



International Journal of Home Science

ISSN: 2395-7476

IJHS 2023; 9(3): 01-07

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www.homesciencejournal.com

Received: 02-06-2023

Accepted: 07-07-2023

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Profile of textile processing units of Pali district, Rajasthan

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Abstract

The present paper deals with the profile of selected cotton and synthetic textile processing units of Pali district of Rajasthan. It is a part of the outcome of the major research work planned to study the profile of textile processing units and effectiveness of CETP by treatment of textile effluents being discharged in Bandi River, along with health status of textile workers and developed guidelines for textile mill owners on environmental sensitization.

Keywords: Profile, processing units, Pali

Introduction

Pali is the largest erstwhile hand processing clusters, now gradually moving to power processing machines. It is best known for dyeing and printing of cotton and synthetic fabric. Pollution is the main culprit in the textile processing units. The effluent discharge from these units causes environmental pollution. The effluent discharge from various textile processing units of Pali flow about 55 km downstream, making the groundwater in several river bank villages unfit for drinking and irrigation and also causes adverse effect on crops and productivity and health of people residing in those areas. Before disposal they need to be treated for certain acceptable tolerance limit since pollution control laws are strictly followed all over the world and captured worldwide attention. The use of toxic chemical in these units cause threat to the manpower employed in such units cause threat to the manpower employed in such units in a way directly resulting in occupational health hazards. Further to be in tune with the government restriction to be connected to CETP, majority of textile processing units of Pali district are now adjoined to CETP. In spite of installation of CETP, the Bandi River still have enormous water and soil pollution adversely affecting the fertility of soil and purity of drinking water. The present research was plan to study the profile of textile processing unit and effectiveness of CETP by treatment of textile effluents being discharged in Bandi River.

Profile of textile processing units of Pali district

The first industrial area in Pali, established in 1962 in the north of the railway line occupies Hectares of area. At present dyeing and printing units in Pali are located in various industrial complexes. There are four RIICO developed industrial areas in the city. About 867 textile industrial units are in operation. Mandia Road industrial area- phase III alone has about 525 small scale textile units, which is 60.55 percent of the total dyeing and printing industries. About 39 small scale textile units are located in industrial area Phase I and 110 units are in operation in industrial area Phase II. Rest of the 77 industrial units are scattered in different localities nearby city area and 85 shifted towards Punayata industrial area.

There is also a difference in the number of process-wise units in Pali. Concentration is more on producing printed cloth; therefore, about 40.36 percent of units are engaged in screen printing of textiles. All the units are in operation at small scale due to lack of capital. Figure 1 and 2 below gives distribution of industrial units both area wise and process wise.

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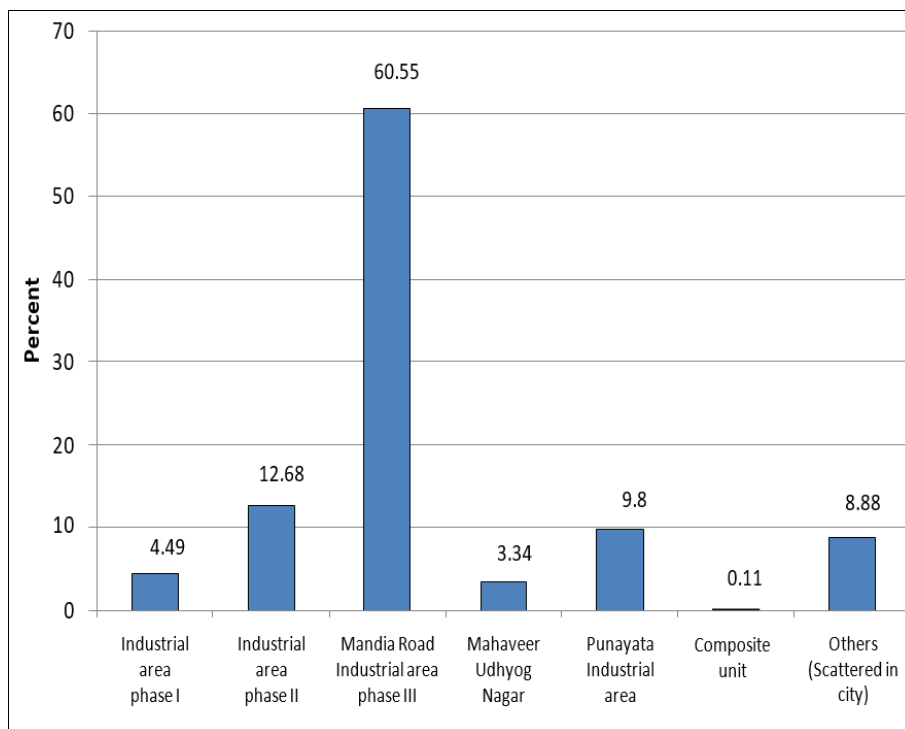


