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PROFITABILITY LIKELIHOOD OF INDIAN BANKS: A DISCRIMINANT ANALYSIS APPROACH

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ABSTRACT

Any country's economic development is inextricably linked to the development of the banking sector. Profit, along with productivity and operational efficiency, is an important criterion for measuring any bank's performance. This paper uses discriminant analysis to identify key characteristics that help in determining a bank's profitability levels. The study covers the period from April 2016 to March 2020. The profitability of a bank is measured using two categorical variables: recorded profit or loss. Predictors are chosen from a group of various financial ratios. The statistical significance of the research is proven by the classification results, canonical correlation, and Wilks' Lambda test. The square of canonical correlation is 0.665 which indicates that changes in the predictor variables are responsible for 66.5% variance in the discriminant model between the two categories of banks. The predictor variables ROCE and Loan to Advance are the most important factors in distinguishing between the two groups.

KEYWORDS

public banks, private banks, bank profitability, financial ratios.

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1. INTRODUCTION

The banking industry is one of the most important financial pillars of the financial sector. Any country's economic development is inextricably linked to the development of the banking sector. The Indian banking sector is a part of the global shift in business paradigms. Since the adoption of the policy of liberalization, privatization, and globalization in 1991, the Indian banking industry has become one of the country's fastest-growing industries. However, it sets up a stiff competition with the new private sector banks, forcing them to become more productive, profitable, and efficient to survive. Currently, there are 12 public sector banks (PSBs), 22 private Indian banks, and 46 private foreign banks functioning in India. Banks in which the significant portions of shares are held by the Indian Government are known as PSBs. Private banks are the banks where the majority stakes are held by the private entity. Moreover, the sector is emerging from a period of intense competition, regulatory changes, and the slow growth of the Indian economy, all of which have an impact on it. In the last few years, the Indian banking sector has undergone a massive transformation. Banking services have become more readily accessible in remote and underprivileged parts of India as new technologies have been introduced. Banks affect every aspect of contemporary societies and play a significant role in economic growth. As the contribution of the banking sector to GDP is about 7.7% of GDP, banks are pushed to perform at their peak efficiency in the fiercely competitive financial services industry (Tamatam et al., 2019). Banks with higher efficiencies have a better chance of survival than banks with lower efficiencies. This creates a pivotal need for bank owners, customers, governing bodies, and shareholders to track bank efficiency. However, banks are now confronted with several challenges, including frequent changes in technology required for modern banking, rigorous prudential norms, increasing competition, a worrying level of NPAs, growing consumer prospects, mounting pressure on profitability, assets-liability management, liquidity, and credit risk management, rising operating expenditure, the shrinking size of the spread, and so on. The banking sector's reforms have also put a strain on profitability (B.S.Bodla & Verma, 2006). As a result, profitability has become a major concern for bank management. Profit, along with productivity, financial, and operational efficiency, is an important criterion for measuring bank performance. The ultimate focus of a banking institution is to generate profit. Banks do this by focusing on financial performance analysis and intend to structure their portfolios to maximize their profit. The most widely used technique for analyzing a bank's financial statements is ratio analysis. Ratio Analysis enables bank management to identify the root causes of changes in their advances, income, deposit accounts, borrowing profits, and profitability over time. It in turn helps in determining the best course of action for increasing the deposits, revenue, advances, and cost-cutting measures which will lead to change in the banks' future profitability prospects (Subalakshm et al., 2018). Because bank profitability is the foundation of its auto-financing process and stability, researching bank profitability is and will continue to be an important issue. Efficient management of banking operations aimed at ensuring profitable growth and efficiency prompts current knowledge of all the factors that influence the bank's profit. In this paper, discriminant analysis is used to identify determinants of bank profitability. Some financial ratios are selected to check whether they determine profitability or not. Using this multivariate statistical method, it may be identified that banks can be classified into profitable or non-profitable groups based on select financial ratios (Ante & Ana, 2013).

