CHAPTER-IV

STUDIES OF INDUSTRIES DEVELOPED IN THE BARODA STATE

Background of the Development of Various Industries:

Before 1901-02, the record of trades and industries in the State was a poor one. The old industries were on the decline and those which were under new methods had not achieved any notable success. There were only 44 cotton-ginning factories and one cotton spinning mill in the whole State. This state of things was mainly attributed to the backwardness of the people and their lack of enterprise and want of adaptability to new circumstances. During the present decade, the Government of Baroda set themselves seriously to the different task of stimulating industries within their territory. The only mill then existing had been established by the State in 1883-84 at a capital expenditure of Rs. 6,35,000 with a view to encourage local manufacture and to foster private enterprise. The mill worked for over twenty years but failed to stimulate private enterprise. Believing that the transfer of the concern to private hands would be an encouragement to private enterprise and that one mill successfully worked by private owners would lead other capitalists to follow the example, the Maharaja sanctioned the sale of the mill to a private company in 1905. The expectations of Government were fully realised and the successful management of the first cotton mill in Baroda by private owners resulted in the erection of three others within a few years. With a view to develop arts and industries in the State, a Technical Institute called "Kala Bhavan" – literally the house of arts, was established in the State in 1890. Besides technical education a large number of students were being sent to foreign countries for being trained at State expense in agriculture, architecture, cabined-making,

textile industries, watch-making and the science of commerce. The co-operative movement started in British India soon reached Baroda, and in the year 1904-05, an Act on the lines of the British India Co-operative Credit Societies Act was passed by the Baroda Government, and arrangements were made to explain to the people the advantages of co-operation. Twenty-four societies were organised in the first year of the movement, and there were no less than 98 registered societies. Agricultural banks were established in 1899-1900 and 1900-01 at Songhad and Vyara in the Navsari District and Harij in the Kadi District with a small capital to help the backward population of these talukas; and though joint stock in name were practically financed and managed by the State, the banks made advances in cash and kind for all purposes to bonafide cultivators. Recoveries were made by the staff, but in cases of obstructive ness on the part of the borrowers recourse was sent to civil courts. The most important event in connection with the development of industries in the State was the creation in 1905 of the office of an Economic Adviser and the appointment thereto Mr. R.C. Whitenack, an American gentleman, who justified his selection by manifestation of great energy and perseverance, quickness in the comprehension of subjects and resourcefulness. Mr. Whitenack visited the principal towns of the State and recommended the establishment of a bank, as economic development generally depends in the first place upon the organization of joint stock banking. The Bank of Baroda, Ltd., an institution subsidised by the State, was, therefore, started on the July 1908, with an authorised capital of twenty lakhs.It provides adequate banking facilities of the modern type in the State for the development of commerce and industry, tanning and fiber industries, improvement of the cotton staple, dyeing and other industries. A large number of duties, which hampered trade, were

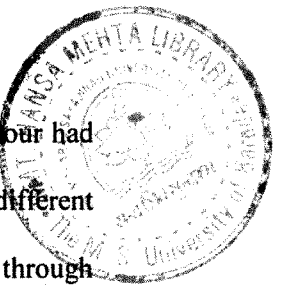
abolished in 1904, and finally, with a view to stimulate trade and industriesfurther, custom duties of every kind were abolished in 1909 at a considerable sacrifice to revenue. All these activities have resulted in a wonderful development of industries within the short space of a few years in the present decade. The total number of factories in the State had risen from one cotton spinning mill and 44 ginning factories and presses in 1901 to 86 factories of all kinds in 1911. Of these, 39 are in the Baroda District (exclusive of City), seventeen in Baroda City, seven in the Kadi District, sixteen in Navsari and seven in Amreli. Kadi, though it had the largest area and population of all the districts, had shown the least industrial development. There was a great scope of further development and continuance of the present liberal policy of the Government. There was every hope that Baroda, will in the near future, takes its legitimate place as a centre of manufactures in Western India.[1]

Industrial Progress:

General Survey- In 1921, a separate schedule was issued to the manager of each industrial establishment in the State. For this purpose, a preliminary register was first prepared per *mahal* of industrial establishments which either employed some form of mechanical power or worked by hand. Only such establishments which employed 10 operators and over, were included in this register. On this occasion, it was decided that the census should merely settle and issue the forms of the schedule, and that the actual details should be got filled in by the Commerce department, whose Director was good enough also to send me a note from which this paragraph was prepared. The number of industrial concerns had increased from 161 to 276. In the aftermath that followed,

[1] Desai G.H. Census of 1911 Baroda State, Summary of Report, The Times of India, Bombay, 1911 p 172-174

projects that were conceived on a large scale had to be abandoned or else curtained, some failed owing to want of proper management and some did not go beyond the initial stage. This was evidenced by the shrinking of the nominal capital of joint stock concerns from about 8 crores in 1921 to 7 crores at the end of 1930, thereby showing that some old projects had to go into liquidation and were afterwards reconstructed. The amount of paid-up capital, however, increased from Rs. 151 lakhs to Rs. 311 lakhs in ten years. The increase in the number and strength of industrial concerns has been mainly in the direction of textile trade, but on the whole, the Industrial return of 1931 has a wider variety than that of 1921. Various small industries, however, which could not be listed in 1921 by reason of their size, did not, for the same reason, find a place in the latest return, although on the present occasion we did not specifically exclude industries employing less than 10 workers. Apart from textiles, the extension of power was most strikingly illustrated by the increase in the population served by electricity, which was 180,571 having grown from 94,712 in 1921. The number of kilowatts registered in 1931 was 2,581 against only 700 ten years ago. A third index of industrial expansion was seen in the increase of factory workers from 12,000 to over 22,000. Okha Salt Works was the most individual achievement of the industrial history of the decade, and its possibilities had been recognised by the Government of India. The mainstay however had been in the cotton industry in which the spindles had increased from 53,428 to 230,416, and the number of looms grew from 722 to 3,382. Petlad and Navsari had now become important mill centres, Kalol and Kadi enterprises were now under reconstruction, and Bilimora retained its position as a centre for oil milling. Generally the cottage industries and handicrafts had suffered a further set-back owing to competition from organised



industries. This has been so in spite of the fact that the pendulum of popular favour had swung towards hand-made and home-spun enterprises. Recently surveys in two different areas showed that this industry was languishing. Hand spinning was kept alive through the urge of political stimuli, but the results achieved so far do not point to any lasting progress in this direction.[2]

Advisory Committee:

An Advisory Committee for the development of Commerce, Industry and Agriculture in the State was appointed in 1913. It was composed of 22 members (13 officials and 9 non-officials); of the latter, eight represent the four District Baroda, two from each, and one represents the Baroda Chamber of Commerce. Its object was to study all the economic problems of the State and advise Government. For the purpose of investigation and inquiry a small sum had been granted.[3]

The Industrial Advisory Board was held on the 25th and 26th September 1916. The proceedings were opened by the Dewan Mr. Manubahi N. Mehta and the meeting was presided over by Mr. Khaserao B. Jadhav. Old pending questions were first taken up. They were disposed off as under -

- 23 were sent to the Departments concerned for consideration,
- 3 were given to a Special Committee appointed for the purpose,
- 5 were sent to the District Committee, and
- 26 were rejected as useless.

Besides these, there were 80 new suggestions, of which 15 were on commerce and banking, 13 on industries, 44 on agriculture and 8 on co-operation.

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[2] Satya V. Mukerjee Census of India 1931 Vol. XIX Baroda Port I a Some Results of the Census, Times of India Press Bombay, pp 72-73

[3] Baroda Administrative Report, 1933-34

1 was sent to the Standing Committee on Agriculture,

1 was sent to the District Standing Committee,

38 were forwarded to the Departments concerned for consideration.

3 were given to a special committee for inquiry.

28 were mere inquiries (and the explanation or the information given by the Departments were communicated to the members),

1 was withdrawn, and

8 were rejected as useless.[4]

The Fourth Annual Session of the Industrial Advisory Committee was held on 1st and 2nd July 1920 in the Council Hall. The Dewan, Mr. Manubhai N. Mehta opened the meeting and in his speech narrated the progress made by the State during the last two years in the development of industries. He made special mention to the stability of the State laws and the power to sue Government which created confidence in the promoters and in the investing public and thus attracted some of the leading capitalists of Bombay and Ahmedabad to start Industries in the State. Mention was also made of the development of harbours at Velan and Dwarka and as also railways of these and other places.[5]

Under instruction from the Dewan, Programmes of work for the Commerce and Industry, Forest, Agriculture and Co-operative Departments were prepared by the respective Departments and placed before the meeting for discussion and suggestion. These were approved without any material change. The Committee decided that at the next meeting an account of the work carried out under this programme be submitted. These were important changes which brought these Departments into direct touch with the public.

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[4] BAR 1916-17, p-140
[5] BAR 1936-37, p-179

The Committee also decided to admit some more non-official members. All the other work before the Committee consisted of suggestions for the development of railways, harbours, banking facilities, construction of roads, opening of experimental farms and agricultural demonstrations.[6]

The Director continued as a member of the Jail Industry Advisory Committee. At his suggestion the Inspector General of Prisons had ordered the introduction of wool-spinning in the central jail.[7]

The department took part in the following exhibitions and demonstrated improved hand-spinning, hand-weaving, calico-printing and soap-making, besides exhibiting samples of tanned leather, blocks for calico-printing and Sankheda lacquer work articles:-

(i) The domestic economy exhibition held at Baroda in December 1932;

(ii) The exhibition held at Vaghodia in January 1933;

(iii) The exhibition held at Amreli in January 1933;

(iv) The exhibition held at Chhani in February 1933;

(v) The exhibition held at Sokhda in February 1933;

(vi) The exhibition held at Makni in February 1933;

Exhibitions:

An agricultural and industrial exhibition was held at Baroda in the month of January 1917.It was organized in a fairly large scale and had five sections: agriculture, forest, horticulture, education and industries including arts, nearly 30,000 exhibits were received and special attention was paid to practical demonstrations and shows in all sections. A series of lectures was also organized on various subjects. Mr.Nanavati worked as

[6] BAR, 1938-39, p-199
[7] BAR, 1932-33 p-175

secretary to the exhibition with Rao Bhadhur G.H.Desai as president and all the administrative work of the exhibition as well as of organization of the industrial section was done by this department. A special report of the exhibition was published during the year 1916-17.

The department sent exhibits and demonstrators to show practical work in spinning, weaving and calico printing at the following exhibitions in the State and outside:-

Serial No.	Name of place	Date
1	Vadia	9/1/38 to 12/1/38
2	Baroda	22/3/38 to 12/4/38
3	Chalthan	9/4/38 to 11/4/38
4	Jamnagar	18/4/38 to 25/4/38
5	Dhari	26/4/38 to 30/4/38
6	Kodinar	6/5/38 to 10/5/38
7	Kosamba	In summer classes

Source: Census Report, 1931 P-78

The department participated in exhibitions held in Lucknow and Delhi at which samples of hand woven and printed textiles, silverwares, wood and metal carving and exhibits from artisans and manufacturers of the State were exhibited. A practical demonstration of Patola-weaving was also arranged. The Patola weaver was awarded a gold-medal. Mr. Prithvipal Jain, a local calico printer stood first in the All India Block Printing competition held at Lucknow and won a prize of Rs. 25 with a medal. Gold and silver medals and certificates of merit were awarded for silverwares and textiles. This encouraged the artisans.

The department sent exhibits and demonstrators to show practical work in spinning, weaving and calico printing at the following exhibitions in the State and outside:

	Name of the Place	Date
(i)	Poona	12/3/39 to 16/4/39
(ii)	Baroda	25/4/39 to 4/5/39
(iii)	Dwarka	26/5/39 to 6/6/39
(iv)	Dwarka Arogya Exhibition	27/6/39 to 7/7/39

The Federation of Baroda State Mills & Industries, Baroda:

The Federation of Baroda State Mills & Industries, Baroda was established on 22nd April 1918 as the Baroda Mill Owners Association and has assumed its present name since 2nd May 1936.It has at present on its roll 42 members including all the textile, mills and all other big industries viz:-chemical, iron, tiles, pottery, match, dyeing ,bolt-nut, pencil, paper, electric, rubber cotton, ginning and pressing and so on of the Baroda State. The Federation is recognized both the Government of Baroda and the Government of India. It has been registered in the Baroda State under the Benevolent Societies Act. It is affiliated to the Federation of Indian Chambers of Commerce & Industry, New Delhi and the All – India Organization of Industrial Employers, New Delhi. In Baroda State, there are about 175 factories associated with a variety of industries and they employ about 41,100 workers. Among these industries, the textile industry has occupied and at present occupies a very prominent position as of the total 41,100 workers employed in the factories, about 22,000 are engaged in the textile industry.(These figures are for the year 1941-42).There are 17 textile (cotton) mills in the State with about 7000 looms and 3,40,000 spindles capable of producing 41 million lbs. of yarn and 33 million lbs. of cloth a year from about 48 million, lbs of cotton grown in the State and imported from outside.

During the war time, the Government of India placed the war orders for cloth and orders for standard cloth, yarn etc. through the Panel member of this federation who distributed it amongst the mill members and dealt with questions pertaining to war orders, requirements in electric lamps, irons and steel and such other articles for those cotton mills. The Woollen textile mill was entirely on war work. There were other factories viz:- Chemical works, rubber factory etc. who were also on work.

The aim and the object of the Federation as set out in its rules and regulations were to protect the interest of its members, to develop trade and industry in the State, to keep harmonious relations amongst the members and among the employer and the labour.

The disputes between the mills and the cloth merchants regarding delivery of cloth etc. were settled through the arbitrators appointed from both the sides. The arbitrator on behalf of the mill is appointed from a batch of Panel through this Federation.

Textile Industries:

The liberal policy of Maharaja Sayajirao III and his sympathies for the industrial development were fully understood and made use of.

In 1919-20, when the opportunity arrived. Prominent people, both from Baroda and outside, came forward to start new industries. The following is the lists of new industries that were promoted. 10 spinning and weaving cotton mills.-

3 at Kalol

2 at Petlad

1 at Billimora

1 at Dehgam

1 at Kadi

1 woollen mill at Baroda

4 sewing thread and Handloom factories for silk (on a large scale at Kalol,Dehgam and Visnagar[8]

The opening ceremony of the Maharani Woollen Mills was performed by Shrimat Maharaja Kumar Dhairyashilrao on 13th December 1922 and that of the Darbhanga Mills by the Maharaja Dhiraj of Darbhanga on 16th January 1923.[9]

The factory of the Union Dyeing and Bleaching Company Limited, which went into liquidation last year, was purchased by the Virgin Mills, Limited, a foreign company registered in Baroda and has already commenced dyeing of yarns. The Company thinks of erecting cotton spinning and weaving mills along with the Dyeing Factory.[10]

The Kalol Spinning and Weaving Mills, the Dadabhai Mills and the Billimora Mills, which were expected to start work in 1924, did not complete their installation of machinery for lack of financial help. The Darbhanga Mills were sent into liquidation, but after paying off the first mortgage debentures worth 7 lacs held by the State, have resumed their operations under the name of the New Darbhanga Mills.[11]

In 1920-21, there were only 4 mills working as against 13 in 1924-25. The capital employed was about 32 lakhs in 1920-21 as against 189 lacs in 1924-25 ,an increase of six hundred per cent. The looms and spindles in 1920-21 were 722 and 54,426 as against 2,096 and 1, 84,878 in 1924-25 respectively – an increase of three hundred per cent. The yarn produced amounted to 33 lakhs of lbs. in 1920-21 as against 130 lacs of lbs. in

[8] BAR, 1919-20
[9] BAR, 1922-23, p-201
[10] BAR, 1922-23, p-201
[11] BAR 1924-25, p 193-194

1924-25. The production of cloth, which was more than 22 lacs of lbs. in 1920-21, rose to 56 lacs of lbs. in 1924-25. The daily wage earners have increased from 2,300 to over 6,500. Similarly, the Cotton Excise Duty derived by the State has increased from Rs. 1.28 lacs to Rs. 2.61 lacs during the last five years, showing more than a hundred per cent increase. It was thus evident that the textile industry had kept pace with the other progressive developments in the state.[12]

Owing to the Swadeshi movement. The two old mills of Kalol recommenced work during 1929-30. The Government gave some concessions to a prominent mill owner of Ahmedabad who wanted to start a new mill at Navsari. The work of erecting the mill was in progress.[13]