Fig 1: Area wise distribution of Dyeing and Printing units in Pali

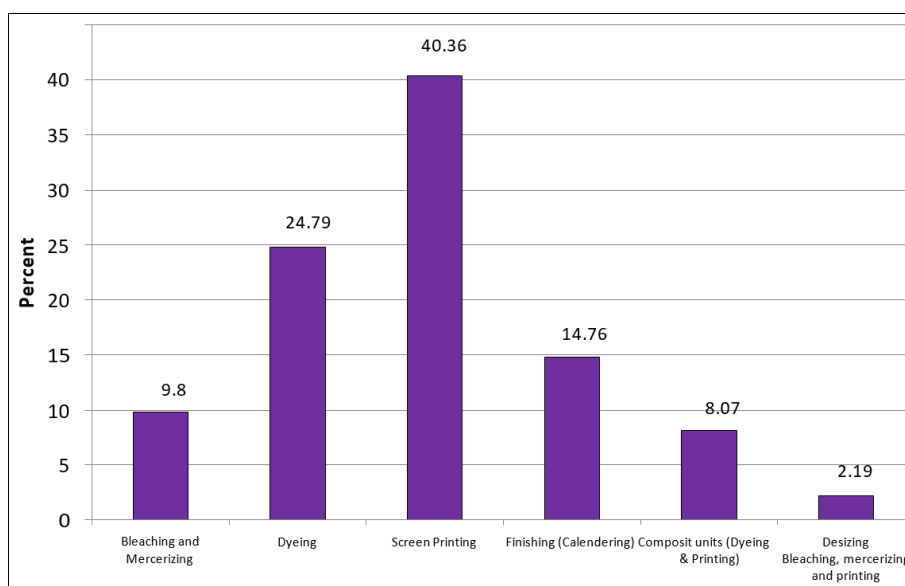


Fig 2: Process wise distribution of Industrial units

Fig. 2 indicates that different processes of dyeing and printing are carried out by separate units. Integrated work is done by few units. Only (8.07%) composite units doing whole process of dyeing and printing work, while bleaching and mercerizing works are done by 9.80 per cent units of study area. Majority of the industrial units (40.36%) are engaged in screen printing work of textiles followed by dyeing (24.79%) and finishing (14.76%).

Profile of Textile processing units

This section reveals the general information regarding location, size, area covered, total capital investment, production per year, yearly turn over etc.

Location and size

The researcher selected 60 textile processing units of Pali from different areas for conducting survey work. The data shows that 50 per cent of textile processing units were

selected from Mandia Road Industrial area due to higher concentration of textile processing units in that area. Rests of per cent units were selected from industrial area phase I and industrial area phase II.

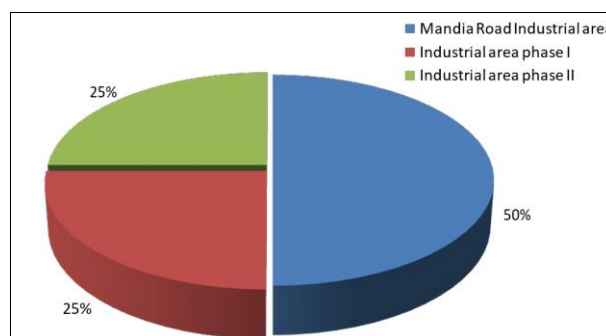


Fig 3: Frequency and Percentage distribution of textile processing units by its location

Regarding the size of textile processing units, all the units selected as sample comes under small scale industries based on their capital investments.

Year of Establishment

The data about year of establishment of selected textile processing units have been presented in fig.4. It was found that majority (66.66%) of textile processing units were established between year 1990-2000 followed by 25 per cent sample units in year 1980-1990. Rests of the 8.33 percent units selected as sample were established in year 2000-2005.

