	31.68	31.31	28.45	4.120
L & T Ltd.	10.15	10.66	10.89	13.75	13.11	11.71	1.607
Lupin Ltd.	20.55	24.19	25.64	31.67	24.29	25.27	4.047
Mahindra & Mahindra Ltd	13.23	12.31	13.85	16.68	17.36	14.69	2.213
Maruti Suzuki India Ltd	19.43	16.38	15	12.39	11.95	15.03	3.068
NTPC Ltd.	4.74	5.66	6.17	7.11	9.11	6.56	1.664
ONGC Ltd.	7.85	8.04	9.38	12.26	13.02	10.11	2.399
Reliance Industries Ltd.	7.97	8.24	7.41	8.08	8.92	8.12	0.544
SBI Bank Ltd.	3.77	4.96	7.43	7.82	10.28	6.85	2.554
Sun Pharmaceutical Ltd.	-0.15	-4.23	-5.58	-27.91	6.38	-6.30	12.946
Tata Motors Ltd.	-6.72	0.67	-16.02	1.08	0.97	-4.00	7.487
Tata Steel Ltd.	3.89	4.79	6.5	6.95	5.92	5.61	1.256
TCS Ltd.	29.91	38.16	41.32	40.74	38.35	37.70	4.573
Vedanta Ltd.	10.19	7.99	3.43	1.97	0.84	4.88	4.024
Wipro Ltd.	16.54	19.02	22.73	23.96	22.98	21.05	3.142

(Source: Computed and compiled from published annual reports and BSE Database website)

From the above table no. 5 shows that the return on capital employed ratio of selected BSE – 30 Companies during the study period. It is found that the highest average value of the return on capital employed of Hindustan Unilever Company Ltd was 83.2 percentage, which shows that the financial performance of the company was good among all the units listed in BSE – 30 companies during the study period and lowest value of this ratio of Tata Motors Ltd was found at -4 percentage which shows that not a good sign for the company among all the units listed in BSE – 30 companies during the study period.

Testing of Hypothesis

H_0 = There is no significant difference in the return on capital employed of selected BSE – 30 Companies during the study period

H_1 = There is significant difference in the return on capital employed of selected BSE – 30 Companies during the study period.

Table No. 6 Two - Way ANOVA Table on Return On Capital Employed

Source of Variation	SS	df	MS	F	F crit
SS Between Companies	55171.47	29	1902.465	55.79285	1.565322
SS Between Years	396.9338	4	99.23345	2.910181	2.44988
Error	3955.451	116	34.09872		
Total	59523.86	149			

Above stated table no. 6 shows two - way ANOVA of return on capital employed ratio which depicts that 'F' Calculated value (55.79) of SS between companies is more than 'F' Table value (1.56) so null hypothesis has been rejected and alternate hypothesis has been accepted which shows that there is significant difference in return on capital employed ratio between companies. So far as concern to years 'F' calculated value (2.91) of SS between years is more than the 'F' Table value (2.44) so null hypothesis has been rejected and alternate hypothesis has been accepted which shows that there is significant difference in return on capital employed ratio during the study period.

CONCLUSION

The analysis of profitability above gross profit ratio, net profit ratio and return on capital employed under the study by sample of BSE 30 companies and result attained from 'F' test (ANOVA) at 5 percent level of significance it is concluded that there is significance difference between companies in gross profit ratio, net profit ratio and return on capital employed and between years there is significant difference in only return on capital employed during the study period.

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Transforming India into a Cashless Economy: A Dream or Reality

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ABSTRACT: During the ongoing decade of this century our government is trying to convert our economy into a cashless economy with the intention of converting India into a well-balanced economy by reducing black money, corruption and inequalities. Cashless economy is an economy where most of the transactions take place without using the physical cash or hard cash. It is the economy where transactions take place with the help of fund transfer through internet banking or by using debit cards, credit cards, e-wallets or other on line mechanism of payments. Definitely there are lots of merits of cashless transaction. But, in a country like ours, it is a controversial question whether India can be converted into a cashless economy at its present socio-economic status in a hurry or within a very short span of time. Keeping these debatable issues in mind this paper attempted to analyse the pros and cons of the controversial issue in the light of prevailing situations. By considering the merits and demerits of the issues, it concluded that converting India fully into cash less economy in a hurry or within a very short span of time is a dream and it may proceed with a long term vision. Finally, the paper ended with some suggestions by the author from his personal viewpoint.

Key words: Indian economy, Cashless economy, Cashless transactions, Digital payments

INTRODUCTION: The demonetization of the government introduced in the country during November, 2016 is a clear message towards the cashless transaction with the intention of converting India into a well-balanced economy by reducing black money, corruption and inequalities. Cashless economy is expected to be free from the curse of corruption, have lesser amount of black money in circulation. Cashless system brings down the cost associated with printing, storing and transporting of cash. The introduction of cashless economy with the help of information technology these days is fully supported by the government of India as it not only reduces the threat of theft and loss of money but also facilitates the risk free transactions among different parties. If we see the same from the Indian perspective it can be concluded that card and online transactions can lead to better spending avenues than the cash transactions. This initiative has not only helped the fast transactions but at the same time it has saved lot of time and money in the country. This saving in times, if utilised for other productive purposes, may lead to the increase in the production and consumption and hence definitely the GDP of the country. It may also pave the ways for the removal of inequalities, creation of employment opportunities, ensuring high living standards as well as higher rate of growth in the economy. Cashless transactions are going to make the things different with increase in income of the state. It will also stop maximum amount of black marketing in the country and consequently increase in the receipts of taxes in the government treasury. If we see the global trend in the market it is clear that all over the world people have started taking interest in cashless transactions. Academicians, politicians, administrators and above all the economists all over the world has strongly advocated about going cashless from the cash rich economy. The present paper is an attempt to understanding the pros and cons of the cashless economy in the light of prevailing situations of our country.

This paper has been divided into five sections. In the first section attempt has been taken to highlight the steps taken by the government of India towards the implementation of the cashless economy. In the next section, impact of demonetization as a step towards cashless has been discussed. In the third section, various pros and cons of the controversial issue have been discussed in the light of prevailing situations. In the forth section, probable impact of the several efforts of the governments on the overall economic growth and development has been studied. In the fourth section, this paper has highlighted challenges faced by the government in establishing cashless economy. Finally, in the last section the paper ended with some suggestions by the author from his personal viewpoint.

INITIATIVE TAKEN BY THE GOVT. TO MAKE INDIA A CASHLESS ECONOMY:

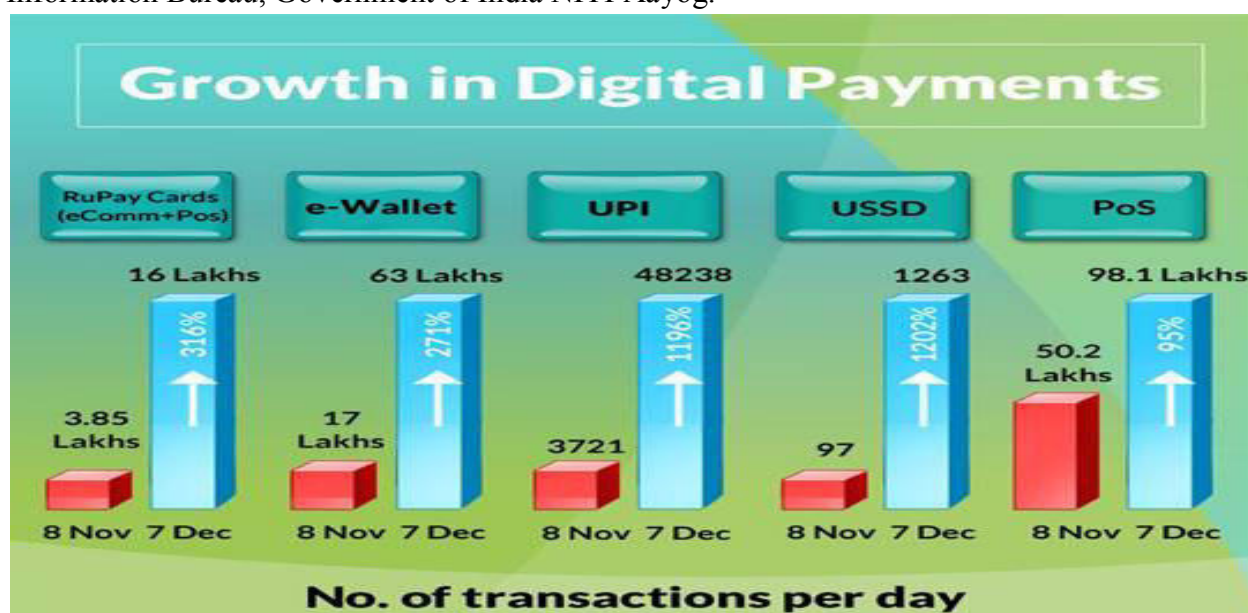
Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. “Faceless, Paperless, Cashless” is one of professed roles of Digital India. The ambitious mission of government of India to drive India towards a cashless economy was boosted with the announcement of demonetization on November 8, 2016.

E-governance initiatives in India took a broader dimension in the mid 1990s for wider sectoral applications with emphasis on citizen-centric services. The major ICT initiatives of the Government included, some major projects such as railway computerization, land record computerization, etc. which focused mainly on the development of information systems. Later on, many states started ambitious individual e-governance projects aimed at providing electronic services to citizens. The government of India is working dedicatedly to push India towards a cashless economy with major initiatives such as demonetization, DBT or Direct Benefit Transfers, BHIM and many more. DBT or Direct Benefit Transfers is an attempt to change the mechanism of transferring subsidies launched by Government of India on 1 January 2013. This program aims to transfer subsidies directly to the people through their bank accounts. The intent is to restructure the economy and curtail corruption. On the other hand, BHIM or Bharat Interface for Money is a mobile app developed by National Payments Corporation of India (NPCI), based on the Unified Payment Interface (UPI). The government approved for a proposal, under which there would be no charge for BHIM, UPI, and debit card transactions up to Rs.2000. NITI Aayog announces the launch of the schemes Lucky Grahak Yojana and the **Digi-dhan Vyapar Yojana** to give cash awards to consumers and merchants who utilize digital payment instruments for personal consumption expenditures. The scheme specially focuses on bringing the poor, lower middle class and small businesses into the digital payment fold. It has been decided that National Payment Corporation of India (NPCI) shall be the implementing agency for this scheme. NPCI is a not a profit making company. It has been entrusted with a responsibility of guiding and transforming India into a cashless society.

The primary aim of these schemes is to incentivize digital transactions so that electronic payments are adopted by all sections of the society, especially the poor and the middle class. It has been designed keeping in mind all sections of the society and their usage patterns. People in village and rural areas can participate in this scheme through **Aadhaar Enabled Payment System or AEPS**. ADHAAR Enabled Payment System provides basic financial services (cash

deposit, balance enquiry, cash withdrawal and remittance) at low cost access devices (called Micro-ATMs) maintained at Business correspondents in an inter-operable way. Apart from the above, government has also introduced **Rupay Card, Unified Payment Interface (UPI), USSD *99# Banking for getting banking services from ordinary phone etc. to expedite the digital India programme.**

DEMONITIZATION AS A STEP TOWARDS CASHLESS ECONOMY: *Demonetization* is a process by which a series of coin or note are withdrawn from use as legal tender. The government's key rationale for demonetisation was to control the circulation of black money and to make the economy a cashless economy. Following figure highlights the growth of digital payments during pre and post demonetisation within a gap of 30 days as depicted by Press Information Bureau, Government of India NITI Aayog.



Source: Press Information Bureau, Government of India NITI Aayog

From the above figure it is seen that number of transaction in each and every case about has increased significantly. The increase in percentage of various modes of payments varies from 95 to 1202 has been presented in the following table (Table No-1).

TABLE NO-1
TABLE SHOWING CHANGES IN THE NUMBER OF TRANSACTIONS DURING PRE AND POST—DEMONETIZATION PERIOD

Mode of payments	Pre-demonetization No. of transactions (in lakh)	Post-demonetization No. of transactions (in lakh)	Changes (In lakh)	Changes (In %)
RuPay Card	3.85	16	12.15	316
E-Wallet	17	63	46	271
UPI	3721	48238	44517	1196
USSD	97	1263	1166	1202
PoS	50.2	98.1	47.9	95

Source: Compiled from the above data

From the above table it is seen that most significant increase is shown in case of USSD mode followed by UPI as shown in Table-1. All other modes of payment have also increased significantly.

ADVANTAGES OF CASHLESS ECONOMY: The Government of India is making concentrated efforts to reduce the use of cash in the *economy* by introducing the digital payment in all spheres of financial transactions. The following are main advantages of introducing digital payment in an economy.

Minimization in the cost of printing and storage of money: In the cash based economy where maximum people work on the cash transaction, government has to print more and more currency notes. Printing notes it is a costly affair. It was estimated that, for 2009–2010, RBI incurred an annual cost of INR 2800 Crores for printing currency notes (**Das and Agarwal 2010**). Other than printing cost of the currency notes there are many other expenses that the government has to do. Another important aspect is the maintenance in the form of storage of notes, transportation of the notes to the distant places, security of the notes, and devices for the detection of counterfeit notes. is reported that all this maintenance cost the government about 5% of the GDP of India.

Convenient: The ease of conducting financial transactions is main motivator to go to the arena of digital payment system. With the introduction of digital payments, one can avoid queue in bank or ATMs, transact twenty four hours seven days and save time. In digital payment system, with the introduction of e-KYC, it is no longer necessary to know the customer physically as the payments model has overcome the limitations relating to physical presence.

Risk Reduction: The main advantage of cashless economy is that an individual does not need to carry cash with him or her everywhere which in turn reduces the chances of theft from wallet, reduces inconvenience due to carrying cash. So, with the introduction of digital payment system the possibility of money getting stolen or lost will be minimal. Even if the card is stolen or lost it is easy to block a credit/debit card or a mobile wallet remotely. It is also a safer and easier spending option during tour and travelling.

Eradication of corruption: Most of the cashless societies are corruption free as all the transactions are being traced, visible and transparent. Going cashless is going to eliminate the corruption to some extent. In cashless system, transactions will be simply easy and transparent which in turn will show in the accounts of the senders and the receivers. It is a well known fact that most of the terrorist related activities are highly funded by the cash. Therefore, placing a limit on the amount of cash flowing in the system, will curtail such activities as such types of transactions criminal transactions can be easily traceable and tracked. This will result in more transparent transactions which in turn lead to fall in corruption in the economy of the country.

Reduction of black money: **Schneider (2006)** estimates the size of India's black money economy between 23% and 26% of the GDP. Some recent estimates consider it between 40% and 75% of the GDP. In a cashless economy it is easier to track the black money. But in cash based economy money does not come into the banking system. In case of digital transactions it is easy to identify and monitor doubtful transactions as all the records are clearly available with the banks. This will, in no doubt, help in the reduction of black money and financial inequality. BJP

in its election manifesto of 2014 general Lok Sabha election announced that if the government is able to bring back the black money then every Indian will have Rs.15 lakhs in their accounts.

Increase in tax collection: It has been observed that traders, small businesses, shopkeepers, never show the actual business on paper. This habit of evading sales has caused a lot of Impact on the tax of the country. Small shopkeepers generally do this to save tax. This practice has created a very big problem of loss of tax to the exchequer. But these will be quite impossible in cashless transactions. The presence of cashless economy will definitely result in surplus tax collection and also to spend these taxes for the benefit of the scheme.

Financial Inclusion: At present, India's low-income households access credit through informal systems, through relatives or private lenders. Forcing them to shift to cashless payment platforms instantly formalizes this world of informality and includes them in formal economy.

Decrease the cost of commodity: the cashless economy aims at reducing the cost of the commodities by setting aside the black market and the proper deposit of the tax. All this leads to the development of the system where one can find the cost of the commodity going down in the market. The developed economy like China is the best example for this.

ECONOMIC GROWTH WITH DIGITAL PAYMENTS: Financial sector plays an important role in the economic development of a country. A strong and healthy banking system is important requirement for economic growth **Sharma (2016)**. Digital payments are believed to be a major force in economic development and significantly affect spending behavior and consumption pattern of a consumer. Both emerging as well as developed countries are believed to be benefited from the implementation of the digital payments. Affluent society is possible as long as we use the digital technology in the economy. It has been observed that cashless economy leads to the start of proper formal and functional economy in the country. When all the transactions are made digitally in a clear and clean way and taxed, it may lead to the effective and efficient financial system that leads economic growth and development. Electronic payments will help business people to boost their customer base even in far of geographic locations and hence will result in enhanced business. The impact of adopting digital payment on economic growth can be significantly observed in the long run. Hence, any policy that promotes digital payment will not affect the economy immediately. The Government has the authority to be prime movers of what is needed towards the development of digital payment mechanism. With the private sector as a valuable partner, governments must lead to encourage progress in areas such as regulatory reform, driving electronic payroll payments and digitizing social benefit disbursements.

CHALLENGES IN ESTABLISHING CASHLESS ECONOMY: Digital payment in India is becoming popular still people face difficulties in making digital payments even in metro cities because of poor network. It always calls for improvement in technology in order to enhance security and ease of transaction. Common people will only shift if and only if it will be easier, certain and safe to make cashless transactions. Government will also have to find ways to incentivise cashless transactions and discourage cash payments. Difficulties are also there in changing attitudes and perception of people towards digital payments. The following are the major challenges in converting India into a cashless economy.

Financial inclusion: At present forty percent of the India's populations do not have access to the bank and banking services. Thus it is one of the major challenges for the government in the implementation in the cashless economy. Government has taken for opening the massive bank accounts under Pradhan Mantri Jan Dhan Yojna, a quarter of them are zero-balance accounts. As of July 2016, approximately 228 million accounts have been opened under the PMJDY scheme. Most of these accounts are lying dormant in the bank, **Gangopadhyay (2009)**. There are several other reasons like lack of money, lack of income, illiteracy and lack of information to the account holders.

Lack of infrastructure: Even today, people have to move to distant places to for banks. In such areas ATM facilities are not available. Most people don't have personal banking equipments. That is why lack of infrastructure is one of the main problems of cashless transaction or digital payments. The other important issue of digital payments is the lack of technology used in the rural areas and also reaches of technology to various locations. In this case also India is in developing stage also because many of the locations where the infrastructures are ready but services are not available for the customers.

Lack of education: According to the 2011 census, India has a literacy rate of 73 per cent. The country has come a long way from the 12 per cent literacy rate since its Independence in 1947; it still is home to the biggest population of illiterate adults in the world. Without the basic knowledge of reading and writing, using internet banking technology is of a distant reality for this population. Digital literacy is just 10% in India. In the absence of digital literacy we can't expect the transformation of Indian economy form cash based to cashless economy.

Access of technology: Technology is the backbone to this digital payment system. Technology must be available in all the areas of the country; it means all the banks at the branch level even in the remote area should have the access to the technology. The technology must have all the aspects that can help the individuals to do the things better and effectively and it should be easily handled and used by the people. The people are not aware of the technology and are not so involved in the use of it.

Lack of trust: Most of the people due to one reason or the others are not willing to join the cashless banking solutions. Trust factor is one of the integral challenges to growth of digital payments in rural sector. Irrespective of whether it is attributed to emerging information security challenges, or lack of awareness of the consumers, still the challenge of gaining the trust of consumers is one of the key challenges facing the mobile wallets, digital transaction service providers like banks, fin-tech companies etc. **Pahwa (2016)**

Lack of customer awareness: The challenge of gaining the trust of customers is one of the major challenges faced by the mobile wallets, digital transaction service providers like banks, and other intermediaries etc. Consumers are not aware about the different aspects of cashless transactions. Lack of awareness is another challenge.

Cyber Security: with the increase in the magnitude of digital transaction, the risk of online fraud, leakage of confidential information, cyber-crimes, malware and virus attacks has been raising day by day. So, it another growing challenge in digital payments system and hence is the

biggest concern to popularize digital payments in our country. The absence of strong cyber security laws in India is a major threat to the dream of cash-less economy.

Charges on Cashless Transactions: Almost all online transactions involve some amount of cost charged by service providers when online transactions are done. These are additional charges that are levied by the vendors. These charges also create problems in the smooth implementation of cashless transactions.

SUGGESTIONS AND CONCLUSION: This paper analyses the key benefits that can be availed of by the proper implementation of digital payment system and thereby converting India into a cashless economy. In doing so, it identifies pros and cons of the cashless economy as well as what is functioning and what requires improvements in our country. It is found that in countries where digital payments have been implemented had positive impact on their economies. The modalities of digital payments of India are at emerging stages and there is considerable need for more effective rules and regulations that can support in improving the process. If we look at the overall scenario of establishing the cashless economy, its benefits and uses in the present system it can be said that cashless economy is the need of the hour. It has become not only important but necessary for the country to go cashless for the systematic development in the economy. It will be better to say that India at this point of time has to go for less cash economy rather than cash less economy. This is to be done in a very systematic way. Some of the initiatives that can be taken in this regard are as follows;

- People should be educated adequately. Buyers and sellers both should be made aware about the benefits of the cashless transactions and can utilize their money effectively through cashless means. The continuous march towards less cash economy will lead to cashless economy in the country in near future.
- Though Significantly higher proportion of individuals are involved in making cashless payments now (12.61% in 2014 as compared to 3.47% in 2011) it is far below the required level. So, various awareness programme is required be conducted in rural as well as urban areas regarding the usage of digital payments like Smartphone based transactions, e-wallet and usage of credit or debit cards at PoS solutions etc.
- In order to encourage people towards cashless payment it is to incentivize. In the same way e-payment costs associated with various types of e-payments must be either eliminated or reduced to the extent possible.
- Licensing of payment banks is one of the best suggestions to promoting the cashless transaction. Mobile banking is to be introduced as extension of banking. At present, payments through mobile wallets dominate the cashless payments, loading the mobile wallet is currently allowed entirely through bank accounts. Provisions are to be taken for the deposit of cash in the mobile wallet directly through cash deposit machine.
- All the line department functionaries such as school teachers, health workers, village development officers, Anganwadi workers, etc. must educate the people about the financial inclusion and digital economy. The self help groups (SHGs) can be of great help to the people in the promotion of digital banking systems in the rural areas. More and more SHGs must be given the charge of Bank Mitras (friend) who can extend their help to the bank, post offices and Bank corresponding for proliferation of digital economy. The Gram Sabhas in Panchayati Raj Institutions and Ward Sabhas in Urban Local Bodies must take up the issue of digital economy at the village level.

- Electronic payment infrastructure should be made completely safe and secure so that incidents of cybercrimes like hacking, leaking confidential information etc. could be minimised automatically .it will automatically boot up digital payments and India will gradually move on from cash based to cashless economy.

