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## **Handmade paper from India. Kagaj: yesterday, today and tomorrow**

*I know that handmade paper can never supply the daily growing demand for paper.  
But lovers of the 7000,000 villages and their handicrafts will always want  
to use handmade paper, if it is easily procurable.*

*Haraijan, 14 September 1934*

### **Kagaj: Yesterday**

No definite clue is available as to the date paper was first manufactured in India. Some people believe paper was invented independently in India\* in Buddhist times around 250 BC. Supposedly it was replaced by the more useful palm leaf and birch bark later on. Archaeological finds at Gilgit in the vale of Kashmir indicate that paper was already applied in the Himalayas in the sixth century AD. The paper is of a very crude nature and resembles that found in Buddhist manuscripts of more recent date from Tibet and Nepal. Other records make mention of occasionally use of paper for religious purposes in the seventh century AD. A Sanskrit dictionary about one hundred years later gives two versions of the Persian word for paper and one for the Chinese word. Paper thus is known some time before the Moslem era. It is probably imported and only used on a very small scale. In the 11th century the followers of the Holy Qur'an begin their massive invasions in North India. In the beginning the invaders do not have much influence over the Indian subjects. The first physical evidence of Indian paper manuscripts dates from that time. They have the oblong format of palm leaf and the scribes continue to leave an open space for the holes of the ropes that originally kept the palm leaf books together. Still almost all the manuscripts are Islamic writings.

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\* When I refer to India in the past I indicate a region that is now covered by the republics of Bangladesh, India and Pakistan. I am well aware of the fact that at several points in history part of the territories of Burma and Afghanistan belonged to the Indian empire.

The Hindu, Buddhist and Jain persevere in recording their texts on palm leaf long after paper becomes a popular writing material. Religious taboos being one of the reasons.

It is generally accepted that somewhere between the 10th and the 13th century the Moslem conquerors introduce the white art in northern India. The earliest centres are established in Daulatabad, Lahore, Sailkot, Ahmedabad and Kashmir. Before that the Moslem courts in Delhi probably import paper from Persia. In those early days many people working in the book trade come from Persia. That is also why most of the Indian paper terminology goes back to Persian or Arabic roots. Like the Hindi word *kagaj* which derives from the Persian word for paper: *kagaji*.

In the 16th century the Great Mogul come into power and the rich culture of the Arabs and the Persians start to blossom in the conquered lands. The Mogul know they have to co-operate with the Hindu if they want to stay. Their common language becomes the new Urdu written in a Perso-Arabic script, literatures start to mix and a new bookform is introduced: the codex, the book as we know it in the West today. From that time on Mogul princes and noblemen establish court studios for the production of manuscripts as did their ancestors before them. Now the miniature painters are not confined to the small size of the palm leaf anymore, they can illustrate the entire page of the book to their heart's content. The Emperor Akbar (1556-1605) in particular takes a keen interest in the book arts, although he himself is an illiterate. He has more than 100 painters living at his court and is said to have possessed a library of 24,000 volumes. At this time the paper industry gets well under way. During the reign of his son Jehangir (1605-1627) the city of Sailkot in the Punjab becomes the most important centre of papermaking. 1500 *Denkhi*, the traditional Indian rice stamper, are producing pulp for the paper mills. Hundreds of *kagjipura* arise, settlements where the Moslem papermakers, the *kagji*, live and work. These quarters have the advantage that the secret of papermaking can be guarded and that they all have enough space and water.

In the realm of further subjugation to the south, east and west paper conquers India. The conservative Hindus in the eastern and southern parts of the country still consider paper unclean, after all it is produced by Moslems. On the other hand their fellow believers in West India are more liberal and those in power even give the *kagji* permission to live and work within their walls. Thus important *kagaj* centres originate in the states of Rajasthan, Gujarat, Maharashtra and Madhya Pradesh. In the east minor centres arise in Utter Pradesh, Bihar, Bengal and in the south in Tamil Nadu and Karnataka. Some of these centres survive until this day. During Mogul rule a distinction can be made between Moslem and Hindu papermaking. The Hindu production is much more localised and their scribes need the normal size folio. Contrasting, the Moslem require much larger sheets that can be cut and bound. Because of the extensive illumination their manuscripts need a thicker and sturdier paper as well. A heavy glazing facilitates the writing and miniature painting. Making paper is not an individual business. It involves the whole family each member being assigned his own task in the production process. Originally, their main raw material is worn gunny bags, made of jute (*Corchorus capsularis* or *Corchorus olitorius*). The papermakers buy them from the pack animal drivers along the trade routes where the *kagjipura* are situated. In addition they use remnants of nets and ropes made from Sun hemp (*Crotolaria Juncea*). Orders are always placed well before the work is commenced. The job earns well not in the least because of a constant demand from the courts.