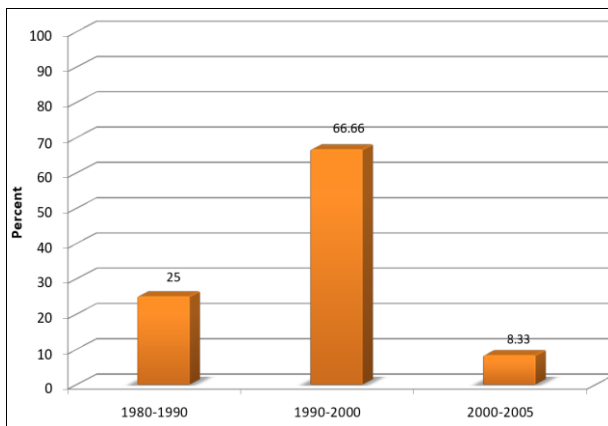


Fig 4: Frequency and Percentage distribution of textile processing units by its establishment

Area covered

Fig. 5 highlights the total area covered by selected textile processing units. A perusal of table indicates that majority (35%) of textile processing units covered the area between 2000-3000 square feet while 26 percent textile processing units were spread between 3000-4000 square feet area. Few textile processing units (16.66%) were found to be having area above 5000 square feet.

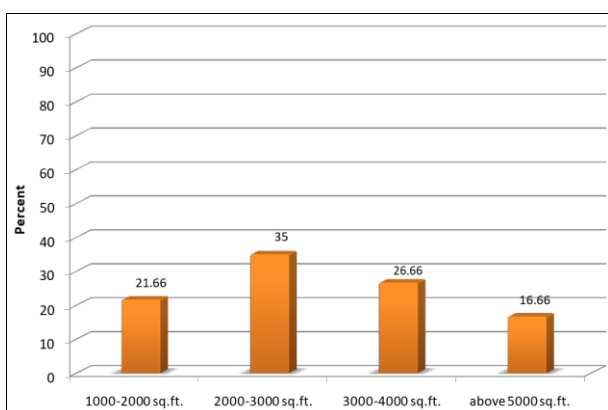


Fig 5: Frequency and Percentage distribution of textile processing units by total area covered

Total capital investment

Money invested in a business venture with an expectation of income and recovered through earning by the business over several years. Capital investment may also refer to a firm acquisition of capital assets or fixed assets such as land, machinery or buildings rather than used to cover the business day to day operating expenses.

Fig. 6 shows that 36.66 percent textile processing units had invested money between 3 to 4 crore, 30 percent between 2 to 3 crore, 20 percent invested between 4 to 5 crore and only 13.33 percent had capital investment between 1-2 crore.

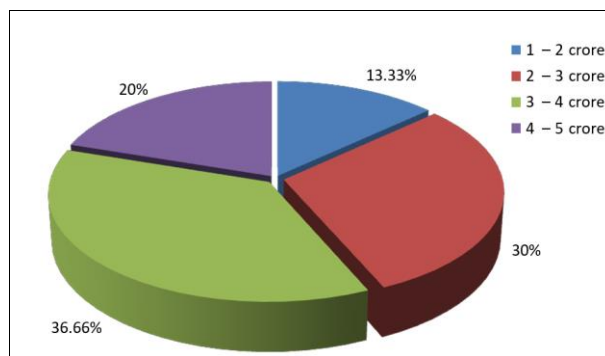


Fig 6: Frequency and Percentage distribution of textile processing units by its capital investment

Production per month: Production involves the processes and methods employed to transform tangible inputs and intangible inputs into goods and services. Productions of any good depend upon the relationship between demand and supply and the industrial environment of the area. Fig 7 shows the frequency and percentage distribution of selected textile processing units by production per month.