The Seva Samiti Khadi Karyalaya at Amreli was given an advance of Rs.2, 000 without interest for carrying on spinning.[14] In1932, industries received a further impetus. Out of 14 cotton mills working one cotton mill went into liquidation. The mill was sold; and it was expected to start operations early next year under the name of "the New Chhotalal Mills Ltd." All the mills did fairly well owing to the increase in demand of Indian made cloth.Some of them worked night shifts.[15]

In 1933-34, industries received a further impetus. Out of the 14 cotton mills working at the end of the last year, one cotton mill the Maharaja Mills Co. Ltd. went into liquidation and one new cotton mill- Keshav Mills, Petlad- started. The failure of the Maharaja Mills Co. Ltd., and the Maharani Woollen Mills, Ltd., was a blow to the investing public.[16]

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[12] BAR, 1924-25, pp 193-194
[13] BAR, 1929-30, p-194
[14] BAR, 1929-30, p-194
[15] BAR, 1932-33, p-172
[16] BAR, 1933-34, p-167

The Sayaji Jubilee Cotton and Jute Mills Limited, Sidhpur, stopped working for the last 18 months.[17]

One cotton mill – the Maharaja Mills Co. Ltd.,- which went into liquidation in 1936 was sold and started working under the name of Shree Jagadish Mills Ltd.[18]

In 1937-38 all the 16 cotton mills in the State were working at the end of the year. The New Darbhanga mills which had been closed since long was purchased by Messrs. H.M. Mehta & Sons Ltd. and started working under the name viz. Navsari Cotton & Silk Mills Co., Ltd.[19] The following table gives the figures of cotton bales consumed in the cotton mills during the year as compared with the previous year:

Year	Number of cotton mills	Number of cotton bales consumed (1 bale = 400 lbs.)		
		Indian	Foreign	Total
1937-38	16	68,860	34,066	1,02,926
1936-57	15	50,294	29,040	79,334

Source: BAR 1937-38 p-185

The textile industry continued to show progress under the impetus of the conditions created by the war. The cotton mills increased their production by 8 per cent and the value of the produce of the woollen mills increased by Rs. 25,000.[20]

In 1941-42, 18 cotton mills were working in the State, of which 8 were in the Baroda district, 7 in the Mehsana and 3 in the Navsari districts. Their consumption of cotton increased by 9 per cent from 1, 20, 00 bales to 1, 31,000 during the year. Of this, 72 per cent was Indian cotton. The number of looms and spindles increased by 58 and 2,500 respectively. The capital invested showed a decrease as compared with the last year from

[17] BAR, 1935-35, p-189
[18] BAR, 1935-36, p-159
[19] BAR, 1937-38, p-185
[20] BAR, 1941-42, p-163

Rs. 384 lakhs to Rs. 380 lakhs, the number of persons employed increased from 22,726 to 24,713, and the total yarn produced increased from 398 lakh lbs. to 431 lakh lbs. The progress of the textile industry showed from the following table:

Year	Number of mills	Capital in Rs. lakhs	Number of looms	Number of spindles	Persons employed	Yarn produced lbs. (lakhs)
1927-28	11	123	2,505	1,77,084	6,250	153
1935-36	14	248	5,865	2,81,000	12,900	231
1936-37	15	290	6,206	2,78,000	15,300	288
1937-38	16	304	6,771	3,24,000	18,600	358
1938-39	16	320	6,914	3,34,500	19,000	344
1939-40	16	317	7,110	3,32,100	20,200	332
1940-41	16	384	6,874	3,25,732	22,726	398
1941-42	18	380	6,932	3,28,232	24,713	431
1942-43	18	504	6,927	3,32,208	23,982	342
1943-44	18	654	6,956	3,35,726	23,482	415

Source: BAR 1942.p-163

Cotton Mills: In 1947-48 out of 19 cotton mills in the State, 18 were working of which 8 were working in the Baroda District, 7 in the Mehsana District and 3 in the Navsari District. Their cotton consumption increased from 1, 01,678 to 1, 12,147 bales. Of these, 64.4 per cent was Indian cotton as against 55.7% in the previous year. The number of looms was 6,967 but the number of spindles decreased from 3, 46,270 to 3, and 45,438. The capital invested came to Rs. 944 lakhs as against 959 lakhs in the previous year. The number of persons employed increased from 27,560 to 27,860 and the total yarn produced increased from 336 lakhs lbs. to 373 lakhs lbs.[21]

Two units each of 19,000 fine spindles were sanctioned by the Government of India for starting new textile mills in the State and they were allotted to (1) Sheth Chaturbhujdas

[21] BAR 1947-48, p-138

Chimanlal and (2) The Managing Agents of the New India Industries Ltd. The latter did not place definite orders in time, and as such the same unit was related to Messrs. Mafatlala Fine Spinning and Manufacturing Co. Ltd., Navsari. The lost spindles 5,512 of the Navsari Cotton Silk Mills Ltd. were also allowed to be re-allotted to the Mills.[22]

The Sayaji Mills at Baroda was to be scrapped and the management obtained an import license for spinning and weaving plant to replace it. Sheth Vadilal Lallubhai requested for acquisition of certain land at Kalol for putting up this plant. Accordingly, 142 bighas of land were sanctioned by the Government.[23]

In 1946-47, the textile industry continued to show progress under the impetus of conditions created by the war.[24]

19 cotton mills were working in the State, of which 8 were in the Baroda district, 8 in the Mehsana district and 3 in the Navsari district. Their consumption of cotton decreased from 1,15,412 bales to 1,01,678. Of these, 55.7 per cent was Indian cotton as against 71.5 per cent in the previous year. There was no change in the number of looms, but spindles increased from to 3, 37,918 to 3, and 46,270. The capital invested increased to Rs. 959 lakhs. The number of persons employed increased from 24,888 to 27,560 and the total yarn produced decreased from 375 lakhs lbs. to 336 lakhs lbs.

Two units for 19,000 spindles each had been sanctioned by the Government of India for starting textile mills in the State.[25]

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[22] BAR 1941-42, p-163
[23] BAR 1941-42, p-163
[24] BAR 1946-47, p-132
[25] BAR 1946-47, p-132

The Baroda Cotton Spinning and Weaving Mill:

The foundation of this mill was laid in May 1882. It was a fact regretted by all well-wishers of India that most of its old arts and industries had decayed and a few new ones had been introduced into the country .Of these few the manufacture of cotton cloth by machinery was by far the most important. The Maharaja from the outset of his career had perceived the absence in the Baroda territory of any industrial institution on a large scale, and finding that the fact was due in a great measure, to the conservative ideas of the people, His Highness resolved to start a state mill as an example of the people. By the end of the year under report, the building was completed and equipped with the necessary engine, and spinning and weaving machinery. To this was added a ginning factory working 40 gins. 10,328 spindles and 104 looms with all the requisite machinery were erected. The cost of the main and subsidiary building was Rs. 1, 79,500 and that of the machinery including the engine Rs. 3, 63,500/-.[26]

Handloom Weaving in Baroda:

Baroda and Gandevi were cited as typical centre of the old hand-weaving industry, and their condition might indicate the trend of decay of this craft in Baroda State. Weaving was by far the most important cottage industry which was flourishing all over the State. Baroda City was a typical locality of honorable traditions in this respect. During Mughal times Baroda was well-known for its fabrics; travellers like Tavernier have praised them. The cloths special to Baroda were however freely copied by weavers later on in a number of places like Nagpur, Sholapur and Bhivandi and finally by mills. The only reason which keeps alive for Baroda its modicum of handloom-weaving was the impossibility of imitating the hand-woven sarees of fine count single yarn on power-looms. The varieties

[26] BAR 1982-83, p-68

of cloth celebrated of Baroda were macheshwari sarees, pitambars (silk dhotis), turban fabrics, chanderi khands (blouse cloth) and garments with embroidered border and 'solid' border. The marginal table gives information about the castes engaged in the work; the number of looms and of workers and the kinds of cloth special to each caste, 52 families of Vohras and 90 of (untouchables) Vankars had given up weaving. 40 families of Ravalia weave newar (putties or tape) and were not technically weavers. In addition there were a small handful of Bandhara and untouchable weavers. All the looms except one are of the primitive type. One or two factories started on the tide of Swadeshism, used by shuttle and automatic looms, but with the ebb of the favor, the factories lapsed into idleness. The raw material –cotton and silk yarn were now provided by the mills; preliminary processes such as warping, sizing, dyeing, etc. were entrusted to local specialists. Hardly 30 weavers had their own capital and they derive no advantage except independence from it. The others resort to the inevitable middleman and were content to receive the weaving wage only. The average monthly income of a weaver is hardly 8 rupees a month and supplemented by an even more meager earning of his wife (if she works), he ekes out a miserable existence. The merchant who finds the market for these people's production grumble that their standard does not come up to the set by weavers of Dholka and other competing places. The gradual sinking of the industry appears to be due not only to the mill competition as was the universal belief, but also to the lack of energy, inventive originality and effort to study the demand, on the part of the weavers themselves; they could if they chose, always be a step ahead of the mills in designs. But their apathy was not altogether due to want of intelligence; indebtedness and the struggle for existences as well as fickle people's taste were apt to dishearten them. They had so

much an air completely beaten, the efforts on the part of the Commerce department to give them a co-operative society, a weaver's store and to help them with demonstrations met with little response hitherto.

Caste	Looms		Number of families	Actual workers	Depen-dents	Kind of cloth woven by caste
	Running	Idle				
1	2	3	4	5	6	7
Khatri	128	122	59	94	173	Sarees, Khanda Pitambars, embroidered border cloth and other fine count fabrics
Khatri Pancholi	7	2	7	11	21	
Tai	32	18	50	76	187	Ghagrapat and Lungis
Vohra	116	46	96	164	298	Paghdi (Turban cloth)
Total	283	188	212	345	679	

Source: Census Report 1931p-24

Handloom Weaving in Gandevi:

The story of Gandevi was just like Baroda. A long tradition of artistic craft, competition of the machine and a gradual sinking, spasmodically revived by the veering of public opinion in favour of hand-woven cloth – these were various stages that the industry had undergone. Till the end of the nineteenth century Gandevi held its place as a prominent weaving centre. It mainly catered to the rough needs of the primitive Dublas and Chodhras round about. Later on it took to weaving silk bordered cloth and continued to supply the simple needs of the good folk of a considerable region of South Gujarat. Their protests having left the local authorities, importers of mill-cloth and buyers all equally

unmoved, they took to other vocations like tailoring or migrated to foreign countries like Africa and the Fiji Islands. At present Khatris form the bulk of the weaving class; the entrepreneur was as prominent among them as anywhere else though the Muslim weavers did not share this doubtful advantage. The marginal table gives the list of castes and families occupied in the callings. There were 252 old handlooms, 56 fly shuttle slays and 74 dobbies. The kinds of cloth produced were cotton sarees of various types-with plain, mercerised or silk borders. 30 to 40 looms have profited by the guidance of the Commerce department demonstrations class and were producing the Cambay type of fine count cotton sarees. The 56 fly shutters and 74 dobbies were introduced through the efforts of the class which had thus achieved better success than in the City of Baroda. Practically all the preliminary processes except dyeing (done by the local Galiaras) were finished in other places like Surat and Bombay before the yarn was put on the loom. The idea of a Co-operative Society or a weaver's store appeals to Gandevi weavers no more than to their brethren in Baroda.

Caste	Families	Workers	Dependents
Khatri	88	252	147
Tai	21	50	67
Ghanchi	64	133	174
Khatri Pancholi	4	8	8
Dubla	3	6	11
Pathan	9	17	27
Total	181	466	434

Source: Census report 1911 p-35

The above table shows the number of people of different caste. The number of person who were workers and dependents.

Handloom Demonstration:

The Hand-loom Demonstration class opened at Patan, and an Antyaja weaver was added to the staff. Altogether 30 improved hand-looms were introduced among the weavers of Patan and the surrounding villages.[27]

The appointments of a Textile Assistant and two additional demonstrators were sanctioned. Thus, in this branch of the Department there were one assistant and four demonstrators working during the greater portion of the year. Out of the four, two demonstrators were kept in the Kadi District while the other two were in the Baroda District, the Assistant supervising the work of them all. The Khadi batch works mostly in the Pattan and Chansama talukas and held demonstrations in four villages and introduced 15 fly-shuttle looms. It worked successfully. The other had its headquarters at Padra, but held demonstrations at two villages, and introduced two looms. This party was unsuccessful. One of the demonstrators proved useless and he had to be removed and a new one brought from Pattan. He introduced a few looms in Sadhi. The Head Demonstrator of this Party was sent to Mahuwa (Navsari) for a short period and he succeeded in introducing a few looms. He also worked with some success at Dabhoi. The Weaving Assistant visited Bangalore and Bombay and saw the hand-loom factories and demonstration stations in those parts. The Weaving Assistant conducted a few experiments in silk-weaving at the School of Arts and in weaving wool at Patan with some success.[28]

The staff in weaving branch consisted of one assistant, three demonstrators and three weavers. The demonstrators with the weavers worked in the Kadi, Navsari and Baroda

[27] BAR 1913-14, p-124
[28] BAR 1914-15, p-170

districts: the Kadi party worked in Visnagar, Gojaria, Langhnaj, Saldi, Aithor and Unava; the Baroda party at Petlad, Sojita, Vatav and Simarada; and the Navsari demonstrator carried on the work at Gandevi, Dhamdachha and Billimora. Improved fly-shuttle looms could not be introduced in a larger number among the weavers, principally owing to the high prices of loom-accessories and the general apathy among the weaving classes for the introduction of new methods and devices. A number of weavers in Gandevi did adopt improved dobbies. Thus, during the year1917-18, only 35 fly-shuttle looms, 16 dobbies and a few warping and winding machines could be introduced.[29]

The weaving assistant supervised the working of the demonstration parties and carried on experiments for improving the present mechanism of looms. Two factories at Baroda and two at Petlad had been launched for manufacturing warps. Some merchants were also persuaded to erect handloom factories at Visnagar and Petlad.[30]

During 1916-17 in Hand loom weaving demonstrations, the three demonstrators with their weavers worked in the Kadi, Navsari and Baroda Districts. The Kadi party worked principally at Vadnagar, Visnagar, Valam, Sander and Kanthravi. The Baroda party at Baroda, Petlad, Pij and in a few villages of the Padra Taluka; and the Navsari demonstrator worked at Navsari and Gandevi. Amreli also got the benefit of the demonstrations for a month. The work at Kadi was very successful, since more than fifty fly-shuttle looms have been introduced in that district. The Navsari and the Gandevi weavers did not much favour the fly-shuttle looms, but they adopted improved dobbies. The Baroda demonstrator was more successful with the hand-warping machines.

[29] BAR 1917-18, pp 151-152
[30] BAR 1917-18, pp 151-152

Altogether 75 looms, 15 dobbies and 3 hand-warping machines were introduced – a fair result considering the conservation of the weaving community.[31]

The Weaving Assistants supervised the working of the demonstration parties and carried on a few experiments in improving the present mechanism of the looms. A Jacquard hand-loom was prepared and experiments were made with double shuttle type. A Khatri weaver of Baroda was induced to introduce an automatic loom and a tape weaving loom. Arrangements were made to train for sometime the pupils of the Amreli Stri Hunnar Shala (Female Industrial School) in hosiery knitting machines.[32]

At the Agricultural and Industrial Exhibition held in the month of January 1917, a complete weaving demonstration was conducted by the Department. Various kinds of looms and accessories designed by the Department were shown in working order and a power loom worked by electric motor was shown weaving silk 'Pitambars.' One of the demonstrators was also sent to the Junagadh Industrial and Agriclutral Exhibition in the month of February.[33]

Experiments in Wool-weaving were also continued at Amreli. Mr. Adalja made thorough inquiries into the woollen yarn obtainable in Kathaiwar and with Dhoraji warp and Cawnpore weft prepared several samples of woollens. They appear to be rather rough and experiments were being made to prepare type of cloth that would easily sell. So far the experiments appeared to be hopeful, the chief difficulty in utilising Dhari wool was that it was difficult to get spinners to spin fine yarn as good as Dhoraji. Mr. Adalja tried to induce local women to take up this industry.[34]

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[31] BAR 1916-17, pp-14
[32] BAR 1917-18, pp 151-152
[33] BAR 1917-18, pp 151-152
[34] BAR 1922-23, p-209

The Wool -weaving machine purchased in 1921 and was used on herds at Dhari and the results were very favorable.

