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CHAPTER - IV

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PRODUCTION PERFORMANCE OF THE CO-OPERATIVE

SPINNING MILLS.

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CHAPTER-IVPRODUCTION PERFORMANCE OF THE CO-OPERATIVE SPINNING MILLS

An effort is made in this Chapter to describe the production performance of the selected mills under study with a view to study their progress particularly during the latest period from 1983-84 to 1986-87.

In the first introductory section, the product of yarn is described according to its varieties and its use pattern. Section - II describes the actual production process with its mechanical aspects. In Section -III, the profiles of selected units are given from their production capacity of view and spindle utilisation.

SECTION - I : THE NATURE OF THE PRODUCT

The cotton textile industry is a highly sophisticated industry involving use of the modern technology. Production of fabrics is dependent on the production of yarn of the desired quality, which is in turn dependent on procurement of the desired quality of cotton. The fineness of yarn is measured by the number of hanks of yarn that weight one pound. This is known as its count. A hank is 840 yards long and so, for example, one pound of number 10s (ten single) count cotton yarn would be unwind to 8400 yards. Thus number for yarn are based on length per unit weight and are higher for fine yarns than coarse. The breaking load of a cotton yarn depends only to a minor extent on the intrinsic strength

of cotton fibre, the important factors are count and twist. The count to which a given type of cotton can be spun commercially, depends mainly on its staple length. The long cotton yields finer yarns. The spinning co-operatives have been spinning from 1s to 80s counts of yarn.

SECTION : II : PRODUCTION PROCESS

Spinning is an operation of forming the continuous thread by twisting together several overlapping fibres or filaments. Before the fibre is spun it is cleared, strengthened, then preliminary process including carding and for finer yarns combing is completed. In spinning co-operatives, we notice the following operation process.

1. The highly compressed cotton is reduced to the greatest possible state of division and impurities are removed. The fibre is formed into a rope or **sliver**.
2. The **slivers** are drawn between rollers to alternate them and are sometimes combed to arrange the fibres in parallel rows and to increase the regularity of the materials.
3. Sufficient twist is inserted into the alternated slivers by now called roving, to make a firm thread

Description of Machinery Used :

The principle machines used by the mills in spinning are,

1. Bale breakers, openers, scatcher (for cleaning and belnding cotton).
2. Cotton machine.

3. Draw Frame
4. Combers (for high quality yarns)
5. Ring frames.

The growers mills organised in cotton growing areas have installed their own ginning and pressing units. At this stage, loose cotton is formed into a sheet (the lap) nearly an inch thick and rolled it up into a package weighing 40-50 lbs. The regularity of this lap is important for the success of subsequent process. The real process of converting cotton into yarn starts with the operation at carding machine.

CARDING MACHINE :

Here the elimination of impurities including neps, is completed. The picker lap is reduced for a brief moment to gossamer fineness and then rolled into a soft rope called a sliver. Trash and short, broken and immature fibres are jettisoned but the machine must be carefully set and supervised so that it does not create more neps than it removes.

At the start of carding operation the pickerlap is unwound ~~xx~~ by a small roller and presented to a taker in roller or licker in. This consists of a series of fine toothed circular saws mounted together as shaft. The teeth move at a speed of about 1000 fts a minute and tear away small bunches of fibre from the lap. These are stripped from the licker-in by a cylinder about 50 inch in diameter, that is covered with closely set steel wire teeth and revolves

at about 2000 fts a minute. Above parts of this cylinder are narrow bars called flats, that are carried by an endless belt and are covered with wire teeth similar to those on the cylinder but pointed in the opposition. The cotton passes between the cylinder and flats, the distance between them is set to about $7/1000$ th of an inch. Since the flats move in the same direction as the cylinder but only at two to three inches a minute, they have a retarding and combing action and pick-up the tresh, short fibre and neps. This material is removed from the flats by a comb and a rotary brush and is deposited in a waste receptacle. The good cotton is held between the wire teeth on the main cylinder from which it is doffed by a smaller cylinder. This doffer also has wire points, facing into those of the main cylinder, but travels at only about $1/25$ th of the speed. A rapidly rocking comb takes the cotton fibres from the doffer in a continuous sheet nearly as fine as a spider web. The web is immediately formed into a sliver by a pair of rollers that pull it through a trumpet or funnel shaped hole and pass it on to a mechanism that coils it into a tall can.