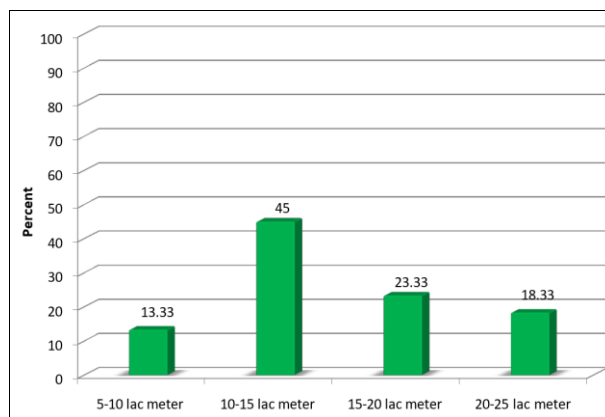


Fig 7: Frequency and Percentage distribution of textile processing units by its Production per month

Data shows that 45 percent of textile processing units had production per month in between 10 to 15 lac meters; that means average production of approximately 300 'than' for dyeing and 150 'than' for printing per day. One 'than' is equal to near about 130 meters. In a year, generally 300 days are counted for production.

Yearly turn over: Table depicts the distribution of selected samples units by its yearly turnover.

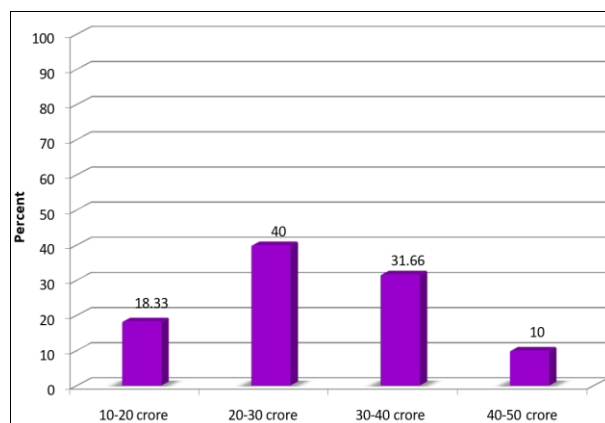


Fig 8: Frequency and Percentage distribution of textile processing units by its Yearly turn over

The data in above figure shows that 40 percent of responding units had yearly turn over between 20-30 crore, 31.66 percent between 30-40 crore and only 10 per cent had 40-50 crore. Turn over depends upon their investment, capacity, production and marketing.

Raw Materials

The raw materials used in dyeing and printing industry of the study area included the grey cloth (loom cloth) various chemicals and dyes. Almost all the raw materials were brought from the industrial units situated outside of the basin. The raw materials used for dyeing and printing industry was 'pure material' and these raw materials did not lose their weight during the production process, however Chemicals and dyes used in production processes, sometimes increase the weight of final products.

Grey Cloth: The basic requirement of dyeing and printing

works is the power loom produced grey cloth. Various qualities of grey clothes are required in the processor to produce different kinds of dyed and printed cloth.

Quality of cloth

The quality of cloth depends upon the number of threads used in preparing grey cloth commonly referred as 'Thread Count'. 'Ends and picks' are the vertical and horizontal threads. These are counted per inch by different methods to test the quality of cloth. Greater the ends and picks, better is the cloth. As the ends and picks decreases, the quality becomes coarser. Quality of cloth is also associated with the width of cloth which is in local dialect called the 'paina' of the cloth. Large paina of cloth is used to prepare sarees and dress materials. Generally, the dyeing and printing industries of the study area use, different quality of clothes as shown into following Table.

Table 1: Quality of clothes commonly used in textile products

S. No.	Product	Thread Count	Reed x Pick	Paina (width of fabric in inches)
1	100% cotton Plain voile	80s x 100s 100s x 120s	64 x 64 96 x 112	39 39
2	100% Cotton Plain Voile (Lining cloth)	40s x 60s 60s x 60s	36 x 36 48 x 36	39 39
3	100% Cotton Rubia 2 x 1 and 2 x 2 for ladies blouse	55s x 120s 120s x 120s	68 x 68 72 x 72	40 40
4	100% poplin	345 x 345 305 x 305	80 x 52 52 x 48	39 39
5	100% Cotton dress material	40 s x 40s 40s x 60s	68 x 64 84 x 76 50 x 58	48 48
6	100% cotton printed saree		52 x 42 52 x 36 80 x 76	46 46 46
7	100% polyester printed saree, dress material		84 x 74	48
8	100% cotton Khanga and Kitanga	34s x 34s 30s x 30s 40s x 40s	54 x 50 80 x 75	39 39

Source: Field survey october 2011

Sources of grey cloth

The grey cloth used in dyeing and printing industries of the study area are mostly bought from the power loom mills located in the states of Gujarat, Maharashtra and Tamilnadu mainly by road transport. The main centers are Ahmedabad, Malegaon, Mumbai, Bhiwandi, Ichalkaranji, Surat and Tripur.