When in the 18th century the Rajput and the Maratha take over from the Mogul it is impossible to imagine life without papermaking. For some time cotton rags are utilised as a raw material next to gunny bags. All the government records are written on paper. The local courts even give their worn ledgers to recycle. And at several times the *kagji* are so much in demand that when they settle in an area the local ruler grants them the land. Paper is not only used in the courts. To some extent religious men need paper for their writings, officials and public servants for their correspondence, and merchants for their account books. The demand for paper is kept within the limits of the *kagji*. Most of the common people cannot write or read, there is practically no education.

When written communication is indispensable those who possess the power do so by writing in the sand or on rough material as wood or slate. A peculiar writing material developed amongst the merchants of Mysore. They wrote with soapstone or chalk on a cotton cloth impregnated with tamarind seed paste and blackened with charcoal. These folding books were in use as account books, called *kaditam*.

Papermaking is still considered a profitable business at the turn of the 19th century. To an increasing degree East India becomes an important centre of papermaking activities. Bengal and especially the region around Kalpi form busy centres. The west of the country with its new centre around the Bombay residency remains a prosperous paper producing area. This may be illustrated by the following example. A certain Balaji Abaji, a Thakur from the Kshatriya caste, left around 1800 his village Roje in Maharashtra together with several other residents. He wanted to start up papermaking at Nasik. The inhabitants of Roje however summoned Balaji because he would harm the village welfare by leaving. Fortunately for Balaji Abaji the legal officer in charge agreed with him. The inhabitants of Roje did not win their case. After 90 years the mill still stands and Nasik had a prosperous paper industry for a long time.

East India becomes a very important paper producing area in this century. In Ahmedabad rich Moslem of the Sunni Bohora sect employ over 800 men in the manufacture of paper in 1848. They mix gunny bags with European scrap paper to make a paper widely in use in Central India. Nevertheless the new rulers, the English, do not like the locally produced paper. In the first half of the 19th century the European paper market struggles with a huge shortage of rags. This forces the colonial powers to import their papers initially from China. Later the odds change with the perfection of Robert's paper-machine and the invention of woodpulp. The European paper market picked up. It was not long before the colony completely depends on the production of paper in the motherland.

The first paper-machine enters the Indian continent as early as 1832, two years earlier than in the Netherlands. Dr. William Carey, a Baptist missionary, starts to make paper by machine in Serampore. By 1870 eight paper-machines are in operation.

The next 20 years many more are working most of them in the Bombay and in the Calcutta area. When the nineteenth century comes to a close the investments in making paper by machine are doubled in 20 years and the employment rose to 400%.

The time is ripe to search for raw materials on the Indian subcontinent. The reports on the grasses *munj* and *bhabar* show the most promising results. When at last Raitt discovers how to digest bamboo properly that plant becomes a very popular raw material for the steam driven paper plants. India had a vast quantity of bamboo forests at that time. With the Bamboo Paper Industry Act of 1925 the colonial government protects the local paper mills. The need to lean on locally produced paper is a lesson the government learned from the Great War. She puts all her money on machine made papers. The cottage industry of the *kagji* did not stand a change. The more so since the import of paper rises to big proportions in spite of the increasing numbers of paper plants. The acute shortage of raw material for the *kagji* results in poor quality paper. As a last resort they even start mixing their pulp with a whole lot of cuttings from the factories. Only the traditional scribes continue to use handmade paper for their account books. Letter writing and official administration is done on European paper. The papermakers of West India and East India, today's Pakistan and Bangladesh, never recovered from this blow. The remaining *kagji* were in dire straits and could barely make ends meet.