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पूर्व विदर्भातील टसर रेशीम उद्योगाची निर्माण प्रक्रिया आणि उत्पादन

हरिश्चंद्र काशीनाथजी कैताडे

संशोधक विद्यार्थी

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सारांश :

भारत हा कृषिप्रधान देश आहे. महाराष्ट्र राज्यामध्ये शेतकरी अलिकडच्या काळात नवनवीन पिके व तंत्रज्ञान वापरत आहेत. या सर्व बाबींची नक्कलच त्यांच्या आर्थिक स्तर उंचावण्यास मदत होईल. भारतीय अर्थव्यवस्थेत आजही कृषी क्षेत्राला अनन्य साधारण असे महत्त्व आहे. परंतु आज वाढत्या महागाईमुळे व बाजारभावातील चढ उतारामुळे शेतकऱ्यांना शेतीपासून म्हणावा तितका नफा मिळत नाही. पर्यायाने निव्वळ शेतीवर अवलंबून राहणे सर्वसामान्य शेतकऱ्याला परवडणारे नाही. या पार्श्वभूमीवर जोडधंद्याचा विकास होऊ लागतला असून यातून टसर रेशीम उद्योगाचा विकास होत आहे. पूर्व विदर्भातील गडचिराली, भंडारा, गोंदिया व चंद्रपूर या चार जिल्ह्यात टसर रेशीम उद्योग ढिवर समाजाचे लोक मोठ्या प्रमाणात बऱ्याच वर्षांपासून करीत आहेत. दृष्य स्वरूपात तरी मेहनत, चिकाटी आणि जोखीपूर्ण हे काम आदिवाशी शेतकरी उत्कृष्टरित्या करून राज्याची व देशाची टसर रेशीमाची मागणी काही प्रमाणात भागवत आहेत. उपजिविकेचे साधन म्हणून धैर्याने या भागातील सर्व तरुण आदिवासी बांधवानी हा उद्योग स्विकारल्यास त्यात त्यांची आर्थिक उन्नती हाईल.

प्रस्तावना :—

जगामध्ये रेशीम उद्योगाची सुरुवात ५००० वर्षांपूर्वी चीन या देशामध्ये झाली. त्यानंतर १८ व्या शतकामध्ये या उद्योगाचा प्रसार जपान, चीन, भारत, रशिया, ब्राझिल, दक्षिण कोरिया, व्हिएतनाम, इटली, फ्रान्स, स्पेन, मेक्सिको इत्यादी देशामध्ये झाला. सध्या जगातील सहा खंडात ९० देशांमध्ये रेशीम उत्पादन घेतले जाते. यामध्ये आशिया खंडात २३ देशांचा समावेश आहे. जागतिक रेशीम उत्पादनात भारताचा चीननंतर दुसरा क्रमांक लागतो. जागतिक उत्पादनात भारतीय रेशमाची वेगळी छाप आहे.

आपल्या देशात सध्या २२ राज्यांमध्ये रेशीम उद्योग विकासाचे काम सुरू आहे. यामध्ये कर्नाटक, आंध्रप्रदेश, तामिळनाडू, प.बंगाल व जम्मू काश्मीर या ५ राज्यांमध्ये पारंपारीक पध्दतीने रेशीम उद्योग आहे व उर्वरित १७ राज्यांमध्ये अपारंपारीक पध्दतीने रेशीम उद्योग आहे. अपारंपारिक रेशीम उत्पादन करणाऱ्या राज्यांमध्ये महाराष्ट्राचा पहिला क्रमांक लागतो. ज्या देशाची आर्थिक घडण शेतीवर अवलंबून आहे व लोकांना कायम रोजगार द्यावयाचाही गंभीर प्रश्न आहे. अशा देशांना रेशीम उद्योग खऱ्या अर्थाने वरदान ठरणार आहे.

रेशीम शेती उद्योग हा ग्रामीण भागातील लोकांना मोठ्या प्रमाणावर रोजगार उपलब्ध करून देणारा शेतीवर आधारित कुटीर उद्योग म्हणून देशात नावारूपात येत आहे. ग्रामीण भागातच हा उद्योग करता येत असल्याने ग्रामीण भागातूनच शहराकडे होणारे स्थलांतर थांबवता येऊ शकतो. रेशीम कोष उत्पादनाचा उद्योग सुरू केल्यास शेतकऱ्यास दरमहा वेतनाप्रमाणे सहज व घरबसल्या उत्पन्न मिळून शकते तेथील शेतकरी मोठ्या प्रमाणात तूती व टसर रेशीमाचे उत्पादन करून त्यांनी आर्थिक उन्नती केलेली आहे व भारत देशाला रेशीम उत्पादनाद्वारे देशाबाहेरील बाजारपेठेत स्थान मिळवून दिलेले आहे.

अशा या वैशिष्ट्यपूर्ण उद्योगात महाराष्ट्रा राज्य हे अपारंपारिक राज्यामध्ये आघाडीवर असून राज्यात तूती व टसर रेशीममध्ये उत्पादन घेतले जाते. टसर रेशीमाचे उत्पादन नागपूर विभागातील

प्रामुख्याने गडचिरोली, भंडारा, गोंदिया व चंद्रपूर जिल्ह्यात तर राज्याच्या उर्वरित भागात तूती रेशीम उत्पादन घेतले जाते. सन २००४-०५ च्या केंद्रीय रेशीम मंडळाच्या सर्वेक्षणात तूती रेशीम उत्पादनामध्ये महाराष्ट्र राज्य दुसऱ्या क्रमांकावर आहे. महाराष्ट्रात रेशीम सूताची १५० मे. टनाची प्रति वर्षी मागणी असून उत्पादन ४० मे. टनापर्यंत असल्याने रेशीम उद्योगाच्या बाढीस राज्यात चांगली वाव आहे.

रेशीम उद्योगाचा वेगाने विकास व्हावा म्हणून महाराष्ट्र शासनाने १ सप्टेंबर १९९७ पासून स्वतंत्र रेशीम संचालनायाची स्थापना केली असून त्याचे मुख्यालय नागपूर येथे आहे. महाराष्ट्रात विदर्भ, मराठवाडा व पश्चिम महाराष्ट्रातील १८ जिल्ह्यात हजारो एकर तूती व टसर लागवड असून बहुमूल्य उत्पादन घेतले जाते. अशा या वैशिष्ट्यपूर्ण उद्योगात महाराष्ट्र राज्य हे अपारंपारिक राज्यामध्ये आघाडीवर असून राज्यात तूती व टसर रेशीमाचे उत्पादन घेतले जाते. टसर रेशीमाचे उत्पादन पूर्व विदर्भात नागपूर विभागातील प्रामुख्याने गडचिरोली, भंडारा, गोंदिया व चंद्रपूर जिल्ह्यात तर राज्याच्या उर्वरित भागात तुती रेशीम उत्पादन घेतले जाते.

अभ्यास क्षेत्र :-

आजच्या आधुनिक युगात रेशीम उद्योगाला विशेष महत्व प्राप्त झाले आहे. महाराष्ट्रात विदर्भ, मराठवाडा व पश्चिम महाराष्ट्रातील १८ जिल्ह्यात हजारो एकर टसर व तुती लागवड असून बहुमूल्य परकीय चलन मिळवून देणारा रेशीम कोषाचे उत्पादन घेतले जाते. पूर्व विदर्भात भंडारा, गोंदिया, गडचिरोली व चंद्रपूर या चार जिल्ह्यात टसर रेशीम उद्योग होतो. कारण या ठिकाणची भौगोलिक परिस्थिती व हवामान रेशीम उद्योगास अत्यंत अनुकूल आहे. रेशीम उद्योगाचा वेगाने विकास व्हावा म्हणून स्वतंत्र रेशीम संचालनालयाची स्थापना केली असून त्याचे मुख्यालय नागपूर येथे आहे.

पूर्व विदर्भ हा महाराष्ट्राच्या पूर्वेकडील वैनगंगेच्या खोऱ्यात वसलेला असून याचा उत्तर अक्षांश १८°६५' ते २१°३८' आणि पूर्व रेखांश ७९°२१' ते ८०°७२' च्या दरम्यान वसलेले आहे. महाराष्ट्राच्या २०११ च्या जनगणनेनुसार पूर्व विदर्भातील चार जिल्ह्याची लोकसंख्या ५७,८७,१९८ एवढी आहे. पूर्व विदर्भातील प्रशासकीय मुख्य ठिकाण चारही जिल्ह्यात असून राज्याच्या राजधानीपासून ८९२ कि.मी. अंतरावर आहे. उपराजधानीचे ठिकाण ६२ कि. मी. असून मुंबई, कलकत्ता या राष्ट्रीय महामार्ग क्रं. ६ वर आहे पूर्व विदर्भात एकूण ४३ तालुके आहेत.

पूर्व विदर्भात मृदा मुख्यतः लाल मृदा, मिश्र लाल, काळी मृदा, गर्द काळी मृदा व उथळ काळी मृदा प्रकारची आहे. त्यापैकी लाल मृदा जास्त मोलाची आहे. लाल पिवळसर सिंहावर जमीन स्फटीकमय दगडाच्या घर्षणापासून झालेली आहे. वैनगंगा नदीच्या काठावरील भागात काळी कन्हार व प्रथम दर्जाची मोराड जमीन आढळते. ती खोल थराची चिकट आर्दता टिकवून ठेवणारी असून त्यात वर्षातून दोनदा पिके घेतली जातात.

पूर्व विदर्भ समुद्रसपाटीपासून फार दुर असल्यामुळे हवामान विषम स्वरूपाचे आहे. येथील उन्हाळा व हिवाळा सारखाच तिब्र असतो. वर्षातील सरासरीच्या ९० टक्के पाऊस ह्याच कालावधीत पडतो. पूर्व विदर्भात सर्वसाधारणतः ९७३ ते १५३५ मि.मी. पाऊस पडतो. पूर्व विदर्भाचे वार्षिक सरासरी तापमान २५° ते ३०° से. असले तरी ऋतुनुसार तापमानात फरक पडतो. म्हणजेच विदर्भात कमी जास्त अशा प्रकारचे असमतोल तापमान दिसून येते. पूर्व विदर्भात प्रामुख्याने शेती हा व्यवसाय आहे. यात धानाची शेती प्रामुख्याने करण्यात येते. तसेच अन्य पिके घेतले जातात व जोडधंदा म्हणून टसर रेशीम उद्योग या आदिवासी लोक करून आपला उदरनिर्वाह चालवतात.

अभ्यासाचे उद्दिष्ट्ये :-

१. टसर रेशीम उद्योगात टसर अळीचे संगोपाचा अभ्यास करणे.
२. टसर उद्योगासाठी टसर अळीचे खादय झाडांच्या प्रमुख जातीचा अभ्यास करणे.
३. पूर्व विदर्भातील टसर रेशीम उद्योगाच्या उत्पादकतेचा अभ्यास करणे.

टसर रेशीम उद्योगात टसर अळीचे संगोपन प्रक्रिया :-

टसर एन्थेरिया माईलिटा या किडयापासून प्राप्त होणारे रेशीम आहे. या प्रजातीचे किटकाचे खाद्य, आंजन, ऐन, साल, बोर, धावडा, सावनी इत्यादी झाडांचे ते मुखत्वे भारतामध्ये उष्ण कटीबंधीय जंगलामध्ये उपलब्ध आहे. टसर अळीचे जिवन चक्र चार अवस्थेमध्ये होते. अंडा, अळी, प्युमा, पतंग (फुलपाखरू) यापैकी अळी खादय झाडांची पाने खाऊन वाढत असते. व पूर्ण विकसीत झाल्यावर आपल्या भोवती रेशीम धाग्याचे आवरण (कवच) तयार करून कोष तयार करते आणि याच कोषापासून धागा निर्मिती करून कापड तयार केला जातो.

टसर अळीचे संगोपन कार्य खुल्या वातावरणात जंगलामध्ये केल्या जाते. खादयाचे झाडावर नवजात किटकांना पोषणासाठी टाकल्या जातात. या अळ्या झाडांची पाने खाऊन वाढत असतात. झाडांची पाने खातांना पूर्णतः संपल्यावर या अळ्यांना दुसऱ्या झाडावर खादयाकरिता स्थानांतरीत केल्या जातात. साधारणपणे झाडांच्या पानाचा उपयोग खाद्याकरिता वर्षातून एकदाच केला जातो. या मुळे झाडाना क्षती होत नाही. किंबहुना अळ्या स्थानांतरन करते वेळी फाद्यांची काट छाट तथ अळ्यांची विष्टा झाडाखाली पडल्यामुळे खत निर्मिती होऊन झाडांचा पानाची वाढ मोठया प्रमाणात होते.

उष्ण कटीबंधीय प्रदेशात टसर किटकांची ३६ प्रकारचे झाडाचे पाने खाण्याची क्षमता आहे. त्यातील महाराष्ट्र राज्यातील पूर्व विदर्भात टसर अळीचे संगोपन कार्य मुख्यतः आंजन व ऐन झाडावर केलेली किटक संगोपन प्रक्रिया लाभदायक ठरलेली आहे.

टसर रेशीम किटकांचे जिवन चक्र :-

टसर रेशीम हे ' एन्थेरिया माईलिटा ' या किटकापासून प्राप्त होणारे रेशीम आहे. या प्रजातीचे किटकाचे खाद्य, अर्जून, ऐन, साल, बोर, धावडा, सावनी इत्यादी झाडांची पाने असून ते मुखत्वे पूर्व विदर्भातील गंडचिरोली, भंडारा, गोंदिया व चंद्रपूर या चार जिल्ह्यातील जंगलामध्ये उपलब्ध आहेत. टसर अळीचे जिवनचक्र चार अवस्थेमध्ये असते.

(१) अंडी :- मडहाऊसमध्ये जवळपास ६० ते ७० टक्के नर-माद्याचे नैसर्गिकरित्या जोड मिळाल्यास असे जोड किमान ७ ते ८ तास ठेवून मादी पतंग वेगळे केले जातात. त्यानंतर मादी सच्छिद्र मातिच्या वाटयामध्ये मादी पतंग तीन दिवसर ठेवले जाते. या कालावधीत मादी पतंग १५० ते २०० अंडी देतो. चौथ्या दिवशी मादी पतंगाचे उदराचा भाग मॉर्टर पिस्टलमध्ये कश करून सुक्ष्मदर्शक यंत्राखाली तपासली जाते. तपासणी नंतर अंडीपुंज ट्रिटमेंट देऊन वॉश केली जातात. धुतलेली अंडीपुंज सावलीमध्ये थंड हवेच्या झोतात सुकविली जातात. सुकविलेली अंडीपुंज सुती कापडाच पिशवीमध्ये वनज करून शेतकऱ्यांना वाटप केली जातात. पिशवीवर अंडीपुंज अत्पादनाची तारिख नमुद केली असल्याने त्यामधून आठ दिवसांनी नवजात अळ्या बाहेर पडतात.

(२) अळी :- अंडीपुंजातून बाहेर पडलेल्या नवजात अळ्याचे ब्रशींग घेण्यासाठी पसरट ट्रेमध्ये वर्तमान पत्र पसरवून त्यावर ऐन/अर्जून झाडाची कोवळी पाने फांदयासह टाकावीत जातात. त्यानंतर थोडयाच वेळात अळ्या पानावरती चढल्यास अशी फांदी ऐन/अर्जून झाडावरती ज्या ठिकाणी किटक संगोपन घ्यावयाचे आहे. त्या ठिकाणी ठेवावी लागते. अंडीपुंजातून अळ्या सतत तीन दिवस बाहेर पडत

असल्याने असे तिन्ही दिवस ब्रशीगचे काम करावे लागते. अशा अळ्यांच्या एकूण पाच अवस्था असतात.

अवस्था	लागणारा कालावधी	मोर्लींग कालावधी
पहिली	३ ते ४ दिवस	२४ ते २६ तास
दुसरी	४ ते ५ दिवस	२६ ते २८ तास
तिसरी	५ ते ६ दिवस	२८ ते ३० तास
चौथी	७ ते ९ दिवस	३० ते ३४ तास
पाचवी	१० ते १५ दिवस	—

वातावरणातील बदलानुसार अवस्था निहाय कालावधी कमी किंवा जास्त होवू शकतो. थंडीच्या मौसम असल्यास कालावधी वाढतो. तर उष्ण कालावधीत मात्र तो वरीप्रमाणे अवस्थेनुसार दिवस लागतो.

(३) कोषावस्था :— पाचव्या अवस्थेतील अळ्यांचे परिपूर्ण वाढ झाल्यानंतर रेशीम अळी तांडावाटे रेशीम लाळ बाहेर टाकते व हवेशी संपर्क येताच त्याचे घनरूपात धागा तयार होत असून स्वतःभोवती आवरण तयार करते. ही प्रक्रिया साधारणता ४ ते ६ दिवसपर्यंत सुरू असते. अळीने कोष तयार केल्यानंतर कोषामध्ये अळीचे रूपांतर प्युमा/सुरवंठ मध्ये होते. सदर प्युमा/सुरवंठ ठराविक कालावधीमध्ये सुप्ता अवस्थेत असतो. त्यानंतर मात्र २१ व्या दिवशी सदर कोषापासून पंतंग बाहेर पडतो.

(४) पतंग (फुलपाखरू) :— पूर्ण विकसीत झालेल्या कोषातून नर किंवा मादी पतंग बाहेर पडतो. तथापी पूर्ण विकसीत झालेल्या कोषापासून अंडीपुंज निर्मिती करावयाचे झाल्यास बीजकोष मडहाळूमध्ये नियंत्रित वातावरणात ठेवले जातात. उच्च प्रतिचा धागा तयार करणेस्तव प्युमाला/सुरवंटास सनड्राय करून किंवा स्टॅफलींग करून मारले जाते. असे कोष रिलींग युनिटला वर्ग केले जातात. व त्यांच्या पासून धागानिर्मिती केला जात असतो.

टसर रेशीम उद्योगासाठी अळीचे खादय झाडांच्या प्रमुख जाती :—

जगामध्ये वेगवेगळ्या प्रकारचे रेशीम निर्मिती केले जाते. प्रामुख्याने रेशमाचे दोन मुख्य प्रकार सर्वत्र आढळतात. १. तुती रेशीम २. वन्य रेशीम तुती रेशीम हे सर्वसाधारणपणे सर्वत्र उत्पादित केले जाते व एकूण रेशीम उत्पादनाच्या ८० ते ९० टक्के सरासरी वाटा हा या प्रकारच्या रेशमाचा आहे. हे रेशीम उत्पादन करण्यासाठी तुतीच्या झाडांचा पालाच फक्त किटक अन्न म्हणून खातात व रेशीम निर्मिती करतात. कारण ते विविध प्रकारच्या झाडांचा पाला अन्न म्हणून खावू शकत नाही. सदरचे किटक संगोपन हे बंदिस्त खोलीत करण्यात येते. वन्य रेशीमचा विचार करता त्यामध्ये तीन प्रकारचे रेशीम येते अ) टसर रेशीम ब) मुगा रेशीम क) ऐरी रेशीम भारतामध्ये प्रामुख्याने ऐरी रेशीम हे उत्तरपूर्व राज्यामध्ये उत्पादित केले जाते. तसेच मुगा रेशीम फक्त आसाम राज्यातच व भारतातच उत्पादन होते. अन्य देशात बिहार, मध्यप्रदेश, महाराष्ट्र राज्यात उत्पादन घेतले जाते. महाराष्ट्रात जर विचार केला तर टसर रेशी उद्योग हा गडचिराली, भंडारा, गोंदिया, यवतमाळ व ठाणे इत्यादी जिल्ह्यात आढळून येतो. टसर रेशीम किटक अँथेरिया मायलीटा हा विविध प्रकारच्या वनस्पतीची पाने खाऊन रेशीम निर्मिती करतो. परंतु योग्य व आवडणारे कोठेही त्याचे उत्पादन होत नाही. टसर रेशीम जंगलमय राज्यामध्ये उदा. खाद्य वनस्पती म्हणून ऐन व अर्जुन वृक्ष हे प्रमुख आहे.

भारत हा उष्णकटीबंधीय देश असून आपल्याकडे बऱ्याचशा जंगलामध्ये अर्जुन व ऐन वृक्ष भरपूर प्रमाणात आढळून येतात. या वृक्षाचे असंख्य गुणधर्म आयुर्वेदात वर्णन केलेले आढळून येतात. या वृक्षाची पाने खाऊन अँथेरिया मायटिचा नावाचा टसर रेशीमची निर्मिती करतात व हे एक

प्रमुख खाद्य वृक्ष म्हणून गणल्या जात असते. टसर रेशीम कोषांचे उत्पादन हे प्रामुख्याने बाहेर जंगलामध्ये घेतले जाते व त्यासाठी अर्जुन वृक्षाची संख्या, त्यावर असणाऱ्या पाल्याची मात्रा व त्याची प्रत तसेच वातावरण व इतर पिडादायक किडीचा प्रदुर्भाव इत्यादीवर अवलंबून असते. टसर रेशीमाचे उत्पादन वाढविण्यासाठी तसेच नेहमी उत्पादन मिळण्यासाठी अर्जुन वृक्षाची वाढ करणे व त्याचे व्यवस्थित संवर्धन करणे गरजेचे असते. या वृक्षाचे उत्पादन, प्रत तसेच झाडाची वेळावेळी करण्यात येणारी छाटणी व किडीचा प्रादुर्भाव यावर जर मात करून टसर रेशीमाचे उत्पादन घ्यावयाचे असल्यास या वनस्पतीचे संवर्धन कलमापासून केल्यास नक्की फायदा होवू शकतो.

टसर रेशीम किटक बहुआहारीत किटक आहे. गुणवत्तेनुरूप टसर अळीचे खाद्य झाडांच्या जाती प्राथमिक व द्वितीय श्रेणीत विभागणे सोपे आहे. टसर रेशीम किटक मुख्यतः तीन प्रकारचे खाद्य झाडे काम्ब्रीटेयी परिवारच्या अर्जुन व ऐन तथा डिप्टेरोकारपेसी परिवारचे साल चांगल्याप्रकारे पसंद करतात. त्यामुळे या वृक्षांना प्राथमिक खाद्य वृक्ष म्हणण्या जाते. लेन्डी हे इतर प्रथम पसंतीचे खाद्य वृक्ष आहे. द्वितीय खाद्यमध्ये हर्रा, बेर, सागवन, वड इत्यादी मुख्य आहे. या जातीचे झाडे मुख्यतः पाऊस १२०० ते २००० मी.मी. असणाऱ्या आर्द्रपर्णपाती जंगलात उपलब्ध असतात तर शुष्कपर्णपाती जंगलात जिथे पाऊस १००० मी.मी पेक्षा कमी पडतो तिथे उपलब्ध असतात.

पूर्व विदर्भातील टसर रेशीम कोष उत्पादनाचे अर्थशास्त्र :-

टसर कोष उत्पादनकांना पारंपारिक किटक संगोपन पद्धतीने लाभ मिळतो. साधारणतः एका परिवारातस ५० दिवस परिश्रम करून २०० अंडीपूजापासून १००० कोष उत्पादन होते व त्यापासून त्यांना रुपये ८०००/- प्राप्ती होते. अशा प्रकारेच वर्षातून ३ पिके घेण्यात येतात त्यापासून ३० ते ३१०००/- हजार रुपये पर्यंत वार्षिक उत्पन्न मिळते.