2. LITERATURE REVIEW

Bank profitability has been comprehensively investigated in different countries. Several factors affect a bank's profitability. There is a significant amount of literature detailing several research techniques used for performance assessment including Data Envelopment Analysis (Ong & Teh, 2011; Sufia & Habibullah, 2010), Ordinary least square analysis (Garcia & Guerreiro, 2016; Javaid et al., 2011),ratio analysis where several ratios are used as proxy of banks profitability (Alper & Anbar, 2011; Bogdan & Ihnatov, 2014).Further (Subbarayan et al., 2017) employed discriminant analysis to identify the ratios that are the determinants of profitability Six ratios viz. Capital Adequacy, Risk Sensitive Assets to Risk Sensitive Liabilities, Net Nonperforming Assets to Net Advances, Liquid Assets to Total Assets, Total Advances to Assets, and Expenditure to Income are taken as predictor variables where profitability is the predicted variable. The standardized discriminant model demonstrates that the predictor variable, Return on Assets, is the primary one that distinguishes between the two groups of banks. ((Ante & Ana, 2013) also performed discriminant analysis to examine and illustrate core features of bank profitability levels of all banks in the Republic of Croatia. Using discriminant analysis, it was confirmed that banks can be categorized as profitable or non-profitable and above or below average in profitability based on their financial ratios with greater precision. In earlier studies, other external factors that affect bank profitability were also incorporated into the models such as industry characteristics and macroeconomic variables (Alper & Anbar, 2011; Batten & Vo, 2019). The most widely used analysis is ratio analysis to determine banks profitability as (Simlai & Guha, 2019) in their study examined the liquidity, solvency, and profitability position of five popular and well-established automobile companies based on

different ratios such as Liquidity Ratios, Solvency Ratios, and Efficiency Ratios, and Profitability Ratios. After analyzing the ratios, the study also reveals how to improve a firm's long-term financial position by improving its conditions. Similarly, (Almaqtari et al., 2018) undertakes research that looks into the factors that influence commercial bank profitability in India. Return on assets (ROA) and return on equity (ROE) are used to determine the profitability of Indian banks, meanwhile, bank size, capital adequacy, liquidity, deposits, leverage, assets quality, operating efficiency, and the number of branches are used as bank-specific factors. The analysis indicated that bank size, branch count, asset management ratio, operational efficiency, and leverage ratio seem to be the most significant bank-specific determinants affecting Indian commercial bank profitability.(Sharma et al., 2018) undertook a study to evaluate the stock market performance of selected Indian pharmaceutical companies on the basis of a set of financial ratios. The most important variables distinguishing Market Outperformers and Market underperformers are revenue from operations/share and current ratio. The statistical significance is confirmed by classification results, canonical correlations, and Wilks' Lambda. The most common financial ratios used in the literature is ROA, ROE, Capital adequacy (AGBEJA et al., 2019) checks how the capital adequacy ratio affects bank profitability. Other goals include examining the effects of loans and advances on bank profitability of selected five Nigerian banks for the period 2010-2014. Findings suggest that the capital adequacy ratio and the profitability of a bank have a strong relationship. Banks are more profitable when their capital is higher., Return on Capital Employed in the study **(**(SINGH & YADAV, 2013) who examined the use of return on capital employed (ROCE) as a profit strategy. The return on capital employed of 30 SENSEX companies is investigated. Findings show that HDFC Ltd. has a high ROCE in the banking and finance industry and its operating profit is also high. In the consumer goods sector, HUL has the highest ROCE; (Chavali & RAO, 2016) conducted a study to assess and compare the relative performance of various public and private banks Results indicate that all the parameters except Interest Income as a percentage of total assets significantly affect profitability. Also, Deposits in current and savings accounts (CASA) have a significant impact on the cost structure of the banks. They are the most cost-effective ways for banks to raise funds. The higher the CASA deposits, the more profitable the banks are.

Accordingly, the present study aims to assess the determinants of profitability of select Indian banks on the basis of select financial ratios. The objective of the research is to compare the performance of Indian banks by classifying them into two groups to examine whether significant differences exist among the performance groups in terms of selected ratios. Also, to identify the main financial ratios which discriminate between two groups i.e profit-making and loss-making banks.

3. HYPOTHESIS DEVELOPMENT

H0: Financial ratios do not affect the profit or loss of banks.

H1: At least one of the financial ratios affects the profits or loss.

4. OBJECTIVES OF THE STUDY

The objective of paper is to determine the profitability likelihood of banks on the basis of financial ratio.

