

IMPACT OF THE DROUGHT OF 1985-1988 ON JETPUR DYEING AND PRINTING INDUSTRY

(Saurashtra. - Gujarat)

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The objective of this paper is to appraise the impact of the drought on the dyeing and printing industry in Jetpur, in Saurashtra.

Being based on a water intensive process, this industry is particularly vulnerable to this type of scarcity. Saurashtra is known as a drought prone area, though, with the last three years of recurring drought (1985-86, 1986-87, 1987-88), this is the first time in the history of Jetpur printing industry that the consequences on economic activity were so dramatic.

We shall review the various adverse effects of the drought on this industry, but we shall also try to give a more qualified appraisal of the situation by showing how certain industrialists could take advantage of some favourable factors.

But first of all, a brief presentation of the data used, as well as a general view on Jetpur dyeing and printing industry are necessary.

A - SOURCE OF THE DATA. (1)

The findings presented in this paper are based on an ongoing research concerned with industrialisation and urban development in Indian middle-sized towns. The main objective is to investigate the role of the labour markets of industrial medium towns, like Jetpur, in attracting migrants.

In the case study of Jetpur, the data collected are issued from two demographic surveys. The first one is a household survey on migration and employment which has been conducted from January to April 1988 in a 10 % sample of households of the urban agglomeration and of a few surrounding villages. 2400 households were surveyed.

The second one is a survey of economic establishments of the dyeing and printing industry : in-depth interviews with 50 industrialists have been carried out in November-December 1988.

As the processing of the information collected is still going on, and as the field study has to be completed by another round of observation, our paper should be considered more as an exploratory essay pointing out directions of research for further investigation, than as a communication stating conclusive results.

(1) For further information on the surveys conducted, see :
DUPONT V.- Integration of circular mobility in the analysis of urban dynamics. Reflections and methodological implications - example of middle-sized towns in India.
Paper presented at " JOURNÉES DÉMOGRAPHIQUES DE L'ORSTOM" - Migration, social changes and development. Paris (France), 20-22 Sept. 1988.

B - GENERAL VIEW ON JETPUR DYEING AND PRINTING INDUSTRY. (1)

B-1- Setting up and development.

Jetpur is a medium-sized town located in Rajkot district, in Saurashtra. Its economic development is based on a mono industry : the dyeing and printing of cotton saris.

Dyeing of cloth was a traditional craft whose origin in Jetpur goes back to at least two centuries ago. Block printing started developing around 1930.

In 1947 the technique of screen printing was introduced, and in the fifties the printers shifted from block printing to screen printing.

The best expanding period for the dyeing and printing industry in Jetpur took place from 1965 to 1983. For the last four years the industry has faced an economic crisis, mainly due to keener competition and lack of demand, increased by the effect of drought on water supply.

The number of industrial units has gone up to 1200, all of them belonging to the small scale sector. However, due to a common practice amongst the industrialists to divide their concern in small-sized administrative units, in order to avoid extra taxes and to escape the labour legislation, these 1200 units correspond only to about 500 individual entrepreneurs or familial groups. As far as employment generation is concerned, the maximum capacity of Jetpur printing industry amounts to about 40 000 workers.

The considerable expansion of this industry over the last forty years is also rendered by the rapid population growth of the town, indicating a high immigration. Between 1971 and 1981 the decennial growth rate was 50.4 %, with a population amounting to 63 074 in 1981.

Today the urban and industrial spread of Jetpur also includes an adjacent suburb, Navagadh, and constitutes altogether an urban agglomeration with a total population of about 100 000 (2). The printing industry not only leads the entire urban economic activity, but it also provides employment opportunities for numbers of commuters living in the surrounding villages.

(1) For further information on Jetpur dyeing and printing industry, see :

• ASHRAF M.S. - Economics of cloth printing in the decentralized sector.

A study of handprinting in Jetpur (Gujarat); GIRI Institute of Development Studies, Lucknow, July 1985.

• TRIVEDI R.K. - Block and screen printing at Jetpur, in :

Census of India, 1961, Vol. V - Part VII-A, Selected crafts of Gujarat (N° 20). Central Government Publications, Delhi, 1970.

(2) This estimation is based on the provisional results of the household survey.

B-2- Process of production.

To be able to understand the various effects of the drought on the dyeing and printing industry, a minimum knowledge about the process of production is required.