महाराष्ट्रा राज्याची भौगोलिक स्थिती अन्य राज्यापेक्षा भिन्न आहे. त्यामुळे हे आवश्यक आहे की विकसीत तंत्रज्ञान हे महाराष्ट्र राज्याच्या परिस्थितीनुसार असते. टसर क्षेत्रीय अनुसंधान केंद्र भंडारा, यांनी टसर क्षेत्रीय अनुसंधान केंद्र मोरगाव जिल्हा गोंदिया येथील १५ कोसा उत्पादकांना दत्तक घेऊन झाडांचे प्रबंधन तथा टसर किटक संगोपन विकसीत तंत्रज्ञानाद्वारे प्रयोगाद्वारे सिध्द करून दाखविले आहे. त्यामुळे उत्साहजनक परिणाम समोर आहे आहे. १ ले पिकाचे संगोपनामुळे त्या अंडिपूज ३० कोषावरून ४० कोषावर उत्पादन झाले. त्यामुळे १० कोष प्रति अंडीपूज उत्पादनात वाढ झालेले आहे. परंपरागत पद्धतीने प्रति अंडीपूज सरासरी ४० कोष उत्पादन होत आहे.

टसर कोष उत्पादनाकरिता पूर्व विदर्भात उपलब्ध असलेल्या गांविहाय लाभार्थी व उपलब्ध वनक्षेत्र (ऐन / अर्जुन वृक्ष) हेक्टर :-

अ. क्र.	जिल्हा	वनविभाग	रेशीम विभाग	एकूण क्षेत्र	गाचांची संख्या	लाभार्थी संख्या
१	गडचिरोली	७५२१	४००	७९२१	५८	६५०
२	चंद्रपूर	८०१५	५००	८५१५	७९	७२०
३	गोंदिया	१३७३	१५०	१५२३	१७	३१३
४	भंडारा	८५७	५०	९०७	०९	२८३
	एकूण	१७७६६	११००	१८८६६	१६३	१९७२

दिनांक ३१ मार्च २०१८ अखेर टसर रेशीम :-

अ. क्र.	जिल्हा	लाभार्थी संख्या	वापरलेले क्षेत्र (हेक्टर)	अंडीपुंज वाटप	कोष उत्पादन (लक्ष)
१	गडचिरोली	६५०	३५१८	३५१७९१	१०९१०४३५
२	चंद्रपूर	७२०	३१६३	३१६३१०	८४५००००
३	गोंदिया	३१३	९१९	९१८८६	२९०१५२३
४	भंडारा	२८३	११६८	११६७६४	३१४२१८२
	एकुण	१९७२	८७६८	८७६७५१	२५४०४१४०

टसर रेशीम उद्योगातील भौतिक प्रगती :-

अ. क्र.	तपशिल	२०१२. १३	२०१३. १४	२०१४. १५	२०१५. १६	२०१६. १७	२०१७. १८	२०१८. १९
१	उपलब्ध मातृवृक्ष ऐनक्षेत्र (हेक्टर)	१८८६६	१८८६६	१८८६६	१८८६६	१८८६६	१८८६६	१८८६६
२	डपयोगात आणलेले ऐन व अर्जुन मातृवृक्ष	८७८८	६४९१	९७६५	१०७३७	१२४५६	१०६६९	१०९००
३	लाभार्थी संख्या	२२५९	१४९२	२८११	२७४४	२९६०	२९२०	१८०१
४	अंडीपुंज पुरवठा संख्या (लाख)	९.४६	६.३८	११.०३	११.०२	१२.३५	१०.६७	१०.९०
५	कोष उत्पादन (संख्या लाख)	२४३.८३	१८७.१६०	३४८.१२०	३९४.५२२	५०१.६१	३५४.७०	४१६.१८
६	सुत उत्पादन मे.टन	९.७५३	१०.१९९	१८.९७	२१.५०	२७.३३	१९.३३	२२.६८
७	श्रोजगार निर्मिती (लक्ष) म. दि.	१४.६३	१५.३०	२८.४५	३२.२५	४१.००	२८.९९	३४.०२

सद्यास्थितीस चारही टसर जिल्हयामध्ये जवळपास प्रकल्पांतर्गत ३००० कुटूंबे टसर रेशीम उद्योग करीत आहेत. सदर टसर जिल्हयामध्ये सन १९८२ मध्ये षेज्ज प्रकल्पांतर्गत १५ शासकीय फार्मवर ११०० हेक्टर वनक्षेत्रावर अर्जुन ऐन वृक्षाचे ब्लॉक प्लॅनटेशन करण्यात आलेले आहे. तसेच १७६६६ हेक्टर अर्जुन/ऐन वृक्षाचे नैसर्गिक वनक्षेत्र उपलब्ध आहे. पूर्व विदर्भात रेशीम संचालनालय अंतर्गत एकुण २५ मडहाऊस (अंडीपुंज निर्मिती केंद्र) आहेत. सन २०१७-१८ मध्ये मार्च २०१८ अखेर ५.३७ लक्ष अंडीपुंज निर्मिती करण्यात आलेली असून २०१८-१९ मध्ये १५ डिसे.२०१९ अखेर ४.१० लक्ष अंडीपुंज निर्मिती करण्यात आली आहे. सन २०१७-१८ मध्ये एकुण २९२० लाभार्थीनी १०६६९ हेक्टर वनक्षेत्राचा वापर करून १०.६७ लक्ष अंडीपुंजापासून ३५४.७० लक्ष कोष उत्पादन केलेले आहे. त्यापासून कच्चे सुत उत्पादन १९.३३ मे.टन असून २८.९९ लक्ष रोजगार निर्मिती झालेली आहे.

सन २०१८-१९ मध्ये १५ डिसेंबर २०१८ अखेर पर्यंत १७५५ लाभार्थीनी १०.७७ लक्ष वाटप अंडीपुंजाकीरता १०७७५ हेक्टर वनक्षेत्राचा वापर केलेला आहे. त्यापासून ९७.३८ लक्ष कोष उत्पादन झाले असून कच्चे सुत उत्पादन ५.३१ मे.टन आहे व रोजगार निर्मिती ७.९६ लक्ष म.दि. झाली आहे.

टसर रेशीम उद्योगात मुलभुत सुविधा:

१. टसर रेशीम या अंतर्गत चार जिल्हयामध्ये १५ ठिकाणी ११०० हेक्टर क्षेत्रावर ऐन व अर्जुन वृक्षाचे शासकीय फार्म आहे. या फार्मवर बीज कोषाचे उत्पादन शासकीय ग्रेनेज प्रकियेकरीता करण्यात येते.
२. अंडीपुंज निर्मिती केंद्र पूर्व विदर्भातील चार जिल्हयामध्ये २५ मडहाऊस द्वारे अंडीपुंज निर्मिती कार्यक्रम राबविल्या आत आहे. सन २०१७-१८ ग्रेनेज अंतर्गत ५.३७ लक्ष अंडीपुंज निर्मिती करण्यात आली आहे.
३. पूर्व विदर्भातील चार जिल्हयामध्ये प्रशिक्षण व सुत उत्पादनासाठी सहा रिलींग केंद्र कार्यान्वित आहे.
४. केंद्रीय रेशीम मंडळाचे भंडारा येथे खालील प्रमाणे टसर रेशीम विकासासाठी कार्यालय सुरू आहे.

Regional tasar Reaseatch statio(RTRS), Basic Sed Multiplisate & Training Centre (BSMTC), Demonstration Cum Training Centre (DCTC), RMB Sub-Depot.RTRS, Bhandara

निष्कर्ष :-

१. टसर रेशीम उद्योगासाठी नैसर्गिक झाडांची निर्मिती केली जाते. त्यामुळे लागवडीचा खर्च लागत नाही.
२. टसर रेशीम उद्योगात टसर अळीचे संगोपनासाठी प्रशिक्षण व योजना राबविल्या जातात.
३. पूर्व विदर्भात टसर उद्योगासाठी टसर अळीचे खादय झाडांच्या ऐन/अर्जुन जाती मोठया प्रमाणात उपलब्ध आहे.
४. शेतकऱ्यांना उद्योगाचे प्रशिक्षण देऊन नियमित तांत्रिक मार्गदर्शन केले जाते.
५. रेशीम कोष शासन आधारभुत दराने खरेदी व्यवस्था, ग्रामीण युवक व बरोजगार यांना रोजगाराची संधी, अशिक्षित, आदिवासी समाजाला, स्त्रियांना भरपूर रोजगार उपलब्ध होते.
६. टसर रेशीम उद्योग इको फ्रेंडली असल्यामुळे पर्यावरणातील प्रदुषण टाळता येते.



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डॉ. बाबासाहेब आंबेडकरांचे आर्थिक विचार : एक अन्वयार्थ

डॉ. अश्विनी एस.राऊत

अंशकालीन प्राध्यापक

राजकुमार केवलरामानी कन्या महाविद्यालय

जरीपटका, नागपुर

सारांश : डॉ. बाबासाहेब आंबेडकर हे चतुरस्त्र व्यक्तिमत्व असणारे बुद्धीजीवी व निष्णात अर्थतज्ञ होते. डॉ. आंबेडकरांनी विविध लेखातून आर्थिक विचार मांडले. त्याचा अभ्यास केला असता सध्याच्या स्थितीतही त्यांचे विचार लागू होतांना दिसून येते. यावरून त्यांची दूरदृष्टी लक्षात येते. प्रस्तुत शोधनिबंधात डॉ. आंबेडकरांचे शेती व शेतमजुराविषयी विचार, औद्योगिकरण व कामगार विषयक विचार, चलनविषयक विचार, सरकारची आर्थिक भुमिका, विमाविषयक विचार, जातिव्यवस्था व आर्थिक विषमता इ. घटकांचा थोडक्यात आढावा घेण्याचा प्रयत्न करण्यात आहे.

प्रस्तावना: डॉ. बाबासाहेब आंबेडकरांचे व्यक्तिमत्व बहुआयामी होते. त्यांनी धर्मशास्त्र, कायदाशास्त्र, समाजशास्त्र, इतिहास, विविध देशांचे संविधान, मानववंशशास्त्र इ. अनेक विषयांचे अध्ययन केले होते. त्यांचे विविध ग्रंथ व लेख प्रकाशित आहे. डॉ. आंबेडकरांनी दलित अस्पृश्यांना शिका, संघटित व्हा व संघर्ष करा असा कानमंत्र दिला. दलितांच्या चळवळीत सर्वतोपरी त्याग करून त्यांनी स्वतःला झोकून दिले होते. प्रा. सेनिंगमन हे नामवंत अर्थतज्ञ डॉ. बाबासाहेब आंबेडकरांचे मार्गदर्शक होते. आज भारत देश महाशक्ती बनण्याच्या मार्गावर वाटचाल करित आहे. परंतु भारतातील स्वातंत्र्यपूर्व काळात ज्या समस्या होत्या त्या अध्यापही तीव्र गतिने जाणवत आहेत. जसे कामगारांचे प्रश्न, शेतकऱ्यांच्या समस्या, गरीबी व श्रीमंत यातील वाढत चाललेली दरी, शेती सुधारणा कार्यक्रमात अपयश, नैतिकतेचे अधःपतन, भ्रष्टाचार, सामाजिक, आर्थिक, शैक्षणिक समस्या देशाला त्रस्त करीत आहेत. चलनफुगवटा, बाह्य व अंतर्गत शक्ती प्रभावामुळे असंतुलन व अस्थिरता निर्माण झाली आहे. अश्या स्थितीत डॉ. आंबेडकरांच्या आर्थिक विचारांचा अंगीकार करून वास्तवात उतरविणे ही काळाची गरज आहे.

उद्देश :

डॉ. बाबासाहेब आंबेडकरांच्या विविध आर्थिक विचारांचे अध्ययन करणे.

गृहितके :

- सध्याच्या स्थितीत डॉ. आंबेडकरांचे विचार दुर्लक्षित आहे.
- डॉ. आंबेडकरांच्या आर्थिक विचारांना व्यवहारिक रूप दिल्यास भारतीय अर्थव्यवस्था मजबूत होऊ शकते.

संशोधन पद्धती :

प्रस्तुत शोधनिबंधात विश्लेषणात्मक अनुसंधान पद्धतीचा उपयोग करण्यात आला हे विश्लेषण दुय्यम साधन सामग्रीवर आधारित आहे.

कृषी विषयक विचार

डॉ. आंबेडकरांनी 'स्मॉल होल्डींग इन इंडिया अण्ड देअर रिमेडीअस' हा लेख 'द जर्नल ऑफ इंडियन इकोनॉमिक सोसायटी मध्ये १९१८ साली प्रसिद्ध केला. शेती ही केवळ उपजिविकेचे साधन नाही तर तो राष्ट्रीय उत्पादनाचा एक मोठा स्रोत आहे याकडे आर्थिक विकासाकडे साधन यादृष्टीने बघितले पाहिजे. त्यांच्यामते

सुधारीत बी—बियाणे, रासायनिक खते, यंत्रे, अवजारे, तंत्रज्ञान इ. चा वापर शेतीमध्ये करण्याइतपत भारतीय शेतकरी आर्थिकदृष्ट्यासक्षम नाही. शेतीच्या विकासावरच अर्थव्यवस्थेचा विकास अवलंबून आहे. शेतमजूर व शेतकरी यांचे प्रश्न जाणून घेता. डॉ. आंबेडकरांनी शेतीचे राष्ट्रीयीकरण करण्याचा पुरस्कार केला. भारतीय शेती तुकड्यांमध्ये विभाजीत झाली. तसेच अपखंडनही झाले. भविष्याचा विचार करता शेतीचे राष्ट्रीयीकरण, सामूहीक शेती, शासकिय स्तरावर शेती आदी उपाय आंबेडकरांनी सांगितले. शेतमजुरांना शेती लीजवर करण्यास दयावी. राज्यातील सर्व शेती वर राज्यसरकारने नियंत्रण ठेवावे. राज्यसरकारने स्वःखर्चाने शेतीविषयक व्यय करावा.

औद्योगिकरण व कामगार विषयक विचार :

डॉ. बाबासाहेब आंबेडकरांना भारतीय अर्थव्यवस्थेच्या सुधारणेसाठी व विकासासाठी यंत्रयुग स्विकार्य होते. औद्योगिकरणामुळे शेतीवरील बोझा कमी होऊन भूधारक व भूमिहिन यांना रोजगाराचा स्रोत मिळेल परिणामतः कामगाराचे उत्पन्न वाढेल. सार्वजनिक हिताच्या दृष्टीने पायाभूत उद्योग, मध्यम व महत्वाचे खाजगी उद्योगही राज्य सरकारने स्वतःकडे ठेवावे. तर काही खाजगी उद्योगांना प्रोत्साहन द्यावे. यामुळे देशातील आर्थिक विषमता दूर होण्यास मदत होईल. वाढती जोपर्यंत शेती व उद्योगाची सांगड घालणार नाही तोपर्यंत शेतकऱ्यांचे विविध प्रश्न सुटणार नाही. म्हणून शेतमाल प्रक्रिया उद्योगांची निर्मिती करणे आवश्यक आहे.

डॉ. आंबेडकरांनी **Das Capital** या ग्रंथात उच्चवर्णीय व भांडवलदार वर्गाकडून श्रमिकांचे होणारे शोषण याबाबत सविस्तर विचार मांडलेले आहेत. डॉ. आंबेडकरांनी दलित कामगार व समाजातील दुर्बल व दुर्लक्षित श्रमिकांना न्याय मिळवून देण्यासाठी १९४३ मध्ये स्वतंत्र मंजूर पक्षाची स्थापना केली व त्यामध्ये त्यांनी श्रममंत्री पद भूषविले. ब्रिटीश सरकारने कोल माइन्स मध्ये स्त्रीयांना खाणीत काम करण्यास प्रतिबंध घातला. तेव्हा डॉ. आंबेडकरांनी १९४३ मध्ये स्त्रीयांना पुरुषांच्या बरोबरीने काम करण्याचा समान अधिकार मिळवून दिला. १९ व्या शतकापूर्वी इंग्लंडमधील उद्योजकापेक्षा भारतीय उद्योजकाच्या नफ्याचे प्रमाण अधिक होते. याचे कारण म्हणजे भारतातील कामगारांना देण्यात येणारी अल्पमंजुरी होय. हे विचार त्यांनी 'प्राब्लेम ऑफ रुपी' या ग्रंथात प्रत्यक्ष आकडेवारी व गणितीय आलेखावरून सिद्ध केले आहे. डॉ. आंबेडकरांनी कामगार हिताचे बरेच कायदे केले ते पुढीलप्रमाणे —

१) किमान वेतन कायदा २) ट्री कंट्रोल बिल ३) बॉयलर्स अमेंडमेट बिल ४) मोटार व्हेइकल ड्रायव्हर्स अमेंडमेट ५) वीर इंजुरीज कॉम्पेनसेशन इन्शुरन्स बिल ६) कोलमाइन्स सेफ्टी स्टोईंग बिल ७) फॅक्ट्रीज अमेंडमेट बिल ८) फॅक्ट्रीज सेकंद अमेंडमेट बिल ९) पेमेंट ऑफ वेजेस अमेंडमेट बिल १०) औद्योगिक कामगार वसाहतीचे धोरण यासारखे अनेक कायदे केले.

चलविषयक विचार :

१९२३ मध्ये डॉ. कॅनन यांच्या मार्गदर्शनाखाली डॉ. आंबेडकरांनी **The Problem of Rupee : It's Origin & it's Solution** हा मौद्रिक अर्थशास्त्रावरील ग्रंथ लिहीला. याच प्रबंधावर त्यांनी डी. एस्सी ही सर्वोच्च पदवी प्रदान करण्यात आली. हाच ग्रंथ १९४७ मध्ये **History of Indian currency & Banking** या नावाने प्रकाशित करण्यात आला. १८३५ मध्ये संपूर्ण भारतात रौप्यमानकांची सुरुवात झाली त्यापूर्वी भारतात सुवर्णमानक व रौप्यमानक अशी व्द्विचलन पद्धती होती. परंतु रौप्य पद्धत ही देशाच्या गरजा भागविण्यास असमर्थ ठरली. याची दोन प्रमुख कारणे होती.

१ देशाच्या देवाणघेवाणीत चलनाचा वापर मोठ्या प्रमाणत वाढला.

२ आंतरराष्ट्रीय व्यापार वाढून चालनाचा वापर वाढला.

डॉ. आंबेडकरांनी याबाबत अध्ययन केले. रौप्यमानक व रौप्य कागदी चलनव्यवस्था व्यवहारात आणली. परंतु १८७६ मध्ये सोने व चांदी यांचा विनिमय दर स्थिर ठेवणे कठीण झाले व रूपयाचे अवमुल्यन होऊ लागले. याचे कारण म्हणजे चांदीचा अतिरिक्त पुरवठा नसून जगातील प्रमुख देशाने रौप्यमानकाचा त्याग करणे हे होते. त्यामुळे रूपया व पौंड यांच्या विनिमय दरात विसंगती निर्माण झाली. व भारताकरीता सुवर्णमान पद्धतीचा वापर करण्याचे ठरले. सुवर्णमान पद्धती दोन प्रकारची होती सुवर्णमानक व सुवर्णविनिमय पद्धती यापैकी भारतासाठी कोणती चलन पद्धती योग्य ठरेल याबाबत वाद निर्माण झाला. अर्थशास्त्रज्ञ किन्स यांनी सुवर्ण विनिमय पद्धतीचा पुरस्कार केला. परंतु डॉ. आंबेडकरांनी त्याला तीव्र विरोध केला. त्यांच्या मते भारतासाठी सुवर्णमानक हेच योग्य होते. हे स्पष्ट करण्यासाठी त्यांनी काही ऐतिहासिक पुरावेही दिले की, सुवर्णमानक असतांना रूपयाच्या किमती कश्या स्थिर होत्या. सुवर्ण विनिमय मानक पद्धती अस्तीत्वात असतांना रूपयाचे कसे अवमुल्यन होऊन भाववाढ होते. यावरून त्यांचा चलनविषयक दुरदृष्टी समजते.

सरकारच्या भूमिकेविषयी विचार

डॉ. बाबासाहेब आंबेडकरांनी 'द एवोल्युशन ऑफ प्रोविशियल फाईनेस इन इंडिया' या प्रबंधात १९२५ मध्ये भाष्य केले आहे. त्यांच्या मते सरकार देशाला समृद्ध व संपन्न बनविण्यासाठी संवैधानिक व राजकिय अधिकाराचा वापर करून साधनांची जुळवाजुळव करू शकत नसेल तर सरकारकडे संसाधन उपलब्ध करण्याचा व सर्वशक्तीनिशी वापर करण्याचा राजकिय कौशल्याचा अभाव आहे.

एडमस्मिथ नंतर डॉ. आंबेडकरांनी सरकार विषयीचे आर्थिक विचार मांडले जवळजवळ २०० वर्षांनंतर १९४९ मध्ये संविधानाच्या मसुद्यात एक महत्वपूर्ण टिप्पणी त्यांनी लिहली. त्यामध्ये नियंत्रक व महालेखापरिक्षक यांची महत्वपूर्ण भूमिका स्पष्ट केली होती. डॉ. आंबेडकर म्हणतात, सरकार कराच्या स्वरूपात जनतेकडून धनसंचय करते. या धनाचा उपयोग नियम व कायदानुसार करण्यात यावा. धनव्यय करतांना सरकारने जनतेच्या विश्वासाला तडा जाऊदेऊ नये. या उत्पन्नातून जो सार्वजनिक खर्च करण्यात येतो. त्याचा पर्याप्त लाभ, पूर्ण उपयोग व लाभाची सविजनिकता इ. बाबी लक्षात घ्याव्या. कराव्दारे प्राप्त होणारे उत्पन्न, कायदा व सुव्यवस्था ठेवण्यावर खर्च करण्यात येतो. या मूलभूत सुविधांचा लाभ सर्वच प्रकारच्या जनतेला मिळतो. यामधुन देशाची दळणवळणव्यवस्था, व्यापार, उद्योग, परकिय संबंध सुधारतात.

विमा व्यवस्था

डॉ. बाबासाहेब आंबेडकरांनी 'राज्य आणि अल्पसंख्याक' या ग्रंथामध्ये विम्याच्या राष्ट्रीयीकरणाची संकल्पना मांडली. विमाक्षेत्रावर राज्यसरकारचा एकाधिकार असावा. जेणे करून राज्यसरकारच्या निर्देशानुसार प्रत्येक प्रौढ व्यक्तींना विधीमंडळाच्या सुचनेनुसार विमा काढणे बंधनकारक ठरेल. म्हणजेच सक्तीची विमा योजना लागू करावी. यामुळे दोन फायदे होतील. एकाबाजूने औद्योगिक प्रगतीकरीता प्रीमिअमच्या माध्यमातून सरकारला भांडवलाचा कर्ज पुरवठा करता येईल. व दुसऱ्याबाजूने आजारपणात भारतीयांना संरक्षणाची हमी मिळेल. खाजगी विमा कंपन्यांपेक्षा राष्ट्रीयकृत विमा कंपन्या व्यक्तिला अधिक सुरक्षितता मिळवून देतात. विम्याच्या रक्कमेच्या अंतिम परतफेडी मिळवण्याची शाश्वती असते.