5. METHODOLOGY

5.1 Sampling and data collection

This study is based on secondary data. Secondary data published is gathered from money control as well as from annual reports of banks In the present study a sample of 26 public and private banks are selected out of which 10 are public sector banks and the rest are private. Data for the past 5 years i.e., from 2015 to 2020 has been collected to fulfill the objectives of the study. Various accounting and statistical techniques have been used for analysis. The authors have considered the ratios viz., Capital Adequacy, Loan to advance, Return on capital employed (ROCE), Current and saving account (CASA) relating to public and private sector banks in India as independent variables where profitability is the dependent variable. Financial ratios such as are used to check their impact on bank performance. Multiple Discriminant Analysis is used to classify the banks into profit-making and loss-making banks.

Discriminant analysis

Discriminant analysis is a collection of linear equations with independent variables that discriminate between different groups of dependent variables. The discriminant function is the linear combination of these two functions. The primary goal of discriminant analysis is to determine whether the classifications of groups in a variable Y are affected by at least one predictor. Discriminant Analysis is commonly used to estimate membership in particular groups. The discriminant analysis consists primarily of two steps: (1) determining the significance of a set of discriminant functions and (2) classification. The multivariate F test is used to determine whether or not there are any significant differences between groups. If the test is statistically significant, one must determine which variables have significantly different means across groups. If the means of the groups are statistically significant, the variables are classified.

5.2 Categorization of select public and private banks in India as profit-making and loss-making

The sample consists of 26 Public and private banks. The average Net profit for the last five years has been calculated from 2015-16 to 2019-20. If the average net profit is positive then it is said to be a part of the categorical group “Profit-making banks”. If the average net profit is negative, then it is said to be a part of the categorical group “loss-making banks”. Based upon the above specifications, all selected banks have been classified into two groups i.e., ‘One’ and ‘Zero’, ‘One’ i.e., “Profit-making banks” and ‘Zero’ i.e., “loss-making banks”. Hence, each bank gets weights of either 0 or 1 for each ratio depending upon their average net profit.

TABLE 1: AVERAGE NET PROFITS

Sr. No.	Banks	Average net profit	Performance Group	Sr. No	Banks	Average net profit	Performance Group
1.	Punjab And Sindh Bank	-348.21	0	2.	SBI	5847.53	1
3.	UCO Bank	-3168.84	0	4.	Indian Overseas Bank	-4975.7	0
5.	Indian Bank	890.27	1	6.	Central Bank	-3084.9	0
7.	Union Bank	-1837.16	0	8.	Bank of Maharashtra	-1362.5	0
9.	Bank of India	-4439	0	10.	Bank of Baroda	-1092.9	0
11.	DCB Bank	288.82	1	12.	Dhanlaxmi Bank	-28.90	0
13.	IndusInd Bank	3,405.86	1	14.	CSB Bank	-12.44	0
15.	City Union Bank	539.73	1	16.	Karnataka Bank	420.44	1
17.	Karur Vysya Bank	393.03	1	18.	South Indian Bank	228.28	1
19.	RBL Bank	592.31	1	20.	ICICI Bank	8,813.1	1
21.	Jammu and Kashmir Bank	-337.61	0	22.	IDFC First Bank	-495.41	0
23.	Axis Bank	3,369.46	1	24.	IDBI Bank	-8,008.0	0
25.	Yes Bank	-2,121.06	0	26.	Lakshmi Vilas Bank Ltd.	-375.74	0

6. ANALYSIS AND DISCUSSIONS OF RESULTS

TABLE 2: POOLED WITHIN-GROUPS MATRICES

Correlation	Roce	Casa	loan advance	capital adequacy
ROCE	1.000	.550	.205	.138
CASA	.550	1.000	-.348	-.292
Loan to advance	.205	-.348	1.000	.674
Capital adequacy	.138	-.292	.674	1.000

The correlation matrix is prepared to see if there was any multicollinearity (a high correlation between pairs of independent variables). The table results show that the correlation between any pair of values is not greater than 0.75. There does not appear to be any problem with multicollinearity.