A small quantity of cloth is also brought from the powerloom of Kishangarh in Rajasthan.

Persual of Table shows the location of powerlooms centers and their distance from the centres of dyeing and printing industry of the study area.

Table 2: Manufacturing centers of grey cloth and distance from study area

Manufacturing centers	State	Distance by Road (Km.)
Ahmedabad	Gujarat	415
Mumbai	Maharashtra	970
Bhiwandi	Maharashtra	888
Ichalkaranji	Maharashtra	1298
Malegaon	Maharashtra	1312
Surat	Gujarat	511

Above 80% of the grey cloth (cotton cloth) is brought from the three power loom centers located in Malegaon Ichalkaranji and Bhiwandi.

Chemicals and colour

Colour is the most important element which transforms the entire lots of the fabric of life. Colour evokes immediate response in the buyer's eye.

Dyes used: The researcher made effort to find out the type of

dyes used for dyeing and printing. Table shows that all the respondents used synthetic dyes for dyeing and printing purpose, however 16.66 percent respondents also used eco-friendly dyes, for fabric coloration as per the export order procured.

Table 3: Type of dyes used in textile processing units N = 60

S. No.	Dyes used	Frequency (f)	Percentage (%)
1	Synthetic	60	100.00
2	Eco friendly	10	16.66

Synthetic dyes and chemicals

With the change of technique and revolution in the industry, different kinds of synthetic dyes and chemicals are being used in various processes of dyeing and printing.

Dyes which are mainly used in study area are selected according to the nature of fabric. In the study area, mainly two types of fabrics are used for dyeing and printing i.e. cotton and polyester. For cotton, mainly Reactive, Ramazol, High Exhaustive dyes, Azoic dyes, vat dyes and sulphur dyes

are used. Selection of dye depends on the requirement of colour and shade of the fabric Disperse dye is applied on most of the synthetic fabric. For polyester, it is only for colouring. Procion and pigment dyes are used for printing of cotton fabric and disperse dyes for polyester printing. Besides these dyes, various textile auxiliaries are also used to perform various functions such as colour fixation etc. as shown in table below.

Table 4: Auxiliaries used in Textile wet processing

Description	Composition	Function	Processing step
Salts	Sodium Chloride Sodium Sulphate	Neutralise Zeta Potential of the fibre, retarder	Dyeing
Acids	Acetic acid sulphuric acid	pH control	Preparation Dyeing, Finishing
Bases	Sodium hydroxide Sodium carbonate	pH control	Preparation, Dyeing finishing
Buffers	Phosphates	pH control	Preparation Dyeing, finishing
Sequestering Agents Chelates	EDTA	Complex hardness Retarder	Preparation Dyeing
Surface Active agents	Anionic, Cationic and non-ionic	Softner, disperse dyes, Regular dye application, wetting agents, Emulsifier	Preparation Dyeing Finishing
Oxidising agents	Hydrogen Peroxide Sodium nitrite	Insolublise dyes	Dyeing preparation
Reducing agents	Sodium hydrosulphite sodium sulphide	Solublise dyes Remove unreacted dyes	Dyeing
Carriers	Phenyl Phenols Chlorinated benzens	Enhance absorption	Dyeing

Water supply: Water is needed in large quantity for performing various processes of the textile industries such as desizing, scouring, bleaching, mercerizing dyeing, washing, finishing etc. This water is essential requirement in dyeing and printing industry. Not only the quantity of water but quality of water is equally important.

Sources of water: Adequate water supply is the biggest problem in textile dyeing and printing units of Pali. The surface runoff water of tributaries of Luni, Jawai and Bandi rivers, is stored in reservoirs of Jawai and Hemavas. The reservoirs of Hemavas and wells along the bank of Bandi River supply the requirement of water to the inhabitants and also to the dyeing printing units.

Requirement of water: Water requirement per day in textile processing units depends on the size of the unit and production capacity. Approximately 5 to 6 liter of water on an average is needed up to the final product of one meter cloth.