Meanwhile India is preparing for independence. Mahatma Gandhi becomes a popular figure in the nationalist struggle. In his opinion the British Empire and its vassals are the only ones to benefit from the Indian economy. The traditional cottage industry had disappeared from the Indian landscape. Instead big factories and large-scale agriculture took their place. The labourers set to work for the English did not benefit at all, they remain poor. To change the position of all the exploited Gandhi wants to bring about economic changes by breathing the rural communities back to life and propagate village industry. Finally this should result in a small-scale economy that is not harmful to the environment. A strong movement emerges from the masses. The traditional *khadi*, hand-woven cotton cloth from home spun yarn, becomes their symbol. The spinning wheel their logotype.

In the beginning the Khadi Movement concentrates on improvements in the cotton industry but later it concerns itself with all village industries. To support his work Gandhi founds the All India Village Industries Association in 1934. This initiative is soon taken over by the residencies of Hyderabad, Jaipur and Bombay. Their mutual motto becomes: Boycott British, Buy Indian. With its long history as a cottage industry the craft of papermaking splendidly fits in the Khadi Movement. Besides it is a good alternative to the colonial industrial paper plants. On his long journeys in the countryside Gandhiji stimulates people to take up the old craft.

In that way he is directly responsible for the revival of the handmade paper industry in Rajasthan, Gujarat, Maharashtra, Madhya Pradesh and Uttar Pradesh. Soon paper research and teaching institutes arise in Wardha, Kalpi and Pune. After initial hesitation the old *kagji* teach their ancient craft to the eager youngsters. Essential improvements are introduced in the production process and experiments with alternative raw materials are started off. Shri K. B. Joshi, who leads the experiments at Pune, gets permission from Gandhi to employ non-human power to facilitate the production process. The main raw material for the new papermakers is cotton. That is not without reason. The first protests of the Khadi Movement were exactly concentrated on the colonial policy of forcing the farmers to cultivate cotton. Subsequently the raw cotton was transported overseas to be processed in the homeland.

When the British moved the cotton plants to Ahmedabad Gandhi decided to set up his Satyagraha Ashram not far from the toiling labourers. It is on these premises that the first paper mill, the Kalam Kush Paper Mill, based on Gandhian ideas was established. The fully cotton hosiery of the so detested cotton mills of Ahmedabad could be miraculously changed into wonderful papers. The transformation of textile waste thus also became a strong political act of a nationalistic movement against its oppressors.

When on the 15th of August 1947 India at last reaches its independence the Gandhian ideas are incorporated into the new constitution.

Although Nehru, India's first Prime Minister, initially does not agree on Gandhi's economical ideas he changes his mind and thinks that the cottage industry could well be the answer to unemployment. In the new and free India the production is hopefully planned. Large-scale businesses and threatening imports are checked. The Khadi Village and Industries Commission (KVIC), founded in 1957, has the difficult task to stimulate and protect the cottage industry. The KVIC was and still is today a powerful stimulator of *kagji*.

Their initial program comprises the following:

- assistance for organising co-operatives and registered institutions of *kagji* and other skilled workers of handmade paper
- assistance for raw materials and for marketing of paper
- emphasis on continuous improvement in techniques and introduction of modern tools and equipment for paper production and supply of technical know-how
- diversification of production on new lines, particularly production of fancy papers, training of artisans and managerial personnel

Nevertheless the production stagnates before 1960. The *kagji* cling to old techniques and traditional raw materials. There is a strong resistance to change. Besides the KVIC does not plan the production. Finally they are persuaded to modernise. At the beginning the Commission stimulates big, medium and small units. Ten years later she changes that policy and propagates small units, home units and units in jails. Especially the latter ones are a success. Gandhi suggested the production of paper in the jails 30 years earlier. After all the prisoners had a chance to make some money and what else was there to do. Around 1965 150 co-operatives are registered but only a few of them make a small profit. They do not take into account the changes in the market and the growing competition at home. The forming of co-operatives has its roots in Gandhian ideas. India since its independence has been trying to establish a socialist and democratic society. It is therefore obvious that the co-operative movement must necessarily constitute an integral part of socialist democracy. Through the five-year plans an earnest effort is being made to spread the co-operative ideas in many aspects of life. These plans stress the growth of a progressive

co-operative rural economy, later specified as a agro-industrial economy. Completely in line with the body of thought of Gandhiji. But the times change and the idea does not find acceptance anymore. The co-operatives are suffering from inefficient management, indifference of members, corrupt practices and selfish motives, as one official states. Around 1970 only 44 out of the 135 production centres are organised as co-operatives. Finally at the end of the decade the co-operative idea is exchanged for the concept of private enterprise.