जातीव्यवस्था व आर्थिक विषमता:

डॉ. आंबेडकरांनी आपल्या 'स्टेट्स अँड मायनॉरिटीज' या ग्रंथात जातीव्यवस्था व विषमता याचे अध्ययन केले त्यांच्या मते जातीव्यवस्थेमुळे भारतीय समाजाची आर्थिक प्रगती व आर्थिक विकास खुंटलेला आहे. गरिबी हटाव, विषमता निर्मुलन आणि शोषण मुक्तता. जातीव्यवस्थेमुळे व्यवसाय निवडीवर बंधने होती कौशल्य असुनी व्यक्ती आर्थिक प्रगती साधु शकत नाही. अल्पसंख्याकांच्या हाती सत्ता व संपत्तीचा संचय केंद्रीत झाली तर बहुसंख्यक वर्ग दलित असावा परंतु संपत्तीचा संचय जमा करण्याचा अधिकार सर्वांना असावा परंतु संपत्तीचा संचय मुठभर लोकांनी करावा व गरीब जनतेला जखडून व दाबुन मारावे अश्याप्रकारची निती भारताच्या आर्थिक विकासास मारक ठरली आहे.

निष्कर्ष :

आजची वर्तमान स्थिती लक्षात घेता डॉ. बाबासाहेब आंबेडकरांचे आर्थिक विचार वास्तववादी दुरदृष्टीकोन ठेवणारे आहेत हे लक्षात येते. सामुदायिक शेती बदलचे डॉ. आंबेडकरांचे विचार पूर्णपणे योग्य नसले तरी सामुदायिक शेती व शेतीला उद्योगाची जोड या तात्कीक विचारांची मांडणी ८० वर्षांपूर्वी केली होती. हे विचार पूर्णश्रद्धेने आणि सामर्थ्याने राबविले तर शेतीच्या वृद्धीवर नक्कीच वाढेल. त्याचबरोबर शेतीच्या अपखंडन व विभाजनालाही आळा बसणार.

भांडवलदार—कामगार संबंध व उद्योजकाच्या नफ्याचे प्रमाण यांचे अध्ययन केले असता असे दिसून येते की अद्यापही मालक हा कामगारांचे कोणत्या ना कोणत्या रूपात शोषण करित असतो व अधिकाधिक नफा कमविण्याचा प्रयत्न करतो. आज वेगवेगळे सरकार सत्येवर येत असले तरी चलनफुगवटा व अर्थसंकल्पीय तूट कमी होतांना दिसून येत नाही उलट भाववाढीच्या समस्येला समोर जात आहे. यामुळे कुपोषण, विषमता, उपासमार यासारख्या समस्यांना तोंड द्यावे लागते.

डॉ. बाबासाहेब आंबेडकरांच्या विचारानुसार सरकारची भूमिका असल्यास देश जलद गतीने विकास साधाणार यात काही शंकाच नाही डॉ. आंबेडकरांनी सांगितल्याप्रमाणे राज्यसरकारने सक्तीची विमा योजनी लागू करायला पाहीजे. त्यामुळे गरीबांना आरोग्याची व नुकसान भरपाईची रक्कम मिळण्यास मदत होईल. भारतीयांच्या समस्यांचे मुळ जातीव्यवस्थेचे आहे. व तिची प्राचीन तसेच आधुनिक काळात आर्थिक, सामाजिक, राजकीय विषमता वाढविण्यास कारणीभूत आहे. व प्राप्त उत्पादनातून शेतीविषयक झालेला खर्च बाजूला काढून अन्य उत्पन्नाचे राज्यातील सर्व कुळ व शेतमजूरामध्ये समान वाटणी करावी यापद्धतीमुळे अतिरिक्त उत्पादन होईल शेतीच्या विभाजन व अपखंडनालाही आळा बसणार. काही प्रमाणात भारतीय शेतीची मोठी धारण क्षेत्रे आहेत यामध्ये बऱ्याच अडचणी निर्माण होतात. या सर्व बाबींचा विचार करून डॉ. आंबेडकरांनी शेतीचे राष्ट्रीयीकरणाचा उपाय सुचविलेला आहे.

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Study of Religion, Parental occupation and playing facilities in Relation to Participation in Sports in Maharashtra

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Jawaharlal Nehru once said “To awaken the people, it is women who must be awakened, once she is on the move the family moves, the village moves the nation moves”.

“Though women have always played a definite role in the history of mankind, the history of sports is generally one of the masculine domination in his world”. This was the reason that women and sports has been a topic completely ignored by most scholars in our country.

The Baron de Coubertin, who played so instrumental a role in reviving the modern Olympic Games, stated clearly the traditional view of the role of women in sports when he said: “The role of women in the Olympic Games, as well as in ancient tournaments is to crown the winners and garlands.”

This historical speech reveals that in the ancient world sports and physical education was specially meant for men.

Physical Education and Sports is the birth right of every child.

Physical education provides awareness and learning attitude for the physical, mental, social and spiritual development of the human personality. It strengthens the social relationship and examines the impact of interaction between the individual, the family, the wider community and the environment of the health of population. It is education through physical these are conceptualized and taught through an integrated approach to ensure that children achieve a healthy, active lifestyle that includes a sense of well-being. These are organized instruction in activities that contribute to the physical growth, health and body image of the individual.

Problems Faced by Indian Women:

Formal organization for games and sports in India, women and girls have long been deprived of participation in games and sports by direct or indirect social inhibitions. The earlier social handicaps were 'purdah' early marriage attitude, and the idea that physical, cultural and games unsex the girls and make them into 'tom boys'¹⁶. These factors are still handicaps to our women in general and even students who have greater freedom of movement and thought are also affected by this bias to a great extent.

In India, sporting world is still man's world. Women constitute almost 50 percent of the total population, but in no sense do equal the male athletes in numbers, inspite of the facilities being available or equal for every one either male or female.

Although contemporary women's sports in India cannot entirely claim to be of world class/port by itself, is by no means something new or strange to the country.

There are innumerable instances in Indian mythology of women who excelled at games of skill. It was the famous Indian heroine Shakuntala who taught archery to her son, the son of the equally famous king Dushyanta.

Indian history similarly provides striking examples of women of martial race fighting side by side with their men in times of emergency. Invasion tales of the Rajputs and Maharashtrians schivalry suggest that the women of those races were skilled in riding and chase.

Family and Sports:

Greendorfer in his study examined whether differences existed between these systems of socializing agent's family and peers of school during three life cycle stages. She found that during childhood, the female participation was more likely to have been influenced by peers and family respectively, than by teachers and coaches. At the adolescent stage, the influence of family and teachers had great influence. During young adulthood, the most influential agent was the peer group.

Synder and Spreitzer analysed family influence on sports and found that involvement in childhood is reinforced by parental encouragement continuously into middle age and dininished during the last stages of life cycle.

In another study conducted by Givi Masoud entitled " The Role of the Family in the Socialization of Children into Sports", the purpose of this study was two-fold; (1) to investigate the role of significant-others in general and the role of mothers in the socialization of children into sports, and (2) to examine in greater detail the role of mothers in the sports socialization of children as well as to consider the process of sex- typing and its relation- ship to sports.

It was concluded that the value that girls place on sports is equal to the value boys place on sports. Peers compared with family and teachers were the strongest pedictors of childern's active sports involvement within the family context, fathers proved to be the most important agnet of sport socialization.

Motivating Factors for women Participation in sports

A study done by Greendorfer provides descriptive information related to age of first sports participation, type of sports and influence of socializing agents, His study was based on a sample consisting of 585 women athletes. He found that approximately 70 percent of women were participating in some form of sports by the age of 8.

Furthermore, the entire sample was actively involved at the age of 14. Regarding relation to agents responsible for sports participation/ involvement, he found that 39.5 percent were stimulated by family, 31.3 percent by neighborhoods, 23.6 percent through school, 3.4 percent through community, and 1.7 percent through other clubs. In this study, major population of the sample was stimulated by family, neighborhood and school.

Menstruation and Sports participation:

As regards menstruation, the modern sports physicians do not ever recommend stoppage of swimming (gynocologists may differ for fear of infection) or gymnastic les- sons during menstruation periods. According to them, it is more of a psychological effect besides the sanitary problem because of the difficulty in wearing dresses during menstruation that hinder activity. The girls are unnecessarily taught to feel ill by their grandmothers during menstruation.

Duntger and Hallendall (1929) indicated that the achievement of 60 percent of 1561 women competing in the college gymnastic festival in 1928 were as great or greater during their menstrual periods than they usually achieved. Morehouse and Rash quote several research studies which clearly indicate that no significant disturbances occur in the normal menstruation cycle of healthy and well-trained women because of participation in the heavy schedule of competitive sport or even in competition.

Rapidly myths and attitudes, that women are physically, physiologically, socially and psychologically weaker are fading away slowly. Now women are even presidents, and prime ministers and holding higher positions. In recent Olympics the mass media discovered women's sport and this has been even growing phenomenon featuring great athletes such as Olga Korbut, P. T. Usha, Karanam Malleswari, Anju B. George and many others. Today more and more Girls are entering play fields unchaining all the barriers that was created by family, society and by herself. There is a marked change in the environment which allows women to go in pursuit of physical fitness and recreation. Through participation only the meaning of the word 'female', can be equalized with male.

PURPOSE OF THE STUDY:

The purpose of the study is to find out how family environment was influencing women in participating in sports and games. The allied objectives of the study are:

1. To study whether Religion influences the female participation in sports.
2. To study whether Parental occupation influences female participation in sports.
3. To study whether Nativity influences female participation in sports.

SIGNIFICANCE OF THE STUDY:

This study will bring light on some new facts regarding female participation in sports there are many prejudices in our tradition bound society regarding female participation in sports.

HYPOTHESIS:

The following hypothesis has been made before starting of this research work.

1. Religion may not influence the factors for female participation in sports.
2. Parental occupation may not influence the factors for female participation in sports.
3. Availability of playing facilities at early years may not influence the factors for female participation in sports.
4. Nativity may not influence the factors for female participation in sports.

REVIEWS OF RELATED LITERATURE:

In the present study the researcher used the libraries of Sant Gadge Baba Amravati University, Amravati, Degree College of Physical Education, Amravati, Lord Baden Powell Scout Library, Amravati, L.N.I.P.E., Gwalior, RSTM Nagpur University and North Maharashtra University, Jalgaon. He also used the internet facilities for collecting the review of related literature. The researcher found 427 reviews. It is worth to mention here that the research scholar found no reviews, which were directly related to the present study

METHOD OF STUDY

In this chapter, the selection of subjects, selection of variables, reliability of the data, reliability of the questionnaire, tester 's reliability and tester's competency, orientation of subjects administration of questionnaire, collection of the data and statistical techniques employed for analyzing the data will be described.

SOURCES OF DATA

The subjects for this study will be randomly selected from selected universities in Maharashtra, female students who will be pursuing post graduate course during the academic year 2013-14. The subjects selected for the study will be those who have not participated in sports. The purpose of the study is to find out how family environment was influencing women in participating in sports and games. During the early childhood, the girl will develop certain interests which will directly or indirectly simulate the girl to select her way of life, the interest may be converted into habits. Parents interests, environmental reasons such as societal values and norms of behaviour will have influence on the girls participation if sports activities.

To know the deterrents for female participation in sports this study will be conducted. So that a standard programme for female participation in sports can be planned for the future generations. To achieve this goal the post graduate female students studying in different universities in Maharashtra will be considered proper for this study and evaluation. To facilitate the study, the investigator confined him to the survey method using a questionnaire as an important tool for the collection of data.

SAMPLE

200 women students of 10 universities from five districts of Maharashtra will be selected on a random sampling basis. They will be the subjects for the present study and they will be selected from selected universities of Maharashtra. The subject's will be pursuing their post graduate courses during the academic year 2013-14. .

TOOLS FOR THE COLLECTION OF DATA:

Questionnaire was the main tool for the collection of data.

To collect the information how family environment was influencing women in participating in sports and games, a questionnaire was used.

At the outset a preliminary questionnaire was developed. The outline was discussed with the faculty members. After discussion the questionnaire was developed and given a trial run among the local college students. Necessary modifications were made and the validity and reliability of the questionnaire was found and questionnaire was prepared. The finally developed questionnaires were printed as per the required number. The questionnaire was attached with a separate covering letter.

The final questionnaires were distributed to all the selected subjects along with covering letter from Gondwana University, Gadchiroli along with a request letter and self-address stamped envelope. Sample questionnaire is attached in Appendix-1. The printed final questionnaires were distributed to all the selected students of different universities.

Keeping in view the Bunn Delon's definition regarding questionnaire, by observing the past research work in this areas and taking the advice of the guide, the research had prepared his questionnaire.

During preparation of the questionnaire researcher was followed the following rules so that no difficulty he should face during collection of data.

1. Questionnaire was related to the study.
2. Questionnaire was not too longer too short.
3. Questionnaire was in simple and general language.
4. The questionnaire included only the specific questions.
5. The purpose of the study was fulfilled by the questionnaire.
6. The questions were set according to logical sequence, from simple to complex and from general to specific.
7. Questionnaire was constructed in such a way that it was easy to tabulate and doing statistical analysis.
8. The words those needed special emphasis were underlined so that the respondents do not lose sight of them while responding.
9. Clear direction was given for each section of the questionnaire.
10. Questionnaire was free from annoying or embarrassing question.
11. The language used in questionnaire was free from error.
12. Important items were clearly defined and each questions deals with a single idea defined in unambiguous terms.

Follow up:

The subjects from whom the questionnaires were not received with in one month were given reminders and they were pursued for sending their responses. In some cases the researcher himself went to the respondent and collected the filled-in questionnaires. (Please see Photographs)

Collection of Data:

The filled up questionnaires were collected and responses to different question/statement were fed in to a Computer Programme for the systematic collection in an electronic Media. For this Microsoft Excel was used.

RESULTS:

The purpose of this study is to ascertain from female post graduate students of selected Universities of Maharashtra, on the influence of parental environment on their participation in sports. This is with the bid to unveil the status of family as a necessary factor in female participation in sports. In order complete the study Questionnaire was used to collect the data. The data collection is analysed and presented below:

Table-1

Table Showing the Sports Person in the Family and its relationship with Sports Participation

Family Income	Number	Percentage
Father	10	5.0
Brother	15	7.5
Sister	1	0.5
None	176	88.0

From the above table it is observed that out of the 200 players, 5.0 % (N=10) of players' Father is a Sports Person, 7.5 % (N=15) of players' Brother is a Sports Person, only 1 has a Sister who is a Sports Person and 88.0 % (N=176) are having none as Sports Person.

It shows that having some body as Sports Person in the family never influence for participation in Sports.

Table-2

Table Showing the Religion and its relationship with Sports Participation

Religion	Number	Percentage
Hindu	198	99.0
Muslim	02	1.0

From the above table it is observed that out of the 200 players, 99.0 % (N=198) belong to Hindu while 1.0 % (N=2) belong to Muslim. It shows that the Hindu family encourages their girls for participation in sports in comparison to Muslims.

Table-3

Table Showing the Occupation of the Parents and its relationship with
Sports Participation

Occupation	Mother	Percentage	Father	Percentage
House Wife/Farmer	197	98.5	115	57.5
Job/Business	3	1.5	85	42.5

From the above table it is observed that out of the 200 players, 98.5 % (N=197) of Mothers are Housewife, 1.5 % (N=3) of Mothers are doing Job or Business.

From the above table it is observed that out of the 200 players, 57.5 % (N=115) of Fathers are Farmers, 42.5 % (N=85) of Fathers are doing Job or Business.

It shows that Housewife Mothers and Farmer Fathers encourage their daughters for participation in sports.

Table-4

Table Showing the Facility and its relationship with Sports Participation

Response	Number	Percentage
Yes	44	22
No	156	78

From the above table it is observed that out of the 200 players, 22.0 % (N=44) received all the sports facilities while 78.0 % (N=156) did not. It shows that the both having and not having the sports facilities are favourable for participation.

Table-5

Table Showing the Facility and its relationship with Sports Participation

Range	Number	Percentage
1 K.M.	14	7.0
2 K.M.	41	20.5
3 K.M.	117	58.5
4 and above	28	14

From the above table it is observed that out of the 200 players, 7.0 % (N=14) players stay within 1 K.M. from the Play grounds, 20.5 % (N=41) players stay within 2 K.M. from the Play grounds, 58.5 % (N=117) players stay within 3 K.M. from the Play grounds, and 14.0 % (N=28) players stay more than 4 K.M. from the Play grounds.

It shows that majority of the players stay far away, even then they participate in sports which implies that distance is not a hindrance for participation in sports.

SUGGESTIONS :

A much more critical study is required to collect detailed information in respect of the different factors that influencing the female participation.

The researcher recommends the following suggestions.

1. A study about the environment and background of the male students can be conducted like financial position and sports background, if any.
2. Comparative study of the facilities provided for the female students and male students in academic colleges should be made.
3. Similar study can be conducted at different States of India.
4. A similar study can be conducted at different levels of education and in different region.
5. An experimental study may be undertaken to identify the games and sports activities which are helpful for physical development of women.
6. Study of the female participation in rural sports at the district level.

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रामभाऊ रूईकरांचे भारत छोडो आंदोलनातील योगदान

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स्वातंत्र्यासाठी प्राणाची बाजी लावणाऱ्या व कामगार क्षेत्रात कर्तृत्वचा डोंगर उभा करणाऱ्या रामभाऊ रूईकरांचा जन्म ८ जानेवारी १८९५ रोजी कोल्हापूर जिल्ह्यातील, इचलकरंजी तहसीलीतील 'रूई' या गावी झाला.^१ त्यांच्या वडिलांचे नाव सखारामपंत बाजी कुलकर्णी व आईचे नाव आनंदीबाई होते. सखारामपंत कोल्हापूर संस्थानाच्या शाहू महाराजांच्या पदरी पशुरोग चिकित्सक म्हणून काम करीत होते. नोकरीत असतांना सखारामपंताना त्यांच्या 'रूई' या गावची १६ एकर जमीन इनाम मिळाली आणि म्हणून पुढे ते कुलकर्णी या नावाऐवजी 'रूईकर' या नावाने ओळखले जावू लागले. रामभाऊंचे शालेय शिक्षण कोल्हापूरला राजाराम हायस्कूल मध्ये झाले. राजाराम हायस्कूल मध्ये शिकत असतांनाच रामभाऊंनी विद्यार्थ्यांची संघटना स्थापन केली करून चळवळीला सूरवात केली. ब्रिटीशांचा व संस्थानाच्या महाराजांचा रोष पत्कारावा लागेल या भीतीने त्यांना हायस्कूल मधून काढण्यात आले.^२ पुढे ते शिक्षणासाठी पुण्याला आले. पुण्यातच्या प्रसिद्ध 'फर्ग्युसन महाविद्यालयातून पदवीचे शिक्षण पूर्ण केले. नागपूरच्या मॉरीस कॉलेजमधून त्यांनी एम.ए. इतिहास व अर्थशास्त्र विषयात पदवी मिळवली. कायद्याची आवड असणाऱ्या रामभाऊंनी अलाहाबाद विद्यापीठातून वकिलीची सनदही प्राप्त केली.^३ रामभाऊंचा विवाह इ.स. १९१८ला नागपूरला एका श्रीमंत कुटुंबात उच्च अधिकारी असणाऱ्या श्री. गणपतराव लोथे (ई.एस.सी.) यांची कन्या कु. सुशिला हिच्याशी झाला. विवाहानंतर त्यांचे नाव इंदिराबाई असे ठेवण्यात आले. रामभाऊ व इंदिराबाईंच्या पोटी सहा अपत्य जन्माला आली वसंत, शरद, मधुकर ही तीन मुले तर कुसुम, मालती व सरोज या तीन मुली.^४ रामभाऊंना पैश्याचे पाठबळ नव्हते म्हणून लग्नानंतर वकिली करायची असा निश्चय करून ते नागपूरला स्थायिक झाले.

विद्यार्थी जीवनापासून त्यांच्यावर लोकमान्य टिळकांच्या विचारांचा प्रभाव होता. १९२०च्या नागपूर काँग्रेस अधिवेशनात त्यांनी सक्रीय सहभाग घेतला. त्यानंतर १९३० मध्ये महात्मा गांधींच्या नेतृत्वात सुरू झालेल्या सविनय कायदेभंग चळवळीत त्यांनी सहभाग घेतल्यामुळे दोन वर्षांची शिक्षा त्यांना भोगावी लागली. महात्मा गांधींशी झालेल्या वैचारीक मतभेदामुळे १९३९च्या त्रिपुरा अधिवेशनानंतर सुभाषबाबूंनी २९ एप्रिल १९३९ ला भारतीय राष्ट्रीय काँग्रेसच्या अध्यपदाचा राजीनामा दिला. व लगेचच ३ मे १९३९ मध्ये 'फॉरवर्ड ब्लॉक' पक्षाची स्थापना केली.^५ रामभाऊ सुभाषबाबूंच्या फॉरवर्ड ब्लॉक पक्षात सहभागी झाले.

चलेजाव आंदोलन

इ.स. १९४२चे चलेजाव आंदोलन भारताच्या स्वातंत्र्य संग्रामातील अतिशय व्यापक स्वरूपाचा शेवटचा लढा होता. इ. स. १९३९ मध्ये दुसऱ्या महायुद्धाचा भडका युरोपमध्ये उडाला त्यावेळी भारताचे व्हॉईसरॉय लॉर्ड लिनलिथगो यांनी भारत महायुद्धामध्ये सामील असल्याची घोषणा केली. यावेळी त्यांनी भारतात सर्वात मोठी राजकीय संघटना असलेल्या काँग्रेसशी विचारविनिमय केला नाही. इंग्लंडने आपला युद्ध हेतू आणि भारताविषयी आपली भूमिका स्पष्ट केल्याखेरीज काँग्रेस इंग्लंडच्या युद्ध कार्याला पाठींबा देवू शकणार नाही अशी भूमिका काँग्रेसने घेतली. काँग्रेसची मदत मिळावी म्हणून भारताला वसाहतीचे स्वराज्य देण्यास इंग्लंड वचनबद्ध आहे याचा पुनर्रचार व्हॉईसरॉयने ऑगस्ट १९४० मध्ये केला. फेब्रुवारी, मार्च १९४२ मध्ये सिंगापूर व रंगून ही

ब्रिटीशाची नावीक ठाणी जपानने जिंकली. आझाद हिंद सेना व जपानी सैन्य भारताच्या सिमेवर येऊन ठेपले त्यामुळे ब्रिटीश चिंताग्रस्त झाले. तत्कालीन परिस्थितीच्या सखोल अवलोकनानंतर गांधीजींची पक्की खात्री पटली की इंग्रजांना भारत सोडून जाण्यासाठी निर्वाचनाचा इशारा देण्यास हीच योग्य वेळ आहे म्हणून त्यांनी राष्ट्रव्यापी आंदोलनाचा निर्णय घेतला. सेवाग्रामला भरलेल्या काँग्रेस कार्यकारणीच्या बैठकीत भारत छोडोचा ठराव मांडला व तो सर्वांमते पारित करण्यात आला. गांधीजींनी यावेळी “करा किंवा मरा” अशी घोषणा केली व सर्व भारतीयांनी या आंदोलनात सहभाग घ्यावा असे आवाहन केले.