The Draw Frame :

It is only necessary to attenuate and twist the card sliver to produce a yarn. The initial processing at this stage is carried out on the draw frame. Steps are taken to make the sliver more regular and to arrange constituent fibre in approximately parallel order. Four, Six or Eight card slivers are blended into one sliver on the probability

that a thick place in one sliver will balance out a thin place in another. To prevent the combined sliver from becoming thick the blending is accompanied by attenuation or drafting as a result of which the product becomes four, six or eight times as long as but no thicker than one of the card sliver.

The draw frame has four pairs of smooth, leather covered rollers arranged fairly close together in four rows. The pairs are driven so that the speed of rotation increases from row to row until the front pair is moving four, six or eight times as fast as the back pair depending on the number of card slivers being fed into the machine. Because of the increasing roller speed, the individual fibres slit forward as they pass between the pairs of the rollers and are also pulled straight. The increasing amount of parallelism of fibres becomes apparent in the increased lustre of the draw frame, sliver which is quite silky.

The Comber :

For high quality and fine yarns it is usual to remove 5%-15% or even 20% of the shorter fibres as this enhances the "spinability" of the remainder. To remove the fibres, the slivers are recombined into small rolled up laps that are fed to the comber. At regular intervals a lap is advanced so as to present a fringe to a set of combs that pass through the fringe and take out the loose short fibres. These are detached from the combs and reserved for use in spinning a coarser yarn.

The combed fringe is then pushed forward and combined with the tail of the previous fringe. To complete the attenuation of the sliver the same principle of drafting i.e. reducing the bulk and weight per unit of length by means of rollers is exploited in series of machines known collectively as slubbing, intermediate roving and fine jack frames.

Ring Frames :

In the process of ring spinning the drafted roving is twisted into yarn and wound on to a bobbin. Simultaneously and continuously as in the flyer frames except that on the ring frame, the flyer is replaced by a smooth ring with a flanged upper edge over which is sprung a small C-shaped piece of steel wire or plastic, known as traveler. The spindle carrying a wood, paper or metal support for the bobbin, projects vertically through the horizontal ring. The drafted roving runs from the drafting system to the traveler a few inches away and then to the bobbin, as the latter revolves with the spindle the yarn drags the traveler round the ring and the twist is thus inserted. The ring is mounted on a rail that moves up and down as a close succession of coils on the bobbins. The size of bobbin and the degree to which the yarn is twisted are governed by the diameter of the ring and weight of the traveler. There is another method of mule spinning but in India ring spinning is preferred.

For many purposes two or more single spun yarns are twisted together (doubled) when the luster and smoothness are desired, the yarn is passed several times through a gas

flange or red-hot tube at such a speed that the fibres projecting from the surface are burnt off without damaging the rest of the yarn.

SECTION - III : PRODUCTION OF YARN

Classification of selected co-operative spinning mills.

TABLE NO. 4.1

Sr. No.	Name of the Mill	Type of Mill
1)	Sholapur Sahakari Soot Girani Niyamit, Solapur	: Organised by the weavers
2)	Yeshawant Sahakari Soot Girani Niyamit, Solapur	: Organised by the weavers
3)	Shri Swami Samarth Shetkari Wa Vinkari Sahakari Soot Girani Niyamit, Valsang	: Organised by the weavers and cotton growers.
4)	Shetkari Sahakari Soot Girani Limited, Sangola	: Organised by the cotton growers

TABLE NO. 4.2

Licensed spindles and Installed spindles of the selected mills.

Year	Sholapur		Yeshawant		Valsang		Sangola	
	Lice-nced	Inst-alled	Lice-nced	Inst-alled	Lice-nced	Inst-alled	Lice-nced	Inst-alled
1983-84	29680	39680	37718	30248	25080	23321	-	-
1984-85	39680	39680	37718	30248	25080	25080	25056	25056
1985-86	39680	39680	37718	30248	25080	25080	25056	25056
1986-87	39680	39680	37718	30248	25080	25080	25056	25056

Table No. 4.2 shows that in 1983-84 three mills were in production of which two mills were in weaver sector and one mill was in mixed sector i.e. organised by weavers and cotton growers. Sangola mill started its production since 14th Sept. 1984 which was organised by cotton growers. All the selected mills under studies have the installed capacity according to their licences except the case of Yeshawant Mill.

The Quality of Yarn :

The qualitative and quantitative progress of the production of yarn by the mills showed that there were changes in the quality i.e. counts of yarn made by the mills in weavers sector as per demands from their members. The mills in the weaver sector tried to adjust their production programmes in terms of quantity and counts as per market position.