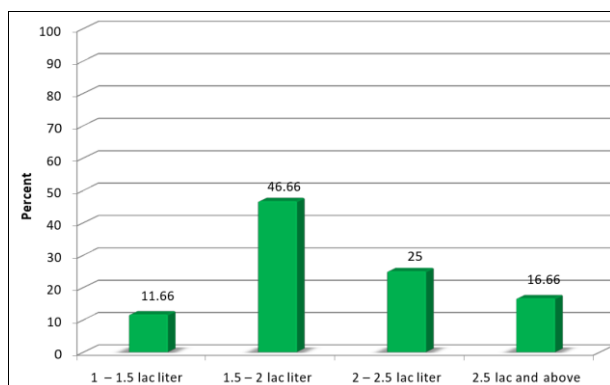


Fig 9: Frequency and Percentage distribution of textile processing units by its Requirement of water

Majority of the units (46.66%) required 1.5 lac to 2 lac liters water per day for textile processing followed by 25 units whose water requirement is 2 to 2.5 lac liter per day. There are about 10 units whose water requirement is more than 2.5 lac per day.

Table 5: Water requirement of cotton textile wet processing.

S. No.	Process	Requirements in liters/1000kg of product
1	Desizing	2,500-8000
2	Scouring	20,000-40,000
3	Bleaching	2,500-25,000
4	Mercerizing	16,000-30,000
5	Dyeing /Printing	7,500-15,000

Textile wet processing consumes large quantities of water and produce large volume of wastewater from different processes. A glimpse of water consume during cotton textile wet processes is given in table above. It showed that maximum water is consumed in scouring (20000-40000 liters/1000 kg. of products) followed by dyeing, mercerizing and bleaching processes.

Wastewater discharged

The textile processing units consumed large volume of water for various processes such as desizing, scouring, bleaching, mercerizing, dyeing, printing finishing and washing. Due to various chemical processing of textiles, large volumes of waste water with numerous pollutants are discharged. The waste water generation by the dyeing and printing units is due to various activities performed on grey cloth to shape the final product. All the respondents reported that 60 to 70 of total water consumed in textile processing is being discharged as waste water after final finishing of the products.

Man Power Requirement

Dyeing and printing' industry being a part of textile industry

is labour intensive. Since labour cost accounts for up to 60 percent of total cost in dyeing and printing, it provides an important location influences. The availability of plentiful supply of cheap labour is the important factor in the establishment of this industry in the study area. Following table provides a glimpse of the manpower requirement in different cadre in these textile processing units.

Table 6: Man power engaged in Textile processing units N = 60

S. No.	Man power	Number	Frequency (f)	Percentage (%)
1	Administrative	0-5	48	80.00
		5-10	12	20.00
2	Supervisor	0-5	47	78.33
		5-10	13	21.66
3	Dyeing master	0-2	48	80.00
		2-4	12	20.00
4	Workers	10-25	12	20.00
		25-50	27	45.00
		50-75	12	20.00
		75-100	5	8.33
		above 100	4	6.66

Data depicts that 80 textile processing units had administrative staff ranging between 0 to 5 remaining 20 percent units had staff between 5 to 10. More than 75 units had supervisor (0 to 5) to supervise the work of different departments or subunits. All textile processing units had dyeing master for mixing of dyes to get particular shade according to the demand of customers. 80 textile processing units had 1 or 2 dyeing master. Only 20 had more than 2 dyeing master depending on the size of the unit. Number of employed workers in different department depends on the load of work or production capacity of particular textile processing unit. 45 percent of units had 25 to 50 workers for its production. Only 6.66 percent units had more than 100 workers.

Working hours

Majority of textile processing units (81.66%) runs in both shifts. It means industry runs 24 hours a day continuously. Remaining textile processing units had production in one shift only.

Type of labour

Small scale operations in dyeing and printing industry do not

require high degree of skill. In textile processing units majority of workers were found unskilled or semiskilled based on their experience. Very less were skilled. Skilled labour required for mixing of dyes, printing of clothes and dyeing of polyester fabric. All the textile processing units had all type of labours.

Training

It was found that 80 of respondents preferred trained workers in their units. When asked about need of providing training to these workers, majority (60%) of respondents affirmed that they did not provide any kind of training to these unskilled and semiskilled workers.

Products

The dyeing and printing units of the study area produced a variety of value added clothes especially poplin, voil and rubia which is used as dress materials, sarees, lining material, and lungi etc.

These products have comparatively low prices than the variety of the mill produced goods of the same kind but captured higher demands in the rural areas, although the demand of poplin, Rubia and dress material is very much in urban areas also.