मुंबईचे काँग्रेसचे अधिवेशन संपवून नागपूर-विदर्भातील नेते परत असतांना मलकापूर स्टेशनवर त्यांना अटक करण्यात आली. महात्मा गांधींनी भारत छोडो आंदोलन सुरू केल्यानंतर रामभाऊंनी वार्ताहरांना मुलाखत देतांना म्हटले “महात्मा गांधी आणि काँग्रेस पक्षाची कार्यकारी समिती आता सुभाषचंद्र बोस आणि फॉरवर्ड ब्लॉकच्या पदचिन्हावर चालत आहे. इ. स. १९३९ च्या त्रिपुरी अधिवेशनात आणि १९४० च्या रामगड येथील अधिवेशनात सुभाषबाबूंनी जे सांगितले तेच महात्मा गांधी आणि काँग्रेसचे पक्षप्रमुख नेते करीत आहेत.”^६ पुढे ते म्हणले “इ.स. १९३९ मध्ये सुभाषबाबूंचा पराभव झाला पण १९४२ साली वर्ध्याला ते विजयी झाले”^७ तसेच “त्यावेळी काँग्रेसने फॉरवर्ड ब्लॉक पक्षाला बेकायदेशीर घोषित केले परंतु काँग्रेस वर्किंग कमेटीच्याच माध्यातून पक्ष पुन्हा जीवंत झाला आहे.”^८

९ ऑगस्ट १९४२ रोजी मुंबई प्रमाणेच नागपूर शहरातही सर्व भागातून सरकारी दडपशाहीच्या निषेधार्थ लोकांनी मिरवणूका काढल्या. चौकाचौकात एकत्र येवून लोकांनी सरकारच्या विरोधात घोषणा दिल्या व राष्ट्रीय नेत्यांचा जयजयकार केला.^९ काँग्रेसच्या वरिष्ठ नेत्यांना सरकारने पकडल्याच्या निषेधार्थ ९ ऑगस्ट १९४२ च्या संध्याकाळी चिटणीस पार्कच्या मैदानात सभेचे आयोजन रामभाऊंनी केले. मात्र इंग्रज सरकारने सभा घेण्यावर बंदी घातली तरीही रामभाऊंनी आपल्या सहाकाऱ्यांना सभेच्या प्रचाराची व आयोजनाची जबाबदारी सोपवून नागपूरातील नेत्यांशी त्यांनी स्वतः संपर्क साधून सभेला येण्यासाठी आग्रह केला. सरकार सभा घेण्याच्या विरोधात असल्यामुळे सरकारने सभेसाठी मंच आणि ध्वनीक्षेपकही मिळू दिला नाही, व सैनिकांना सशस्त्र सभेच्या ठिकाणी उपस्थित राहण्याचे सांगितले. ही वार्ता रामभाऊंना कळताच त्यांनी नागपूर शहरात प्रत्येक वस्तीत असणाऱ्या आखाड्यांच्या प्रमुखांना संपर्क साधून त्यांना शस्त्रासहीत सभा स्थळी येण्याची विनंती केली व पोलीसांच्या मागे काही अंतरावर उभे रहावे असे म्हटले. सभेपूर्वी नागपूरातील काही नेते रामभाऊंना भेटून सभा न घेण्यासंबंधी बोलले पण रामभाऊ मागे हटले नाही. संध्याकाळी हजारोंच्या संख्येने लोक चिटणीस पार्कवर एकत्रित झाले.^{१०}

वातावरण तापलेले होते कोणत्याही क्षणी काय होईल हे सांगता येत नव्हते इतक्यात भाई तिमोजी महाजन, विठोबा बळवाईक, विनायकराव सुर्यवंशी, सौ सुभागाबाई काशीकर, शेल्लेकर वकिल आणि इतर नेत्यांनी सैनिकांच्या मध्ये घुसून एक टेबल ठेवला. सर्वप्रथम रामभाऊ टेबलावर उभे झाले. लोकांची उत्सुकता वाढलेली होती सोबतच भीतीही वाटत होती. पुष्कळशे नेते भीतीमुळे सभास्थळी आलेले नव्हते. रामभाऊंनी बोलायला सुरवात केली ते म्हणाले “मी जिल्हाधिकारी साहेबांना विनंती करतो की ही सभा कायदेशीर असल्यामुळे पोलीसांना या ठिकाणहून हटविण्यात यावे, सभेचे कार्य शांततेने चालेल. आम्हाला सरकारी धोरणाचा निषेध करण्याचा अधिकार आहे. जर आपण लाठ्या चालविल्या तर येथे रक्ताच्या नदया वाहील

म्हणून कृपया शिपायांना येथून हटविण्यात यावे.” जवळपास एक तास रामभाऊ बोलत राहिले “इंग्रज सरकारला माझे आव्हान आहे” असे म्हणून त्यांनी आपल्या अंगावरचा कोट काढला व म्हणाले “हिंमत होगी तो चलाव गोली” त्यांची ही घोषणा ऐकून सभेला जमलेला जमाव आणि खुद्द सैनिकही थक्क होऊन त्यांच्याकडे पाहतच राहिले. लोक निषेध व जिंदाबादचे नारे लावत राहिले. शिपायी आपल्या जागी उभे राहिले. रामभाऊनंतर तीन चार नेत्यांची भाषणे झाली त्यामध्ये सौ. सुभागाबाई काशीकर, शेलेंकर हे होते. या प्रसंगी कोणताही अनुचित घटना घडली नाही. चिटणीस पार्कच्या सभेनंतर रामभाऊंवर कोणतीही कार्यवाही सरकारने केली नाही. १० ऑगस्ट रोजी नागपूरात सार्वत्रिक हस्ताळ पाळण्यात आला. शहरातील सर्व लहान मोठी दुकाने, विद्यालय, आणि बाजारपेठा बंद राहिल्या.^{११}

१२ ऑगस्ट १९४२ रोजी सरकारच्या सभाबंदीच्या आदेशाला न जुमानता चिटणीस पार्कवर पुन्हा सभा घेण्यात आली. डॉ. चोळकरांच्या अध्यक्षतेखाली झालेल्या सभेत जवळपास १५,००० लोक उपस्थित होते व रामभाऊ, बी. जी. देशपांडे, डॉ. परांजपे, अनुसयाबाई काळे यांनी सभेत प्रक्षोभक भाषणे केली.^{१२}

रामभाऊंवर सरकारची करडी नजर होतीच, कदाचित सरकार वातावरण शांत होण्याची वाट पहात असावे. शेवटी २३ सप्टेंबर १९४२ला रामभाऊंना पकडण्यात आले व तीन वर्षांची शिक्षा सुनावण्यात आली.^{१३} त्यावेळी रामभाऊंना पकडल्याच्या निषेधार्थ नागपूरातीलच नव्हेतर पुलगाव व हिंगणघाटच्या कामगारांनीही संप केला.^{१४} सुरवातीला थोडे दिवस त्यांना नागपूरच्या तुरुंगात ठेवण्यात आले त्यानंतर वेलोर व उर्वरित तुरुंगवास त्यांनी शिवनी येथे भोगला. याच काळात त्यांची भेट विनोबा भावंंशी झाली दोघेही सोबतच तुरुंगात होते.

तुरुंगातही रामभाऊ स्वस्थ बसले नाही. महात्मा गांधींनी केलेल्या २१ दिवसाच्या उपवासाबद्दल सहानुभूती म्हणून त्यांनी ११ ते १७ फेब्रुवारी १९४३ ला सात दिवसाचा उपवास केला.^{१५} तीन वर्षांच्या दीर्घ कारावासानंतर सप्टेंबर १९४५ मध्ये शिवणीच्या तुरुंगातून रामभाऊंची सुटका झाली. ११ सप्टेंबरला नागपूरच्या स्टेशनारवर रामभाऊंचे भव्य स्वागत करण्यात करून प्रचंड मिरवणूक काढण्यात आली. यावेळी कामगारांच्या आनंद गगणात मावेनासा झाला कारण त्यांचा वाघ तीन वर्षांनंतर डरकाळी फोडण्यासाठी पुन्हा सज्ज होणार होता.

स्वातंत्र्याच्या धगधगत्या यज्ञकुंडात आपल्या प्राणांची बाजी लावणारे रामभाऊ लोकमान्य टिळकांच्या आक्रमक विचारांचे जरी समर्थक असले तरी त्यांनी महात्मा गांधींच्या असहकार आंदोलन, सविनय कायदेभंग चळवळ, व भारत छोडो आंदोलनात सहभाग घेतला. सुभाषबाबूंनी फॉरवर्ड ब्लॉक पक्षाची स्थापना केल्यावर सुभाषबाबूंच्या देशसेवेच्या कार्यात त्यांना मोलाची साथ दिली व स्वातंत्र्य चळवळीत अनेकदा तुरुंगवासही भोगला. म्हणूनच रामभाऊंचे स्वातंत्र्य चळवळीतील योगदान अमूल्य असे होते.

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Interior Decoration (आंतरिक सजावट) : मुलींमधील जागृकता आणि स्वयंरोजगाराच्या संधी

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सारांश:

आजच्या तंत्रज्ञान युगात सौंदर्यदृष्टी टिकवून ठेवणे खूप महत्वाचे झाले आहे. Interior Decoration ही एक कला आणि विज्ञान यांचा समन्वय आहे. सौंदर्यातून माणसाला समाधान, आनंद, मनःशांती मिळत असते. Interior Decoration हे एक असं माध्यम आहे की जेथे व्यक्तीच्या सृजन गुणांना वाव मिळतो. तसेच उपयोजनेचा विचार केला तर उत्तम रोजगार देखील मिळवून देऊ शकतो.

मुलींना घर सजविण्याची आवड मुळातच असते. त्याच आवडीला ज्ञानाची व प्रशिक्षणाची जोड देऊन योग्य वळण दिल्यास अभिरुचीतून कौशल्याकडे वाटचाल करित ती यशस्वी होऊ शकते.

तेंव्हा Interior Decoration या क्षेत्राकडे बघण्याचा मुलींमधील दृष्टीकोन, जागृकता ज्ञान जाणून घेणे महत्वाचे ठरते.

बीजशब्द : Interior Decoration, जागा (Space), आर्किटेक्ट.

प्रस्तावना:

आपल्या घराची सजावट इतरांच्या घरापेक्षा असावी वेगळी असावी असे प्रत्येकाला वाटत असते आणि त्यासाठी ती व्यक्ती वेगवेगळ्या मार्गाने आपल्या घराचं वेगळेपण जपत असतो. व्यक्तीच्या ह्याच वेगळेपणाच्या कल्पनेला प्रत्यक्ष वास्तवात उतरविण्याचे Interior Decoration असते.

आंतरिक सजावट म्हणजे सुसज्ज किंवा सुशोभित केलेली जागा. अशी व्याख्या जरी केली तरी याचे क्षेत्र व्यापक आहे. केवळ घराच्या आतिलच बाजूची सजावट नसून बाह्य भाग देखील सुसज्ज व सुशोभित केल्या जातो.

कलेच्या मुलभूत घटकांचा, कलेच्या तत्वांचा एकत्रित संगम आपल्याला या क्षेत्रात पाहायला मिळतो. कलेच्या मुलघटकांचा वापर करून मिळालेली जागा अधिकाधिक सुंदर बनविणे आणि निर्माण होणारी कलात्मक कृतीतून आनंद निर्माण केला जातो.

या क्षेत्रात सृजनशिलतेला भरपूर वाव मिळत असतो. तसेच या क्षेत्रात मुलींना स्वतःची ओळख निर्माण करण्याची संधी मिळते.

तिच्या कल्पना, सृजनविचार, कलेच ज्ञान,आवड एकूणच तिच्या व्यक्तिमत्त्वाच्या विविध पैलूंचा अविष्कार तिने केलेल्या Decoration सजावटीमध्ये दिसून येते.

प्राचीन इतिहासाचा विचार केल्यास ही कला फार जुनी आहे. प्राचिन भारतिय आर्किटेक्स देखील इंटिरियर डेकोरेटर म्हणून काम करित हे विश्वकर्माच्या वास्तूविशारदाच्या उदाहरणावरून लक्षात येते. प्राचिन काळापासून अस्तित्वात असलेलं हे क्षेत्र हळूहळू बदलत गेलं. त्यातील Fashion फॅशन, स्टायल (Style) तत्वे आधुनिकतेकडे वळत गेले असले तरी सजावटीमध्ये पारंपारिक व प्राचिन गोष्टींना एक वेगळं महत्त्व आहे.

अगदी आधीपासून आपण पाहात आहोत या क्षेत्रात मुलांची संख्या जास्त आहे. मुलींना जेव्हा की सौंदर्य दृष्टी मुळातच प्राप्त झालेली असते तरी या क्षेत्रात मुलींचा सहभाग कमी दिसतो.

ग्रामीण भागात या विषयाची जागृकता दिसून येत नाही. या क्षेत्राची मर्यादा शहरी भागापूरताच सिमित आहे असा गैरसमज लोकांमध्ये असतो. तेव्हा या विषयाची माहिती जास्तीत जास्त मुलींपर्यंत महत्वाचे ठरते.

उद्दिष्टे:

- 1) Interior Decoration मधील मुलींमधील जागृकता जाणणे.
- 2) Interior विषयीची मुलींमधील अभिरुची व त्यातील ज्ञान जाणून घेणे.
- 3) या क्षेत्रात उपलब्ध असलेल्या रोजगार संधी विषयी जागृकता निर्माण करणे.
- 4) सुप्तगुणांना संधी/वाव मिळवून देवून मुलींना स्वअस्तित्वाची जाणीव निर्माण करून देणे.

गृहितके/परिकल्पना

- 1) मुलींमध्ये Interior विषयी जागृकता आहे.
- 2) मुली Interior Decoration हा विषय केवळ छंद म्हणून जोपासतात.
- 3) या क्षेत्रातील रोजगार संधीविषयी माहिती नसते.
- 4) Interior Decoration या क्षेत्रातील योग्य मार्गदर्शन नसते.
- 5) प्रशिक्षणाचे योग्य मार्ग माहित नसतात.

विषयाची व्याप्ती :

आधीच्या काळात Interior Decoration हे केवळ श्रीमंतांच्या घरातच बघायला मिळत असे. परंतु बदलत्या काळात ह्या क्षेत्रात मागणी वाढलेली दिसून येते हे क्षेत्र demanding झालेल आहे. घर बांधतांना घराची सजावट करून त्यांचे सौंदर्य कसे खुलविता येईल याकडे लक्ष दिले जाते. हे क्षेत्र केवळ घराच्या सजावटीपुरताच मर्यादित नाही तर याचे दोन विभाग आहे.

1) Residential

2) Non Residential

1) **Residential** या मध्ये मुख्यत्वे घराचा आतिल व बाहेरील भागाचा विचार केला जातो.

2) **Non Residential** या मध्ये दुकान, रेस्टॉरंट मॉलस, ऑफिसेस, बिल्डिंग्स, book maker, music shop, coaching classes या सारख्या ठिकाणी interior decoration केल्या जाते.

विविध ठिकाणी संधी उपलब्ध असल्याने decorator ला त्या त्या क्षेत्रातील लोकांना जाणण्याची संधी मिळत असते. या क्षेत्रात पैसे देखील भरपूर मिळतात. या क्षेत्रात उतरण्यासाठी विशेष प्रशिक्षणाची गरज नाही. काही दिवस एखाद्या Interior कडे (interiorship course) इंटर्नशिप केल्यास स्वरूप लक्षात घेवून स्वतःच्या talent च्या भरवशावर यशस्वी होवू शकतात.

या क्षेत्रात काम करणाऱ्या व्यक्तींना कार्पेंटर, इलेक्ट्रीशियन, पेंटर, ग्राफिक कम्प्युटर डिझायनर यांची आवश्यकता असते.

हा उद्योग demanding आणि प्रशंसणीय असा आहे. कारण व्यक्तीची सौंदर्यदृष्टी व त्याचे talent त्याच्या कामात दिसून येते.

या उद्योगातून व्यक्तीला समाधान मिळत असते कारण ती स्वतःची आवड जोपासत असते आणि सृजनशिलतेला भरपूर वाव मिळत असतो. त्यामुळे interior decoration करतांना एकप्रकारचे job satisfaction मिळत असते. आजची तरुण पिढी पाहतांना job satisfaction खुप महत्वाचा विषय झालेला आहे.

या क्षेत्रात कार्य करित असतांना जागा (Space), प्रकाशयोजना, रंगसंगती फर्निचर, लय, संगती, प्राधान्य, कल्पना या सारख्या कलेल्या मुलतत्वाचे परिक्षण करण्याची क्षमता असायला हवी.

Interiod decoration हा एक बहू आयामी व्यवसाय आहे. ज्यातून तूमच्या सुप्त गुणांना प्रगट करायला वाव आणि संधी मिळत असतो. मुलींमध्ये आत्मविश्वास वाढीस लागण्यास मदत मिळू शकते.

Interior Decoration ही आर्किटेक्ट ची एक branch आहे. परंतु आता या विषयाकडे स्वतंत्रपणे बघितल्या जाते त्याचा स्वतंत्र अभ्यास केल्या जातो. त्यामुळे याचे महत्व आधीपेक्षा वाढलेले दिसून येते.

निष्कर्ष :

Interior Decoration या क्षेत्रात मुलीचे प्रमाण मुलापेक्षा कमी दिसून येते. कारण मुलींमध्ये या विषयाचे ज्ञान फार कमी असते. ग्रामीण भागातील मुली तर हा विषयच माहिती नसतो काही मुली ह्या केवळ स्वतःच्या घराची सजावट एवढ्या पुरत्याच आपला छंद जोपासतांना दिसून येतात.

या विषयाचे योग्य मार्गदर्शन नसल्याने विषयाची व्याप्ती व त्यातील रोजगार संदर्भातील मिळणाऱ्या संधीची माहिती त्यांच्या पर्यंत पोहोचत नाही.

आधुनिक काळातील मागणी बदलते तत्व तंत्रज्ञान याची माहिती मिळविण्यास मुली उत्सुक नसतात. त्यामुळे या क्षेत्रातील नाविन्यता माहिती होत नाही.

विविध सेमिनार, वर्कशॉप, व्हिडीओ यांच्या माध्यमातून या विषयाची आवड मुलींमध्ये निर्माण होऊ शकते. या क्षेत्रात कार्य करणे म्हणजे आपल्या सुप्तगुणांना संधी उपलब्ध करून देणे होय ही गोष्ट त्यांना पटवून देणे.

अतिशय सहज उपलब्ध होणारा रोजगार मुलींचे भविष्य यशस्वी करू शकतो तेव्हा मुलींमध्ये या विषयाची जागृकता निर्माण केल्यास त्या स्वावलंबी होण्यास नक्कीच मदत मिळू शकेल.

संदर्भग्रंथ सूची

1. गृहव्यवस्थापन आणि आंतरिक सजावट – डॉ. सुनंदा वसू, डॉ. रजनी मेहरे
2. Interior Decoration – Pramila Mehra.

Blending And Physicochemical Properties Of Mahua Biodiesel And Its Effect On Performance Of Diesel Engine

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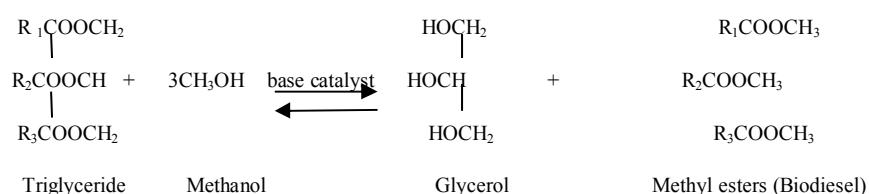
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ABSTRACT: Biodiesel production has received considerable attention in the recent past as a biodegradable and environmental friendly fuel. It can be used as alone or blend with diesel. In both it does not require any modification in engine. Biodiesel fuel has better properties than commercial fuel like it is renewable, biodegradable, non-toxic and free from sulphur and aromatics and less emission of hazardous gases. In the present study biodiesel production from mahua seeds was experimentally investigated. Expeller method was used to extract mahua oil from their seeds. Oil converted in to biodiesel by transesterification process by using methanol and oil in 1:6 molar ratio, at the rotation of 900 rpm, temperature 60 degree celcius for 60 minutes in the presence of 2 wt % KOH catalyst. Biodiesel blends with commercial diesel at different proportions. The properties like density, viscosity, acid value, iodine value, pour point, cloud point, and its effect on performance of diesel engine like brake power, brake thermal efficiency, calorific value.

KEYWORDS: Mahua oil, , transesterification, biodiesel, molar ratio, blending, engine performance

1. Introduction : Biodiesel is defined as mono alkyl esters of long chain fatty acids originated from natural oil and fats of plants and animals. The main component of natural oil and animals fats are triglycerides or esters of fatty acids attached to glycerol [1,2]. Biodiesel has gained the importance in the recent past for its ability to replace fossil fuels. Biodiesel is an alternative fuel made from renewable biological sources such as vegetable oil both edible and non-edible oil and animal fats. The environmental issues concerned with the exhaust gases emission by the usage of fossil fuels also encourage the usage of biodiesel which has proved to be eco-friendly than the fossil fuel. The biodiesel has various number of advantages over the fossil fuels. It can be used as a very good alternative fuel for diesel engine. Biodiesel is known as carbon neutral fuel because the carbon present in the exhaust was originally fixed from the atmosphere. Biodiesel degrades rapidly in the environment and is non toxic [3]. Pure biodiesel degrades 85 to 88% in water with in 28 days. Storing biodiesel is also safe. The best part of biodiesel is that it can be used in any ratio in any diesel engine with little or no necessary engine modification. Significantly there is no change required for the existing internal combustion engine technology and infrastructure. The biodiesel can be produced from animal fats, edible and non edible oils (jatropha oil, karanja oil, neem oil, cotton seed oil, linseed oil, mahua oil, rubber seed oil)and waste cooking oil and by products of the refining vegetable oil and algae [4,5]. Biodiesel from edible oil has higher oxygen content than petroleum diesel and its use in diesel engine have shown great reductions in emission of particulate matter, carbon monoxide, sulfur, poly aromatics, hydrocarbons, smoke and noise. In addition, burning of vegetable oil based biodiesel fuel does not contribute to net atmospheric CO₂ levels because such fuels are made from agricultural materials which are

produced via photosynthetic carbon fixation [6]. But by converting edible oils into biodiesel, food resources are converted in to automotive fuels. It is believed that large scale production of biodiesel from edible oil may bring global imbalance to the food supply and demand market. The debate started on the negative impact of biodiesel production from edible oil [7]. The direct usage of vegetable oil as biodiesel is possible by blending with conventional diesel fuel in suitable ratio. The blending process is simple which involves mixing alone. But the direct use of vegetable oil in diesel engine is not favorable and is problematic due to high viscosity, acid contamination, free acid formation resulting gum formation by oxidation and polymerization and carbon deposition. The three processing techniques are mainly used to convert vegetable oil to fuel form [8] and these are pyrolysis, micro emulsification and transesterification. The transesterification process is the most conventional way for the preparation of biodiesel because this method is relatively easy, carried out at normal conditions and gives the best conversion efficiency and quality of the biodiesel [9]. The transesterification is a catalysed chemical reaction involving oil and alcohol to yield fatty acid alkyl ester(biodiesel) and glycerol. The reactions requires the catalyst usually a strong base such as sodium hydroxide, potassium hydroxide or sodium methylate [10,11] or acid like sulphuric acid. Acid catalyst are too slow for converting triglycerides to bio diesel. A catalyst is usually used to improve the reaction rate and the better yield. Since the reaction is reversible thus excess alcohol is used to shift the equilibrium to the right side. In transesterification process methanol is because of its low cost and its physical and chemical advantages. Methanol can quickly react with oil and KOH can easily dissolved in it [12,13]. However an excess of the alcohol is used to increase the yield of the biodiesel and allow it easily phase separation from the glycerol phase [14].