The Baroda Demonstrator was teaching the operation of hosiery machines at Baroda and was able to train a few people. Several small hand-loom factories were started and in the year under report, two Joint Stock Companies were started with the same object. The Department had collected accurate data about the capital cost and revenue accounts and was in a position to render good assistance. The Weaving Assistant, therefore, prepared two pamphlets – one on the improved hand-loom and another on the organisation of a hand-loom factory.[35]

Spinning wheels were obtained from the Khangi Department. These were sent by. The Maharaja Sayajirao from Germany. They were worked at both the classes at Baroda and Amreli and gave satisfactory results for spinning wool.[36]

The Demonstrator of the Baroda class was sent several times to Shri Maharani Girls High School to show the working of the Salvation Army Hand-loom which they had purchased. Working of a model small loom ordered from America was also demonstrated to the girls of the Maharani School. Instructions in working the spinning wheels imported from Germany were given at the Training College for Women.[37]

Demonstration of the working for the improved Fly-shuttle Pit as well as 'Frame looms' was given at Baroda, Dabhel (Navsari Dist.) and at Dwarka and Varvala in Okhamandal.[38]

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[35] BAR 1922-23, p-209
[36] BAR 1922-23, p-209
[37] BAR 1922-23, p-209
[38] BAR 1922-23, p-209

The weaving class at Amreli was closed as almost all the Vanza weavers of Amreli have adopted improved looms. It is estimated that nearly 500 improved Fly-shuttle looms are in use in the town of Amreli. This class was transferred to Okha as it was thought necessary to introduce the same sort of cottage industry there and also to improve the lot of the local weavers by introducing improved Fly-shuttle looms.[39]

The local Dwarka weavers have left off their hereditary occupation of weaving and joined the ranks of ordinary day-labourers. Another class was opened at Varvala where the weavers used to adhere to old methods of weaving. They have now fully realized the advantages of the Fly-shuttle looms and some of them have decided to introduce these looms in their homes. A Weavers' Co-operative Society had been started there of which the weavers, will it was hoped, took full advantage for purchasing Fly-shuttle Pitlooms.[40]

The weavers of Kalyanpur in Okha who mostly weave woollen Kamlis had asked for a Fly-shuttle loom with free advice of a weaving teacher at intervals and their request had been complied with.[41]

The class at Baroda was closed and transferred to Dabhel in the Navsari district at the suggestion of the Navsari Suba. The Mahomedan weavers of this place were fully impressed with the advantage of the improved loom. The looms were introduced during the period the class was there and afterwards ten more looms were added. As near all of them have introduced Fly-shuttle looms and as they no longer stood in need of the assistance of a demonstrator the class at Dabhel was subsequently closed. Two classes were working – one at Dwarka and the other at Varvala in Okha.[42]

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[39] BAR 1922-23, p-209
[40] BAR 1924-25, p-201
[41] BAR 1924-25, p-201
[42] BAR 1924-25, p-201

Hand Spinning:

For some subsidiary occupation to agriculturists a spinning centre was opened at Bahial in Dehgam taluka, by the All India Spinners' Association with Government's help. The experiment proved successful as it was carried out without any loss or additional expenditure to Government. 2,034 square yards of cloth valued at Rs. 1,250 was produced and 56 spinners, 1 carder and 4 weavers were given work who earned Rs. 255-9-0, Rs. 256-13-9.

The number of looms, dobbies and thread, ball making machines introduced were 119,8 and 1 respectively. Out of these, 93 looms were supplied to weavers on the installment system: these included 66 supplied to weavers at Pattan.

A survey, including an intensive examination of their economic condition, of weavers in Gandevi was carried out on the lines of the work done in Baroda city. A report was prepared and submitted to Government.

A demonstration of powerloom weaving was carried out in Baroda. The demonstration proved successful and as a result applications were received for loans for purchasing power looms and accessories.

Weaving classes were held at Sidhpur, Unjha, Petlad and Gandevi. The class at Sidhpur succeeded in introducing sewing thread-ball machine and newar-weaving in Vanita Vishram at Sidhpur and looms at Unjha and surrounding villages. The Petlad demonstrator trained artisans to weave silk sarees with gold thread borders and succeeded in introducing fly-shuttle looms at Vaso. The work of wooden dobbies for developing fancy borders was demonstrated with success at Gandevi.[43]

Four weaving demonstrators were employed who worked in the following centres:

[43] BAR 1929-30, p-197

Name of place	Period of classes held
1. Baroda	1-8-1932 to 8-1-1933
2. Sonvadi	1-8-1932 to 25-8-1932
3. Vakal	26-8-1932 to 9-9-1932
4. Kosamba	10-9-1932 to 6-11-1932
	23-3-1933 to 30-5-1933
5. Tarsadi	7-11-1932 to 21-12-1932
	11-2-1933 to 16-2-1933
6. Kharod	17-2-1933 to 10-6-1933
7. Bilvai	19-6-1933 to 31-7-1933
8. Lavet	1-6-1933 to 31-7-1933
9. Dwarka	5-8-1932 to 31-7-1933
10. Amreli	1-8-1932 to 9-1-1933
11. Kodinar	11-1-1933 to 12-4-1933
12. Chalala	14-4-1933 to 31-7-1933

Source: Baroda Administrative Report 1932-33, p-169

Fly-shuttle looms were introduced. Out of these 42 were supplied on installment system and the rest were purchased by the weavers. Besides these, 29 applications were received for looms on the installment system.[44]

Two spinning demonstrators were employed who demonstrated hand-ginning, carding and spinning. The following table shows the classes conducted at various centre:

Name of place	Period of classes held
1	2
1. Pipal	7-7-1932 to 29-11-1932
2. Amreli	1-12-1932 to 6-1-1933
3. Damnagar	7-1-1933 to 14-6-1933
4. Vadnagar	13-6-1933 to 31-7-1933
5. Kadi	1-8-1933 to 10-9-1933
6. Kosamba	11-9-1932 to 20-10-1932
7. Thuvavi	8-11-1932 to 11-4-1933
8. Nardipur	20-4-1933 to 31-7-1933

Source: Baroda Administrative Report 1932-33, p-177

[44] BAR 1932-33, p-176

The hand-spinning centres at Bahial and Vadnagar continued to work and an advance tasalmat) of Rs. 5000 was continued during the year to the All India Spinners' Association for working these centres, while the Saher Samiti Karyalaya at Amreli .*was given an advance (tasalmat) of Rs. 2000 without interest for carrying on hand-spinning according to their programme.[45]

The number of fly-shuttle looms introduced during 1932-33 was 45. Of these, 21 were supplied on the installment system. 11 frames for newar-weaving and 2 for weaving artisans, 4 warping trollies and 2 bobbin winding machines were introduced by weavers and artisans at their own expense.[46]

Two spinning demonstrators were employed, who demonstrated hand ginning, carding and spinning. Classes were held at the following centres:

Name of place	Period of classes held
1	2
1. Nardipur	1-8-1933 to 20-9-1933
2. Vasai Dabhala	24-9-1933 to 7-10-1933
3. Amreli	13-10-1933 to 16-12-1933
4. Kodinar	5-12-1933 to 25-1-1934
5. Dolasa	25-1-1934 to 31-7-1934
6. Vadnagar	1-8-1933 to 31-8-1933
7. Visnagar	31-8-1933 to 13-10-1933
8. Vankia	18-12-1933 to 31-7-1934

Source: Baroda Administrative Report 1933-34 p-172

Three demonstrators were employed for hand-ginning, carding and spinning classes were held at the following centres:

[45] BAR 1932-33, p-171
[46] BAR 1932-33, p-177

Name of the centre	Period of classes held
1. Chalala (Dhari taluka)	1-8-1935 to 31-7-1936
2. Atladra (Baroda taluka)	1-8-1935 to 13-10-1935
3. Kotali (Braoda taluka)	14-10-1935 to 4-4-1936
4. Amaliara (Baroda taluka)	5-4-1936 to 31-7-1936
5. Alampur (Karjan taluka	1-8-1935 to 6-3-1936
6. Kambola (Karjan taluka)	7-3-1935 to 31-7-1936

Source: Baroda Adminisrative Report 1935-36 P-195

A sales depot was also started during the year at the institute to provide marketing facilities for the products of different cottage industries in the State.

The Diamond Jubilee Trust:

Diamond Jubilee Trust played an important part in reconstruction activities in the state. The works in the Diamond Jubilee Trust were progressive. The income from the people's Diamond Jubilee Trust was utilised in giving scholarship to agriculturists to learn improved agriculture and subsidiary industries for encouraging the production of Khaddar. Girls from villages were also trained in construction activities.[47]

For the development of cottage industries in the state, the Government maintained the Diamond Jubilee Cottage Industries Institute in Baroda and in the villages a large number of training classes, where scholarships were given to students. The Government also gave grants-in-aid to private institutions, which promoted the development of cottage industries and loans for starting them. The following classes were held at the cottage industries institutes at Baroda:

(1) Calico Printing and block engraving

(2) Lacquer work

(3) Metal work

[47] BAR 1942-43, p-141

Diamond Jubilee Cottage Industries Institute:

The institute was found in 1936 to co-ordinate and extends the efforts of the state.[48] This institute was promoted to provide training in tailoring, wood carving, lacquer work. leather work, glass toys, commercial designing, painting etc.,The artisans scattered over the state, were given assistance by way of organising them into co-operatives providing them training in capital, raw materials and marketing their finished their products.* The industries which the institute was intended to encourage were:

(i) As whole-time occupation by men with small capital belonging to the middle artisan classes.

(ii) As part-time subsidiary occupations by agriculturists.

The function of the institute was to take up industries which can usefully employe these classes of people, teach such industries, carry out investigation for simplifying processes and for the use of power and mechanical devices, introduced new design finance schemes started by trained persons and study marketing of finished products. The institute pays special attention to the revival of such well known arts as the Visnagar brass work and the Sankheda lacquer work. The institute was the central institute of the state. The following statement shows the classes and the number of students in this institute:

Serial Number	Name of the Class	Number of Students in each class
1	Calico Printing Class	16
2	Block engraving class	16
3	Lacquer work class	8
4	Metal work class	18
5	Leather work class	11
6	Visnagar brass metal and wood engraving class	8

Source: Baroda Administrative Report, 1939-40 p-130

[48] BAR 1945-46, p-133

The leather-work class and Visnagar brass metal and wood- engraving class started in 1939. A sum of Rs. 3,283 was given as scholarship to 61 students, for a few years.

The following table shows the number of students from 1940-1948:

Year	Calico Printing Class	Block engraving Class	Lacquer work class Sankheda	Metal work class	Leather class work	Wood carving	Visnagar metal & engraving	Brass work	Total
1941-42	12	8	6	11	6	Nil	10	Nil	53
1942-43	8	8	5	16	Nil	Nil	Nil	Nil	46
1943-44	...	...	...	...	...	....	...	...	...
1944-45	8	5	2	15	Nil	Nil	8	Nil	46
1945-46	9	Nil	5	9	8	18	3	18	Nil
1946-47	9	Nil	1	9	6	Nil	6	16	47
1947-48	7	Nil	4	7	9	4	Nil	18	49

Source: Baroda Administrative Report, 1941-42 to 1947-48

The total number of students in 1941-42 was 53 but in the next year it decreased. No of Calico Printing, metal work class and Tailoring class gradually increased.

ERI-SILK:

A trained Eri -silk demonstrator was obtained from Bhagalpore and a class for conducting experiments in rearing of Eri silk worm was started from May 1939.[49]

[49] BAR 1938-39, p-200

Eri- silk demonstration class at Devli near Kodinar was continued. The success of the class encouraged the department to start another at Kachchiawadi near Navsari. The climate at both the places appears to be very well suited for rearing of Eri- silk worms.[50] In 1942-43, 156 persons took advantage of these classes. Demonstrations were also given at Ajarai and Kadodara. 22 broods of Eri worms were reared which produced 476 total of cocoons which were all spun into yarn. In addition 224 tolas of cocoons were bought from rears and spun into silk yarn. Eri eggs were distributed among the surrounding villages and were sent to Baroda, Bansada, Dharampur and Junagadh. 90,952 cacoons (2,878 tolas). 700 tolas were spun and 25 yards of silk cloth woven in 200 villages of the State.[51]

Calico Printing Class for Women:

Shree Chimnabai Stri Udyagolaya for training middle and backward class women in dyeing and calico printing was continued by the assistant demonstrator. In 1942-43 Government sanctioned Rs. 200 for purchasing printing blocks and 22 women received training. In 1945-46 a scholarship of Rs. 476/- were awarded to students. Total 19 women received training.[52]

In1946-47 a scholarship of Rs. 619 was awarded to the students under training. 16 women students received training.

Sales Depot:

The sales depot of the institute organised to provide facilities for the product of different cottage industries in the state done useful work. Orders for special kinds of textile curtains, towels, napkins, mashru cloth etc., were canvassed, obtained articles of leather

[50] BAR 1939-40, p-132
[51] BAR 1942-43, p-142
[52] BAR 1924-24, p-202

work, lacquer work metal work, wood carving and printed materials of various shapes, sizes and designs were also exhibited and prepared on orders.

In the following table shows the total value of the sales:

Year	Total Value (Rs.).
1940-41	5,429
1941-42	6,007
1942-43	7,070-8-0
1943-44	.....
1944-45	7,357

Source Baroda Administrative Report: 1940 -1945

It shows that the cottage industries improved the facilities for the students and to promote them, Government also took action.

Scholarship:

The Government sanctioned following scholarships for a period of 3 years in 1944.

i) 8 scholarship of Rs. 5 each for the first year students.

ii) 8 scholarship of Rs. 5 each for second year students.

iii) 2 scholarship of Rs. 10 each for advance training of the best 2 students who completed the regular 2 years course.

An equipment grant of Rs. 1,900 was also sanction.

Demonstration in Villages:

Demonstration classes in handloom weaving were held at Ranju, Balisana, Bahucharaji, Unjha, Deoli (Kathiawad) and Kodinar. Demonstration of classes in cording and spinning were held at Zarola, Tarva, Sadhali and Deoli. The Calico printing class was conducted at Kungher (Patan) till 1943 and then shifted to Petlad. Demonstration classes of silk were

held at Deoli (Kodinar) and Gadat (Gandevi), improved method of bark tanning was demonstrated to chambers and other village tanners.

Knot Printing:

Knot printing on Bandhani was carried on in Amreli and other towns. The raw material of the cloth comes from Bombay and the safflower or kasumbo from Gujarat. Whole pieces of muslin were brought by the dyers and printers. Then washed with soap, the cloth was cut into pieces of the size required for turbans, gharcholas or scarves and other feminine garments and given to the knot-tier. Then, measuring with string, the different parts of the cloth were printed with geru or red dust in the *butivel* or flower pattern *hativel* or elephant pattern, *morvel* or peacock pattern, *popatvel* or parrot pattern and *zarmar* or border pattern. With his thumb and forefinger nails the dots of cloth that were to be left white were picked up tied and they then in a knot with double cotton upon them.. The cloth was then taken to the dyer. After all the process the threads that tied the knots were taken out and the cloths were drawn straight. This was not a big industry but many people were engaged in it during all the process. This occupation followed by generation to generation. Only workers were invited to dye work.