. Printing technique

The dyeing and printing industry in Jetpur specializes in printing of cotton saris. This is a labour intensive industry and the process of production is entirely manual.

The main operations consist of preparation of dye solutions, printing by the means of screens of the fabric previously spread on long wooden tables, silicating or steaming process (to develop the colours), washing, ironing and pressing, folding and packaging of the saris.

. Importance of the water in the process of production.

Water is an essential element in the dyeing and printing process : sufficient quantities as well as adequate quality of water have to be provided.

Water is first used in the preparation of the colour solutions, to solve the dyes. Then large quantities of water are required to wash the saris. For these two operations the quality of the water is also important. A good amount of water is also needed to wash the tables on which the saris are printed, the screens, buckets and other tools.

The Bhadar river, which flows in Jetpur, is famous for its special properties that help in developing the colours and prints. This is the main reason for the initial location and concentration of dyeing and printing craft in this area.

In the past the saris were washed directly in the river. Nowadays the flow of the river is quite insufficient to fulfil the requirements of the increased number of printing factories. Besides the construction in 1964 of a dam on the Bhadar river, 22 kilometres upstream from Jetpur, has considerably reduced the flow of the river.

. Raw materials.

The raw materials can be divided in two categories, as far as the possible impact of the drought is concerned.

The first one consists of the raw materials issued from agricultural products

and whose supply can be directly affected by drought : there are cotton cloth, gum and starch.

Cotton cloth from power looms is the basic and principal raw material required in this industry. But the question of cloth supply should be stated in different terms, according to the system of production adopted by the entrepreneur.

In the most frequent system, known as "job-work" system, and which concerns 75 % to 80 % of the printing units, the entrepreneurs undertake printing work only on contract base. They receive the cotton cloth to be printed from the traders who provide them the orders and ensure the marketing of the printed saris. Thus the factors which can affect the cloth supply are not the direct concern of these industrialists.

In the alternative system, called "own business" system, the entrepreneurs work as independent establishments : they purchase the cloth to be printed and have also to take in charge the marketing of the saris.

Gum is used in the preparation of the colour solutions as a thickening agent. It is extracted from a leguminous plant, the "gowar", which is grown particularly in Rajasthan.

Starch is extracted from maize. It is used to prepare a mixture in which the saris are passed through after washing, to attain hardness.

The other category of raw materials consists of synthetic products, whose supply does not depend directly on climatic conditions. There are, first of all, synthetic dyes, and other chemicals used to develop the colours (acetic acid, sodium nitrate, caustic soda, sodium silicate ...).

• Impact of climatic conditions on the process of production.

A wet atmosphere is not suitable for printing, besides the saris are to be dried out in sun light or in dry air. Therefore monsoon is the slack season for printing work. Most of the sari factories cannot run during all the year and have to close seasonally.

However few factories are equipped with "hot tables", that is tables with a heating system, in order to dry the dye solutions applied on the saris, and thus enabling the printing process to operate even during the monsoon.

. Marketing

The cotton saris of Jetpur are produced mainly for the lower and lower-middle classes, and they are sold all over India. Proportionally, Gujarat represents only a very small part of the whole market, as for Saurashtra part, it is insignificant.

Large quantities of saris are also sent to Bangladesh from Calcutta, and some to Sri Lanka. A few units in Jetpur also print "khangas" and "mishars", pieces of cloth used by African and Arab women as head gear, which are exported to East Africa and Middle-East countries.

C - EFFECTS OF THE DROUGHT

At the first sight, the last drought had catastrophic consequences on Jetpur printing industry, as a result of water shortage and lack of demand.

The situation described by the President of Jetpur Dyeing and Printing Association in October 1987 was very alarming : 60 % to 70 % of the units stopped functioning, the reduction in the production estimated at 50 %, and the level of employment evaluated at 15 000 as compared to a maximum employment capacity of 40 000. At that time, predictions made for the next months and more particularly next summer were even worse : all the factories would be condemned to stop their production due to water scarcity.

Fortunately for Jetpur, this expectation proved to be over-pessimistic, and the printing industry was not compelled to discontinue its production, even in summer 1988. The figures given by the Industries Association seem also exaggerated as compared to the results of our own investigations.

We would like to give here a more qualified appraisal of the situation, by presenting a review of the various effects of the drought on the printing industry, the adverse effects but also the favourable ones.