Scheme 1: Transesterification Reaction

The biodiesel production is strongly affected by parameters such as molar ratio of oil and alcohol, reaction temperature, reaction time and catalyst concentration.

About Mahua Seeds: Mahua (*Madhuca indica*) fruit contains about 1-2 seeds. The outer cover of the fruit has to be removed to obtain the inner Mahua seeds. These seeds have to be broken in order to obtain the inner kernels. This is done usually by hand and the outer coat is broken by a stone to remove the kernel. The seeds (kernels) are then sun-dried to remove the moisture content from the seeds and stored for oil extraction purposes. The best quality Mahua seeds are said to contain 40-45% oil. Proper storage of seeds is of major importance in order to maintain the oil content in the seed. The seeds need to be stored in dry and airy conditions devoid of moisture in order to retain their oil content. The mahua seed oil is pale yellow in color. The oil cakes obtained after oil extraction also have industrial uses.

1. Material And Methods

1.1 Seed Material: The seeds are collected from Chandrapur and Gadchiroli region located in maharashtra. The seeds are selected according to their conditions where damaged seeds were discarded. The seeds in good condition were cleaned, deshelled and dried at high temperature at 100-105 degree celcius for 45 minutes. Seeds were then taken for oil extraction.

1.2 Extraction of oil: The oil can be extracted by cold percolation, soxhlet extraction and mechanical expeller method. We are chosen the mechanical expeller method. It is an ordinary method used for the extraction of all type of oils. This is the rapid process and oil can be extracted in larger amounts.

1.3 Transesterification Reaction:

Transesterification is one of the reversible reaction. However the presence of a catalyst which speed up the reaction. In the present work the reaction is conducted in the presence of base catalyst [15]. The transesterification scheme is shown in scheme 1.

A two stage process is used for the transesterification of mahua oil. The first stage process consist of acid catalysed to reduce the free fatty acid (FFA) in crude karanja and mahua oil by esterification process with methanol and sulphuric acid as acid catalyst for 90 minutes at 60 °C at 900 rpm in closed reactor vessel. At first crude seed oil was first heated to 50-60 °C to remove the moisture if present. The oil and methanol was taken in 1:6 molar ratio and 0.5 wt% sulphuric acid was added as catalyst to speed up the reaction. This reaction proceed for 90 minutes at 60 °C at 900 rpm with regular analysis of FFA every after 20 minutes.

1.4 Base Catalysed Transesterification:

The catalyst used is typically potassium hydroxide (KOH) with 2 wt% of total quantity of oil mass. The mahua seed oil and methanol is used in 1:6 molar ratio respectively. First catalyst is dissolved in methanol at 700 rpm speed for 20 minutes. The alcohol catalyst solution was prepared freshly in order to maintain the catalytic activity and prevent the moisture absorption. The prepared alcohol catalyst solution was added to oil, the system was closed to prevent the loss of alcohol as well as to prevent the moisture. The reaction temperature was maintained at 60 °C that is nearer to the melting point of methanol. The reaction time was for 60 minutes at the 900 rpm . Excess alcohol is normally used to ensure total conversion of the oil to biodiesel. After completion of reaction it is allowed for settling over night in separating funnel . At this stage two major products obtained that are glycerol and biodiesel. The glycerol layer is much denser than biodiesel layer and thus glycerol is settled down while biodiesel floated up. These can be separated simply with glycerol drawn off from the bottom of the separating funnel. In this way mahua biodiesel (MOME) were prepared.

1.5 Diesel Engine Performance parameter:

Brake Power :

Indicated power is based in indicated network and is thus a measure of the forces with in the force developed within the cylinder . More practical interest is the rotational forces available at the delivery point at the engine crankshaft (term the drive shaft) and the power corresponding to it. The power is interchangeably referred to as the brake power. BP is used to indicate the power ,actually delivered by the engine[16]. The brake power is usually measured by attaching

absorption device sets of the engine. Such device sets up measurable forces counteracting the force.

Brake thermal efficiency :

Brake thermal efficiency is defined as the ratio of energy in brake power to the input fuel energy in appropriate units. For the large of C.I. engines , brake thermal efficiency of about 40%.

Calorific Value :

Calorific value of a fuel is the thermal energy released per unit quantity of the fuel when the fuel is burned completely and the product of combustion are cooled back to the initial temperature of the combustible mixture.

Other terms used for the calorific value are the heating value and the heat of combustion. When the products of combustion are cooled to 25°C practically all the water vapour resulting from the combustion process is non-condensed. The heating value so obtained is called higher calorific value or gross calorific value of the fuel[17]. The lower or heat released when water vapor in the product of combustion is not condensed and remains in the vapor form.

2. Result and Discussion:

2.1 The extraction of oil from mahua seeds was performed by using mechanical expeller method and the yield was obtained about 27% by weight.

2.2 The mahua oil converted in to mahua biodiesel(mahua methyl ester) by transesterification process by using the base catalyst. Mahua oil converted in to biodiesel by transesterification process by using methanol and oil in 1:6 molar ratio, at the rotation of 900 rpm , temperature 60 degree celcius for 60 minutes in the presence of 2 wt % KOH catalyst. The physicochemical properties of resulting mahua oil methyl ester (biodiesel) by transesterification reaction were determined as per the ASTM method and these properties were compared with the properties of the commercial diesel. It is reported in table no.1. The properties of mahua oil methyl ester were found comparable with the commercial diesel.

Table: 1 Physicochemical properties of mahua oil methyl ester (mahua biodiesel)

Prorerties	Mahua Oil	Mahua Biodiesel	Diesel
Density (g/cm ³) 20 ⁰ C	2.32	1.0	0.82
40 ⁰ C	2.12	0.9	0.80
80 ⁰ C	2.07	0.74	0.79
Viscosity (mm ² /s) 20 ⁰ C	18.25	4.4	2.8
40 ⁰ C	15.14	3.8	2.4
80 ⁰ C	9.47	3.2	2
Acid value (mg/KOHg)	10	1.09	0.35

Iodine value (g/100g)	55	88	125
Cloud point (°C)	16	9	-10
Pour point (°C)	11	4	-15
Refractive index	1.329	1.328	1.32

2.3 Blending means the mixing of biodiesel with the commercial diesel. The mahua methyl ester blended with the diesel in different proportion and their physicochemical properties were measured and reported in table 2. The blending with the 50% composition (50% biodiesel + 50 % diesel) were found the comparable results with the diesel.

Table 2: Physicochemical properties of blended biodiesel

Properties	30% Biodiesel + 70 % Diesel	40% Biodiesel + 60 % Diesel	50% Biodiesel + 50 % Diesel	60% Biodiesel + 40 % Diesel	70% Biodiesel + 30 % Diesel	80% Biodiesel + 20 % Diesel	Diesel
Density (g/cm ³) 20°C	0.72	0.74	0.79	0.8	0.82	0.84	0.82
40°C	0.64	0.71	0.74	0.81	0.84	0.9	0.80
80°C	0.61	0.64	0.7	0.78	0.8	0.82	0.79
Viscosity (mm ² /s) 20°C	3.2	3.4	3.4	3.5	3.7	3.9	2.8
40°C	3.0	3.1	3.2	3.5	3.6	3.8	2.4
80°C	2.7	2.9	3.0	3.2	3.4	3.7	2
Acid value (mg/KOHg)	0.94	0.96	0.96	1.0	1.2	1.3	0.35
Iodine value (g/100g)	88.7	85.1	83.6	82	77.1	74.2	125
Cloud point (°C)	8	8	9	9	9	9	-10
Pour point (°C)	3	3	4	4	4	4	-15
Refractive index	1.327	1.326	1.325	1.324	1.323	1.321	1.32

2.4 Diesel engine performance parameter

Brake power:

For the engine performance, calculation of the brake power had been done on the constant 1500 rpm and varying value of the working load. From the performance calculation, the brake power parameter have been calculated .

$$BP = (2 \times \pi \times N \times T) / (60 \times 1000) \text{ kWatts}$$

Where

N = RPM of Cranshaft

T = Torque

Brake thermal efficiency

$$BTE = BP \times 100 / (mf \times CV) \text{ in } \%$$

Where

mf = Fuel consumption rate

BP = Brake Power

CV = Calorific value of the fuel

Effect On Fuel Consumption Time (Sec.):

From experimental set up of diesel engine, the fuel consumption time for biodiesel at different workload have been obtained and decrease continuously at higher different load. Thus fuel consumption time is an important engine parameter for diesel engine.

Effect On Brake Thermal Efficiency (BTE):

For varying work load ,brake thermal efficiency values have been calculated. The values of brake thermal efficiency for mahua methyl ester increases dramatically as the load increases. Thus brake thermal efficiency is an important engine parameter for diesel engine that reflects the performance of engine. All these diesel engine performance parameters for the different work load are reported in table 3.

Table 3: Diesel engine performance parameter

Working Load (Kg)	Time (Sec.)	Brake Power (kw)	Brake Thermal Efficiency (%)	Calorific Value
5	377	1.656	32.05	10843
10	260	3.313	44.30	10843
15	199	4.927	50.32	10843

Effect On Fuel Consumption Time (Sec.):

From experimental set up of diesel engine, the fuel consumption time for biodiesel at different workload have been obtained and decrease continuously at higher different load. Thus fuel consumption time is an important engine parameter for diesel engine.

Effect On Brake Thermal Efficiency (BTE):

For varying work load ,brake thermal efficiency values have been calculated. The values of brake thermal efficiency for mahua methyl ester increases dramatically as the load increases. Thus brake thermal efficiency is an important engine parameter for diesel engine that reflects the performance of engine.

Conclusion :

Edible oils are in use in developed nations such as USA and European nations but in developing countries the production of edible oils are not sufficient. In a country like India, there are many plants species whose seeds remain unutilized therefore have been used for the biodiesel production. Mahua oil are the potential feedstock for production of biodiesel in India. This species have shown promise and fulfills various biodiesel standards. Proper processing of mahua seeds and its transesterification by using the base catalyst can produce the quality of mahua biodiesel and can satisfy the large commercial applications. Biodiesel can be used as an alternate and non-conventional fuel to run diesel engine without any modification. Engine parameters like brake power, calorific value, brake thermal efficiency of mahua methyl ester which was prepared in 1:6 molar ratio are close to that of the commercial diesel.

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The Study On Breathing Capacity Of Senior Citizen Regular Practice In Yoga And Pranayam

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Abstract

Yoga is basically a spiritual discipline dependent on an amazingly unpretentious science, which centers on bringing agreement among psyche and body. It is a craftsmanship and study of sound living. The word 'Yoga' is gotten from the Sanskrit root 'Yuj', signifying 'to join' or 'to burden' or 'to join together'. For the above investigation the legitimate strategy has been finished by the analyst. For this investigation the specialist picked the elderly folks individuals who consistently perform yoga activities of the old age home in Chandrapur district. In the wake of gathering the information, the information has been determined and dissected by factual strategies. The breathing limit was examined of the senior residents who consistently used to perform yoga practices and pranayam. The near investigation was done to break down the breathing limit of the senior residents routinely performing yoga and pranayam.

Keywords: yoga, pranayam, breathing, activity, exercise

Introduction

The act of Yoga is accepted to have begun with the actual day break of human advancement. The study of yoga has its source millennia prior, some time before the main religions or conviction frameworks were conceived. In the yogic legend, Shiva is viewed as the primary yogi or Adiyogi, and the principal Guru or Adi Guru. A few Thousand years prior, on the banks of the lake Kantisarovar in the Himalayas, Adiyogi emptied his significant information into the unbelievable Saptarishis or "seven sages". The sages conveyed this ground-breaking yogic science to various pieces of the world, including Asia, the Middle East, Northern Africa and South America. Curiously, present day researchers have noted and wondered about the nearby equals found between antiquated societies across the globe.

Yoga is basically a profound order dependent on an incredibly unpretentious science, which centers around bringing concordance among brain and body. It is a workmanship and science of solid living. The word 'Yoga' is gotten from the Sanskrit root 'Yuj', signifying 'to join' or 'to burden' or 'to join together'. According to Yogic sacred texts the act of Yoga prompts the association of individual awareness with that of the Universal Consciousness, demonstrating an ideal agreement between the psyche and body, Man and Nature. As per present day researchers, everything in the universe is only a sign of a similar quantum atmosphere. Along these lines the point of Yoga is Self-acknowledgment, to defeat a wide range of sufferings prompting 'the condition of freedom' (Moksha) or 'opportunity' (Kaivalya). Living with opportunity on the whole different backgrounds, wellbeing and agreement will be the primary goals of Yoga practice. "Yoga" likewise alludes to an internal science including an assortment of techniques through which individuals can understand this association and accomplish dominance over their destiny. Yoga, being generally considered as an 'undying social result' of Indus Saraswati Valley development – tracing all the way back to 2700 B.C., has substantiated

itself obliging both material and profound upliftment of mankind. Fundamental human qualities are the actual character of Yoga Sadhana.

In current yoga as exercise, it comprises of synchronizing the breath with developments between asanas, but on the other hand is an unmistakable breathing activity all alone, generally rehearsed after asanas."Regular yoga practice makes mental lucidity and tranquility; expands body mindfulness; diminishes ongoing pressure designs; loosens up the psyche; focuses consideration; and hones fixation. The advantages of yoga for seniors are similarly as those for everybody: expanded muscle tone, balance (which is especially significant), strength, and improved state of mind. Through pranayama (breathing activities), lung limit is expanded. You can anticipate that your posture should improve and you may rest better. Yoga improves the flow and there is better perfusion of tissues. It builds the strength of respiratory muscles and decreases thoughtful reactivity in this manner assists with diminishing pressure and uneasiness.

Breathing Capacity

Gas trade during breath happens basically through dispersion. Dispersion is a cycle wherein transport is driven by a fixation slope. Gas particles move from an area of high focus to a locale of low fixation. Blood that is low in oxygen focus and high in carbon dioxide fixation goes through gas trade with air in the lungs. The air in the lungs has a higher centralization of oxygen than that of oxygen-drained blood and a lower grouping of carbon dioxide.

1. Tidal volume (image VT or TV) is the lung volume addressing the ordinary volume of air dislodged between typical inward breath and exhalation when additional exertion isn't applied. In a sound, youthful human grown-up, flowing volume is roughly 500 mL for every motivation or 7 mL/kg of weight.
2. The inspiratory hold volume (IRV) is the extra measure of air that can be breathed in after a typical motivation (flowing volume).
3. Expiratory hold volume-

The extra measure of air that can be lapsed from the lungs by decided exertion after ordinary termination — look at inspiratory hold volume.

4. Residual volume-

The volume of air actually staying in the lungs after the most persuasive lapse conceivable and summing normally to 60 to 100 cubic inches (980 to 1640 cubic centimeters) called lingering volume.

5. Inspiratory limit is the volume of air that can be roused following an ordinary, calm lapse and is equivalent to flowing volume + inspiratory save volume.
6. Expiratory limit is the maximal volume of air that can be breathed out after finished resting motivation. Expiratory limit is equivalent to the amount of flowing volume and expiratory hold volume. $EC = VT + ERV$.
7. Vital limit is the greatest measure of air an individual can oust from the lungs after a most extreme inward breath. It is equivalent to the amount of inspiratory hold volume, flowing volume, and expiratory save volume. It is around equivalent to Forced Vital Capacity.
8. Total lung limit is the volume of air present in the chest after full motivation. The absolute lung limit (TLC), around 6,000 mL, is the greatest measure of air that can fill the lungs ($TLC = TV + IRV + ERV + RV$).

Pranayam

Yoga breathing activities, otherwise called pranayama, are a significant piece of a creating yoga practice. Pranayama is one of the Eight Limbs of Yoga referred to by The Yoga Sutras of Patanjali, which implies that it was viewed as a necessary advance on the way to edification. Prana implies energy, breath, or life power. Figuring out how to direct and control prana in the body has for quite some time been viewed as a vital part of yoga. As a fundamental substantial capacity, breathing is a compulsory demonstration. In spite of the fact that we can't handle whether we inhale, we can, somewhat, control the way that we relax. Activities in breath control, like breath maintenance and purposeful techniques inward breath and exhalation for explicit mental and actual advantages are at the center of pranayama practice.

Pranayama Exercises

- Three-Part Breath - Dirga Pranayama: A decent breathing activity for fledglings. Doing three-section breath shows you how to fill and discharge the lungs totally, which is significant on the grounds that you're likely not used to utilizing your full lung capacity.² It's likewise a pleasant method to change into your yoga meeting.
- Equal Breathing - Sama Vritti Pranayama: Taking long, profound, moderate breaths relaxingly affects the body. Carrying your complete consideration to keeping your inward breaths and exhalations a similar length consumes your psyche, offering it a much need reprieve from its typical murmur of action.
- Alternate Nostril Breathing - Nadi Sodhana: In nadi sodhana, you close off one nostril, breathing out and breathing in through the open way prior to exchanging sides.² This brings you into balance by clearing the energy channels on the two sides of the body.
- Cooling Breath - Shitali Pranyama: A basic breath, ideal for a hot day or when the body is warm in the wake of rehearsing yoga stances.

- Ocean Breath - Ujjayi Pranayama: Ujjayi breath is truly fascinating in light of the fact that it acts to quiet the thoughtful sensory system simultaneously as it helps your oxygen utilization. It is the essential breath utilized in vinyasa yoga since it is adequately incredible to help an overwhelming stream.
- Lion's Breath - Simhasana: Lion's breath delivers the strain in your face and causes you brush off some steam.² You can do it whenever during a yoga practice.

Survey of Literature

One Puvartz 18 thought about the Breathing furthest reaches of 38 understudies. Among 38 understudies he apportioned them in two social occasions. One get-together was given planning of yoga rehearses and other get-together was not set up by any yoga works out. After the Training there was colossal difference in breathing constraint of the social events.

Jadhav Kamal 21 examined the effect on breathing constraint of the understudies by giving them energetic and anaerobic exercises. He parceled understudies in three social occasions however he saw that there was a qualification in breathing constraint of two get-togethers.

Lee SW, Mancuso CA, Charlson ME. Imminent investigation of new members locally based psyche body preparing program. J Gen Intern Med. 2004;19(7):760-5. Tracking down: A 3-month yoga program improved psychological wellness scores and other personal satisfaction measures. Yoga Type: Dahn-hak. 1) extending practices for enormous muscle gatherings and shoulders, neck, hips, back, and knees, 2) stances are held for "energy amassing 3) 5-to 10-minute reflection proposed to encourage "energy mindfulness", 4) redundancy of the huge muscle bunch stretches. Yoga Frequency/Duration: 1-hour class offered 2-to-3 times each week for a very long time.

Uebelacker LA, Epstein-Lubow G, Gaudiano, BA. Hatha. Yoga for discouragement: basic survey of the proof for adequacy, conceivable instruments of activity, and headings for future examination. J Psychiatr Pract. 2010;16:22–33. FINDING: A survey of eight clinical preliminaries showed the yoga may help treat sadness. Note: Methodological worries with most trials. Yoga Type: Some asana-zeroed in, some contemplation focused. Yoga Frequency/Duration: Varied long from 3 days to 12 weeks and in power from day by day to once each week.

Birdee GS, Legedza, AT, Saper RB. Attributes of yoga clients: aftereffects of a public study. J Gen Intern Med. 2008;23(10):1653-1658. A public overview of yoga clients demonstrated it to be useful for generally speaking wellbeing and prosperity, emotional wellness, and musculoskeletal conditions. Yoga Type: N/A. Yoga Frequency/Duration: Self-report that individual had rehearsed yoga during recent months (and not kendo or qi gong)

Woolery A, Myers H, Sternlieb B, Zeltzer L. A yoga intercession for youthful grown-ups with raised side effects of despondency. Modify Ther Health Med. 2004;10(2):60-63. A 5-week

program of yoga showed decreases in misery and nervousness among youthful adults. Yoga Type: Iyengar Yoga Frequency/Duration: Two 1-hour classes each week for 5 weeks.

Methodology

When researcher used to research about any topic, it needs to have proper direction over it. When there occurs any kind of problem then to direct the research properly and face the problem it needs to concentrate on the direction and proper way of research. For this it is important to collect the proper data for research. Statistical methods were used in this study to analyze the data. After this the values were calculated and Mean and S.D. were calculated and from this 'T' ratio was also calculated. After the calculation the researcher concluded the study.

Formulae:

$$\text{Mean} = \frac{\text{Sum of terms}}{\text{Number of terms}}$$

Standard Deviation

$$= \sqrt{\frac{n-1 \sum (x_i - \bar{x})^2}{n}}$$

Selection of Topic

For this study the researcher chose the old people who regularly perform yoga exercises of old age home in Chandrapur District.

Sources of Data

For the above the study the researcher had data collection through old people.

Collection of data

The researcher collected the data of through old people who regularly performed the yoga exercises. The age of the old people were 50 to 60 from them researcher chose 44 senior citizens randomly.