The government hopes that the privately organised craftsmen will on the one hand increase employment and on the other hand produce more environmental friendly. Although the *kagji* show a little better results the measure does not quite produce the desired effect. About 1980 the Indian government realises that the demand for paper has outplaced the supply so much that a paper famine is feared in the future. It's true paper consumption per capita is very low (1,4 kg) compared to 285 kg in the USA. But the economy is prospering. This prompts the government to launch a crash program to meet the expected paper shortage. And in this program room is made for the handmade paper industry. The KVIC introduces a three-pronged program:

- one for production of high grade paper
- one for the manufacture of technical paper
- one for the manufacture of fancy paper

The point is that these papers all have specific demands and will not be produced by the large-scale industry.

### **Kagaj: today**

Today the KVIC supports some 450 handmade paper enterprises all over India. In 1996 they produce more than 12.000 metric tonnes of handmade paper and board a year. Most of the states have their own Khadi Village and Industry Board that backs up the *kagji* in their region. It seems that some of the measures taken by the KVIC have positive effects on the papermakers. Notably the production of fancy papers comes along by leaps and bounds. The *kagji* even prove very creative in this respect. Not many only sell broadsheets anymore.

Most of the sheets are turned into paper products on the premises of the factory. The quality of these products however leaves much to be desired. This can be partly explained by the lack of a continuous bookbinding tradition in India. Especially the bigger shops employing up to 100 people seem to do very well. The manufacture of high grade and technical papers however stays way behind. The traditionally oriented and locally based *kagji* continue to have a hard time. Daulatabad for instance was once a flourishing community where 5000 people were making their living in the paper industry. Later around 1800 this once royal fortress became famous for its fabulous *afshani* paper, paper mottled with small pieces of gold leaf. Today halfway between Daulatabad and the Ellora caves there is one *kagjipura* left. An old *kagji* sadly admitted that the mill had to close down in 1995. Now the machinery is rusting away and stacks of paper are collecting dust in a corner of the white building. Apparently nothing was sold out. At one time two huge Hollander beaters were in operation. The co-operative employed 150 people, practically the whole village. The Bombay Mercantile Co-operative Bank even adopted it but all was in vain. Slowly but surely the turnover was falling off and in the end they could not pay the electricity bill anymore.

There are an unknown number of independent papermakers some of whom are organised in the All India Handmade Paper Industries Association. Since the government allows the papermakers to make their shops privately owned it makes the business attractive to persons outside the *kagji* community. Papermaking by hand can be a profitable business. Several Hindu families tried their luck. Some of them build up experience with the traditional *kagji* for quite some time. Still most of the important papermakers come from an old line of Moslem *kagji*. Throughout the country several *ashram*, spiritual communities organised around the ideas of a particular Indian philosophy, are involved in papermaking by hand. The most famous one is the Sri Aurobindo Ashram near Pondicherry in northern Tamil Nadu. Since 1959 their objective is to manufacture high quality paper from the best available raw materials. Like other modern papermakers they use waste textile from the hosiery factories. These 100% cotton rags are sorted, dusted and cut into strips before boiling with caustic soda.

After a mild bleach the pulp is prepared in the Hollander beater. Very often the pulp is mottled in the vat with several substances of vegetable nature like rice or wheat straw, grass, flowers, petals, husks, jute waste, wool waste, tea dust. Several other *kagji* mix pieces of leaf metal into their pulp or even artificial silk, rayon, which is entirely cellulose based. Lately more and more block printed and even screen printed papers find their way to the foreign markets. A nice example of how two birds can be killed with one stone is the birth of algae mottled paper.