TABLE 2: TESTS OF EQUALITY OF GROUP MEANS

	Wilks' Lambda	F	df1	df2	Sig.
ROCE	.475	26.535	1	24	.000
CASA	.994	.146	1	24	.706
Loan to advance	.473	26.785	1	24	.000
Capital adequacy	.663	12.201	1	24	.002

Tests of equality of group means shows that Return on capital employed, loan to advance, and capital adequacy all have p-values less than the alpha value of 0.05. As a result, there is strong statistical evidence that profit-making banks and loss-making banks differ significantly in terms of ratios. This provides strong statistical evidence of significant differences in profit and loss-making methods for all banks with ROCE, loan to advance ratio, and capital adequacy producing a very high-value of the F statistic.

TABLE 3: EIGEN VALUE

Function		Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
dimension0	1	1.978[a]	100.0	100.0	.815

The eigenvalues table contains information on each discriminant equation generated. The number of discriminant equations produced is limited to the number of groups minus one. Because there are two groups in the current study, profit-making banks and loss-making banks, only one equation is produced. An eigenvalue represents the proportion of variance explained. A higher eigenvalue denotes a more powerful function. A canonical relationship is a correlation between discriminant scores and dependent variable levels. A high correlation indicates a discriminating function. The correlation, in this case, is 0.815, which is quite high. The canonical correlation coefficient squared is 0.664. This means that the changes in the predictor variables mentioned above account for 66.4 percent of the variance in the discriminant model between two groups of banks

TABLE 4: WILKS LAMBDA

Test of Function(s)		Wilks' Lambda	Chi-square	df	Sig.
Dimension 0	1	.336	24.011	4	.000

Wilk's lambda represents the proportion of total variants that are not explained by the discriminant function. Wilk's lambda and chi-square values are 0.336 and 24.011, respectively. The chi-square value clearly shows that there is a significant difference between the two groups of banks.

TABLE 5: STANDARDIZED CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

Ratios	Function
	1
ROCE	.866
CASA	-.380
Loan to advance	.468
Capital adequacy	-.039

In general, any variable with a correlation of 0.3 or higher is considered significant. The interpretation of discriminant coefficients (weights) is the same as it is for multiple regressions. Table of standardized canonical discriminant function coefficients shows an index of importance for each independent variable, similar to how standardized regression coefficients (beta) do in multiple regressions. The sign denotes the relationship's direction. Table demonstrates that ROCE, CASA and loan to advance are the most powerful independent variables. Large coefficient variables stand out as those that strongly predict bank allocation into loss-making and profit-making banks.

TABLE 6: STRUCTURE MATRIX

	Function
	1
Loan to advance	.751
ROCE	.748
Capital adequacy	.507
CASA	-.055

The Structure Matrix table depicts a different method of emphasizing the relative importance of predictors. Structure matrix correlations, according to researchers, are more accurate than Standardized Canonical Discriminant Function Coefficients. Table 8 shows the correlations of each variable with each discriminant function. These are also referred to as discriminant loadings. In general, any variable with a correlation of 0.3 or higher is considered significant. Loan to advance, ROCE, and Capital adequacy has the highest loadings and are used to differentiate between profit-making and loss-making banks.

TABLE 7: CLASSIFICATION RESULTS

		profit/loss		Predicted Group Membership		Total
				0	1	
Original	Count	dimension2	0	15	0	15
			1	1	10	11
	%	dimension2	0	100.0	.0	100.0
			1	9.1	90.9	100.0

a. 96.2% of original grouped cases correctly classified.

The classification results show that 96.2 percent of the banks were correctly classified as "profitable" or "loss-making." The 'hit ratio' refers to the discriminant function's overall predictive accuracy. It can be seen that all 15 banks were correctly classified as loss-making banks, and ten banks were correctly classified as profit-making banks out of 11 banks.

7. CONCLUSION OF THE STUDY

The current study used discriminant analysis to determine the impact of financial ratios on the performance of selected Indian banks. The study took into account four major financial ratios based on their correlation with one another. Return on capital employed, capital adequacy, CASA, and loan to advance ratio were thus the predictor variables. Based on Box's M and Approximate F, the alternate hypothesis, H1, is accepted. As a result, it has been established that at least one financial ratio influences the performance of a subset of Indian banks. The discriminant model correctly classified 96.2 percent of the banks into two groups. A closer look at the Structure Matrix table reveals three significant predictors, namely Return on capital employed loan to advance and Capital adequacy. The study's findings may aid in the formulation of policies for the efficient determination of financial ratios by bank management authorities. Individual and institutional investors will find the discriminant model presented in this study useful in their decision-making process.