C-1- Shortage of water.

Its process of production being water intensive, the dyeing and printing industry was hit in the first place by shortage of water resulting from drought.

To ensure the functioning of their establishments, the industrialists had to buy water from rural ^{areas} and bring it back by means of tankers. They had also to send the saris for washing to places where water was available in sufficient quantities, sometimes up to 90 kilometres away from Jetpur.

This resulted in increasing the cost of water in the cost of production of the saris. The average printing cost of a sari is 8 to 10 rupees, including all costs of production except cloth. Out of it the cost of water

in normal climatic conditions ranks from 0.05 to 0.25 rupee per sari, but during the drought it amounted up to 0.20 to 0.60 rupee per sari.

The problem of water supply was not faced in the same terms by all the establishments. Some very small units pointed out that their requirement in water was very modest due to their limited processing capacity, and thus it did not raise great difficulties; whereas in the biggest units the large quantities of water required made the problem of supply more acute.

Another important factor of differentiation has to be taken into consideration : whether the entrepreneur has his own independent source of water, in particular wells in agricultural fields, and his own washing ghats. From this point of view the industrialists belonging to the Patel community, from families of agriculturists owning fields, may have had an advantage, providing the source of water -if any- was not dried up during the drought.

The imperative search for water even led to more or less illegal practices. For example to go beyond the water consumption quota imposed to the industry by the government because of the drought, some industrialists brought back tankers of water from villages even at night to avoid controls.

In April 1988, the collector of Rajkot had to take action against the industrialists from Jetpur who were using electric motors to pump water from the Bhadar dam and other reservoirs : 50 motors were seized. In the same area 120 ghats for washing saris were also broken, to fight against water pollution(1).

Saurashtra being a drought prone area, Jetpur printing industry had already had to face problem of water scarcity. But in the past the number of sari printing factories was lower, thus the total quantity of water required for the industry was less important than today. Besides, the last three years of recurring drought (1985-86, 1986-87, 1987-88) made the scarcity of water much more severe.

However, the shortage of water was not absolute, for the industrialists it turned to be first a problem of increasing cost of production : water was not easily available, but still obtainable for the ones who could afford it.

(1) source : FULCHAB, 20-4-1988

C-2- Increase in the prices of raw materials.

Due to drought, the prices of raw material issued from agricultural products - cotton cloth, gum, starch - increased, following a deficiency in the crops of the corresponding agricultural staple products.

Gowar crop in particular was dramatically affected by the drought that hit Rajasthan, where this leguminous plant is grown. Consequently the price of gum flared up : it tripled, from 20 rupees per kilogram before the drought up to 60 rupees per kilogram.

The rate of cotton cloth also increased in 1987-88. However the grey cloth market is a very fluctuating and speculative one, it is affected by not only the level of cotton supply, but also by various other factors like the Government of India export policy. Thus it is difficult to appraise the specific impact of drought on the level of prices.

On the other hand, for the three fourths of the establishments in Jetpur printing industry , those working on contract , the price of cloth is not a component of their cost of production, as the cloth is provided by the traders who give the orders.

C-3- A dry weather more favourable for printing work.

As we already mentioned , monsoon or even moist atmosphere is not suitable for printing. On the contrary, the three years of recurring drought brought ^{about} climatic conditions more favourable for printing work. The sari factories were not compelled to stop their production for two or three months because of the monsoon . as they - usually are. The number of working days could be significantly higher - provided the establishment was not obliged to close due to other difficulties faced during the drought.

For example, in the sample of 50 industrialists interviewed, the number of working days reported in 1987 amounts to 247 on an average, as against 222 working days in 1988 (year with a good monsoon). In some establishments the gain of working days in the year of rain scarcity is more than 60 days, up to 77 days in extreme cases. Concerning now the number of saris printed, in half of the establishments the production declared was significantly higher in 1987 than in 1988.

Moreover, at the question "When was the best period for your business, in respect to production, since you have been running this factory?", 16 industrialists out of 50 answered the years -or one of the years- of the last drought, from 1985-86 up to June 1988, and they mentioned explicitly the good climatic conditions for printing as the main reason.

In fact, for the industrialists who could solve the problem of water supply, and whose market was not affected (see below), the years of drought proved to be prosperous ones, as far as the level of production is concerned.

C-4- Impact on the demand.