Hand Spinning of Wool:

Experiments in wool- weaving with final woollen yarn were continued at Dwarka. The hand-spinning wheels which were sent by The Maharani Saheb from Germany were demonstrated at Dwarka and they were found very useful in spinning wool. The people of Okha seemed willing to take up hand-spinning of wool but there was the difficulty of

getting any enterprising merchant who would be willing to carry on this trade by supplying raw wool.[53]

The Maharani Woollen Mills Ltd. produced 3, 74,712 lbs. of cloth valued at about Rs. 4, 46,000.[54]

The Maharani Woollen Mills Ltd. worked for about 6 months and then went into liquiation.The director of commerce to whom the papers were referred, states that the mill went into liquidation, though attempts were being made to receive them before the mills were closed, they sent, with other mills in India, a joint representation to the Government of India for the grant of protection.[55]

The Maharanai Woollen Mills went into liquidation was sold out and has restarted work under the name of Shree Dinesh Mills, Ltd.[56]

In the year 1938-39 Shree Dinesh Mills Ltd., continued to work. It produced 1,01,326 lbs. of woven cloth and 27,181 lbs. of yarn valued approximately at Rs. 1,26,607 and Rs. 19,058, respectively.[57]

In 1939-40, the mill was engaged in the execution of orders for war supplies and manufactured over one lakhs of blankets. The value of the output increased from Rs. 1.46 lakhs to Rs. 8.85 lakhs.[58]

In 1941-42, the mill manufactured 65,000 blankets and 2, 77,379 yards of cloth. The value of the output was Rs. 18 lakhs.[59]

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[53] BAR 1932-33, p-173
[54] File No. 233/9B dated 1-1-1935 p-57
[55] BAR 1933-34, p-168
[56] BAR 1938-39, p-194
[57] BAR 1939-40, p-128
[58] BAR 1941-42, p-164
[59] BAR 1942-43, p-139

In 1942-43 the mill manufactured 25,570 blankets and 2, 17,172 yards of cloth. The value of the output decreased from Rs. 18.25 lakhs.[60]

While in 1944-45 the mill manufactured 5 ¼ lakhs yards of cloth and blankets worth about Rs. 26 ½ lakhs.[61]

In 1946-47, the entire production of Shri Dinesh Mills Ltd. Baroda was appropriated against orders of the Government of India for war and civil purposes. The total production of the mill was 4.94 lakhs finished yards of woollen cloth, valued at about Rs. 24.70 lakhs.[62]

Village Industries:

In the State as a whole, nine persons out of ten were supported by simple village occupations. A peculiar feature of Indian rural life was the way in which each village is provided with a complete equipment of artisans and menials and until the recent introduction of western commodities, such as machine-made cloth, kerosene oil, umbrellas and the like; it was wholly self-supporting and independent. Most of the village occupations were hereditary. The potter's son becomes a potter, the barber's son, a barber, the shoe-maker's son, a shoe-maker and the like. The affairs of each functional caste are regulated, as pointed in the chapter on Catse, by its own panchayat. The village barber, porter, blacksmith, carpenter, washerman, purohit etc. each has his defined circle of customers (gharaks) within which he works and no one can attempt to deprive him of his customers without severe punishment at the hands of the caste panchayat. The duties and remuneration of each group were fixed by customs and the caste rules prohibit a man from entering into competition with another of the same caste. The method of payment

[60] BAR 1943-44, p-143
[61] BAR 1946-47, p-132
[62] Census of India 1911 Vol-XVI Baroda Part I Report pp 333-334

for professional services rendered by barbers, potters, etc. consists in their taking a recognised noon-day meal of bread and pulse and an anna and a half in cash. It was difficult to secure his services for less than a similar meal and four or five annas in cash. The condition of agricultural labourers of all kinds has consequently much improved within the decade.[63]

Fishing and hunting support only one person in a thousand in the whole State. 5 per mille in the Baroda City, 7 per mille in the Navsari District and 2 per mille in the Amreli District were maintained by fishing and hunting. In the Kadi and Baroda Districts there was no fishing and hunting industry worth the name.[64]

Mining Industry:

There was practically no mining industry in the State. Only 41 males and three females have returned "mines and metallic miners" as their occupation: and the majority of these (26 males) were in the Amreli District. In 1898 a Geological Survey of the State was made by Mr. R.B. Foote, of the Geological Survey of India. But the question of Economic Geology was not thoroughly investigated then with the result that the Baroda Government remained in ignorance as to the hidden resources of the State. A new Geological Survey was therefore conducted in 1909 from an economic point of view by obtaining a loan of the services of Mr. V.S. Sambashiv Iyer, an expert from the Mysore Government. The result of his investigations has just been published in a detailed report which deals principally with ceramic materials, materials for glass-making and cement.

Sub-class III is numerically the most important in the whole occupation scheme and goes to support 123 per thousand or nearly one-eighth of the total population. It comprises no

[63] Census of India 1911, Vol.-XVI Baroda Part I Report pp 333-334
[64] Census of India 1911 Vol. XCI G.H. Desai

less than 14 orders which are further sub-divided into 73 groups. The number per 1,000 supported by each of the main industries was noted in the margin, from which it will appear than textiles alone include more than one-fifth of the total population supported by all industries together. 86 per mille were supported by textile in Baroda City, 35 in the Amreli District, 59 in the Kadi District and 20 in the Baroda District. Textile fabrics and dress together supported 34 per mille in 1901.

48 per mille showing an increase of 14 per mille supported by those industries. The improvement was mainly due to impetus given to hand and power-loom weaving in the decade and there was a bright future for this old and important industry. The weaving industry of Navsari District was of ancient repute. Fine dhoti, sari, basta, and bafta made in Navsari and Gandevi were in great demand at the Portuguese, Dutch and English factories in Surat in the seventeenth and eighteenth centuries for export to Europe, and in 1788, Dr. Hove, a European traveller visited Gandevi, to learn the art from Parsi weavers. The industry pratically died out early in the nineteenth century, but Parsi women still manufacture quantities of kasti, the sacred thread worn by Parsi men and women, and were skilful in making ornamental borders of saris. In Baroda District, there was considerable weaving industry at Dabhoi where fine turbans are manufactured. Cloth, superior to the common coarse cloth of the lower classes,was produced at Petlad, Vaso and some other places. In the Kadi District, Patan, the old capital of Gujarat (from the 8th to the 14th century) was famous for its weaving industry. A great part of the grade was transplanted to Ahmedabad, when that place was chosen as the capital, but the decayed weaving community of Patan silk run out a superior quality of cloth which has a fair sale. Silks, however, were the specialty of Patan, and the silk patola of this town was largely in

demand in all parts of Gujarat. The rise of Ahmedabad diverted a part of the silk as well as the cotton weaving from Patan which had never flourished since.

Industries relating to hides, skins and hard materials from the animal kingdom support 16,032 persons or nearly 8 per mille of the population. The number of actual workers is only 5,760 males and 694 females; the rest were dependants. Most of these who were tanners, curriers and leather dressers belong to the Chamar caste and those who make trunks, scales, water-bags, etc., belong to the dabgar caste. Shoe-makers created separately "Industries of dress and the toilet". The tanning and curing work done by Chamars was the most primitive. For three or four weeks the skin was allowed to soak in lime-water till it is divested of hair. It is then saturated several times with a solution of baval (Acacia Arabica) bark. After being rubbed with salt and dried, the skin was handed over to the shoemaker who blackens it with hirakashi, sulphate of iron. The butcher tans the goat-skins in a different manner. To divest it of hair he places it in salt for a fortnight, then rubs lac into it to give it a red colour and finally soaks it in a solution of garmala (cassia fistula) to make it pliant. Hides and skins thus cured, and bones were exported in large quantities from all the districts and were again re-imported as finished articles. There was good scope for the establishment of leather, button and other industries on modern methods.

26,275 persons or nearly 13 per mille are supported by wood industries. This order includes sawyers, carpenters, turners and joiners and also basket-makers and other industries of woody materials, including leaves. The occupation of sawyers and carpenters mainly concerns buildings. A carpenter in this State was not only a house-builder, but also a plough-maker, furniture-maker and a carriage builder. Turners are

mostly of the Kharadi or Sanghadia caste, which employed the lathe in turning bed posts, children's cradles and the bracelets of blackwood or ivory worn by Hindu women. They are found in all towns but those of Patan, Vadnagar, Dabhoi and Navsari are well-known. The art of ornamental wood-carving was formerly very common and a few specimens of carving on the doors and verandahs of the houses were still to be seen in Vaso, Sojitra, Petlad and other places. Owing to consideration of cheapness, woodcarving in house construction is growing out of fashion.

Basket-making and other industries of woody materials, including leaves, support no less than 5,306 persons, of which 1,533 males and 1,632 are actual workers. This was one of the few industries in which female workers preponderate over males. Basket-making is the main occupation of Varisfodas and Buruds and the subsidiary occupation of untouchables (scavengers). There was a large industry in datan or tooth-sticks, which are made by cutting tender branches of babul trees and aval and lamboli shrubs and are used by most of the people in cleansing their teeth. Making of leaf-plates was also a flourishing industry. In all Hindu caste dinners, food was served in leaf-plates and leaf-cups made of palash, cad or makuda leaves.

Industries relating to metals include forging and rolling of iron and other metals, plough and agricultural implement makers, makers of arms, guns, etc., other workers in iron, workers in brass, copper and bell metal, workers in tin, zinc, lead and quicksilver and workers in mints and die-sinkers. Goldsmiths, jewel-setters, enamellers, etc., were classed separately under order 18 – Industries of luxury. The total population supported is 16,150 persons or 8 in 1,000. Of those, 6,405 males and 335 females were actual workers and the rest were dependants. There were no returns under groups 38 and 39, because

forging and rolling, etc., were not a separate industry but are included in groups 41, 42 and 43.

Food industries include rice-pounding and flour-grinding, bakers, biscuit-makers, grain-parchers, butchers, fish-curers, butter and ghee makers, makers of sugar and molasses, sweetmeat makers, brewers and distillers, toddy drawers and manufacturers of tobacco, opium and ganja. They together maintain 11,314 persons or about 6 per mille, of which 2,565 males and 277 females are workers and the rest were dependents. Food-stuffs were generally sold by those who manufacture them, who are supported by other manufacturer and trade. Of all industries connected with food, rice pounding and grinding are the most important and support nearly one-half of the persons returned under this Order. Golas are generally professional rice-pounders and musters but in most the families this work was done by the females in the houses. There were only a few bakers in the whole State, and they were confined to the City of Baroda. There were no consumers of readymade bread elsewhere. Grain-parchen mostly from Upper India and sweetmeat sellers, mostly Shrimali Vanias, were to be found in most of the towns and together support 1,848 persons. In the whole State, there are only 683 males and 42 females who work as butchers. Fish-curers had not been returned separately from fish-dealers. The small number of butchers and fish-dealers were limited extent to which meat-eating enters into the diet of the people. Even those who are not precluded from eating it by religions scruples, cannot afford it owing to poverty. There were only 132 brewers and distillers who were confined to the city of Baroda, where the State Central Distillery was situated and only 884 toddy drawers, who were confined to the Navsari District, where juice yielding palms grow. Makers of molasses and gur were generally those who grow sugar

plantations and they had been returned as agriculturists, no more than 3 persons have been returned under this head in the order. Sugarcane is largely grown in the Navsari and Gandvi talukas of the Navsari District, and Kodinar and some other parts of the Amreli District. The sugarcane mill or koholu was of the same primitive construction as the oil pressing ghani, it was composed of two cylinders of wood which revolve in opposite directions but in close proximity. The cane introduced between the two was drawn in, crushed and cast out. The juice collected in an earthen vessel below was removed to a boiler close by and converted in molasses. Iron roller mills for crushing sugarcane had come into use in Amreli.

Ghee and butter was made by females of agriculturists and herdsmen, as a subsidiary occupation. Manufacture of tobacco, opium and ganja was retained as supporting 1,328 persons only. The growers of these special products were included under agriculture and their sellers, who with then dependants number 17,814, under trade. Opium manufacture was confined to the Government factory at Sidhpur, while tobacco manufacture consists mainly in making snuff. In every large town, snuff is manufactured, but the snuff of Petlad, Vadnagar and Kadi is considered the best and is largely exported. Manufacturing tobacco into cigars and cigarettes was capable of becoming a very paying industry in the Petlad taluka where the Paddas prepared at present fetch only 4 or 5 rupees per mound.

Furniture industries support only 142 persons mainly in Baroda and Navsari. Furniture was generally made by those who sell it, a total of 665 who were supported by making and selling furniture. Very little furniture was used by the people in this country and a few tables, chairs and cots of the most ordinary kind, as was required, were made by the common carpenters. Under the patronage of Sayajirao Gaekwad III, factory had lately

beets started in Baroda and was likely to both create and supply a demand in artistic furniture.

12,931 persons or 6 per mille are supported by building industries, such as line-burners, masons and bricklayers, building contractors, house-painters, tilers, etc. Carpenters and sawyers are classed separately. The number of actual worker in building industries was 5,593 and 7,388 are dependants. The number of actual workers and dependants was probably much larger than returned under this order. Most of the Kadias or bricklayers belong to the Kachhia, Sathawara, Koli, Kanbi and other castes, and as they continue agriculture with the occupation, they must have retained agriculture as their principal occupation. The art of sculpture was once very flourishing in the State. Splendid specimens of stone carving still exist in different parts of the State which prove how great was once the excellence attained in this direction. In the Baroda District, Dabhoi stands prominent with its side gates, the Diamond gate and the temple adjoining it. Base-reliefs, and figures of superior workmanship found in Padra, Sinore and Petlad. The Kadi District was naturally the richest in such remains of ancient skill in sculpture and architecture. The artistic riches of Patan, Sidhpur, Modhera and many other places, which still survive the bigotry of the Musalman invaders, may some day yet serve to excite the emulation of the people. Though the decay of the art has been enormous, the stone masons of the State, especially those from Patan, Visnagar and Vadnagar, were in good repute and find employment in Bombay, Ahmedabad and other centres of industry. Throughout the State, those who were able to afford were replacing structures of mud and other less durable materials by houses of brick and the building industry were apparently very thriving.

Industries of luxury include (1) printing, engravers and litho-graphers, who number 337 and support 624 persons, (2) newspaper managers and editors who with their dependants number only 22, (3) 27 book-binders, (4) 21 musical instrument makers, (5) 148 watch and clock makers, (6) 13 bangle makers, (7) 441 supported by kite and toy making and (8) 10,158 persons supported by workers in precious stones and metals. The last group was the most important and includes Sonis (goldsmiths), who were to be found in most of the villages, Jadias (tracers of designs on ornaments) and Parichigars (precious stone setters), who were to be found in most of the towns. Females in this country were very found of ornaments. Whatever their position in life may be, they must have some ornaments of gold or silver for the adornment of their body. Some ornaments had come to be regarded as symbolical of married life and must always be worn by a female whose husband had been alive. The goldsmiths have, therefore, a thriving business. They have a bad name in Gujarat for filching gold and for mixing metal. The saying was "A goldsmith steals gold even out of his sister's ornaments."

Industries concerned with refuse matter include sweepers, scavengers and dust and sweeping contractors. They support 19,590 persons or nearly 10 per mills of which 56 per cent (7,337 males and 8,671 females) are workers and 8,582 of 54 per cent dependants. Most of the sweepers engaged in refuse matter are Government of Municipal servants and receive as pay from 2 to 4 rupees a month. This income is supplemented by grain or food allowance from private people near whose houses they work and who were looked upon by them as their customers.[65]

[65] M.H. Shah Op. Cit., p-133

Tanning:

Leather Industry:

The tanning materials found in the forests were collected .These on which sufficient work was not done in India. It was being sent to experts in England to test their tanning values and possibilities of making extracts from them.

The important centers of tanning in the state were Tarvada, Patan, Mehsana, Visnagar and Dabhoi. The Sarvodaya mandir at Tarvada which aims at developing tanning and production of leather article on a cottage industries scale was the most important centre of leather industry. The industry was making good progress and full advantage was taken of the facilities afforded by the state for imparting training technique.[66]

A tanning demonstrator was employed in December 1931 and was deputed to Amreli where improved processes of tanning were demonstrated to the chamars. The class was transferred to Padra in April 1932 and thence to Kadi in July 1932.[67]

In1932-33, demonstrator taught improved tanning at Kadi and Vijapur. The chamars of Kadi were interested in improved methods of dyeing leather and tanning.[68]

Improved methods of tanning were demonstrated at Ladol (Vijapur taluka) to the chamars. Besides tanning raw hides by improved method, they were shown the process of improving their half-tanned leathers and thus securing a higher price for them. The chamars constructed pits of their own at a cost of Rs. 30 each, supplied raw materials and tanned about 500 hides. They are also preparing champals from their own leather.[69]

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[66] 1932-33 p-177
[67] 1935-36, p-196
[68] BAR 1935-36, p-189
[69] BAR 1938-39, p-178

Chrome tanning had been started along with the bank tanning work at the tanning class at Patan.[70]

In 1935-36, improved methods in bark tanning were demonstrated to the chamars of Gozaria, Vijapur and Patan. The chamars erected pits and purchased tanning implements for which they were given small loans in all.8 of Gazaria, Vjapur were given loans of Rs. 100 and 200 each respectively without interest and on installed basis for buying raw materials.[71]

The Visnagar centre conducted by the All India Spinners' Association as well as the centre at Chalala continued their work.[72]

During the year 1938-39 improved methods in bark tanning were demonstrated to the chamars of Patan, Chanasma, Ranuj, Jitoda, Manud and Ramol. Besides tanning raw hides by improved methods, they were showed the process of improving their half tanned leather to secure high prices. The chamars erected pits and purchased tanning implements for which they were given small loans.[73]

During the year 1939-40 improved methods were demonstrated to chamars of twelve different centres of the State. A new class was started at Ladol for training chamars in the preparation of ordinary leather articles. Eighteen chamars were trained in the class.[74]

Lacquer Work:

Government had sanctioned the opening of a demonstration class at the Kalabhavan to promote the lacquer work industry. A trained artisan from Sankheda had been employed who trained recruits in improved methods.