TABLE NO. 4.3.

Varieties of yarn manufactured by the mills under study.

Sr. No.	Particulars	Sholapur	Yeshwant	Valsang	Sangola
1.	Plain Reel	40s, 60s, 2/40s, 2/60s, 2/80s,	20s, 2/20s, 2/40 viscose	-	-
2.	Cross Reel	34s, 40s, 42s, 60s, 80s, 2/30s, 2/40s, 2/60s, 2/80s	14s, 20s, 40 viscose	-	-
3.	Cone	20s, 34s, 36s, 40s, 42s, 44s, 60s, 2/28s, 2/30s, 2/40s	14s, 20s, 24s, 2/14s, 2/20s, 2/40 viscose	-	-
4.	S.T.F.	40s, 80s, 2/40s, 2/60s	-	-	-
5.	Carded Cone	-	-	18, 19, 20, 22, 24, 25, 26, 28, 30, 34, 35, 36, 40, 42, 60, 2/20, 2/24, 2/26, 2/30, 2/32	-
6.	Hank Plain	-	-	34, 60	Contd..

Contd.

Sr. No.	Particulars	Sholapur	Yeshawant	Valsang	Sangola
7.	Hank XX	-	-	18, 40, 60, 2/20, 2/26	-
8.	Comed	-	-	-	20, 30, 40, 41, 60
9.	Carded Hosiery	-	-	-	24, 30, 32, 34, 36, 40, 42, 44, 60, 2/30, 36/1, 36/2, 40/1, 2/40
10.	Export Quality	-	-	20, 24, 2/20, 2/34, 2/30, 2/32.	30, 41, 2/40, 36/1

Every unit under study is generally manufacturing a particular varieties of yarn as it is stated from Table No.4.3. 4 mills are manufacturing nearly 9 varieties of yarn. This includes plain reel, cross reel, cone, S.T.F., carded cone, Hank plain, Hank XX, Combed, Carded Hosiery, etc. Out of these 9 varieties mainly 3 varieties such as plain reel, cross reel and cone are being manufactured by both Sholapur and Yeshawant Mill, whereas the varieties such as carded cone and Hank plain and Hank XX are manufactured by Valsang Mill only. The Sangola Mill concentrating on combed, carded hosiery with a specialisation in export quality of 30 counts, 31 counts, 2/40 and 36/1 counts. Valsang is the next unit which is also concentrated on the export quality of yarn with its counts no. such as 20.24. 2/20, 2/24, 2/30, 2/32 etc. while considering the count of yarn, it is observed that every unit is manufacturing different counts of yarn according to their demand. The common counts of yarn being manufactured by all units include 20s,34s, 36s, 40s, 42s, 60s, 2/30s, 2/40s etc.

Moreover it is also observed that the Sangola Mill is manufacturing very specialised quality of yarn 41s, 36/1, 36/2 and 40/1 varieties of yarn for export purpose only.

Achievements :TABLE NO.4.4.

Year	Sholapur	Yeshawant	Valsang	Sangola
1983-84	1790832	4204957	3500.00	-
1984-85	2673900	4002225	978986.20	448382
1985-86	2937672	3978310	1611031.80	1890334
1986-87	3082077	4485944	2127242.00	2255206

It can be observed that, in case of Sholapur Mill total production during study period increased from 1790832 kgs. to 3082077 kgs., which indicates that production increased by 72.05%. In case of Yeshawant Mill total production was declined from 4204957 kgs. in 1983-84 to 40022²₅ and from 4002225 to 3978310 in 1985-86 while it increased upto 4485944 kgs. in 1986-87. The rate of increase in production during study period was only by 6.65%. The production of Valsang Mill and Sangola Mill increased rapidly comparatively than Sholapur and Yeshawant Mill. In case of Valsang Mill the production increased by 64.53% in 1985-86 and by 32.00% in 1986-87. In case of Sangola Mill the production increased by 321.55% from 1984-85 to 1985-86 and by 19.30% from 1985-86 to 1986-87.