Besides the shortage of water, another main adverse effect of the drought on the printing industry was the slump in demand, especially in 1987, due to the extent of the drought in many parts of the country.

Fall in populations' purchasing power reduced demand for consumer goods, like saris, especially in rural areas directly affected by the crop failure.

Now, the consumers of Jetpur saris are mainly village women.

Indeed, many industrialists complained about the general depression of the market during the years of drought, and the subsequent reduction of orders. However, the situation may differ considerably among the establishments, according to the places of marketing of the saris and the capacity of adaptation of the industrialists to the changing conditions of the market.

The units whose market is concentrated in regions severely hit by the drought were obviously the most affected, and in the first place the establishments whose main market is Gujarat.

But we found also some paradoxical situations. Let us mention for example the case of this industrialist whose saris are sold in North Gujarat, and who pointed out that the demand was even better during the drought in 1987-88 than during a year with a normal monsoon. According to him, the implementation of relief works by the government, especially in 1988 when the system was functioning regularly, provided "steady" employment for the rural people throughout the year whereas usually they get employed only during the agricultural season. Thus their purchasing power in summer 1988 proved to be better than usual.

Some major markets for Jetpur saris were not affected by the last drought: this is in particular the case of Bihar, West Bengal (and Bangladesh through Calcutta), Maharashtra. Thus the establishments whose saris are sold in these areas should not have suffered from lack of demand.

Moreover, in West Bengal Puja Festival, which falls in October or November, is the peak season for sari sales : in order to face this hike in the demand, the industrialists have to print the saris in August-September, which raises difficulties during a good monsoon. So the years of rain scarcity turned to be very profitable to these industrialists, by ensuring more favourable climatic conditions to print during their peak season.

Jetpur saris being sold all over India and in some foreign countries (like Bangladesh), some important markets remained unaffected by the drought, thus the demand did not shrink dramatically for all the establishments. Some industrialists even managed to take advantage of the combination of a dry weather favourable for printing work and of a buoyant demand on certain markets.

C-5- Fierce competition, reduction of margin of profit and closure of factories.

Though selectively affected by the drought, the sari market was globally depressed, and the slack in demand resulted in a keener competition amongst the industrialists in Jetpur. To snatch contracts from traders, some industrialists were ready to lower their price. Therefore it was not possible to transfer the increasing cost of production (mainly the extra cost of water and of certain raw materials) to the printing prices of the saris. Besides the traders would argue that the conditions of the market (fall in consumers' purchasing power) did not allow them to increase the sales prices of saris. Consequently the margin of profit in the sari printing industry was cut down.

Faced with such difficulties, the industrialists reacted in various ways. Some of them admitted that they used raw materials of a lower quality in order to maintain their margin of profit, or at least to realize a minimum profit.

On the contrary, other ones refused to compromise on the quality of the printing, in order to preserve the reputation of their work amongst the traders, and they rather preferred to incur loss, or to close their unit temporarily.

Priorities could also differ : for some it was first a question of continuing the production in order to satisfy their commitment to the traders and to maintain their position on the market. For others, reputation through quality of work was the most important thing.

But some industrialists had just no choice, and were compelled to close their unit because they could not afford to spend more on water and / or did not get any orders.

The small establishments proved to be the most vulnerable, for many of them were already suffering from industrial sickness for the past years. On the contrary the big establishments were better armed against the difficulties brought in by the drought. Their financial means allowed them to bear the increasing cost of production and to lower their printing prices to face the competition. Generally their market is also more diversified, so that they could compensate a lack of demand or even a loss incurred on a specific market by sales realizations on other markets. Moreover the biggest industrialists have also their own trading agencies and thus a better control on the market of their saris than the industrialists depending on the orders provided by traders.

As a fact the establishments which were condemned to close during the drought were small or middle-sized units, working on contract base, and not the big ones, nor the independent business establishments.

Another characteristic of the establishments which closed is that they were mainly functioning in rented premises. In Jetpur the entrepreneurs can rent ~~on a temporary base~~ a factory already equipped to carry out printing work. This system which concerns 35 % to 40 % of the units is adopted by entrepreneurs who do not own fixed assets, or by industrialists who already own a factory and resort to this solution when they have to face extra orders. Whenever there is a slump in demand, the printing units running on a rental base are the first ones to be affected by the adjustment of the production. An indirect evidence of the extent of the closure of rented factories during the drought is given by the decrease of the rent : on an average the rent was twice or thrice lower at that time.