In Pudukuppam, a coastal fishermen village not far from Pondicherry, researches were looking for ways to control endemic malaria. It appeared that the algae growing in the saline water lagoons were used as a breeding ground for the vectors of the malaria parasite. Removal of the algae seemed to be the only practical solution. As the researchers were looking for an economic utility of the algae they heard of the papermaking project in the Sri Aurobindo Ashram. Not long after algae mottled paper came onto the market. Now the villagers collect and sell the algae to the *ashram*. Thus a total elimination of malaria was demonstrated exclusively through community action.

A particular group of employers in the papermaking business are the non-governmental organisations (NGO's). Interested in any income generating activity they ventured on papermaking some 20 years ago. Lack of experience and a full measure of naïveté saw to it that the first projects failed miserably. But with trial and error and the support of their foreign sponsors they finally got the hang of it. So far not many NGO's took up papermaking on the Indian subcontinent. But the number is believed to increase in the near future. One of the biggest is Development Alternatives from New Delhi. They established a few mills throughout the country and keep on improving the papermaking process. Bangladesh, the country that accommodates the most NGO's in the world, today has almost ten papermaking projects. They put a lot of time and effort in training the employees and improving the products. Gender is one of the spearheads of development co-operation. That is why these projects principally employ women, especially underprivileged women.

It is intended that in the end the women will run their projects independent of their former employers. With the extended network of the NGO's most of the projects have no problem finding a foreign market. By and large they are doing fine.

Sound education and research is considered very important today. The paper research and education centres at Pune, Sanganer and Kalpi are very successful. All of them are supported by their state Khadi Village and Industry Board. The centre at Wardha is backed up by the Centre of Science for Villages, an institute founded in 1977. In general their aim is the development of rural and appropriate technology. Today the centre is not very important anymore for the handmade paper industry. Yet in the past they produced interesting results. The others offer a curriculum at different levels that attract people from several continents. It is not uncommon to find someone from Africa in the classroom. The modern papermakers send their sons to attend at least a course at one of the centres. But most of the young successors will follow the study of paper factory manager in Pune. At a regular bases national seminars are organised and they are well attended. The search for new fibre sources and mixtures is continuous. The emphasis lays on agro-waste. Highly trained scientists are experimenting with all kinds of waste every day. Some of the results are striking like the tissue paper from banana fibre.

The new credo in papermaking by hand is export. In general the local market for the papers is small. Even the merchants, once the backbone of the Indian handmade paper industry, use machine made paper for their traditional account books these days. Traditionally most of the papermakers are used to supply the local and at most statewide markets. As many products are exported the need for marketing grew. The employers' organisation the All India Handmade Paper Industries Association makes a good case for marketing. Doing business has changed drastically over the years. Now the trading and selling is often left to paper traders, mainly Hindu who usually set up shop in the big cities. Others concentrate on specialised products for the local market. Many *kagji* meet at the big paper fair held in New Delhi every two years.

To what extent did the technology of Indian handmade paper change? The question is not difficult to answer: it changed almost completely!

To name a few changes:

#### raw materials

- Presently the main raw material is industrial waste. The use of cotton textile waste from hosiery and tailor shops, and jute waste from the carpet factories started early this century.
- Mixing the pulp with waste paper is still done today. It has a long tradition and goes back to Mogul times, but gunny bags, hemp ropes and nets are out of use already a long time.
- The use of agro waste was introduced in Gandhian times, some 60 years ago, and the search goes on until this day.

Strangely enough the utilisation of alternative fibres like bamboo, eucalyptus and several grasses is confined to the large-scale paper industry. Mottling the paper with all kinds of vegetable material is a very recent innovation.

#### mould

- In the old days the kagji used a laid mould, a *chapri*, made of grass or bamboo. Today it is rarely seen in a paper mill. In Gandhi's era Joshi in Pune developed a unique lifting system. It is still widely used today and even found its way to other continents. With a foot pedal the vatman lifts the heavy mould which is suspended from an iron frame to facilitate the lifting. The contraction is hooked up to simple counter weights. It is a surprisingly simple mechanical lifting system. There also exists a more simple form. The woven mats are replaced by nylon, cotton or wire mesh screens.