Sholapur Sahakari Soot Girani Niyamit, Solapur

Year	Particulars	34s	40s	2/40s	60s	2/60s	80s	2/80s	2/60STF	Total				
1983-1)	Plain reel	---	3092	94069	272	28920	---	11486	31250	169089				
84	2) Cross reel	14528	884574	61653	153452	7082	61154	---	---	1182443				
	3) Cone	125900	309650	3500	250	---	---	---	---	439300				
	Total	140428	1197316	159222	153974	36002	61154	11486	31250	1790832				
1984-	Particulars	20s	34s	40s	2/40s	60s	2/60s	40 Warp	80s	2/60s	40 STF	2/40 STF	Total	
85	1) Plain reel	---	---	182	107326	---	15164	---	---	2451	---	---	12513	
	2) Cross reel	---	69190	1243325	46399	88217	6855	---	24591	---	4200	---	18350	
	3) Cone	2800	164350	833950	38250	4750	---	4300	---	---	---	---	250	
	Total	2800	233540	2076457	191975	92967	22019	4300	24591	2451	4200	---	18600	
1985-	Particulars	34s	36s	40s	2/40s	42s	60s	2/60s	80s	2/80s	40STF	Total		
86	1) Plain reel	---	---	---	94527	---	---	47216	---	36956	---	178699		
	2) Cross reel	34504	---	1257580	76862	6538	114813	4585	79518	91	5240	1579731		
	3) Cone	134742	3050	1020450	20400	600	---	---	---	---	---	1179242		
	Total	169246	3050	2278030	191789	7138	114813	51801	79518	37047	5240	2937672		
1986-	Particulars	2/28s	2/30s	34 Weft	34 Warp	40s	2/40s	44s	60s	2/60s	40s STF	2/40STF	80sXX	Total
87	1) Plain reel	---	---	---	22700	8898	75273	---	---	29510	---	---	---	136381
	2) Cross reel	---	3550	21519	28695	1046471	80358	---	20021	11214	3150	---	3585	1218697
	3) Cone	8120	14535	611600	146050	847050	59700	16000	21750	---	---	---	2194	1726999
	Total	8120	18085	633119	197443	1902419	215371	16000	41771	40724	3150	---	5770	122

TABLE NO.

Yeshawant Sahakari Soot Girani Niyamit, Solapur.

Year	Particulars	14s/2/14s	20s & 2/20s	24s	2/40s Viscose	Total
1983-84	1) Plain reel	---	20000	---	---	20000
	2) Gross reel	537800	3012200	---	3400	3553400
	3) Cone	2590	580407	25250	---	631557
	Total	563700	3612607	25250	3400	4204957

Year	Particulars	2/14s	2/20s	34s	2/40 Viscose	Total
1984-85	1) Plain reel	---	234205	---	---	234205
	2) Gross reel	490600	2621200	---	22600	313400
	3) Cone	2100	608770	22750	---	633620
	Total	492700	3464175	22750	22600	4002225

Year	Particulars	2/14s	2/20s	40 Viscose	Total
1985-86	1) Plain reel	---	231600	---	231600
	2) Gross reel	648800	2879600	5070	3533470
	3) Cone	14950	148290	---	213240
	Total	663750	3309490	5070	3978310

Year	Particulars	2/14	2/20s	Total
1986-87	1) Plain reel	---	32000	32000
	2) Gross reel	1003600	3439415	4443015
	3) Cone	---	10979	10979

Year	Particulars	34	40	Total
1983-84	1) Carded Cone	28300	6700	35000
	2) Export	-	-	-
	3) Hank	-	-	-
	Total	28300	6700	35000

Year	Particulars	20	24	30	34	40	60	2/20	2/26	Total
1984-85	1) Carded Cone	34100	55350	102752	405400	288050	63200	-	-	948852
	2) Export	-	-	-	-	-	-	-	-	-
	3) Hank	-	-	-	363	23426.40	544.80	5600	-	30134.20
	Total	34100	55350	102752	405763	311476.40	63744.80	5600	-	978986.20

Year	Particulars	18 to 30	31 to 60	2/20	2/26	2/30	2/32	Total
1985-86	1) Carded Cone	684696	614509	-	52350	1250	400	1352205
	2) Export	-	-	-	-	-	35000	35000
	3) Hank	-	159626.80	64200	-	-	-	223826.80

Year	Particulars	18 to 30	31 to 60	2/20 to 2/30	2/31 to 2/60	Total
1986-87	1) Carded Cone	996200	411650	69700	1050	1478600
	2) Export	66000	-	134750	6500	207250
	3) Hank	55600	273992	111800	-	441392
	Total	1117800	685642	316250	7550	2127242

TABLE NO.