8. FURTHER SCOPE OF THE STUDY

This study is limited to public and private sector banks of India which may be extended all commercial banks as well as companies to determine the factors that influence profitability. Also, few financial ratios have been used to discriminate between profit-making and loss-making banks. Some other factors such as macro-economic, management attitude, and NPAs which may affect profitability may be considered.

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FINANCIAL ANALYSIS ON MANUFACTURING OF SUGAR FROM SUGARCANE CULTIVATED IN INDIA

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ABSTRACT

The study finds out that India has the world's largest area under sugarcane. This crop is the main source of sugar, gur and khandsari and holds a pre-eminent position as a cash crop in the country. It accounts for the largest value of production amongst all commercial crops. India stands next only to Brazil in the production of sugarcane and accounts for nearly one-fifth of the world cane production. This report on sugar and cultivation of sugarcane in our country will become useful for the further researches too.

KEYWORDS

liberalization, centrifugal, khandsari, gur.

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INTRODUCTION TO INDIAN SUGAR MILLS

The origin of Indian sugar industry dates back to 1930, when the first sugar factory was set up in the pre-independence era. For the past 76 years, the sugar industry has steadily grown and has become the backbone of the agricultural and rural economy in India. Sugar is the second largest Agro Processing Industry, next to textile industry. Among all the countries, India is one of the largest producers of sugar in the world, with a production of over 25 million tones. Sugar factories are situated mostly in the rural area. Uttar Pradesh (UP) will be the largest producer of sugar in India; followed by Maharashtra, which is expected to trail marginally behind UP. The prospects of earning foreign exchange from export of sugar are also quite high.[1]

India has become largest producer of sugar cane/sugar producing 280 MnT of cane and 16.5 MnT of sugar in 1995-96, making it the largest producer of sugar in the world, representing about 20% of cane sugar production. India also produces another 10 MnT of traditional sweeteners (gur 9 MnT, khandsari 1 MnT). India also has a large consumer base, thus makes it quite vulnerable to international sugar market, in the event of surplus or deficit situation. At the same time, it has good potential and prospects.[2]

Sugar production commenced in 1920's but it got industry status in late 20's/early 30's when India had 29 sugar mills producing just 100,000 tons of sugar. The industry, facing competition from imported sugar, sought tariff protection. Sugar production picked up under the Sugar Industry Protection Act passed in 1932 and country became self-sufficient in 1935. Today this sector produces 60% of country's production.

REVIEWS OF EARLIER STUDIES

C.H. Hanumantha Rao's (1965); The small farms need to be explored further not only in output maximization but also surplus generation for economic development. Similar view expressed by S.K. Chakravarthy (1972); that even the small cultivators with operational holdings below 5 acres may stand viable with positive utilization of inputs. R.B. Parthasarathy and K.S.P. Satyanarayana (1976) pointed out that the losses and profits differed from one region to another and one landholding to other. In 1965-66 sugarcane growers in North and South circles incurring losses when compared with farmers in Telangana due to higher the cost of cultivation. Salam. A, (1976) that self-operated farms generally obtained higher yields than tenant operated farms. R.K. Patel and A.C. Gangwar, (1983); Accumulation of capital for agriculture operation is still a problem for small farmers. Technology also has been found to increase the net income of small farms followed by medium and large farms All these studies covered different aspects of the agriculture production and as well as sugarcane. But they don't mention the separate production function to estimate the cost of cultivation in the sugarcane.[3]

FACTORS DETERMINING INDIAN SUGAR PRODUCTION AND ITS COMPARATIVE ADVANTAGES

Under the structured Industrial Development Policy, sugar industry was part of the Five-Year Plans introduced in 1951 and has been under the direct control of the Government ever since. Sugar industry is highly politicized and so closely controlled by the Government which has no parallel in the industry. Govt. control, covers all aspects of sugar business i.e., licensing/capacity/cane area, procurement/pricing/sugar pricing/distribution and Imports and exports.