#### calander

- Calendering paper was first done by hand with a stone roller and bench. In Pune Joshi designed a simple calander machine driven by manpower. Later the same machine was driven by a motor and could be switched in reverse position.

### maceration

- The *denkhi* was put to use in the paper mill to macerate the pulp already a long time ago. The traditional stamping device operates by treading on a tilt-bar driven by manpower. Now the power driven Hollander does the job. Although at some projects in Bangladesh they use both.

### soaking

- The traditional soaking process in the open air is usually replaced by vomiting digesters. In case of waterhyacinth both methods are applied.

### chemicals

- The KVIC introduced new additives for the pulp which in former times were not available. Now internal sizes (rosin/alum), whiteners and chemical colorants are added. Bleaching powders are employed even when it is not always necessary.

### drying

- Formerly the wet papers were put on a roughcast wall to sundry. Today different racks are in use, mainly indoors. In some areas the papers are dried in the sun on zinc sheets, sometimes even without the sheets. The wall drying completely disappeared. A big problem is drying the wet papers during the monsoon season. Therefore some mills introduced artificial drying with Japanese steam dryers.

### machinery

- After World War II the KVIC forced the kgaji to modernise, it was bend or break. So finally the kagji started using machines. Besides, the whole working process, including all the equipment, was brought on a standing level. Instead of using sunken vats the new vats were brought on table height. Papermaking was literally lifted off the ground, but the squatted working position never completely disappeared.

## **Kagaj: Tomorrow**

Since the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, 1992 the world community finally realised that something had to be done in order to save the environment. Ever since standards are developed and a list of priorities to protect the environment is drawn up. Sustainable development becomes a widely used term, development that meets the needs of the present without compromising the ability of future generations to meet their own ends. The need for a more ecologically sound and small-scale industry is growing. At last after almost 20 years the maxim Small is Beautiful catches on. Naturally from this line of argument concepts as appropriate technology, recycling, closed-production-process, zero-effluent, waste-management, sustainable forest management and forest stewardship developed. Appropriate technology must ensure a balance among social, economic, ecological and technical factors. It is the creation of human ingenuity and springs in response to local needs and possibilities. Different from high-technology appropriate technology is ready for use by the common people.

Today the United Nations advocates the planning of a small-scale paper industry on basis of sustainable development and appropriate technology. Exactly these aspects are the strongest selling points of Indian handmade paper industry. The whole idea of sustainable development and appropriate technology fully reflects Gandhian ideology. The society Gandhi envisaged is made up of small-scale agricultural communities where people produce no more than they need. Shri J.C. Kumarappa, a dear friend and follower of Gandhiji, specified the idea in the field of economics and in 1945 he published a book on the subject: the economy of permanence.

Though the socialist five-year planning of the industry did not work and hardly any of the papermaking co-operatives survived till this day, the industry continues to reflect the Gandhian practical philosophy. There is no mill that employs more than 100 people, they all use waste products for raw material, they apply very little chemicals, the machinery is very simple and most of them recycle waste paper as well. The modern Indian handmade paper industry is a small-scale industry

that applies appropriate technology in a sustainable production process. This is the surplus value of the industry. With marketing receiving increasing attention the Indian papers are now appreciated all over the world. Over the last five years the export of handmade papers steadily rises. We can buy the papers in Amsterdam, Berlin, Brussels, New York, Sydney, Tel Aviv and Tokyo. And there is enough room in the market for more Indian papers. Thus Indian handpapermaking has great possibilities.

In a developing country that has over one billion inhabitants employment is the principal aim of any government. It finally persuaded Nehru for example to accept Gandhi's ideas. It is also the main reason why the present governments support the handmade paper industry. In 1990 a nation wide plan was developed that would provide work for 40,000. papermakers. To realise this the Kumarappa National Handmade Paper Institute (KNHI) in Sanganer, Rajasthan is founded. In this million dollar project the Khadi Village & Industry Commission (KVIC) works together with the United Nations Development Programme (UNDP) and the United Nations Industrial Development Organisation (UNIDO). The objective is to back up the paper mills with research and development, training, product development and project consultancy, all at a moderate price. To implement their initial plan the Indian government in 1995 calls the National Program on Handmade Paper into being for a period of three years. During this time 460 paper units would be built that provide work for 26,000 workers in the countryside, of which 10,000 must be women. Indirectly the program provides jobs for another 10,000. Furthermore one marketing organisation, four auxiliary branches of the KNHI and 20 welfare centres will arise. For these paper units-to-be target areas are selected. Mountain regions where a lot of adivasi, tribal people, live are considered as such as they belong to the poorest areas in the country.