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[70] BAR 1938-39, p-199
[71] BAR 1938-39, p-199
[72] BAR 1939-40, p-132
[73] Page No. 133-134, M.H. Shah
[74] BAR 1924-25, p-197

In 1930-31, this class was transferred to the old Pedhi building in the city from the Kalabhavan and demonstrations were given on a lathe work by electricity. Useful articles were being prepared against orders and candidates were trained in this works. It discontinued from the end of February 1932. Again it opened at Kalabhavan in Baroda from 5/3/1937 and woodturning and lacquering were taught to Kharads and other students. Articles of different shapes, colours and designs were manufactured and order from public was encented. Small toys were prepared on work machines.

Mr. M.H. Kharadi, the demonstrator for wood tanning and lacquering was sent to Lahore to the Mayo school of Arts for training for five months.

The Lacquer Work of Sankheda:

The artisans of Sankheda were very proud of their centuries -old legendary talent. The unique art of Sankheda which uses paint and lacquer on wood to fashion exquisite pieces of furniture as well as other ornate objects. The carpenter had kept up with the age of automation as far as some of their tools were concern but not at the cost of compromising on the inherent quality of the art the wood used was teak wood and the brush used was made of hair from a squirrel's tail.

The lacquer work articles produced in Sankheda had this advantage over other handicraft productions, that their individuality could not be overshadowed by foreign or machine-made substitutes. The industry thus had better hopes of surviving than other cottage industries. The articles produced were moreover peculiarly suited to the local demand, e.g., cradle-stands, four-legged stools for worship, costs, swingoots, continued before the War, but the increase in prices which the artisans were forced to make during that event, and the subsequent depression which tempted the usual buyers of these articles to go in

for cheaper foreign substitutes, drove many a worker out of this craft into workers – supported nearly 30 families with about 150 persons, now there are only 4 families with 20 persons engaged in this work. The Department of Industries has come to the rescue of this craft in several ways such as:-

(i) By giving publicity to the articles in exhibitions by arrangements of sales, catalogues, etc.,

(ii) By securing orders for them,

(iii) By suggesting improvements in design to suit changing tastes,

e.g., varying the old colours, and instructing them to make things more likely to appeal to modern demand-things like electric lamp stands, flowerpots, hat stands, chess boards, paperweights, pin-cushions, etc. and

(iv) By opening a class to teach better methods.

The buying public however does not show the old interest, and even the articles of orthodox demand are outrivaled by competitive production in other places.

Cloth Dyeing and Printing by Bhavsars and Chhipas:

This industry appears almost uniformly all over the State, but notable centres were Padra, Bahadapur, Sinor, Vadnagar, Kathor, Gandevi and Amreli. The Bhavsars and Chhipas and some Muslim Galiars who do similar work had certain stock types of printed and dyed cloth such as chhidris, skirt cloth and quilt covers, and they seldom attempt any new enterprise in other directions. They bulk more largely in Padra, Gandevi and Amreli than the other centers. As in other industries, cheaper and better machine printed substitutes had been the ruin of this one too. Only the villages where custom dies hard, the good old Bhavsar prints were still patronised. There was no incentive to artistic work

as the machine cannot be outdone at any price and consequently quality and quantity of these people's work has declined. The dyeing materials formerly used were indigo, kasumbi, and kasilo for blue, red and black colours respectively. Foreign synthetic dyes had long displaced these native ingredients. With a view to improve the lot of these people, the Department of Industries had engaged a demonstrator to teach them methods of cheap and easy dyeing. Six scholarships were given to sons of Bhavsars to learn new methods and it was hoped that such learners will make due use of their knowledge in their traditional occupation.

Poultry:

This activity was carried on under the supervision of the agriculture department. The scheme had been in operation since 1937 and a special officer was in charge.

To popularise and spread this industry, poultry development centres have been organised in the state. These centres may be divided into two groups:-

(1) Those managed by Government.

(2) Those managed by the poultry farmers.

In all there were 24 such centres, 16 being managed by poultry farmers. Every poultry farmer was given a subsidy of Rs. 200/- for implements and purchase of breeding cocks. During the year 1940-41, 3000 eggs and 126 breeding cocks were distributed in different villages by these poultry farmers. Each poultry farmer reared nearly 100 birds during the year.

Besides the farms developed by the poultry farmers there are departmental farms which issued during the year 163 cocks and 1510 eggs for hatching. A central poultry farm has

also been developed to supply pure bred birds to the chicken farmers and the public when required.[75]

Dairy:

Dairy was the most important industry connected with agriculture. Almost every cultivator keeps one or two buffaloes and the rabaris and bharvad or professional cattle-breeders keep large herds of cows, goats and sheep. The milk is useful for the daily use and for manufacturing of ghee which was sold to local dealers. Baroda state was also a agricultural state. The people in the State realized the necessity of providing pure milk and with that view two companies had been promoted. The Government started the Palace Dairy Farm at Makarpura. This institution had been transferred for supervision purposes to the department of commerce from 1st July 1925. The pasteurizing plant had been installed. The proposals for fixing rations for the improving the cattle in the state.[76]

Brick Factory:

To meet the growing needs of the Public Works Department a Brick factory was started in the year 1890 at a cost of Rs. 24,722. Provision was made in it for the manufacture of Mangalore tiles, earthenware, pipes and jars, and the necessary machinery was purchased. For some time, experiments were made in the manufacture of the other articles mentioned besides the regular manufacture of bricks. But none of the experiments proved successful. In the year, 1907, the factory was sold to a local P.W. contractor for Rs. 16,699 on the condition that he supplied the P.W. Department a certain number of bricks at a special rate. It was now working successfully and besides bricks, it was

[75] BAR 1945-46, p-133
[76] BAR 1947-48, p-141

manufacturing Mangalore tiles. Experiments were also being made in the manufacture of jars and earthenware pipes.

Glue Making:

In India glue was manufactured in Punjab and in Mysore state on a cottage industry scale. However, probably there was not a single glue factory in the whole of India. Moreover glue produced in India was of an inferior quality and for superior quality of glue. We have to depend upon foreign sources.

Baroda state had undertaken an experiment in glue manufacture in the state. A glue expert had been appointed and the experiments were carried out in the Diamond Jubilee Cottage Industries Institute Baroda.

The material used in manufacture of glue are sheep head, skins from butchers, raw bones etc. In the experiments conducted in Baroda, fleshing from the local tannery are used. The process of glue making can be classified into four parts. Preliminary treatment, extraction of glue, evaporation of glue liquor, setting and drying of glue. It had been calculated that on an investment of Rs. 700, it was possible to produce one maund of glue daily and thus to earn a daily profit of about Rs. 6.

Flour Mills:

-Bansidhar Flour Mills Ltd.,Baroda,installed their plants for rava- menda etc,near Baroda station.Construction of a similar factory at Mehsana was started by Ramakrishna Flour Mills.[77]

Kohinoor Grain Mills Construction of a scientific mill was under constructionand on completion It was the best mill in Western India.[78]

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[77] BAR 1941-42, p-166
[78] BAR 1932-33, p-175

Forest Industries:

To encourage manufacture of bobbins the bobbin factory in Navsari was granted permission to take soft wood Haldvan,.Kalam etc., at concession rates for three years from the State forests as import of foreign timber had stopped.[79]

Match Factory:

Forest wood in the manufacturing veneer and splints for matches was successfully demonstrated in 1924. A party had started a match factory named the Maharaja Match Works Baroda, in Baroda the Datar match factory at Petlad and the Anant Match Mfg. Co.,Ltd ., at Bilimora. In 1933 these factories had remained closed from April 1934 owing to the uncertainty created by impossible of the excise duty on the production of matches for small period .During 1935-36 these factories were working .The following table shows the quantity of matches produced and sold during the years in the Maharaja Match Box Baroda.

year	Balance at the beginning of the year	Quantity produced in gross boxes	Quantity sold in gross boxes	Balance at the end of the year in the gross boxes
1931-32	.....	1,600	1,300	.....
1932-33	.....	95,756	86,479	.....
1933-34	18,579	67,078	80,607	5,050
1934-35	.....	.....	.....	.....
1935-36	11,900	39,950	49,900	1,950

Source: BAR 1931-32 to 1935-36

In the above table it shows that the quantity produced was increasing. In 1934up to the end of the year this factory remained closed .When it started again the quantity of the production was increased and quantity sold was also increasing.

[79] BAR 1908-09, p-72

The Datar Match Factory, Petlad:

In 1931-32 the factory produced 16,196 and sold 15,310. Next year production was 6, 66,200.The factory remain closed from April 1934 up to the end of the year. The balance grosses 47,150 produced 5, 69,970 and sold 6, 17,120. During 1935-36 the balance 94,610 quantity produced 5, 44,432 and quantity sold in gross boxes 5, 67,702 and balance at the year in gross boxes was 71,430. In 1938-39 balance was 59,154 produced gross 6, 40,176 and sold gross 6, 73,241. The balance at the end of the year was 26, 080. In 1939-40 it produced 5, 97,448 gross match boxes. It produced 3, 68,658 gross match. in 1941-42. It produced 1, 71,222 gross matches in 1942-43., 2, 41,319 in 1943-44. In 1946-47 2, 48,541gross matches during the year as against 2, 24,267 in the preceding year. The excise duty collected on this amounted to 4.02 lakhs in 1947-48 it produced 2, 26,821 and the excise duty collected amounted to rupees 5.04 lakhs.

China Clay:

Deposites of China clay had been found on the bank of the Sabarmati river about a mile to South-East of the village Ransipur, Vijapur Taluka, Kadi district. It was experimented upon for use in the Bombay Mills and also for the manufacture of porcelain.

Messers Sarab Dalal & Co. had been permitted to work at the Ransipur china-clay mines as sanctioned by Government. During 1933-34 the company had commenced work.
In 1941-42 it refined 910 tons.

Year	Refined (Tons)	Royalty (Rs.)
1938	876	1754
1939	1413	3162
1940	840	2522
1941	910	2731
1942	932	2798
1943	440	2000
1944	------	------
1945	-------	------
1946	757	2270
1947	445	2000

Source: BAR 1938 to 1943, 1946 to 1947.

The above table shows in 1939 the china clay refined increased but next few years it decreased.

The China clay factory was also organised by private individuals in Baroda city for manufacturing China clay articles. The Government sanctioned a loan of Rs. 50,000 for the purpose.

Porcelain:

A family found a large quantity of white china clay (kaolin) near Ransipur under Vijapur. It was experimented upon for use in the Bombay Mills and also for the manufacture of Porcelain.

Messers Sorab Dalal Co. have been permitted to work at the Ransipur china-clay mines as sanctioned by Government. The draft lease was ready by the end of the year.[80] The China clay works at Ransipur refined 1,413 tons as compared with 876 tons in 1938-39. The royalty recovered amounted to Rs. 3,162 as against Rs. 1,754 in the previous year. [77.1] The China Clay Works at Ransipur refined China clay 440 tons of china clay paid a

[80] BAR 1941-42, p-164

royalty of Rs. 2,000.[81] 910 tons of china clay and paid a royalty of Rs. 2,731 in 1941-42.[82]

The Baroda Potteries Ltd., Baroda, produced Refectories such as fire bricks, cupola bricks, ingot pouring wets etc. Their construction work has not yet been completed and as such only their Refractory section is working at present.[83]

The Patan Pottery:

According to R. Bruce Foote, "the polished and glazed ware manufactured at Patan, some of it of quaint and grotesque shapes".[84]

That was very imperfectly fired and breaks readily in consequence, all were made or moulded. The glaze was very badly applied to the figures or vessels treated to it, as in many cases large patches of unglazed surface remained and offended the eye greatly. The specimens of ware such as bowls, plates, saucers, gogles, pipe bowls and water chamber etc.[85]

Vegetable Products:

There were two industries in the Baroda State, which manufactured refined oils vegetables ghee and washing soaps.

1. Messers Ashwin Industries Ltd.
2. The lily oil industries Ltd.[86]

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[81] BAR 1939-40, p-129
[82] BAR 1947-48, p-140
[83] Foote Burce R. The Geology of Baroda State, p-138
[84] Ibid, p-138
[85] BAR 1947-48, p-141
[86] BAR 1947-48, p-138

Messers Ashwin Industries Ltd.:

Messers Ashwin Industries Ltd. established in 1944, and had carved out a niche for its marketing and distribution of Vansant and refined oils. Its manufacturing plants located at Samlaya (Vadodara) and its office located at Premier Chambers near Railway Station, Alkapuri (Vadodara). It manufactured Refined Oil such as cotton seed oil, sunflower oil, soyabean oil, maize oil and coconut oil. Ashwin was among the pioneers in the manufacturing distribution of Hydrogenated vegetable oils popularly known as Vanaspati. This humble beginning had a deeper insight in the minds of promoters.

Primarily it was positioned as an affordable alternative to ghee for the common man but without compromising in quality sincerely efforts and clear perspective of promoters were coupled with dynamism, experience and enthusiasm of a highly ambitions and spirited team.

Oils and Soaps:

The importance of oil industry increased in Gujarat. Some oil mills started in the state government ordered to open class for the study of oils and soaps. In 1919, Government sanctioned necessary funds for the purpose.[87]

The local oil mills obtained export licenses of local oil mills obtained export licenses of different varieties of oils from the central government. Messers.Vithal Oil Mill and Narayan Oil Mill exported ground nut oil to Czechoslovakia, Italy, Switzerland, Finland, Burma, Malasiya etc.[88]

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[87] BAR 1947-48, p-138
[88] Nanavati M.B., p-21

In 1910, an American export was engaged to investigate the possibilities of oil industry and the manufacture of soap and other products.[89]

In 1934, the following oil mills and factories in the state which came under the Indian factories Act:

1. The Kadaji Ganuji oil mills (Dabhoi)
2. The Kadi Gining and oil Factory (Kadi)
3. The new Gining and oil Factory (Harij)
4. The Unja oil mill(Billimora)[90]

Metal Work of Visnagar:

The fame of Visnagar metal ware (particularly brass and copper vessels) was of a long standing and once the name was a virtual hall-mark of quality in distant markets. Machine production has given the usual set back to this industry as to all others. However certain articles yet continue to command a sale because of their sound quality: the joint-soldering work of this place is particularly celebrated. There are still about 75 families engaged in this work. Though the competition of machine-made goods renders the making of goods of utility uneconomic, artistic production has yet a definite though small market. The superiority of handicraft in this respect is not likely to be discounted by even the best manufactured products, and Visnagar artisans have a better hope in this line. The most notable work is of Mistry Raghunath Tribhovandas who specialises in highly artistic articles of furniture of carved wood covered with brass or copper sheets, brass inlaid work, brass and silver worked stools for Jain shrines and various ornamental and costly pieces of metal-sheeted furniture for palaces and royal households. His work is

[89] File No. 242/5 Huzur Cutchery, 5th September 1934
[90] BAR 1935-36, p-190

universally appreciated and patronised by Europeans, and other tourists. Others are also working in this direction. The only help the Department of Industries gives to these artisans is publicity to their products.

A Metal Work Class:

A metal work class was started at Baroda in June 1935. 14 students were admitted and trained in moulding, casting, filing, etc. Articles like pen-racks, paper weights, badges, were manufactured in the class.[91]

A metal work class was started at Baroda in June 1938. 18 students were admitted and trained in molding, casting, filing, etc. Articles like pen racks, paper weights, badges, chapras, etc., were manufactured in the class.[92]

The Sayaji Metal Works Company:

This company was organised some years before but in 1911 it was commenced work and brass utensils were being manufactured. In 1939-40, it manufactures agricultural implements cast iron articles, machines for road building and bleaching machines for textile mills.

The Jyoti Ltd. was established in 1943.It began originally as the engineering section of the Alembic Chemical Works. It began as a separate unit with a gross block of about Rs. 6 lakhs soon had its impact in the field of engineering. It decided to apply itself solely to the development of hydraulic machines pumps and electric motors.[93]

In 1947-48 Company manufacture different types of machines like centrifugal and bore hole pumps, pumps, chemical plants, filter presses, blowers, burners and electric motors.