The document gives an overview of agricultural background development in cane. Sugar production, consumption, policy/regulations. The paper ends up dealing with important issues, aspects of deregulation, decanalisation of exports, the potential and the comparative advantage of Indian sugar.[4]

SUGARCANE PRODUCTION AND PRICING POLICY

The GOI supports research, development, training of farmers, transfer of new varieties, and improved production technologies (seed, implements, pest management) to sugarcane growers, to raise yields and recovery rates. The Indian Council of Agricultural Research conducts sugarcane research and development at the national level. State agricultural universities, regional research institutions, and state agricultural extension agencies support these efforts at the regional and state levels. Central and state governments also support sugarcane growers by ensuring financing and input supplies at affordable prices.[5]

THE GOI BUDGET 2018/19 (APRIL-MARCH)

The Union Budget 2018/19 (April-March) has allocated INR 6.11 billion ($76 million) for schemes financed under the Sugar Development Fund compared to INR 9.18 billion (revised) allocated in Union Budget 2017/18. The fund is used to support research, extension, and technological improvement in the sugar sector Additionally, the latest GOI budget has not allocated and or extended funds for i) interest subvention (a low interest subsidy) for extending soft loans to sugar mills and for ii) production subsidies to sugar mills for timely payments to farmers' (GAIN IN8014).[6]

Even though, in the world level our country is the second largest producer of sugar, it has to face many a number of problems from various ways. Inadequate rain facility, ineffective human resource due to poor compensation level; heavy workload; inadequate safety measures, insufficient financial resource, non-availability of high-tech machineries and tools, poor managerial capacity, norms of the Govt. etc., are the great obstacles to survive well in the market. This report may suggest certain measures for the better performance of sugar mills in future.

OBJECTIVES OF THE STUDY

1. To know the reasons for the poor performance of sugar mills functioning in India.
2. To suggest the measures to overcome the critical conditions faced by the Indian sugar mills.

TOOLS OF THE STUDY

To make the analysis effective, tools such as simple percentage, Charts, trend percentages have been utilized for the study purpose.

SUGAR PRODUCTION AND MARKETING

Assuming normal market conditions, sugar mills will be encouraged to use up surplus inventory, up to 6 MMT. With incentives, this surplus could be exported, as out-year sugar supply will be in excess of 31 percent over consumption and normal stock requirements (34.4 MMT). The commercial export basket will ideally include raw and white sugar in equal proportion. Imports are likely to be negligible as a result.

TABLE 1: INDIA: SUGARCANE, CENTRIFUGAL, AREA IN THOUSAND HECTARES AND OTHERS IN 000' TONS

Sugar Cane for Centrifugal	2016/2017		2017/2018		2018/2019	
Market Begin Year	Oct 2016		Oct 2017		Oct 2018	
India	USDA Official	New Post	USDA Official	New Post	USDA Official	**New Post**
Area Planted	4380	4564	5000	4950	0	5200
Area Harvested	4380	4564	5000	4950	0	5200
Production	306700	306069	357000	395000	0	415000
Total Supply	306700	306069	357000	395000	0	415000
Utilization for Sugar	190000	190000	238000	278000	0	290000
Utilization for Alcohol	116700	116069	119000	117000	0	125000
Total Utilization	306700	306069	357000	395000	0	415000

Note: Virtually no cane is utilized directly for alcohol production. 'Utilization for alcohol' in the PS&D includes cane used for gur, seed, feed and waste. 'Utilization for sugar' data includes cane used to produce mill sugar and khandsari sugar.

Interpretation

The above table shows that, the production of sugar from sugarcane cultivated in India, have been increasing during the period selected for the study purpose. During the Financial Year 2016-'17, out of the area planted in 4564 acres, 306069 kg quantity of sugar has been manufactured by the sugar mills. It was increased during the Financial Year 2018-'19 to 415000 kg quantity of sugar from 5200 acres of area planted for sugarcane. But it is not the actual performance of Indian sugar mills. If the resources are being fully utilized to its fullest extent, tremendous improvement may be expected in the field of sugar production.