Shetkari Sahakari Soot Girani Niyamit, Sangola, Dist. : Solapur

Year	Particulars	34	36	40	60	Total					
1984-85	1) Combed	-	-	25682	5500	31182					
	2) Carded	366700	30500	-	-	417200					
	3) Export	-	-	-	-	-					
	4) Plain	-	-	-	-	-					
	Total	366700	30500	25682	5500	448382					
Year	Particulars	30	32	34	36	40	41	42	60	2/40	Total
1985-86	1) Combed	-	7991	-	-	221150	11813	-	50	48686	289690
	2) Carded	13250	-	549250	815950	64453	-	11550	16400	-	1470853
	3) Export	-	-	-	-	-	28000	-	-	-	28000
	4) Plain	-	18709	-	-	75364	-	-	-	7718	101791
	Total	13250	26700	549250	815950	360967	39813	11550	16450	56404	1890384
Year	Particulars	20 to 30	31 to 40	41 to 44	2/30 to 2/40	36/1	36/2	40/1	Total		
1986-87	1) Combed	0.90	3.75	-	-	-	-	-	4.65		
	2) Carded	0.12	10.28	2.40	2.15	-	0.07	0.06	15.08		
	3) Export	0.59	-	-	0.37	0.14	-	-	1.10		
	4) Plain	-	1.72	-	-	-	-	-	1.72		

Utilisation of Spindles :

Full utilisation of spindles installed capacity of the spinning mills is the most important factor influencing the production performance of the mills. This can be achieved only by the following a sound cotton procurement policy and the effective management.

The ideal way is to work the mill for 24 hours a day in three shifts. Taking 7 days as paid holidays in a year, the mill should work 358 days of 3 shifts of 8 hours, each in a year. Ninety-five per cent utilisation of the installed spindle capacity calculated for 358 days for 3 shifts of 8 hours each mill, therefore, be the standard spindle utilisation for co-operative spinning mills.

Therefore, an examination whether the installed capacity is fully utilised by the working mill on multi-shift basis for all days in the year by improving worker's productivity and working machinery at higher speed, has been made. The idle spindleage was checked and its percentage to total spindles worked out.

Following table shows percentage of spindle utilisation of capacity of selected mills.

Spindle Utilization Capacity of Mills under study.

TABLE NO. 4.9

Year	Sholapur		Yeshawant		Valsang		Sangola	
	Spindles Utilised	Spindles Stopped	Spindles Utilised	Spindles Stopped	Spindles Utilised	Spindles Stopped	Spindles Utilised	Spindles Stopped
1983-84	85.58%	14.42%	87.30%	12.70%	71.11%	28.89%	-	-
1984-85	81.53%	18.47%	81.30%	18.70%	48.14%	51.84%	24.34%	75.66%
1985-86	91.71%	8.29%	84.99%	15.01%	52.66%	47.34%	66.60%	33.40%
1986-87	87.73%	12.27%	89.05%	10.95%	66.54%	33.46%	83.95%	16.04%

Above table shows that in 1983-84, 3 mills were in production. Out of 3 mills, 2 mills were under utilisation of 75% to 90% spindles and 1 mill was under utilisation of less than 75% spindles. In 1983-84 all the mills were in the ratio of 10% to 30% unutilised spindles. In 1984-85 4 mills were in production of which 2 mills were utilised less than 75% spindles and 2 mills used more than 75% spindles. The percentage of idle spindles remained less than 30% in 2 mills, while 10 to 30% in other 2 mills. In 1985-86 2 mills were below 75% utilised spindles, 1 mill was between 75% to 90% and 1 mill was above 90%. Percentage of idle spindle was more than 30 in 2 mills and 10 to 30 in other 2 mills. In the year of 1986-87 the percentage of utilised spindles was less than 75 in 1 mill and 75 to 90 in 3 mills. While the percentage of idle spindles was more than 30 in 1 mill and 10 to 30 in remained 3 mills.

Although the reported reasons for non-utilisation of plant capacity differ from mill to mill, the important reasons and their nature can be grouped as under.

Reasons reported for under	Nature of Reasons
1. Failure of electricity	Internal (to be looked after)
2. Shortage of the right type of cotton	Unsound cotton procurement policy
3. Back processes	Lack of production control
4. Power cut	External (Non-controllable)
5. Shortage of operators	Internal
6. Cleaning, gauging and maintenance	Internal (Plant Maintenance)

Most of the reasons reported, it would be noticed, were of internal nature and reflected lack of export managerial control.