But the establishments which discontinued their production during the drought did not close definitively, generally they resumed the production as soon as the situation improved, mainly after the monsoon of 1988.

In our sample of industrial establishments, only 4 industrialists out of 50 had to discontinue their production for several months during the drought, due to lack of orders and/or their incapacity to cope with ^{the} shortage of water.

Though our survey does not enable us to give an estimation of the proportion of units closed during the drought, all the information collected tend to prove that the situation was not as alarming as described by the Industrial Association.

C-6- Reduction of the level of employment.

For Jetpur printing industry considered as a whole, the reduction of the production to adjust to the slack in demand and the closure of factories also affected the level of employment.

Except for the dyers who are employed on a regular base and salaried, most of the workers in Jetpur printing industry are engaged on a daily base and paid according to a piece rate system. In such a system it is therefore very easy for the industrialists to adjust the level of employment to the fluctuations in the orders. Consequently one should expect an increase of unemployment figures resulting of the economic difficulties brought in by the drought.

Surprisingly, the number of unemployed recorded in our household survey is very low. Amongst the ^{production}workers of the dyeing and printing industry, only 3.8 % reported to have been unemployed in 1987 for the whole year or more than four months (1). This figure concerns the labour force living in Jetpur urban agglomeration and the surrounding villages within a radius of 8 kilometres around Jetpur. It may be possible that the commuters coming from a further distance to work in the printing industry have been more affected by the reduction of employment than the workers living in the urban agglomeration or the near-by villages. In a situation of scarcity of employment, the workers from Jetpur might have better contacts to get job.

Unemployment which hit the industrial workers may also be partly disguised by out-migration and occupational mobility.

Our household survey enables us to estimate the proportion of out-migrants who left during 1983-87, from the households surveyed at the beginning of 1988.

But, if all the members of a household out-migrated together, they could not be recorded by our survey. Nevertheless, though partial, the data collected can provide some interesting information.

In the households surveyed, the proportion of out-migrants within the labour force amounts to 4.3 % from 1983 to 1987, but if we consider only the ^{production}workers of the sari printing industry, it goes up to 7.4 % (2).

The ^{production}workers from the printing industry represent 47 % of the out-migrant labour force, against 30 % of the present labour force. These figures show that the workers from the printing industry have been more affected by out-migration than the rest of the working population,

(1) The dyeing and printing industry being seasonal, irregularity of work and partial unemployment are common features of the workers' fate. Therefore to appraise the specific impact of the drought on this industry, we have considered here only the duration of unemployment significantly longer than usual.

(2) These proportions of out-migrants are the observed proportions, that is without taking into account the effect of mortality.

indicating most probably a more severe deterioration in employment in this industry.

As far as the occupational mobility is concerned, some workers from the printing industry found employment in the diamond-cutting factories recently set up. In the last three years about 20 units started, in Jetpur and some surrounding villages, which must have attracted unemployed workers.

From the point of view of the industrialists, the situation of labour surplus during the drought was appraised as a positive factor, at least for those who maintained their factory open. They underlined the fact that during the drought labour was available without difficulties, whereas after last monsoon, when all the factories resumed production, they had to face a relative shortage of labour, for workers coming from rural areas have been mainly engaged in agricultural works, while others had out-migrated or shifted to diamond-cutting factories.

CONCLUSION

Drought had a twofold adverse impact on Jetpur dyeing and printing industry. First of all it directly affected the process of production by way of water shortage and increasing cost of certain raw materials. Secondly it caused slack in demand. But one should also point out a positive effect : dry weather ensured better climatic conditions for printing work.

The resulting consequences on the level of production, closure of factories and the level of employment proved to be less alarming than what some industrialists claimed when faced with the drought. The appraisal of the various effects of the drought on the printing industry has to be qualified. Overall one should underline that the impact has been very selective amongst the establishments, and several important factors of differentiation have to be considered.

The most dramatically affected establishments were the small ones, working on contract, in rented premises, and whose market was concentrated in regions severely hit by drought. On the contrary some establishments did not suffer much, and even managed to take advantage of the dry weather to increase their production. Such cases concern mainly the biggest industrialists, working independently, having their own trading agencies, and whose market is more diversified and includes in particular Bihar and West Bengal, two major markets for cotton saris which remained unaffected by the last drought.