TABLE 2: INDIA: SUGARCANE AREA, PRODUCTION, AND UTILIZATION

Sugar Cane	Area[1]	Yield[1]	Product[1]	Sugar[1]	Khandsari[2]	Gur[2]	Seed[2]
	Mha	MT/ha	MMT	MMT	MMT	MMT	MMT
1990/91	3.69	65.39	241.05	122.32	13.18	76.63	28.93
1995/96	4.15	68.02	282.09	174.76	10.00	67.27	30.06
2000/01	4.32	69.35	299.32	176.65	11.00	75.75	35.92
2001/02	4.41	67.09	295.95	180.32	10.50	69.62	35.51
2002/03	4.52	63.58	287.38	194.33	9.50	49.07	34.49
2003/04	3.94	59.39	233.86	132.51	10.00	63.29	28.06
2004/05	3.66	64.74	237.08	124.77	9.50	74.36	28.45
2005/06	4.20	66.93	281.17	188.67	8.50	50.26	33.74
2006/07	5.15	69.03	355.52	222.00	10.00	80.86	42.66
2007/08	5.06	68.81	348.18	249.91	7.00	49.49	41.78
2008/09	4.44	64.19	285.02	145.00	6.50	99.32	34.20
2009/10	4.18	70.01	292.30	185.55	6.50	65.17	35.08
2010/11	4.89	70.09	342.38	240.00	7.50	53.79	41.09
2011/12	5.08	71.07	361.03	257.00	7.00	53.70	43.32
2012/13	5.06	67.38	341.20	251.50	7.00	41.75	40.94
2013/14	5.01	70.26	352.14	234.32	8.00	67.56	42.25
2014/15	5.14	70.44	362.33	265.40	8.00	45.45	43.48
2015/16	4.96	70.25	348.45	238.00	8.50	60.13	41.81
2016/17	4.38	70.02	306.70	193.30	8.50	68.09	36.80
2017/18	4.95	79.80	395.00	278.00	9.00	60.60	47.40
2018/19	5.20	79.81	415.00	292.00	9.00	55.00	49.80

Note: Figures for 2017/18 and 2018/19 are FAS estimates.

Source: [1] Directorate of Economic and Statistics, Ministry of Agriculture

[2] FAS/New Delhi Estimate.

Interpretation

From the above table, we can say that out of the 241.05 MMTs sugar cane cultivated, during the year 1990-'91, 122.32 MMTs Sugar was manufactured by Indian sugar Mills. It was gradually increased upto the financial year 2002-'03, and then it started decreasing from the year 2003-'04 to 2004-'05. During the financial year 2018-'19, Sugar Mills were able to manufacture 292 MMTs out of 79.81 MMTs of sugar cane cultivated. It shows a fluctuating trend in all the remaining years. With the resources available in the sugar mills, the mills could have produced more quantity of sugar and stability could have been maintained by the sugar mills. But it was completely absent.

OUTCOMES OF THE STUDY

From the analysis made from the reports collected the following outcomes have been made and they are enumerated below.

1. During the study period, Indian sugar mills could be able to produce a lesser quantity of sugar. Also, stability in production and increasing the trend of production were also completely absent in all the years.
2. Even though the mills are having adequate resources to produce more quantity of sugar, due to the interference of the Govt., poor training facilities, inadequate incentive schemes, insufficient motivation schemes adopted to the working community etc. management of the sugar mills is not able to function well.
3. The inability of the management, less initiative level of the mills and interest burden on the loans borrowed by the mills affect the performance of the mills and it makes the mills, not to maintain the stability in its production.

SUGGESTIONS

1. Effective personnel are to be recruited without the political influence and they are to be trained well to work. Scientific methods are to be adopted while recruiting the personnel for the sugar mills. Then only the human resource of the mills will become more effective.
2. Management should be given freedom of operations in the market. Price fixation for the outputs, should be entirely the rights of the management of the mills. The outsiders should not be given any right to fix the price of the commodities.
3. The mills are not to be compelled to supply the produced sugar to the ration shops at lesser rates than the cost of production incurred by the mills. This is a major constraint.
4. Financial burden of the mills in the form of higher rate of interest, charging more tax for the profit earned by the mills etc. should also be reduced to the full extent.

CONCLUSION

As a part of conclusion, India has the world's largest area under sugarcane. This crop is the main source of sugar, gur and khandsari and holds a pre-eminent position as a cash crop in the country. It accounts for the largest value of production amongst all commercial crops. India stands next only to Brazil in the production of sugarcane and accounts for nearly one-fifth of the world cane production. This report on sugar and cultivation of sugarcane in our country will become useful for the further researches too.

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