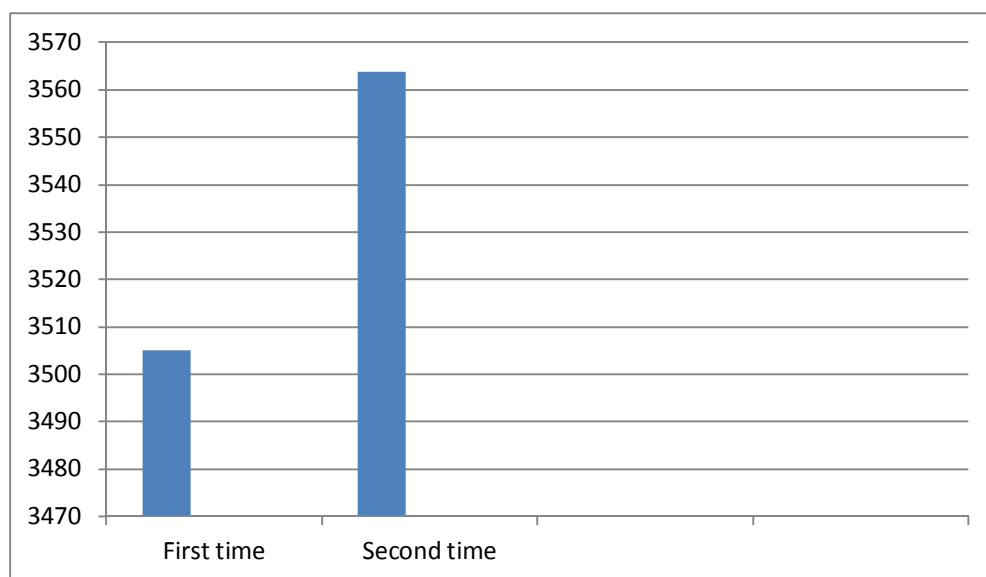
Analysis

The researcher analyzed the Mean, S.D. and 'T' ratio of the senior citizens and studied their breathing capacity.

Sr. No	Vital Capacity	Mean	S.D. $\sqrt{\frac{n-1 \sum (x_i - \bar{x})^2}{n}}$	Mean Difference	'T' Ratio
1	First time Calculated Breathing capacity	3505	749.07	58.75	0.24
2	Second time Calculated Breathing Capacity	3563.75	1350.19		

From the above table, it examined that first time the Mean of the breathing capacity of the senior citizens were 3505 and second time the Mean of their breathing capacity were 3563.75 hence the Mean difference were 58.75. Similarly the the S.D. of senior citizens first time were 749.07 and second time it was 1350.19 and hence 't' ratio was 0.24. Hence the table shows that the breathing capacity of senior citizens second time were more than it calculated first time.

Graphical representation



Conclusion

The breathing capacity was examined of the senior residents who routinely used to perform yoga practices and pranayam. The relative investigation was done to dissect the breathing limit of the senior residents regularly performing yoga and pranayam. The above investigation it found that the breathing limit determined second time was more than the breathing limit determined first time.

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पर्यावरणातील नैसर्गिक साधनसंपत्ती व शाश्वत विकासाची वाटचाल

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श्री निकेतन आर्ट्स व कॉमर्स कॉलेज, नागपूर

प्रस्तावना

कोणत्याही देशाचा विकास हा त्या देशातील साधनसंपत्तीवर अवलंबून असतो. सुरुवातीच्या काळात प्राकृतिक घटकांनाच साधनसंपत्ती म्हणून ओळखले जात असत. कालांतराने मानव हा एक साधनसंपत्तीचा भाग आहे असे मानले जाऊ लागले. पृथ्वीवरील मानव विकासासाठी वापरत असलेल्या सर्व वस्तूंना साधनसंपत्ती म्हटले जाते. साधनसंपत्तीचा वापर, शाश्वत विकास, पर्यावरणीय समस्या दूर करून समतोल राखायचा या सर्व गोष्टींचा अभ्यास अर्थशास्त्रीय विश्लेषणामध्ये केला जातो. मानवी जीवन हे पूर्णपणे निसर्गावर अवलंबून आहे. पूर्वी मानवाच्या गरजा मर्यादित होत्या व त्यांची पूर्तता ही निसर्गातूनच होत असे. आज मानवाच्या गरजा वाढलेल्या आहेत, तसेच आधुनिक तंत्रज्ञानामुळे नैसर्गिक साधनसंपत्तीचा वापर वाढलेला आहे. नैसर्गिक साधनसंपत्तीचे साठे मर्यादित असल्याने नवीन साधनसंपत्तीची निर्मिती करणे व त्यांचा विकास करणे गरजेचे आहे. उदा. दगडी कोळसा, खनिज तेल, नैसर्गिक वायू यासारख्या पारंपारिक साधनांऐवजी पवनऊर्जा, सौरऊर्जा, जलविद्युत ऊर्जा इ. अपारंपारिक ऊर्जा साधनांचा वापर करणे गरजेचे आहे.

संशोधनाची उद्दिष्टे

१. पर्यावरणातील नैसर्गिक साधनसंपत्तीचा अभ्यास करणे.
२. शाश्वत विकासाच्या वर्तमान स्थितीचा अभ्यास करणे.
३. पंचवार्षिक योजना काळातील खनिजांच्या विकासाचा आढावा घेणे.

नैसर्गिक संसाधनाची संकल्पना

नैसर्गिक संसाधन म्हणजे ज्या वस्तूच्या समावेश मानवाच्या भौतिक पर्यावरणात अस्तित्वात असतो जसे नैसर्गिक संसाधनात हवा, भूमी, जल वन, खनिज, सामुद्रीक संपत्ती, वातावरणातील सौरशक्ती, तेल, विद्युतशक्ती अणुशक्ती इत्यादी अजैविक घटक समाविष्ट असून सजीव घटकात प्राणी वनस्पती व भूजीव या संसाधनाचा समावेश केला जातो.

शाश्वत विकासाची वर्तमान स्थिती

शाश्वत विकासाचे मूल्यमापन करतांना आर्थिक बाबी विचारात घेतल्या जातात. काही देशांना प्रगत राष्ट्रे म्हणून संबोधल्या जातात. जसे उत्तर अमेरिका आणि युरोप मधील बहुतेक देश फार पूर्वी औद्योगिक झाल्यामुळे आज आर्थिक

दृष्टीने अधिक प्रगत आहेत. या देशांनी आपल्या देशातील नैसर्गिक संसाधनाचा शोध घेऊन वापर केला व आपली अर्थव्यवस्था बळकट केली आर्थिक मूल्यावर आधारित विकास प्रक्रियेमुळे नैसर्गिक संसाधनाचा व पर्यावरणाचा न्हास होतो. आर्थिक विकासांमुळे लोकांचे जीवनमान सुधारले जाते. परंतु पर्यावरणाची मोठ्या प्रमाणात हानी. झाल्यामुळे विकास करतांना हवा व पाणी यांच्यात प्रदूषणामुळे विपरीत परिणाम होऊ नये याची दखल घेऊन विकास करायला पाहिजे त्यालाच शाश्वत विकास असे म्हणतात. शाश्वत विकासाद्वारे मानवाच्या

गरजा भागविल्या जातील, परंतु आर्थिक विकासाच्या हवास्यापोटी नैसर्गिक संसाधनाचा अधिक वापर केल्यामुळे पर्यावरणाची अधिक हानी होत आहे, आज जग पर्यावरण की विकास या द्वंद्वत अडकले आहे. पृथ्वीवरील नैसर्गिक संसाधने मर्यादित असल्यामुळे आर्थिकदृष्ट्या सबळ घटकांद्वारे अधिक प्रमाणात वापरल्या गेलेल्या नैसर्गिक संसाधनाची भरपाई होऊ शकत नाही. नैसर्गिक संसाधनाचा नाश झाल्यामुळे समाजातील दुर्बल घटकांच्या दैनंदिन गरजा भागविण्यासाठी लागणाऱ्या नैसर्गिक संसाधनांचा प्रचंड प्रमाणात तुटवडा निर्माण होत आहे. शाश्वत जीवनशैली प्रत्यक्षात आणण्यासाठी कुठल्याही आर्थिक विकास प्रक्रियेचा पर्यावरणावर किती प्रभाव पडेल याचा अभ्यास करण्याची गरज असते.

आधुनिक काळात संपूर्ण जगात वेगाने होत जाणाऱ्या वाढत्या औद्योगिककरणामुळे नैसर्गिक साधनसंपत्तीचा अनिर्बंध वापर केला जातो हवा पाणी व जमीन यांच्या प्रदूषणामध्ये बेसुमार वाढ झाली आहे. आर्थिक विकासाला पर्यावरणापासून वेगळे करणे शक्य नाही. कारण वर्तमानकाळात ज्या विकास प्रक्रियेचा अवलंब केला जात आहे. ती पूर्णता उपलब्ध असलेल्या नैसर्गिक संसाधनावर अवलंबून आहे. मुख्य समस्या वर्तमान उपभोग व भावी विकासाकरिता संसाधने सुरक्षित ठेवण्याची गरज आहे. म्हणून वर्तमान पिढीने उत्पादन कार्यात एवढ्याच संसाधनाचा वापर केला पाहिजे की त्यामुळे भावी पिढ्यांवर प्रतिकूल परिणाम होणार नाही. अशा विकासालाच शाश्वत विकास असे म्हणतात.

नैसर्गिक संसाधन वर्गीकरण

१) पारंपारिक नैसर्गिक साधनसंपत्ती

ऐतिहासिक काळापासून काही साधनांचा वापर परंपरागत पद्धतीने केला जातो. उदा. लाकूड, दगड, माती, खनिज तेल यांचा वापर उद्योगधंद्याच्या वाढीसाठी केला जातो. काही नैसर्गिक घटकांचा योग्य वापर करण्याच्या दृष्टीने नवीन तंत्रज्ञानाचा वापर केला जातो. त्या साधनांना अपारंपारिक ऊर्जा साधने असे म्हणतात. जसे पवनचक्की सौरशक्ती इ.

२) विनाशी-अविनाशी नैसर्गिक साधनसंपत्ती

जी साधनसंपत्ती एकदा वापरल्यानंतर नष्ट होते तिला अविनाशी संपत्ती असे म्हणतात. उदा. दगडी कोळसा, खनिज तेल इ. अविनाशी साधन संपत्तीमध्ये ज्या पदार्थाचा पुन्हा पुन्हा उपयोग करता येतो अशा घटकांचा समावेश होतो. उदा. अणुशक्ती विद्युतशक्ती, सौरशक्ती, पवनशक्ती, इ.

३) कालांतराने निर्माण होणारी किंवा निर्माण करता येणारी साधनसंपत्ती

काही साधनांच्या निर्मितीसाठी ठराविक कालावधी आवश्यक असतो. हा कालावधी काही महिन्यांचा किंवा वर्षांचा असतो. जसे कृषी क्षेत्रातील उत्पादने किंवा उद्योग क्षेत्रातील उत्पादने

४) जैविक अजैविक साधन संपत्ती

कोणत्याही साधन संपत्तीचा योग्य वापर लोकसंख्या हया घटकांवरच अवलंबून असते त्यामुळे मानव ही जैविक साधन संपत्ती आहे. अजैविक साधन संपत्तीमध्ये खनिजे, खडक, पाणी, वारा, सूर्यप्रकाश यासारख्या घटकांचा समावेश होतो.

नैसर्गिक संसाधन

भूमीचे प्रकार

भारतीय भूमीचे चार प्रकार आढळून येतात. १) अल्यूव्हिअल जमीन २) काळी जमीन ३) तांबडी जमीन ४) लॅटराईट जमिन

१) अल्यूव्हिअल जमीन

नद्यांच्या प्रवाहाबरोबर वाहून आलेला गाळ दोन्ही थड्यांना साचून ही जमीन तयार होते. गंगा, सिंधु आणि ब्रम्हपुत्रा या नद्यांच्या खोऱ्यांनी उत्तर भारतात अशा प्रकारची जमीन तयार झाली आहे. बंगाल, उत्तरप्रदेश आणि पंजाब या प्रदेशात अशी जमीन आहे. दक्षिण भारतातील नर्मदा, कृष्णा व कावेरी इत्यादी नद्यांच्या लगतच्या प्रदेशातही अशी जमीन आहे. या प्रकारची जमीन अत्यंत सुपीक असून हवामानाप्रमाणे या जमिनीत निरनिराळी पिके काढता येतात.

२) काळी जमीन

काळी जमिन फार जुन्या काळी लाव्हाच्या संचयाने तयार झाली आहे. कापसाची काळी कसदार जमीन हा तिचा एक महत्वाचा प्रकार आहे. अशी जमीन गुजरात, वऱ्हाड व मध्यप्रदेश, मध्यभारत हैद्राबाद आणि तामिळनाडूच्या काही भागात आढळतो. कापूस, ज्वारी व तूर इत्यादी मुख्य पिके या जमिनीत होतात.

३) तांबडी जमीन

लोखंडाचे आधिक्य असणाऱ्या खडकापासून ही जमीन तयार झाली आहे. छत्तीसगढ़ पूर्वघाटचा प्रदेश तामिळनाडू म्हैसूर आणि बिहार उत्तरप्रदेश व राजस्थानच्या काही भागात ही जमीन आढळून येते. पावसाचे पाणी किंवा पाटाचे पाणी या जमिनीला पूरेसे मिळाल्यास तांदूळ व ऊस चांगला पिकू शकतो.

४) लॅटराईट जमिन

डोंगराळ भागात ही जमीन आढळत असून वाळू व मुरुमापासून ती तयार होते. शेतीच्या दृष्टीने ही जमीन कमी प्रतीची असून तिच्या पासून ज्वारी, कांदा इत्यादी हलकी पिके घेता येतात. ही जमीन ओरिसा, महाराष्ट्र, मलबार, आणि आसामच्या काही भागात आढळते.

१) खनिज संपत्ती

कोणत्याही देशाच्या आर्थिक विकासात खनिज संपत्तीला अनन्यसाधारण महत्व आहे. कारण खनिज द्रव्यांच्या उपलब्धतेवरच औद्योगिक प्रगती मुख्यतः अवलंबून असते. कोळसा, लोखंड, मॅंगनीज, अभ्रक, तांबे, बाक्सईट लिग्नाईट, औष्णीक संचातून ६८,७०० मेगावॉट म्हणजे ७३.९ टक्के वीज निर्माण करण्यात आली. विजेचा वापर भारतात सध्या बऱ्याच कमी प्रमाणात आहे.

अणुशक्ती

अणुशक्ती निर्मितीसाठी युरेनियम आणि थेरियम या खनिज द्रव्यांचा उपयोग करतात. युरेनियम बिहारमध्ये आणि थेरियम भारताच्या पूर्व पश्चिम किनाऱ्याच्या प्रदेशात विशेषता केरळ राज्यातील कोबीन व त्रावणकोर विभागात सापडते. भारतातील तिसरे अणुशक्ती केंद्र मदास राज्यातील कालपक्कम येथे स्थापण्यात आले आहे. या प्रकल्पाचा अंतर्भाव पाचव्या योजनेत करण्यात आला होता.

जंगले

भारतासारख्या शेतीप्रधान देशात जंगलांना अत्यंत महत्व आहे. भारतात ७ कोटी हेक्टर जमीन जंगलाखाली आहे. उत्तर पश्चिमी भागात ११ टक्के जमीन जंगलाखाली आहे. मध्यप्रदेशात ४४ टक्के जंगल

असून २० टक्के हिमालय २५ टक्के तराई क्षेत्र पर्यावरण संतुलनाच्या दृष्टीकोनातून हे असमान वितरण योग्य नव्हे. भारतात प्रतीव्यक्ती वनक्षेत्र ०.०६४ हेक्टर असून जगात सरासरी ०.६४ हेक्टर आहे. आर्थिक विकासासाठी उपलब्ध वनसाधनच हा महत्वाचा घटक आहे. वनसंपत्ती हे महत्वाचे नैसर्गिक साधन असल्यामुळे राष्ट्राच्या विकासामध्ये वनसंपत्तीचे फार मोठे योगदान प्राप्त झाले आहे. जंगलांमुळे हवेतील थंडावा वाढतो. पावसाचे प्रमाण वाढते. जंगलांमुळे शेतातील उपयुक्त अशी माती वाहून जात नाही. आणि जमिनीची सुपीकता टिकून राहते. इमारती लाकूड जळाऊ लाकूड या भारतीय जंगलातील प्रमुख वस्तू आहेत. याशिवाय लाख राळ, टर्पेन्टाईन, उपयुक्त तेले, बांबू आणि गवत, औषधी वनस्पती इत्यादी अनेक वस्तू जंगलात मिळतात. भारतातील राज्यांना जंगली पदार्थांच्या रॉयल्टी पासून सालाना ७०० कोटी रु. चे उत्पन्न मिळते.

जल संसाधन

भारत देशात जलसाधन उपलब्ध असून सिंचन सुविधा १३ कोटी ९९ लाख हेक्टर पर्यंत वापरण्याची क्षमता आहे. जगात असणाऱ्या एकूण क्षेत्रापैकी भारतातील एकूण क्षेत्र २.४ टक्के असून लोकसंख्या १७.५ टक्के आहे. एकूण जलसंपदा ४ टक्के आहे. भारतातील पाण्याची मागणी २०१० मध्ये ६५६ बिलियन क्यूबमीटर इतकी होती. २०५० मध्ये ही मागणी १०६९ बिलियन क्यूबमीटर इतकी होईल, असा अंदाज आहे. २०५० मध्ये लोकसंख्येच्या प्रमाणात ही मागणी वाढणार आहे.

अन्न संसाधन

अन्न संसाधन आपल्याला शेती, पशुधन तसेच मासळीद्वारे प्राप्त होते. आपला देश अन्नधान्याच्या बाबतीत स्वयंपूर्ण आहे. अन्नधान्याच्या बाबतीत देशाला शेतीतील प्रगतीमुळे स्वयंपूर्णता प्राप्त झाली आहे. आधुनिक पद्धतीने म्हणजे तांत्रिक पद्धतीने केलेली शेती टिकाऊ पद्धतीने केली जात नाही. या पद्धतीत कीटकनाशके व रासायनिक खतांचा मोठ्या प्रमाणात वापर केला जातो. त्यामुळे वातावरण प्रदूषित होत आहे.

शाश्वत विकासाद्वारे जमीन, पाणी व प्राणी, वनस्पती सुरक्षित ठेवून पर्यावरणाची कमीत कमी हानी होईल याकडे लक्ष दिले जाते. शाश्वत विकास आर्थिकदृष्ट्या व सामाजिकदृष्ट्या फायदेशीर ठरतो. अन्नपदार्थ म्हणून वापरल्या जाणाऱ्या ५०,००० जात वनस्पती आहेत. त्यापैकी केवळ १५ वनस्पती प्रजाती जगातील अन्नधान्य उत्पादनाच्या ९० टक्के अन्नसंसाधनाची निर्मिती करतात. आधुनिक शेतीच्या पद्धतीमुळे पिकांच्या जनुकीय विविधतेचा न्हास झाला आहे. कोमाईट, इत्यादी प्रमुख द्रव्ये भारताच्या खाणीतून काढण्यात येतात. यापैकी कोळसा लिग्नाईट या खनिज द्रव्याचा उपयोग यांत्रिक शक्ती निर्माण करण्यासाठी होतो. खनिज द्रव्ये दोन प्रकारची असतात १) शक्तीद्रव्ये २) औद्योगिक द्रव्ये शक्तीद्रव्ये कारखाना चालविण्यासाठी लागणारी शक्ती पुरवितात. औद्योगिक द्रव्यांचा उपयोग कच्चा माल म्हणून होतो.

पंचवार्षिक योजनाकाळात खनिजांचा विकास

देशाचा औद्योगिक विकास खनिजांच्या विकासावर अवलंबून असतो. दुसऱ्या योजनेच्या काळात औद्योगिक विकासाची गती वाढविण्यात आल्यामुळे खनिजद्रव्याला विशेष महत्व देण्यात आले. व त्यावरील खर्चात वाढ करण्यात आली, पोलाद उत्पादनाची क्षमता ६० लक्ष टनापर्यंत वाढविण्यात आली. दहाव्या व अकराव्या योजनेत खनिज विकासासाठी अधिक तरतूद करण्यात आली. तिसऱ्या योजनेच्या काळात औद्योगिक

विकासावर करण्यात आलेल्या खर्चाच्या १/३ रक्कम खनिजांच्या विकासावर खर्च करण्यात आली. अकराव्या योजनेच्या काळात खनिज द्रव्याचे उत्पादन वाढून भारताच्या औद्योगिक विकासाची गती अधिकाधिक वाढत गेली.

२) प्रेरकशक्ती

कोणत्याही देशाच्या आर्थिक विकासाला आवश्यक असलेला सर्वात प्रमुख घटक म्हणजे प्रेरकशक्ती होय. आर्थिक वृद्धी दरडोई उत्पन्न यात प्रत्यक्ष सहसंबंध असलेला दिसून येतो. आर्थिक व्यवहार वाढू लागले म्हणजे प्रेरक शक्तीचा दरडोई उपभोगही वाढू लागतो. स्वस्त प्रेरक शक्तीची आवश्यकता केवळ औद्योगिक विकासासाठी नव्हे तर आधुनिक शेतीच्या प्रगतीसाठीही असते. ही प्रेरकशक्ती वायु जल लाकूड, इंधन, कोळसा तेल अल्कोहल, आणि वीज त्यापासून निर्माण होऊ शकते.

तेल आणि नैसर्गिक वायू

प्रेरकशक्तीचे स्रोत यादृष्टीने तेल आणि नैसर्गिक वायूला महत्वाचे स्थान आहे. या साधनांच्या बाबतीत भारताला अनुकूल परिस्थिती नाही. व्यापारी प्रेरकशक्तीची ४५ टक्के मागणी याच साधनांपासून पूर्णविली जाते. सन २००६-०७ मध्ये भारतात ३४० लक्ष टन तेलाचे उत्पादन झाले. अकराव्या योजनेच्या काळाच्या अखेरीला अशुद्ध तेलाचे उत्पादन सालीना ५००. लक्ष टन झाले. या तेलामुळे आपल्या देशाची जेमतेम ५० टक्के गरज भागेल व उरलेल्या तेलाची गरज आयात करून केल्या जाईल.

तेल अरिष्ट

तेल उत्पादन करणाऱ्या अरब राष्ट्रांनी तेलाचे भाव जानेवारी २०१९ पासून वाढविल्यामुळे जगात तेलाची समस्या निर्माण झाली तेलाच्या भावातील या अवाढव्य वाढीमुळे यूरोपातील देश जपान आणि जगातील इतर देशांच्या अर्थव्यवस्थेवर दूरगामी परिणाम घडून आले आहेत. भारतासारख्या विकसनशील देशांच्या देण्याघेण्याच्या आढाव्यात असंतुलन निर्माण झाले असून या देशाच्या आर्थिक विकासावर अत्यंत प्रतिकूल परिणाम झाला आहे. भारताचा नैसर्गिक वायूचा साठा जागतिक साठ्याच्या ५ टक्के आहे.

विद्युतशक्ती

औद्योगिक विकासासाठी उर्जेची अत्यंत आवश्यकता असते. वाढत्या औद्योगीकरणाबरोबर ही शक्ती पुरविणारी खनिजद्रव्ये अपुरी पडतील हे उघड आहे. सुदैवाने जलविद्युत पुरवू शकतील अशा अनेक मोठ मोठ्या नद्या भारतात आहे. पंचवार्षिक योजना सुरु होण्यापूर्वी भारतातील वीज उत्पन्न करणाऱ्या केंद्राची क्षमता १,७१० मेगावॅट होती.