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[91] BAR 1938-39, p-198
[92] BAR 1938-39, p-198
[93] Gazetter of India, Gujarat's Role Vadodara district Adm. 1979, p-319

Among the new machinery the most important installed was the Gestalt Balancing machine.

The Vasant Engineering Works, Baroda manufactured textile machinery spare parts universal milling machine ,iron lathes, solar type oil expeller ,textile dyeing and bleaching plants and cloth printing machines.[94]

Fisheries:

In the year 1903, Maharaja visited Dwarka in December, he was informed that real pearl shells were occasionally found in the creek near Beyt.[95] In the year 1905, Government borrowed the services of Mr. James Hornell Marine Zoologist to the Government of Ceylon and Inspector of Pearl Banks Cyclon.[96] He visited the Okhamandal Coast and submitted his report in the year 1909. He had made several useful suggestions for the development of the Okha fisheries. In order to gave some practical effect to these he was consulted Sir Frederick Nicholson, the Director of Fisheries Madras Government undertook to train two of men in his Department. Two science graduates were selected and were receiving instruction, one in pearl and edible oyster culture and the other in fish curing canning and allied subjects. Mr. Gupte was sent out to investigate the sea-coast of the state.[97] Mr. Hornell visited Okha and Kodinar in December and submitted his report embodying his suggestions and programmes both for Okhamandal and Kodinar. In 1917-18, one fishery station in Okhamandal was established.. The assistant at Kodinar was sent to Bangalore to work on the distillation of wood in the Tata Research Laboratory.[98]

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[94] BAR 1947-48, p-141
[95] Nanavati M..B.p-21
[96] Ibid
[97] BAR 1914-15 p169
[98] BAR 1917-18, p-152

The Okha fishery was in charge of Mr. S.R. Gupte, Balapur harbour and Kiu were selected for the cultivation of window pane oysters. A little over 85,000 immature oysters were relaid during the year; as most of these appeared to have grown and thriven, the transplantation will now be undertaken on a much larger scale than was hitherto done as an experimental measure.[99]

The inspection of the west coast of Okha was undertaken with a view to locate new chank-beds south of Katchhigad. Except at Madhi, Baradia and Katehhigad, the ground does not seem to be suitable. The method so long adopted was to pick up the oysters when the tide receded. There were two experimental stations in the State during the year under report: one at Velan in Kodinar, and the other in teh Okhamandal Taluka of the Amreli District. The Velan Experimental Station at Kodinar, in charge of Mr. Kaikhusro R. Dotivals, was started with a view to test new nets and scientific methods of preserving fish, demonstrate the process. The experiments were highly successful as the fish cured in the Government yard was far superior to the fish cured by old methods as evidenced by the considerably higher prices (in some case by more than twenty-five, fifty and hundred per cent) realised for the fish of the station. Pura, a valuable fish, which is caught in great quantities at Madhwar was cured by the fishermen for manure only.

Kotda creek near the Velan Bunder was deepened and improved so that small fishing vessels may come there and conduct fishing. Concessions in Jakat, Mori dues, etc., were also announced. The Okha Fisheries were in charge of Mr. S.R. Gupte, the other Assistant, who conducted the investigation in the Gulf of Cutch. With the assistance from Mr. Hornell, the Marine Biologist, Madras, Department of Fishery, five divers were

[99] BAR 1917-18, p-153

secured from Tuticorin.[100] The Okhamandal Experimental Station alone was maintained the work falls under the following heads:-

(i) In the absence of any bidders it was decided by Government to conduct the window pane pearl oysters departmentally under Mr. S.R. Gupte. However, at the last moment, a Hindu gentleman from Okha came forward and a contract for fishing oysters and chanks was given to him. Upto this time, only the Mahomedan merchants had taken such contracts. The Hindu Contractor being new to the business, the services of the Fishery Officer were lent to him for the location of the beds and for showing the best methods of fishing and the disposal of pearls and chanks.

(ii) Inspection of chank beds: Inspection of the foreshore from Kachhigad to Dhrewar was conducted as in 1918-19 year. In the year under report, the coast from Dhrewar to Kuranga – 12 miles was finished. This completed the inspection of the coast line of Okha. Except near Kachhigad, Bhuvadro and Borekado, no chanks were found. The whole coast was found to be rocky and had a small wave action which was quite dangerous to this species of molluse.

(iii) Current determination: This inquiry was being conducted since 1919. It was undertaken with the object of determining the movement of spat of the window-pane pearl oysters. The inquiry was not finished.

(iv) Transportation of Window-pane Oysters: Owing to severe cold in the winter, transportation of window-pane oysters was carried on only on a moderate scale. During the year under report, about 320,000 oysters were transplanted from Nagara, to the old beds of Balapur, but most of them to the new beds of Gopi and Rajpura. The oysters were thriving and were showing healthy growth. The spawning season has now been well

[100] BAR 1916-17, p-140

determined. It confined to the months of October and November and rarely extended to December.

(v) Velan Fishery: Though the Velan station was not opened the lessons learned from two years' experiments were further investigated by Mr. Dotivala. Large quantities of Pamphlet were fished by the Gujarat and Diu Fishers every year. This was a very valuable fish and was well capable of being canned. The possibilities of this industry were fully inquired into and a report on the possibilities of the Industry was prepared. The estimates of capital and revenue accounts indicated that a very profitable industry could be started. Inquiries were being made to persuade capitalists to take up the industry. The State was ready to give all the facilities in its development and place all the expert advice at the disposal of a promoter.

(vi) Buttons from Okha shells: Most of the important species of Okha shells were examined by an expert who gave his opinion that some of them were capable of being worked for buttons. The samples made indicated a good quality of buttons. On the estimates of quantity available in Okha of those shells supplied by Mr. Gupte, the expert gave a full report on the capital outlay and the cost of running a small button factor which showed that a small but profitable industry could be established. The Department was negotiating with some Okha residents to take up the industry.

As a result of the fish canning experiments carried on by this Department at Velan, an application was received last year for co-operation with Government in the further investigation of the industry and for taking it up if it was found successful. During 1922-23 year the proposals of the Department were sanctioned and order for a can-seaming

machine was put with an American manufacturing firm. Further investigations and experiments were to be carried on in the next fishing season by Mr. Dotiwala.[101]

Fish Culture in and Around Kosamba:

Among subsidiary village industries, the popularization of which among the 'kheduts' was certain to bring about 'happier rural condition in fish-culture. The paramount demand by agriculture of every available water source coupled with general scarcity of water naturally reduces 'fish-culture' to a minor position. Wells, ponds, tanks. Streams etc., which were suitable for the cultivation of fish as an adjunct to agriculture.

Three types of tanks are noticeable; (1) those which maintain a permanent connection with running water (2) those which hold water right through the year or dry up during the hot weather and (3) those which were independent and by themselves, having no such connection whatsoever. It is difficult to find a village without a tank or pond in tanks etc with perennial waters; almost all of them hold water from 5 to 8 months of the year the length of the priory depending on the quantity of the season's rainfall.[102]

Pond culture whereby under proper supervision selected fish, local or foreign, can be made to pay the owners for their exertions, A good quantity of fish food would be raised from the waters which at present are not only practically wasted but remain a positive menace as mosquito breeding places. 1acre of suitable water area, it is computed, will easily produce 1000 lbs. of fish annually.[103]

Pisciculture, according to the dictionary is 'the rearing of fish by artificial methods.' It consists chiefly of stocking or farming in ponds, tanks, rivers etc and in running hatcheries. The methods may be positive, as in increasing the chances of fertilization of

[101] BAR 1922-23, p-207
[102] Moses S.T Fsh-culture p-1
[103] Ibid p-2

the eggs which in nature is purely accidental or merely preventing the enormous mortality among the young fry or providing facilities for living in tanks, ponds etc.,Where not only abundant food is available but also freedom from natural enemies like predaceous fish, frogs or birds. Fish culture thus consists of firstly protecting of the introduced fish from predaceous varieties which have therefore to be removed from the waters to be stocked as a preliminary, secondly maintenance of sufficient and regular supply of food and thirdly proper provision of breeding facilities to enable fish to grow not only in size but in number. The object of fish culture is mainly increase of food supply whatever the general feeling towards fish is available. Among the people in the villages under the jurisdiction of the Kosamba Rural Reconstruction Centre, are Muslims, Rajputs, Dublas and Harijans who freely use fish.[104]

Patient research and experiments have renders fish culture a success and naturally the modern methods are very elaborate and scientific. The experience of the Madras Fisheries department, which has achieved great success in pisciculture is handy for us to benefit by Bihar and now nearer home, Bombay had also started pisciculture. Time and again, Modern research has proved the fallacy of the general belief that a pond can be filled with any kind of fish and left to take care of itself, that was not productive fish culture and this needs intelligent care and some attention. Even without exceptional skill extraordinary knowledge or a large investment, the cultivation of fish, indigenous or exotic in natural or artificial pond of limited area is perfectly feasible. Attention to simple principles and careful management will bring in profits and assure the industry of great commercial development. Even a small but comfortable private house can be made to yield a small but reasonable supply of fish for the owner which will more than repay the

[104] Ibid p-2

time, trouble and money spent, Like kitchen garden it would serve at a pinch to meet the demands of the housewife faced with the problem of dinner for unexpected guests who arrive at untimely hours. Once the particular species for stocking a particular pond is decided upon, the collection of fish if locally available is the first step. Such a collection in the interest of economy should be done as far as possible from adjoining lakes or rivers where the fish breed. In the case of larvicidal fish, catching them in one pond etc. and transferring them to another in the same malarial locality was not advisable since the result will only be that both the ponds will be deprived of sufficient numbers of fish. Intensive surveys carried out during successive seasons may be necessary to locate accurately every breeding and fry collecting ground but in a general way, the local fisherman , professional or otherwise can indicate such grounds and so once the services of such a man are secured the fry and fingerlings are easily found .The trouble, however, is the fact that the fisherman is ignorant of scientific methods and so we or the pond keeper must personally attend to the selection of the right kind of fish. The fisherman was also expert enough to know to distinguish fish even in their young stages; but they are notoriously careless and will disregard instruction which to their mind are useless or superfluous. We should insist on securing exclusively the fry of the only kind of fish decided upon. Otherwise many ubiquitous and obnoxious fish e.g. the Murrel ,the Wallago(Choat, padi) the Goby (Bobhwa, kadapa)will be allowed accidentally and two or more of these destructive fish are enough to ruin our experiments, These were sedulously excluded and only the required kind collected.[105]

An acknowledged principle among pisciculturists was that fish immediately after capture were unfit to travel except very short distances .The transport of fish had to be done in

[105] Ibid, p-3

some portable vessel chatties or special carriers, and the fish unaccustomed to restricted space are apt to dash about and injure themselves. After long journeys and when damages are suspected, it was desirable to give the fish a salt bath before transferring them to their ponds and this would streilise any injuries received and also prevent the growth of fungus and consequent disease.

For transport chatty pots were in extensive use in our country. In the Kosamba area we found such chatties, with perforations on the top half in use in the kathore village on the Tapti. The chatty is good carrier as it keeps the water cool automatically by evaporation and prevents any sudden rise or fall in temperature. While an ideal carrier because of these essential characteristics, suffers from its liability to break easily. Chatty pots were therefore unsuitable for large scale transport over long distances.[106]

It was seen that Fish culture is feasible in the State; it was essential, in fact, in the interest of food supply, that serious work was started early, at least in the favorable localities. A recent enquiry into the fish supplies of Baroda City, conducted for a year, present supply is hopelessly inadequate. One way of tackling the problem of increasing the supply of freshwater fish to the City is to undertake the improvement of the fish stock in the ponds, reservoirs and rivers round about Baroda by the introduction of new forms of fish into such waters or restocking them. In other parts of the State, localities for Fishculture have to be chosen with caution as local sentiment has to be respected. But even in hostile areas where there may be objection even to departmental fishing for survey purposes, the objectors will be satisfied if fishcuture is solely directed towards keeping fish alive in wells etc to keep down the waterfleas which disseminate Guineaworm disease. But where people were interested, fish culture ought to be easy. In the Sayaji Sarowar where the

[106] Ibid p-4

fishing (angling) privilege seems restricted to Europeans who do so from the tower or in boats, stocking can be usefully done and in Sama, a village near Baroda Camp there were two small ponds very popular among Indian devotees of the rod, which was profitably stocked with quick growing fish. In the Sibbur-Timbi tank with its perennial water supply, where shooting and fishing were prohibited and the privilege reserved for the members of the Royal Family, good stock of game fish both local and no indigenous can be introduced. The many rivers which flow through the State all contain fish, though it was the Mahi alone which fetches some revenue to the State, a portion near Dabka being allowed to be fished on an annual lease. The stocking of river which will take time to yield results, can not however be done by our state alone for geographical reasons. River fish culture has to be a joint operation with the Bombay Fisheries. Kosamba area with its ponds and the Tapti river provides the ground where stocking experiments can be started. As the 'Open air' experiments begun in Kosamba progress and attract, the other areas can be thought of. Many of the villages in the Kosamba area visited Hathuran, Nani Naroli etc had an overwhelming Muslim population and even other like Kunvarda, pipodra etc welcomed the scheme. People at Motipardi where there are some wells intimated their readiness for fishculture in their wells on the Tapti and it easilycould be the centre of activities in the development of the Tapti fisheries. [107]

Chemical Works:

Concessions were finally granted to Mr. Jethalal of Damnagar for alkali and salt works at Dwarka and he was arranging to organize a joint stock concern to work the salt and lime deposits at Dwarka. A similar concession was granted to N.Purshottam and company for alkali works at Kodinar and company had organized a joint stock concern to start alkali

[107] Ibid, p-10

works at Velan in Kodinar where excellent materials for the industry were available. Through the instrumentality of this department the company –the Gaekwad oil and Chemical works appointed the Tata Engineering Company, Limited as their consulting engineers and the whole project was being worked out by them. Mr. Stanley Smith, the alkali expert, who had been consulted, was engaged by the engineers.

A factory to manufacture sulphuric and other acids started at Baroda by Messrs Kao and Company at Baroda.

Facilities had been given to Mr. Talwalkar of Bombay for a factory to manufacture solid extracts.[108]

The Modern Chemical Works Limited agreed to work throughout the year. They were in need of working capital which has been recently provided. The initial period of danger seems to be over and it was hoped that they would work successfully.

The alkali industries at Dwarka and Kodinar had not yet materialized and owing to the financial and technical difficulties involved it took yet a long time to establish these industries. The concession for the Dwarka alkali project was extended up to December 1924. The Kodinar alkali lease was under preparation.

Owing to unfavorable conditions, the concessions given for wood distillation were cancelled at the request of the party concerned but they are at liberty to apply again when conditions improve. [93]

Mr.Kapilram H .Vakil, who was granted concessions for the working of salt beds in the Okha mandal talukas, floated a joint –stock company ,the Okha Salt Works Limited with an authorized capital of Rs. 10,00,000 for the manufacture of salt and its bye-product. The company registered at Bombay under the Bombay joint stock companies Act. The

[108] BAR 1920-23, p-201

company was able to raise sufficient capital to proceed with the construction of the factory. The works are under construction and it is expected that salt will be manufactured by November of 1927.

The Tata chemical Ltd. started in 1939 with a paid –up capital of Rs.125 lakhs, made considerable progress. Production of heavy chemicals was expected to begin in October 1942. The manufacture of salt and its bye-products was continued, the production in the year being 8,159 tons.[109]

There are two other chemicals works:

Petlad Chemical Works and Baroda Chemicals Works. Both manufacture mainly sulphuric acids.[110]

The Alembic Chemicals Works Co. Ltd. manufactures pharmaceutical drugs, rectified spirit and spirituous products and fine chemicals. The government sanctioned to the company a grant to carry out semi- commercial experiments for the manufacture of alka-oxiods such as strychnine, caffeine etc.[111]

Both manufacture mainly sulphuric acid. A plant for the manufacture of sodium sulphite had been installed by the latter.

The Sarabhai Chemical Ltd., Baroda had started building operations and hope to start production as early as possible.

The National Chemical and Pharmaceutical Works at Navsari manufactured mainly medical and pharmaceutical products.

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[109] BAR 1941-42, p-164
[110] BAR 1939-40, p-128
[111] BAR 1939-40, p-128

The Hindustan Colour, Chemical & Mfg. Co. Ltd., Kathwada, ceased to manufacture starches for want of raw materials. They have installed art silk looms and starch dryer machine.

The Sanitex Chemical Industries Ltd. at Baroda produced pharmaceuticals, textile auxiliaries, chemicals, silicate and disinfectants etc.