There is greater demand of the low cost colourful and attractive clothes produced in the study area, among the lower and lower middle income group.

Market

One of the prominent features of textile processing units of the study area is that 45 percent of units have their sister concerns in the big towns and cities of Gujarat, Maharashtra, Karnataka, Tamilnadu and West Bengal. These concerns are also wholesale dealers of the products of the above units. Therefore through these dealers the developed products capture the market all over the India. Besides this, the produced clothes is also being supplied to the states of Rajasthan, Uttarpradesh, Madhyapradesh, Orissa, Bihar, Chattisgarh and Jharkhan through commission agent.

The major markets are densely populated states of the country where the goods are supplied and converted to variety of products in the exporter houses of Delhi, Ahmedabad and Mumbai, from where, major export countries to number of foreign countries including saudi Arabia, Emirates, Pakistan, Myanmar, Bangladesh and Srilanka are carried out.

Table 7: Market Areas of the products of Textile processing units

States	Whole sale Market centers	Percentage (%)
Gujarat	Ahmedabad, Baroda, Disa	10.5
Maharashtra	Mumbai, Malegaon, Ichalkaranji	11.5
Karnataka	Banglore, Hubli, Dharwar	5.6
Tamilnadu	Chennai, Madurai	3.6
West Bengal	Kolkata, Hawara	8.4
Rajasthan	Bikaner, Jaipur, Bhilwara	15.5
Uttarpradesh	Agra, Ghaziabad, Sharanpur	17.5
Others (M.P., Chattisgarh, Jharkhand, Orissa)	Indore, Gwalior, Raipur, Bihar, Bhubaneswar	27.4

Source: Field Survey October 2011

Cost

The cost of goods produced depends on the production functions of the firm i.e. input of labour, capital, investment etc. to produce required output. The total cost (TC) is the sum of all costs incurred by a firm in producing goods. The fixed cost (FC) and variable cost (VC) are the two key components of the total cost. The fixed costs include the cost of the

factories, land, machineries etc. Variable costs include wage payments for workers, cost of raw materials, power, water etc. which is dependent on the quality and quantity of production. Thus

$$TC = f(FC + VC)$$

Transport cost

If the sourcing of raw materials and chemicals used for production is carried out from distant places, it also adds up to production cost and named as transportation cost. The transport cost of the cloth for the purpose of dyeing and printing is kept Rs. 0.30 per meter. The variance in this cost corresponds to the distance from the source of raw material.

Production cost

The production cost (vc) of a firm means the cost incurred on input to produce one unit of cloth.

The researcher observed that all the textile processing units selected as samples of the study used to outsource to meet the need of raw materials through different firms located in Ahmedabad, Mumbai, Surat, Baroda and Ichalkaranji. These firms placed their order to local textile processing units of dyeing and printing situated at different places. Generally the dyeing cost is kept at the rate of Rs. 4.50 to Rs. 5.00 per meter. The rate of printing varied from Rs. 6.50 to Rs. 7.00 per meter. The variation in rate depends on the quality of dyes, printing and size of the clothes.

Quality Parameters

Quality control system is to control the quality almost after the particular operation or process is finished eg. Measuring finished width, fastness properties etc.

Data shows that majority of respondents (70%) did not have testing lab for quality control. Only 16.66 percent respondents follow quality standards as per requirement with export orders. 83.33 percent respondents did not follow any quality standards because they produce low quality fabric for lower and lower middle class people at low cost. Only 30 respondents had lab facilities in their unit. 33.33 percent respondents used to check the quality of clothes by manual counting 'Reed and Pick'. Majority of respondents carried out testing of fabric for fastness properties like washing, colour fastness and sublimation fastness for dyed polyester fabric. Most of the respondents did not have lab facility but they used to get the testing done at other places. Only few respondents (23.33%) also test pH of waste water before discharging.

Conclusion

Hence it can be concluded that textile processing units of Pali are of small scale and labour intensive and operating with the limitations. The major problem threatening the textile processing units is the environmental pollution arising out of the processing of textiles. Huge amounts of water and chemicals are used in different processes discharged as wastewater. Thus the presentation has been an effort to describe features and risk factors of pollution from existing textile processing units of Pali district and apply these findings towards a pollution free, better and safe environment for textile workers, owners and local people.

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