भारत आणि शाश्वत विकासाची उद्दिष्टे

शाश्वत विकासाची उद्दिष्टे ही संयुक्त राष्ट्रांच्या इतिहासात एक सर्वात मोठ्या मार्गदर्शकाचे कार्य करतील. ही उद्दिष्टे २०१६ ते २०३० पर्यंत कार्यान्वीत केली जाईल. शाश्वत विकासाची उद्दिष्टे पुढीलप्रमाणे आहेत.

- १) गरीबीचे उच्चाटन करणे.
- २) आर्थिक विषमता कमी करणे.
- ३) लिंगभाव समानता महिला आणि बालिका सबलीकरणाला प्रोत्साहन देणे.

- ४) आरोग्य व शिक्षणाच्या सुधारणा करणे.
- ५) शहरांना अधिक शाश्वत बनविणे.
- ६) हवामान बदलाच्या परिस्थितीवर नियंत्रण आणणे.
- ७) समुद्र व जंगलाचे रक्षण करणे.
- ८) सामाजिक—आर्थिक आणि पर्यावरणाच्या पैलूंचे एकीकरण करणे.
- ९) अविरत विकासाकरिता जागतिक भागिदारी करणे.
- १०) उत्कृष्ट गुणवत्ताधारकाच्या क्षमतेला प्रोत्साहन देणे.
- ११) अविरत विकासावर आकडेवारी व सूचनांचे संकलन करणे.
- १२) आतापर्यंत केलेल्या प्रयत्नांचा पाठपुरावा करणे.

संसाधनांचे समान वाटप व शाश्वत विकास

नैसर्गिक संसाधनांचा होणारा गैरवापर टाळून लोकसंख्येची वाढ आवाक्यात आणणे हे मानव जातीच्या अस्तित्वासाठी आवश्यक आहे. नवीन आर्थिक नितीद्वारे राष्ट्रीय तसेच जागतिक पातळीवर उपलब्ध संसाधनांचे वाटप समान प्रमाणात करण्याचा मार्ग अवलंबण्याची गरज आहे. ज्या प्रदेशातील नैसर्गिक संसाधनांचा वापर मोठ्या प्रमाणावर केला जातो अशा प्रदेशांना योग्य तो मोबदला देणे गरजेचे आहे. शाश्वत विकास करावयाचा असल्यास अनेक उपक्रमांचा अवलंब केला पाहिजे वनप्रदेशाची भव्यता, जंगलातील सौंदर्य, गवताळ प्रदेश, तलावातील पाणी, सागराची अमर्याद शक्ती या अनमोल निसर्गसंपदेचे रक्षण करून शाश्वत विकास साधने काळाची गरज आहे.

संदर्भग्रंथ :

- १) पर्यावरणशास्त्र, एक भरुचा, ओरिएंट लागमन प्रायवेट लिमिटेड.
- २) भारतीय अर्थव्यवस्था, प्रा बी. एल. जिभकाटे, डॉ. सुधाकर शास्त्री, विश्व पब्लिशर्स अँड डिस्ट्रिब्यूटर्स, नागपूर.
- ३) मानवी संसाधनांचे व्यवस्थापन, प्रा बी. एल. जिभकाटे, विश्व पब्लिशर्स अँड डिस्ट्रिब्यूटर्स, नागपूर
- ४) भारतीय अर्थव्यवस्था, बी. के. पूरी, एस. के. मिश्र, हिमालय पब्लिशिंग हाऊस
- ५) भारतीय अर्थव्यवस्था, श्रीधर आ आत्माराम देशपांडे, विनायक श्रीधर देशपांडे हिमालय पब्लिशिंग हाऊस.

Origin of Namasudras

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Abstract: Caste system is a classification of people into four hierarchically ranked castes called varnas. The reformed Hinduism stresses the separation of religion from social institutions so that it becomes a philosophical basis for salvation rather than a way of life. Cosmogonies have never been more than matters of academic interest and have served no other purpose than to satisfy the curiosity of the student and to help to amuse children. The constitution of society prescribed by the Purusha Sukta is known as Chaturvarnya. As a divine injunction, it naturally became the ideal of the Indo-Aryan society. The term Namasudra is seldom found in any authentic Sanskrit literature. But this term is found mentioning in Shymacharan Sarkar's Vyasnaatha Darpan as a subdivision of Shudra caste.

Key words: Namasudras, caste system, varna

Introduction: The Indian Caste System is considered a closed system of stratification, which means that a person's social status is obligated to which caste they were born into. There are limits on interaction and behavior with people from another social status. Its history is massively related to one of the prominent religions in India, Hinduism, and has been altered in many ways during the Buddhist revolution and under British rule.

Caste system is a classification of people into four hierarchically ranked castes called varnas. They are classified according to occupation and determine access to wealth, power, and privilege. Caste has a religion basis in the Hindu ideas of purity and pollution along with Karma, dharma and re-birth with increasing rationalism and secularism, the ideas of purity and pollution have decline and its place taken by reformed Hinduism in the form of Bramho Samaj, Arya Samaj, Ram Krishna Mission, etc. The reformed Hinduism stresses the separation of religion from social institutions so that it becomes a philosophical basis for salvation rather than a way of life.

Who were the Shudras?

- (i) The Shudras were one of the Aryan communities of the Solar race.
- (ii) There was a time when the Aryan society recognized only three Varnas, namely, Brahmins, Kshatriyas and Vaishya's.
- (iii) The Shudras did form a separate Varna. They ranked as part of the Kshatriya Varna in the Indo-Aryan society.
- (iv) There was a continuous feud between the Shudra kings and the Brahmins in which the Brahmins were subjected to many tyrannies and indignities.
- (v) As a result of the hatred towards the Shudras generated by their tyrannies and oppressions, the Brahmins refused to perform the Upanayana of the Shudras.

(vi) Owing to the denial of Upanayana, the Shudras who were Kshatriyas became socially degraded, fell below the rank of the Vaishyas and thus came to from the fourth Varna.

Cosmogonies have never been more than matters of academic interest and have served no other purpose than to satisfy the curiosity of the student and to help to amuse children. This may be true of some parts of the *Purusha Sukta*. But it certainly cannot be true of the whole of it. That is because all verses of the *Purusha Sukta* are not of the same importance and do not have the same significance. Verses 11 and 12 fall in one category and the rest of the verses fall in another category. Verses other than 11 and 12 may be regarded as of academic interest. Nobody relies upon them. No Hindu even remembers them. But it is quite different with regard to verses 11 and 12. *Prima facie* these verses do no more than explain how the four classes, namely, (1) Brahmins or priests, (2) Kshatriyas or soldiers, (3) Vaishyas or traders, and (4) Shudras or menials, arose from the body of the Creator. But the fact is that these verses are not understood as being merely explanatory of a cosmic phenomenon. It would be a grave mistake to suppose that they were regarded by the Indo-Aryans as an innocent piece of a poet's idle imagination. They are treated as containing a mandatory injunction from the Creator to the effect that Society must be constituted on the basis of four classes mentioned in the *Sukta*. Such a construction of the verses in question may not be warranted by their language. But there is no doubt that according to tradition this is how the verses are construed, and it would indeed be difficult to say that this traditional construction is not in consonance with the intention of the author of the *Sikta*. Verses 11 and 12 of the *Purusha Sukta* are, therefore, not a mere • cosmogony. They contain a divine injunction prescribing a particular form of the constitution of society.

The constitution of society prescribed by the *Purusha Sukta* is known as *Chaturvarnya*. As a divine injunction, it naturally became the ideal of the Indo-Aryan society. This ideal of *Chaturvarnya* was the mould in which the life of the Indo-Aryan community in its early or liquid state was cast. It is this mould, which gave the Indo-Aryan community its peculiar shape and structure.

This reverence, which the Indo-Aryan society had for this ideal mould of *Chaturvarnya*, is not only beyond question, but it is also beyond description. Its influence on the Indo-Aryan society has been profound and indelible. The social order prescribed by the *Purusha Sukta* has never been questioned by anyone except Buddha. Even Buddha was not able to shake it, for the simple reason that both after the fall of Buddhism and even during the period of Buddhism there were enough law-givers, who made it their business not only to defend the ideal of the *Purusha Sukta* but to propagate it and to elaborate it.

To take a few illustrations of this propaganda in support of the *Puntsiia Sukta*, reference may be made to the *Apastamba Dharma Smra* and the *Vasishtlia Dharma Sutra*. The *Apastamba Dharma*

Sutra states:

'There are four castes—Brahmins, Kshatriyas, Vaishyas and Shudras.

Among these, each preceding (caste) is superior by birth to the one following.¹

For all these excepting Shudras and those who have committed bad actions are ordained (1) the initiation (*Upanayan* or the wearing of the sacred thread), (2) the study of the Veda and (3) the kindling of the sacred fire (i.e., the right to perform sacrifice).

This is repeated by *Vasishtha Dharma Sutra* which says :

There are four castes (Varnas), Brahmins, Kshatriyas, Vaishyas and Shudras.

Three castes, Brahmins, Kshatriyas and Vaishyas (are called) twice-born.

Their first birth is from their mother; the second from the investiture with the sacred girdle. In that (second birth) the Savitri is the mother, but the teacher is said to be, the father.

They call the teacher father, because he gives instruction in the Veda.* The four castes are distinguished by their origin and by particular sacraments.

There is also the following passage of the Veda : The Brahmana was his mouth, the Kshatriya formed his arms, the Vaishya his thighs; the Shudra was bom from his feet."

It has been declared in the following passage that a Shudra shall not receive the sacraments."

Many other law-givers have in parrot-like manner repeated the theme of the *Purusha Sukta* and have reiterated its sanctity. It is unnecessary to repeat their version of it. All those, who had raised any opposition to the sanctity of the ideal set out in the *Purusha Sukta*, were finally laid low by Manu, the architect of the Hindu society. For Manu did two things. In the first place, he enunciated afresh the ideal of the *Purusha Sukta* as a part of divine injunction. He said :

Tor the prosperity of the worlds, he (the creator) from his mouth, arms, thighs and feet created the Brahmin, Kshatriya and Vaishya and the Shudra. The Brahmin, Kshatriya (and) Vaishya (constitute) the three twice-born castes; but the fourth the shudra has only one birth.

In this he was no doubt merely following his predecessors. But he went a step further and enunciated another proposition in which he said :

"Veda is the only and ultimate sanction for Dharma.

Bearing in mind that the *Purusha Sukta* is a part of the Veda, it cannot be difficult to realize that Manu invested the social ideal of Chaturvarna contained in the *Purusha Sukt*, with a degree of divinity and infallibility which it did not have before. But though the theory of East Bengal Chandals representing a tribal chieftdom is of dubious validity, their gradual evolution as a caste, and also of their racial background, have been supported by other more recent authorities. A general study on the Chandals observes that they were 'one of the several disadvantaged groups of early Indian society', whose condition was gradually deteriorating since the later Vedic age (c.1000 BC-600 Be). Initially they were looked at just as one of the many indigenous tribes 'living on the periphery of immigrant Aryan settlements'. But as the caste system began to stabilise and consolidate itself in the post-Vedic age, i.e., the age of Dharmasutras, such marginal groups as the Chandals came to be regarded as untouchables, with severe restrictions imposed on all kinds of physical contact with them. They came to be regarded not only as

a varnasankara or a mixed caste, but as the lowest among the offsprings of a pratiloma or hypogamous union of a Sudra male and a Brahman woman. Between 200 BC and AD 200, the Manusmriti further reiterated the polluted origin of the Chandalas to justify their relegation to the category of niravasita or excluded Sudras, who were obliged to live outside the village. The exact word asprisya, the Sanskrit equivalent of 'untouchable', seems to have appeared some time between the third and the sixth centuries of the Christian era, when the Chandalas had come to constitute the fifth or the panchama varna, a permanent underclass at the bottom of the Hindu social pyramid. Even the ascendancy of Buddhism and jainism does not appear to have improved their position to any appreciable extent.

There should be a separate history for the Namasudra people so far as their evolutionary concept is concerned. Ballal Sen then the Lord of Bengal wanted to abolish the word Namasudra from the Indian history and forcefully he made them Chandal and he ordered other people also to consider Namasudra people as Chandal during his tenure. If we analyze different religious scripts and “Jatitattva” books of India then we will find that the Namasudras are neither Chandal nor Shudra rather they are the Brahmin offspring. As we know that during the Aryan period due to the process of Aryanisation and Non-Aryanisation Shudra people evolved. In other way the Shudra people were considered very lower during that period as because they were born out from the feet of the Lord or Creator of the all creatures. Chandal is, according to the scripture, a progeny of illegitimate liaisons between Brahmin female and a Shudra male². During that period a higher caste people could marry a lower caste people and that was accepted in their society after purification; but the vise-versa could not be accepted and their offspring were referred as Chandal and they were considered as untouchable later. So, we find that Chandals are the offsprings of Shudra male and Brahmin female³. But the history of Namasudra is different; they are not offspring of Shudra male and Brahmin female rather they are the offspring of Brahmin male and Shudra female.

The term Namasudra is seldom found in any authentic Sanskrit literature. But this term is found mentioning in Shymacharan Sarkar's Vyasnaatha Darpan as a subdivision of Shudra caste (Lahiri & Dev: 1982:155). And etymologically this term means a group of respected Shudra. Naman, — names respected, and Shudra, is a classified section of people who holds the lower strata in the caste society. According to ‘Namasudra suhrid’ by Raicharan Biswas (January, 1908), “We are of the Brahmin Caste; perhaps because of anger or of envy many may be unable to like us, but observing our Brahmanical conduct through the ages, everyone agrees unanimously that the Namasudra caste is descended from the ancient sages, i.e. from the purest Brahmins. The second point is that our source of livelihood is the Aryan practice of agriculture, that glorious occupation of ancient and modern times (Bose: 1975: 158). A similar view has been expressed in a book entitled ‘Jattitattva O Namasya Kuladarpan’ (Ibid). According to Tarak Chandra Sarkar, “The Namasudras are the banished Brahman Buddhists who do not want to change their religion at the time of King Ballal Sen” (Sarkar: Bengali Year 1370: 26). In his book entitled ‘Namasudra Dijatattva’ Pandit Rajbihari Roy Sarnakar hints that “The Namasudras are Brahmin. They were

invited by the King Ballal Sen to preside over his marriage ceremony, but they refused to accept the post of priest in an inter-caste (Hypergamy) marriage, as because the would-be-wife was a Dom caste girl. Her name was Padmini. Ballal Sen ordered his soldier to kill this rebellion group and he declared this group as Shudra. (Das: Bengali Year, 1368:70). Sri Gostha Bihari Debnath, a Nath teacher and scholar, in his Bengali works on Nathaism mentioned “The Namasudra have been given the position of Parasava Vipras” (Battacharyya): 1975: 157). They identify themselves as one of the superior groups, claiming their descent from the purest Brahmin origin. But “Hindu society has always despised this agricultural caste (Bose: 175: 157)⁴. Namasudras are not Shudra which has been narrated by the different writers such as- Shri Gourpriya Sarkar in his book “Jatitwa Sangraha” (Bengali), Shri Jitedranath Majumdar in his book “Jatitwa and Namasudra Jatir Utpatti” (Bengali), Shri Jogendra Chandra Majumdar in his book “ Namasudra Jati Tatwa Katha” (Bengali), Shri Sattya Ranjan Sarkar in “Namasudra Jatitattwa” “ (Bengali), Shri Sukumar Sarkar in “Namasudrai Parsav Bipra” (Bengali), Shri Darakanath Mandal in “Namasudra Jatikatha” (Bengali) by referring different quotations from various religious books and by putting some example. In the above mentioned books the authors have placed that Namasudras are neither Shudra nor Chandal rather they are Brahmin offspring by birth; but because of some social imposed force they lost their identity as Brahmin and as a result they had to live like a Shudra for their survival. The evolutionary history of Namasudra may be narrated in the following ways. The Namasudra is a very strong group in comparison to the other caste in Bengal. In the oldest religious book of Hindu just mentioned about four groups of people such as- Brahmin, Kshatriya, Vaishya and Shudra but not about the Namasudra. Then what is the position of Namasudra and in which category they are belonging to? Or, how they have evolved in this world? After a long investigation one book named “Saktisangam Tantra” (in Sanskrit) was found in Bengal and there, the evolution of Namasudra community was narrated. In that book there is a chapter named ‘Prantoshi’ where Lord Shiva narrated the story about Namasudra to the goddess Parvati, wife of Shiva. In that book it has been narrated that the great saint ‘Namash’ was the son of saint ‘Kashyapa’ whose father was lord “Brahma’s” son ‘Marichi’⁵. When the wife of saint Namash, Solochana was pregnant then he left home for tapsya for a long time. When he returned home after 14 years then he found that his wife has given birth of two sons named ‘Kirtiban’ and ‘Kuruban’. But his wife Solochana expired just after of her delivery and they were looked after and brought up by two saints ‘Afshar’ and ‘Naidhruba’. After his arrival the saint ‘Namash’ was very satisfied with his two sons and he wanted to make them purify by giving sacred thread as it is the ritual of the Brahmin. But he couldn’t make them purify as because they crossed their age limit of 12 years. Then the saint ‘Namash’ again left home for a long time for his son’s up gradation in the society. After a long wait Kirtiban and Kuruban left home for searching their father and finally they reached a king named ‘Simanta’ at present Siliguri. The king Simanta was Shudra king and he had no son but he had two daughters named ‘Shipika’ and ‘Shapitraka’. Then the king made them agree to marry with his two daughters; and they got married with those two girls though they were Shudra by birth. In course of time Kirtiban and Kuruban produced number of children, later on these group of people were known as Namasudra. The word ‘Namasudra’ had its two parts i.e. ‘namah’ and ‘sudra’; these two parts

has been borrowed from the memory of their forefather saint 'Namash' and mother 'Shudra'. Actually the name of Namasudra was given by Lord 'Narayana'; when saint Namash succeeded from his tapsya then Lord Narayana gave him three boons, because he was very much satisfied with his prayer. The three boons were- (i) that though your sons married with Shudra girls still your generation will be equal to a Brahmin, (ii) that your generation will be known by your name i.e. they will be known as Namasudra and (iii) your name will be immortal. From that day onward the word Namasudra evolved and these groups people also evolved. The Namasudra people are of Brahmin origin which may be accepted from the cultural point of view also. In Manu's Doshakosh Pangika it is mentioned that Namasudra jatakhyata sampradaya samvedadhikari!

Dashadishabadhya souchya palanang purusanakramena arjhyate!

Tirtha pravashhe grehavashhe cha sraddhadi karjhyat! Tena pakkanna pindadang bidhi drishyate!!⁶

It is also known from the 'Ballal Charit' that for the sake of a personal promise given to a Dom girl named Padmini to be married, the Bengal emperor Ballal Sen was obligated to invite the Kashyapiya Brahmins to attend and participate in the midday meal party on the very day of engagement ceremony with the girl. But as a result of refusal of the invitation, the armed forces of the king were directed to tear off the 'Holi Brahmin Thread' through force and dexterity. Accordingly the Kashyapiya Brahmins of 'Mulghar' were tortured highly physically as well as mentally. These deprived Brahmins were later on entitled as 'Namasudra' during the time and took the shelter in East, West, South and North Bengal and also in the place of Andaman Nicobar Islands from their Mulghar (presently Josohar in Bangladesh) residential area. During the period of 1158-1179 (Ballal Sen dynasty) the 'Namasudra' of Bengal were deprived and neglected in all terms due to the continuation of ill effect of Sen Times. During that period Ballal Sen conferred the name Chandal in place of Namasudra and Brahmin and he abolished the name Namasudra from all kinds of known religious book forcefully; and he made a rule that those who will not consider Namasudra as Chandal they will be suspended from job and they will be physically punished⁷. In this way the other caste people considered Namasudra people as Chandal and they started to lose their power, fame, right, property, education etc. and in course of time they were considered as untouchable like other Shudra in Bengal.

The etymology of the word 'Namasudra', which is not mentioned in any V of the pre-nineteenth-century medieval Bengali literature, is extremely uncertain. Colonial ethnologists like James Wise and Herbert Risley believed that it was derived either from the Sanskrit word *narruxs* or adoration or the Bengali word *namate*, i.e., below or underneath.¹ In the first case it would mean those who were bound to show obeisance even to the Sudras. In the second case, the word would perhaps mean a lower grade of Sudras, a status the Chandalas of Manu had gained promotion to. But these two explanations appear to be highly improbable in view of the new sense of self-respect associated with the Namasudra identity. The Namasudras themselves were also confused about the meaning of the term. Sashi Kumar Badoi Biswas thought that the word *Namah* could mean two things: *namaskar* or paying obeisance to and *tyajya* or to be avoided. If the word was used in the first sense, then it would mean those who paid obeisance to the Sudras (*Sudrang namati*). But if it was used in the second sense, then it would mean avoided by the Sudras

(Namah Sudrena). None of the meanings, however, seemed to be acceptable to him, though he failed to arrive at a definitive conclusion. According to another Namasudra commentator, Naresh Chandra Das, the word means the best among the Sudras who were paid obeisance to - an explanation which seems to be the most plausible of all.

Namasudras observed a 'general strike' in 1873 in the district of Faridpur (presently in Bangladesh). And this is the country's first general strike. The report of C A. Kelly, ICS, District magistrate, Faridpur in this behalf discloses thus. "In the early part of this year (1873) the Chandals made a general strike in the District of Faridpur (presently in Bangladesh) resolving not to serve anybody of the upper class, in whatever capacity, unless a better position among the Hindu caste than what they at present occupy was given to them"¹¹. Since 1880s the efforts of the Chandals to change their nomenclature to Namasudra are noticed. F.B. Peacock, Commissioner, Presidency Division writes in a letter [No.87 dated Alipur, the 18 July, 1881] that "The improvement in the conditions of the Chandals who are in the chief agriculturists in Narail sub- division [of Jessore District] has led them.....to aspire to a superior status in the Hindu caste system. They called themselves Namasudra and profess to be Baishnab¹². W.C. Macpherson, ICS, Assistant commissioner, communicated the order of the Deputy Commissioner, Sylhet thus: "that Namasudra must always be written not as Chang or Chandal for all persons of the said caste that Deputy Commissioner has ordered that any person who does not write Namasudra shall be removed from employ. On a memorandum submitted to the Chief Commissioner, Assam by some prominent social activists of Cachar district for change of caste name from Chandal to Namasudra, his secretary [letter No.2195 dated 19th August, 1885] says "..... the Chief Commissioner sees no objection to person to call themselves Namasudra being designated as such in official documents. Nevertheless, their prayer for change of caste nomenclature from Chandal to Namasudra was not allowed due solely to opposition of the orthodox Hindus. In 1911 the Bengal Govt. effected the change to Namasudra by a notification. In this regard the revered Namasudra socio-religious leader of Faridpur G C Thakur may be mentioned.

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