The Alembic Chemical Works Co. Ltd., continued to manufacture a number of chemical and pharmaceutical products and managed to supply the needs of the public at large in spite of transport difficulties for movement of their raw materials and finished goods. During the year under review, they added several new preparations to their manufacturing list of the previous year as a result of experiments carried on in their chemical, biochemical and pharmaceutical laboratories. The research work on many other products which are likely to compete with foreign products was in progress.

The working capital of the company amounted to Rs. 68.13 lakhs as against Rs. 58.03 lakhs of the last year. The Research Laboratory is housed in the newly constructed building which is completely fitted on modern lines. The manufacturing of injections is transferred to the new building, where proper conditions for quality products have been established. Their post-war schemes include the installation of separate Caustic Soda Plant, Chlorine Plant, Sulphuric Acid Plant and Super Phosphate Plant. These machineries have arrived though they are still waiting for some of their parts. As soon as the plants were complete in their equipments, their production work on all these plants will be taken on hand.

Tata Chemical Ltd., Mithapur – The Tata Chemicals Ltd., Mithapur, was started in 1939, with a paid up capital of Rs. 125 lakhs. During the period under report, the company's

main plant viz. the soda ash plant which was restarted in October 1947, worked fairly satisfactorily and since March 1948, has been producing on an average about 52 tons of good quality Ash per day. The electrolyser Section for the production of heavy chemicals also worked satisfactorily throughout the period producing fair quantities of the products. During the year under report, they produced 73,201 tons of salt as against 58,340 tons in the previous year.

The Sarabhai Chemicals, Baroda, produced fine chemicals and other medical and pharmaceutical products during the year under report.

The Chemical Works at Petlad and the Star Chemicals, Baroda, manufactured mainly sulphuric acid.

The Vimso Chemicals Ltd., Navsari, manufactured methylated spirit, brandy and tinctures and the Baroda Chemical Industries Ltd., Dabhoi, manufactured spirituous and non-spirituous items, proprietary remedies and injections.

Alembic Chemical Works Company Ltd.:

Prof. T.K. Gajjar was the first great chemist of Bombay. He was a great scientist with a practical insight, deeply possessed by the patriotic desire to serve his country in the economic sphere by applying science to the promotion of industrial growth. He was the first principal of Kalabhavan. He was deservedly called by a British admirer "The father of technical education in the Bombay Presidency." Under his guidance and with monetary assistance, Mr. Kotibhaskar conceived the project of starting and developing a chemical industry of a novel type in India, based on the use of spirit, the manufacture of which was also to be necessary part of the project. From the beginning it was accepted that policy of the concern to manufacture these preparations from the spirit manufactured

by itself, but for this purpose larger quantities of spirit came to be in demand and a special factory for the manufacture of spirit alone was found necessary. The Government of Bombay did not seem to be inclined to grant any concessions, Baroda was a fit place for the location of the spirit factory. Mr. Kotibhaskar approached the Maharaja Gaekwad and Mr. Romesh Chandra Dutta and sought concessions from them for the starting of the factory. Accordingly a factory for the manufacture of spirit was soon launched into existence and established in Baroda in1905.

This factory at first started on a small scale and with slender equipment, was the nucleus out of which has grown the extensive enterprise and famed throughout the Alembic Chemical Works Company Ltd. The word 'Alembic' indicates that the works were principally started for the manufacture of spirit and its products.

The main objectives of the company as stated in the Memorandum of Association were as follows:-

1. To start factories and other undertaking so as to further the development of chemical and other industries of India.

2. To establish a well-equipped laboratory and carry on analytical, experimental and research work for promoting the interests of the factories and other undertakings.

3. To buy, sell, manufacture and deal in chemical spirit, medicines, essential oils, perfumes, Mahuva flower, drugs etc. and also in various kinds of scientific apparatus and appliances.

Messrs Kotibhaskrs, Amin and Co. whose initiative and enterprise had brought the industry into existence and who were mainly instrumental informing and organising the

limited company with a view to expand the business were appointed by the company its Managing Agents and Prof. Gujjar, Consulting Technical Director.

The first task of the company was to extend the factory and its operations and to equip it on the most modern lines. The foundation stone of the new factory building which was constructed at a cost of about Rs. 2 lakhs was laid by the hand of Prof. Gajjar's son Master Krishnalal. Another benefactor who gave his contribution was Mr. Manilal S. Parikh who was a banker from Nadiad. He co-operated with Mr. Tulsibhai and Mr. B.D. Amin.

Accordingly Prof. Kotibhaskar sailed for Europe in 1909 to purchase machinery and to get the necessary experience of distillery and pharmaceutical work in England and on the continent, French Distillery Plant worth about Rs. one lakh was purchased for the distillation of rectified spirit and also machinery for pharmaceutical purposes which were installed at purpose at a cost of nearly Rs. 2 lakhs. A research laboratory and a well-equipped library of scientific books so the company had spent Rs. 5000/- on the library and Rs. 35,000/- on the equipment of the laboratory again to extend the laboratory and spend a further sum of Rs. 50,000/- on its equipment and Rs. 20,000/- annually on its maintenance. The company had made many extensions and constructed a new building. Its operations and production grew in proportion. Excise restriction in British India especially those of the Bombay Government formed such a serious obstacle to the export of the company's spirituous production from Baroda State to other territories, of which much of the production remained on hand without any use. For the disposing of the excess production of spirit, the company was to go in for the state contract which was then open for the supply of the spirit to the Baroda Abkari Department. At last it was

decided by the State to have one contractor for manufacturing and supplying spirit for Baroda, Navasari and Kadi districts, authorising him to utilise for the time being the Baroda, Navsari and Vyara distilleries and to rent the Mehsanat Distilleries from the owner. New processes of manufacturing spirit were brought into use by the factory. The raw material out of which this spirit was distilled, was the well-known Mahuva flower. Mahuva is a large desiduous tree indigenous to many parts of India, plentiful in forests of the Central Provinces and in many parts of the Bombay Presidency, especially in Gujarat. For the manufacture of spirit, the flowers when dried were sold by the hill people at various rates and either to the village distillers or to the Banias by whom they were exported.

Fermentation in the pot still method was effected and proved harmful. The Mahuva flowers were soaked in cold water in a certain proportion with a small quantity of liquid refuse from previous distillation known as 'wash' and allowed to remain for six or seven days with occasional stirring. The wild yeast present on the Mahuva flowers fermented the sugar contained in them but the fermentation cannot be pure as along with wild yeast. Several other organisms exist in the Mahuva flower, producing other by- products such as Lactic acid, Acetic acid, Succinic acid, fusel oil etc. This process was defective. The Alembic Company introduced an improved method. According to this method, the sweet juice from the Mahuva flowers was extracted by Macerators and was then allowed to ferment in vats with the yeast prepared in company's laboratory. To ensure such a supply the Alembic Works started a special laboratory fully fitted up for the culture of pure yeast and for that the small specimens obtained from the Pasteur Institute of France, the Berlin Institute and Jorgensen's Institute at Copenhagen. For the distillation of spirit, the French

patent still, of which Maison Egrot, Paris were the manufacturer, was introduced into India for the first time by the Alembic Company. The factory was located in a place admeasuring about forty acres in area, within a distance of about a mile from the northwest side of the Baroda station.

In 1912, as regards the manufactures carried on in the factory potable spirit for supply to the State under the contract formed the most important item. Among the chemical and pharmaceutical products which the factory manufactured, those which were introduced for the first time in India as indigenous were gold chloride, silver nitrate, bismuth salts, mercury preparations, essential oils like Anisi, Anethi, Clove and Ajwan. Then there were the preparation of the British pharmacopoeia, viz. tinctures extracts, liniments, spirits, liquors pulvis, pilulas, unguetums, emplastnums, acetums and vinums, perfumery and toilet preparations of all kinds syrups disinfectants, essences etc.

In the difficult time (financial problem) the Bank of Baroda came to its rescue by granting a loanto it and saved the industry from a several financial collapse.

Sarabhai Chemicals Works:

The story begins about 150 years ago with Karamchand Premchand, who was engaged in business as a private banker. The business expanded considering and branches of it opened in several cities in India. Sarabhai was only one year old when his father Maganbhai died. His trustees managed the textile printing business till he attained maturity .the attained majority. It was believed that textile printing would only pay only if weaving was introduced, subsequently spinning was added to weaving. Soon after this step had been taken, printing was dropped and restarted in 1935, Sarabhai Maganbhai died when his son Ambalal, present head of the family, was six year old. During his

minority, the business was managed by his uncle who brought about the first major expansion of the mill between 1898 and 1906.

In 1909, Ambalal Sarabhai took the charge of the mills and further expanded operations. A major expansion was also undertaken by the starting of a number of diversified enterprises, particularly a sugar factory and alcohol distillery in Bihar and taking over the swastika oil mills, Bombay. Later variety of shops, hair oils, glycerin, industrial oil and edible oil also were established in Ahmedabad.

Sarabhai Chemicals was started at Baroda in 1943 for the manufacturing of fine chemicals and pharmaceuticals products. Calcium lactate was made from the fermentation of molasses and other chemicals were added to the range of drugs supplied to the pharmaceutical industry of India. It was felt; the progress in fine chemicals would be slow due to small demand in the country and for the cost of research and development could not be born commercial for many years to come for this reason.

As a result of this arrangement Sarabhai Chemicals manufacturing to a constant increasing extent squib products in India. They started with sub dividing antibiotic and extended their manufacturing to hematinics, Vitamins, muscle relaxations, cardiovascular and anti-tuberculosis drugs. Unequaled facilities were added in the manufacturing in quality control section by the introduction of the most modern equipments and instruments.

Glass Manufacture:

During the course of Geological Survey of Mr. Iyer some sand was obtained by crushing and washing the sanet stone occurring in beds of alone the right bank of the Sabarmati

river near Padhamali under Vijapur Taluka of the Kadi Division.[112] During 1910-11 the Baroda Glass Works Company Limited had been able to secure the service of an Indian Expert, trained in Japan in glass manufacture. The company purchased a piece of land near the site of the old Railway Station.

Glass Factory:

The Alembic Glass Industries Ltd. continued to manufacture bottles of various descriptions during the year under report in three shifts. The Company produced on the average 2, 50,000 bottles of various sizes per month. They had started the manufacture of Tin cups and Plastic caps. Automatic Plant for the manufacture of glass bottles had been received from U.S.A.[113]

The British Crystal Glass Works Ltd., Baroda, manufactured all types of glass articles like bottles, chimneys, globes, tumblers etc. For non-availability of essential and vital raw materials they had to temporarily close the work.[114]

As regards the glass industry, it was proposed to have a thorough inquiry into the quality and quantity of available raw materials and to study carefully the economics of the problem before launching a large scale modern major venture.

Jail Industries:

The Jail department was under the police commission. The State contains a central Jail at Baroda, 4 district jails a subordinate jail and 39 lockups. The central jail and three of the district jails were in charge of civil surgeons while the others are supervised by

[112] BAR 1907-08, p-76
[113] BAR 1947-48, p-140
[114] BAR 1947-48, p-140

Vahivatdars or subordinate officials. The chief industry pursued in the Baroda central jail was weaving. All the clothing required for the prisoners themselves and for the police was prepared here. Excellent carpets were also made such as cane baskets, boxes chair etc. The production was sold under a contract and was exported in quantities.[115]

State Furniture Factory:

The State Furniture Factory was amalgamated with the Railway Workshops at Goya Gate. Furniture factory was transferred to Railway workshops. The Superintendent, being attached to His Highness' Palace Staff, could not devote the whole of his time to the Factory. The Factory had no large orders on hand. It carried out the requirements in the matter of furniture to be made and repaired for the Palace.

Surgical Instruments Factory:

Messrs. Powell's Ltd., had been given possession of land for starting a surgical instruments factory at Billimora.[116] It manufactured surgical instruments, and appliances and steel Hospital Furniture.[117]

Other Concerns:

A firm in Navsari continued experiments for the manufacture of a copper still for power alcohol from molasses. The results were encouraging and an order for a still to manufacture 3,000 gallons of pure rectified spirit of 74 O.P. or 95.5% alcohol daily had been received from the Jodhpur State. Among other industrial concerns, the following may be mentioned:

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[115] Imperial Gazetteer of India Baroda 1908 p-52
[116] BAR 1943-44, p-144
[117] BAR 1947-48, p-140

(i) The Hindustan Colour, Chemical and Manufacturing Company Ltd. at Kathwada (Dehgam) with a capital of Rs. 15 lakhs; it manufactured modified starches such as dextrine, quellin, British gum, hydrogen peroxide and other bleaching agents, disinfectants, and sulphuric and hydrochloric acids.[118]

(ii) The Bharat Rolling Mill, with a capital of Rs. 0.5 lakhs, manufactured brass and copper sheets from waste materials and bichromate of potash, chrome, alum litherage and lead acitas.

(iii) The Vijay Enamel Works at Baroda with a capital of Rs. 1 lakh produced enamel wares and sanitary articles.

In 1941-42, several new concerns were started during the year, their production being chiefly for war purposes. The more important of these concerns were:[119]

Mehsana District

1. The Bharat Thread Works, Kalol	-	Sewing threads
2. The United Tent Manufacturing Co., Kalol	-	Tents and accessories
3. The Metro Wood Works, Kalol	-	Bobbins
4. P.R. Kamani & Bros., Mehsana	-	Ingots, solders, alloys, Non-ferrous metal articles
5. The Jaya Cotton ills Ltd., Sidhput	-	Absorbent cotton
Baroda District		
6. The Baroda District Ltd., Baroda	-	Webbing
7. The Baroda Cotton Fabrics Ltd., Baroda	-	Reeds

[118] BAR 1941-42, p-164
[119] BAR 1941-42, p-165

8. The Baroda Anti-gas Co. Ltd., Baroda - Oil dressed fabrics

Paper Mills Arvind Boards and Paper Products Ltd., Billimora manufactured straw boards and grey boards.[120]

The Okha Salt Works:

There was a large deposit of natural salt at Okhamandal which utilized for the manufacture of Soda.[121] The foundation of the Okha Salt works was laid on 5th May 1927.[122] A joint stock company was started in 1928 with unauthorized capital of Rs. 10 lakhs for manufacturing and allied products in Okhamandal .The salt works at Mithapure situated on the north-west corner of Kathiawad produced salt of superior quality which was mostly exported to Bengal.[123]

The establishment of this company opened a new chapter in the economic life of the state. The work afforded employment to the local population and in the other way assisted in the development of this area.

The Okha Salt Works Limited had on hand 1,250 tons of salt in the beginning of the year and produced 5,451 tons. They sold 4,965 tons of salt, of which 4,451 tons was exported to Bengal, 460 tons of salt were washed away and 1,276 tons was in stock. These works had a large programme of extension but it was not carried out owing to an extraordinary slump in prices due to foreign competition.[124] In 1930-31, it had on hand 1,276 tons of salt at the beginning of the year and produced 16,985 tons. It sold 16,571 tons of salt, of

[120] BAR 1947-48, p-147
[121] BAR 1907-08, p-
[122] Speeches by Sir V.T. Krishnamachariar p-112
[123] Shah M.H. Op. Cit., p-124
[124] BAR 1929-30, p-194

which 16,282 ½ tons was exported to Bengal, 968 ½ tons of salt were washed out and 721 tons was in stock.[125] In 1931-32 it had 721 tons of salt at the beginning of the year and produced 34,833 tons. 34,558 tons were exported to Bengal, 491 tons were washed out and 225 tons were in stock. The royalty earned by Government from factory amounted to Rs. 20,866.[126] During the year 1932-33 it had on hand 225 tons of salt at the beginning of the year and produced 34,859 tons during the year. 34,673 tons were exported to Bengal, 186 tons were sold in Kathiawad and Okhamandal, 185 tons were washed out and 40 tons were in stock.[127] And in 1933-34 it had 40 tons of salt and produced 48,553 tons. 46,728 tons were exported to Bengal and 156 tons to the Maldive and Seychelles Isles, 154 tons were sold in Kathiawad and Okhamandal, 1,455 tons were washed out and 100 tons were in stock.[128] In the year 1935-36 production was 44,370 tons of salt and it exported 38,911 tons to Bengal and Rangoon and 356 tons to local and other markets.[129] During the year 1936-37 it produced 63,590 tons of salt and exported 59,783 tons to Bengal.[130]

And in 1937-38, it produced 43,696 tons of salt and exported 42,076 tons to Bengal. 135 tons of salt were sold in Kathiawad of which 54 tons were sold locally in Okhamandal.[131] The next year it produced 33,712 tons of salt and exported 37,262 tons to Bengal. 79 tons of salt were sold in Kathiawad of which 50 tons were sold locally in Okhamandal.

[125] BAR 1930-31, p-170
[126] BAR 1931-32, p-151
[127] BAR 1932-33, p-173
[128] BAR 1933-34, p-168
[129] BAR 1936-37, p-160
[130] BAR 1937-38, p-186
[131] File No. 260/1 Miscellaneous Correspondence in Connection with Memo dated 11th June 1987, p-101

Kodinar Salt:

Large quantities of natural salt form in a 'Khari" which enters the Kadi division of the Gaekwad territory, a little to the north of the Radhanpur village of Rewad and runs thence in a north eastern direction past Hariz to the village of Jamnapur.[132]

Article of the agreement was made between the British Government and Maharaja Gaekwad regarding the conditions for regulating the manufacturing and collection of natural salt within and export of salt from his possessions in Kathiawad dated 14th March 1897.[133]

In 1887 His Highness Government settled an agreement passed between the A.G.G and Dewan. The talukas of Kodinar produces salt sufficient for its own consumption and when the negotiation about the Kathiawad salt in general were going on the Baroda Government looking to the comparatively cheap rates of the sale of salt in Junaghadhh territory, authorized salt to be sold at 6 anna per Bengali mound in the Kodinar Talukas. Even this rate was higher than the Junagardh rate, the Bherai and Dhamleg Salt Works .the latter being 4 ½ annas per Bengali mounds(vide Dewans' letter no 3079 18-1-80 page 106 of the 81 salt selection.[134]

Large amount of salt produced and prevailing there can attract customers even from Kodinar *mahal* and to save loss His Highness Government had authorized the sale at 4 ½ annas per Bengali mound from the Kodinar salt.[135]

Concession given to Messrs .N. Purshotam and Company for Alkali works in Kodinar talukas. Objectives of this company were:

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[132] Ibid, p-167
[133] File No. 260/1, Memo No. 39 of 1904, dated 28th November 1904, p-173
[134] Ibid
[135] File No. 260/1, pp 211-221

1) Manufacture of Alkali from Salt and lime stone

2) Export of salt to places outside India

3) Sale of salt in Kodiar taluka for the household purposes .For the manufacture of salt for above purpose. The area to be settled in the beginning and to be revised from to time. For winning lime stone the above purpose between Chara and Sarakhadi,and near Fafni,Velva and other villages near Odlas and Advi quarries on and under which areas were not in possession of other occupiers or which areas had not been promised by the Baroda Government to any other party for any other purpose previous to the data of signing the agreement of the present lease. for the 30 years of signing the agreement regarding these consessions.Rs.600 per year from the date the concessionaires come to possession of the lands allocated to them to the date of the commencement of alkalies. Other concessions were:

1) Land for factories houses for laboures offices etc.upto 200 hundred bighas to be given free of Nazarana if the lands selected were not in possessions of other occupants and to be acquired at the concessionaires, expense according to the sections 32 and 33 of the land Acquisition Act if the lands selected were in passions of the occupants. Concessionaires would have to pay for the land so given or acquired the usual land assessment but not to pay extra dues for utilizing the lands for other purposes than agriculture The concessionaires may erect on these lands factories or works for manufacturing other than alkalies.[136]

Small Scale Industries:

The Director of Industries and Labor was deputed as a Government representative to attend the Small Scale Industries Conference, held at Delhi in March 1943, with a view to

[136] BAR 1940-41, p-115

discover new source and develop existing sources of production, in order to increase the value of supplies and to provide a measure of insurance against loss of production, due to the dispersal of labour from organised industry, which might occur for various reasons. The Baroda State received orders for stores worth about Rs. 92,027.

Arrangement for Coal Supply: Arrangement was made with the Controller of Coal Distribution, Calcutta, for supply of rakes of coal, through the department, to textile mills and other industries engaged on war work. 15 factories took advantage of this arrangement.

War Effort: The industries of the State were taking their share in supplying articles, required for the war, to the Government of India. The following are some of the more important articles supplied by the industries of the State: Different kinds of cloth like twill, calico white, bandage cloth, netting, khaki long cloth, absorbent cotton wool, woollen blankets and khaki serge, iron and steel materials like water pumps, ingots, solders, alloys, non-ferrous metals, bolts etc., timber and wooden stores, wood packing cases, army boots, rubber stoppers for bottles, refined castor oil etc.

Technical Training: Arrangement was made for training of war technicians such as mechanics, fitters, turners, electricians mill wrights at the Kala Bhavan Technical Institute and the G.B.S. Railway Workshop at Baroda and the Tata Industrial School at Navsari. Out of 299 applications received, 210 candidates were admitted for training in the above centres and 99 trainees were sent to the army training centres before deputing them for active service.

Recruitments: Government granted permission for recruitment on voluntary basis of technical and electrical personnel by the Government of India from amongst the subjects

of the State, including Government servants, provided their services can be spared by the departments concerned without detriment to the requirements of the State. 21 such applications were forwarded to the provincial recruiting officers.

Soil Improvements:

There was much loss from soil erosion which goes on unchecked in Gujarat and Kathiawad, from sheet erosion on farmer's fields or by gully (Kotar) erosion on the denuded sources of streams and along the banks of the larger rivers, like the Sabarmati and the Shetrunji. To educate the people to the seriousness of this loss and discover the best ways of checking the evil, the Government established a separate organisation with a special soil conservation officer under the control of a committee consisting of the Sar Suba, the Commissioner of Agriculture, the Chief Engineer and the Conservator of Forests. Funds have been provided for preliminary operations.

(a) At the head waters of the Shetrunji river, south of Dhari,

(b) In the area to the west of Dhari-Amreli road, and

(c) At Hirapura, as typical of the area bordering the Sabarmati.[137]

In the Dahri Section operations were stated in an area of two square miles ,containing cultivated land, denuded forest area, over –grazed gaucher and many ravines. Grazing was closed, cultivated area of about 200 bighas was provided with contour terraces, the forest area was prepared for replanting by rough contour trenching and construction of bunds and the plugging of minor kotars started.

The work taken up by the Government farms and contour terracing effectively demonstrated on the Amreli Jagudan Deodarda farms and pamphlets on the subject

[137] Ibid

were distributed .A new variety had been established as superior by experiments at the farm.[123]

Sugar Factory:

The second industry pioneered by the state was the sugar factory at Gandevi taluka of Navsari district in the year 1884. It was started as a joint stock concern and the state took shares for half the amount. But as this did not work satisfactorily, the state then, purchased the factory at a cost of Rs. 3, 00,000 and worked it for some time. However, the working resulted in a loss and the factory was closed in 1894. In 1904, the concern was sold for Rs. 70,000. When the factory was first started, it was taken for granted that ample supply of cane obtained from the surrounding districts. But no serious effort was made to develop the cane cultivation nor the extract juice from the date palm found in the district. The new purchase organised a joint stock concern and leased out the factory to another merchant, who has worked it only for a very short time.

In agency of the Gaekwad factory, was transferred but the agent commenced work on an application that was put up by some creditors to send it into liquidation. After a few years it revived and was known as the Gaekwad Sugar Works. During 1931-32, the Gaekwad Sugar Works produced 7096 mounds of sugar and 9250 Bengal mounds of molasses and sold 4617 Bengal mounds of sugar 7275 Bengal mounds of molasses. Next year it produced 2151 Bengal mounds of sugar and 4469 Bengal mounds of molasses and sold 2168 Bengal mounds of sugar and 269 Bengal mounds of molasses. During 1933-34 it did not work.

The Gaekwad Sugar Works was purchased jointly by Messrs. Shivchandrai Jhunjhunvala of Bombay and Radhakrishna Dalmia of Calcutta in 1934 and started in 1935. During

1935-36 the quantities of sugar and molasses produced were 13,788 and 4835 Bengal mounds respectively and 1379 and 335 Bengal mounds were sold. In 1936-37 the quantities of sugar and molasses produced were 20,707 and 15,000 Bengal mounds of which 20,707 and 600 Bengal mounds were sold.

In 1938-39 the quantities of sugar and molasses produced were 6,693 and 2862 Bengal mounds, of which the whole stock of sugar and 212 Bengal mounds of molasses were sold. The factory was permitted to import molasses from outside to manufacture rectified spirit. In 1939 sugar cane cultivation extended as the result of irrigation schemes executed by the Government had enabled the factory to show improved results. Four lakhs Bengal mounds of sugar cane were crushed in 1939.

The Gandevi Sugarcane Scheme:

This was a six years' scheme aiming at the development of Growers' Cane Supply Association round Gandevi factory, and the general improvement of the standard of cane cultivation. To organise the Association, the services of a co-operative organisor were obtained on loan from the United Provinces. Farmers are encouraged to grow more and better cane by concessions in irrigation rates, by trade advances and loans for manures, fertilisers and seeds and by transport improvement.[138]

The new water lifting station on the Ambica River, which could irrigate 750 bighas, was completed. The Gandevi factory took on lease the whole area for 25 years for intensive cane cultivation. These efforts at development had been so successful that the company got 4.15 lakh mounds of local cane in 1940-41.

[138] BAR 1940-41, p-114

The Cement Factory:

There were huge deposits of limestone which can be quarried and sold for use in Bombay ant other parts of India and the debris was only needed to be used for the manufacture of cement.

One of the leading experts in the United Kingdom Mr. Herbert W. Anderson was came to India .Mr. Anderson had visited the Kathiawad coast and had actually made cement from the material he had obtained from there. Briquettes made from this cement which showed splendid results and showed that cement made from the indigenous article was equal to anything made in Europe. The use of cement this was daily increasing. There were shipping charges on the other side as well as the freight to India and landing charging to be considered and these alone amounted to a considerable sum as at 15 shillings a ton for freight to India. According to Anderson's estimate, the manufacture of cement ought to cost very little more than this. Cement sold in Bombay not less than Rs. 6-8-0 cask for large quantity and actually costs at the present moment about Rs. 6-2-0 to Rs.6-4-0,so that there was a big margin to allow for the lower price which new article had to be sold at to commence with and make decent profit. The total cost would not be more than Rs. 2,500/-.To start a cement works in the territory, the two could work together under the same management and be able to dispose to prevent opposition coming into the market and raining the industry.[139]

Mr.Anderson got rock from Velchcha, stone fromTarkeshwar Shahol and Abha analysed by Mr. Anderson and his report was that all of them were far too low in carbonate of lime to of any use for cement purpose. Sample of Kunkur from Abha contains so many oxides

[139] File No. 233/5, p-3

of iron and manganese as well as sandy matter that it was of no practical value for the erection of cement.[140]

There was neither a steamer service nor railway connection so that the materials obtained at Velan undoubtedly make a good cement to face business point of view.[141]

After long process at last the Cement Factory floated at Dwarka in 1929, produced 9,550 tons of clinker and sold 20,533 ½ tons of cement. Owing to the slump in cement trade, the various companies united together to form a marketing board.

The cement factory at Dwarka produced 15,522 tons of cement and sold 13,683 tons and 8 cwts in the year 1930-31.Owing to a slump in the cement trade the various cement companies joined together and formed a marketing board. This has had the effect of curtailing production of the Dwarka factory for which compensation is given by the board.

During the year 1931-32 factory manufactured 40,080 tons of cement and sold 39,234 tons and manufactured 47,430 tons of cement and sold 49,219 tons. In the following table it shows the next four years production.

Year	Balance in tons at the beginning of the year	Quantity in tons			Balance in tons at the end of the year
		Manufactured	Sold	Damaged	
1	2	3	4	5	6
1933-34	3,272	57,031	56,429	303	3,571
1934-35	3,571	62,595	61,537	341	4,289
1935-36	4,290	75,550	72,773	383	6,705
1936-37	6,705	85,621	87,271	150	4,905

Source: Baroda Administrative Report, 1934-1937

[140] File No. 233/5, p 23-24
[141] Ibid, p-35

In the above table manufacture increased rapidly and earned profit each year. The company was progressing.

Iron Manufacture:

There are two important irons works in Baroda state:

1. The Sayaji iron works.
2. The Baroda bolt and engineering works.

The Sayaji iron works was started in 1940. It manufactured Agricultural implements, cast iron articles like pipes, sluice valves etc., machinery for road building and bleaching machines for textile mills .The works made centrifugal castings of any specification and also manufacturing locomotives cylinders and diesel engine cylinders from centrifugal casting which were formerly imported from the continent of Europe.[142]

The Baroda Bolt and Engineering Works:

This concern was manufacturing

1 nuts and bolts and

2. Dogspikes and rivets

The manufactures of nuts and bolts per day per shift was about 5 cwt. For articles in smaller sizes and one ton per article in large size.[143]

In the South-eastern corner of the Kari prant depended on the laleritic haematite occurring just outside the Baroda territory at Kapadwanj, in Khaira District and smelted there. In Alarsamba iron works smelting had been done by their fore-fathers, but the iron was made at Kapadwanj and brought to them and made into swords, knives and cooking utensils. The makers were poor desponding and very wanting in energy to push the sale

[142] Shah M.H. Baroda by Decades 1871 to 1941, p-1, 2, 3
[143] Ibid, 124

of their wares. The knives were straight backed, very pointed and very broad at the base of the blade, the handles were short in proportion and made of pieces of bone rivetted on a rather small tang. The frying or backing pans were shallow circular pans with two loop handles to lift them on and off the fine.

A sword making industry on a small scale existed at Dehgam and turned out good blades and the blades were fitted to old hilts taken from old and worn out talwars. At Patan good betel- nut cutters were prepared which found a ready sale through all parts of Gujarat. In the Baroda district at Sojitra, Vaso and Petlad,locks were manufactured.

During the period 1939-40, it manufactured agricultural implements, cast iron articles like: Machines for road building for bleaching machines for textile mills.[144]

The salt run at Okha has an area of about 60 square miles a portion of which belongs to the Jamangar state. The run was 15 miles long. The average bredth was about four miles and at different places there were juttings into the main land which were most favourable for deposition of salt. The water rises into the Sun at Diwali and, every full new moon day up to Holi; and the whole was dried up by the end of Falgun when at times deposits of salt of six inches thick was formed. The quantity of salt formed was minimizing the available quantity by time and labour. The salt must be collected before the rains begin. For a rough calculation 200 labours and 100 carts with bullocks and drivers can seasonally be supposed to be available for this work. If a central place be selected for string these collect in two months 18000 tons of salt which cost Rs. 0-12-0 per ton.

The salt was of medium quality better than the khari produced at Cambay and used by all Gujarat before the Dr. Monopoly no to pure as the khari ghofa salt and was very near the

[144] BAR 1939-40, p-128

same quality as the salt now produced and used in Bombay. Besides common salt it contains an appreciable amount of salts of magnesium and lime.

Present use: A part only of the large quantity available was used for local consumption by treaty. The local consumption being very small and Kodinar producing enough salt for the requirements of the district the only present use of salt was reported to Janzibar and other places on the African coast. Government obtained, from the subjects of this state over two lakhs of rupees by the salt monopoly for where there was no return.

There was a great scarcity of fuel in Okha-mandal and as Calcutta exports large amounts of cheap coal,the ships taking salt there could bring a cargo of coal in the return voyage for Dwarka.

Salt manufactured into carbonate soda commonly called washing soda or simply soda was the ammonia soda.

The Carbonate produced was very pure and was used for manufacturing glass of a superior kind theoretically. The ammonia once obtained was used over and over again with new qualities of salt but in practice, although all the different stages in the manufacture were conducted in closed vessels requiring part outlay and skill in working, a part of the ammonia was always lost ever in the cold countries of Europe. In Hot climate we could lose more and require a constant supply of this costly material. The first cost of the factory for the production of day, 5 ton of soda per day would be pound 120000 or over 20 lack of rupees.

Produces: The muriaties acid produced is an article of commerce and either be sold or used for the manufacture of bleaching powder. The salt cake can directly be used for the manufacture of glass.

Large quantity of oil seeds were produced in Okha of the neighboring district of Jamnagar and the soda could be used for soap making. Again plenty of quartz could be held in the neighborhood.

The geological formation of the district was such that there is a possibility of finding not only iron lime stone along but even coal in workable quantities under the barren surface. The openings of Alkali worth draw special attention to the district and then help in an indirect way to develop its mineral resources.

Government sent someone with a good scientific training to England for a period of six months.[145]

[145] M.H. Shah, Page No. 134-135