The seven sisters of the northeastern states of India are one of those regions. It is absolutely virgin to the the Khadi Village & Industry Commission (KVIC), yet very fertile. In Arunachal Pradesh, one of the seven states, papermaking has a long history. Traditionally they apply the pouring type of wove mould, such as in Tibet and Nepal.

And like their neighbours they use the same raw material, *Daphne Paperacea*, locally called *shoughun*. No chemicals are used whatsoever, the white bast is cooked with ashes. Nowadays the industry is on the verge of disappearing. Only a few papermakers pursue the craft as a subsidiary occupation. High in the mountains in a hamlet with the name of Mukto 20 families can be found lifting paper. With a few simple changes and a little more efficiency their paper could be made ready for export. In the past they received already a little support of a local NGO. Now the National Program on Handmade Paper with the help of the local chiefs carefully selected 30 people who under the guidance of the KNHI will set up shop. Wild banana is introduced as a new raw material and plantations are considered for the Daphne plants. 18 Kilometres down the mountain a welfare centre is planned. The local NGO, Buddhist Culture Preservation Society, is asked to participate or at least lend support to the project. Similar projects will arise and generate income for the poorest of Indian society. Nonetheless these programs are not beatifically. There is enough room for critical comments. All the *kagji* focus on exporting their goods. But nobody can prevent the market from collapsing.

In particular this market is very sensitive to changes in design. The taste of the spoiled western consumer changes every six months or so. How for example are the *kagaj* in Mukto to find out about these whims. Of course trends can be predicted but still. Some of the NGO's in Bangladesh acknowledged this problem and started up modern sales centres in Dhaka. They sell to the little tourism Bangladesh has, but more important they reach the middle and upper classes. In the Aarong shops in Dhaka you can see Bangladeshi spending money. The many shops of the KVIC, which are all over India, look dilapidated and old fashioned. Different from Aarong these shops do not invite buyers at all. That is a pity as India knows a fast growing middle class. There are many more reasons why a business should not put all its money on export. Luckily one NGO is exploring the local market. Development Alternatives in New Delhi makes good progress in producing a handmade paper for use of photocopy and PC-printer. Technically this is a very difficult enterprise but the results are promising. India, in my belief, could use more papermakers that are not afraid to search for a niche in their domestic market.

As stated above the *kagaj* produce their papers on an ecologically sound basis. Yet when visiting tens of papermakers in 1997 I was struck by the indifference with which the effluent was handled. Most of them discharge the effluent on the bare land behind the factory. In the end the particles of resin, alum, chlorine, colorants, etc might pollute the surroundings, even when the quantities are small. Confronting the papermakers with their behaviour they communicated that nobody told them not to. Yet there is one paper engineer from Udajpur who designed a zero-effluent paper plant, a moderate unit based on the concept of zero-effluent discharge system. Unfortunately he draws little attention. The apparent lack of insight in the true environmental consequences of lifting paper cannot be explained by want of education. Most of them are educated in Pune or another Indian papermaking institute. It must be the absence of a decent body of environmental laws and a general lack of control that gives room to such practices. Besides the government overstresses the employment issue of the handmade paper industry and takes the ecologically sound production of the industry too much for granted. The lack of attention can also point to a low degree of organisation. A professional body can pass on new rules and regulations and expose abuses. But competition and the mutual distrust are big. The KVIC is the obvious institution to organise the papermakers. But alas as so many other Indian institutions the KVIC is extremely bureaucratic and cumbersome. Maybe the Kumarappa National Handmade Paper Institute can fill up the gap. They do publish an interesting small monthly bulletin: Hath Kagaz. Anyhow organisation and communication are essential in any business.

The *kagji* have great possibilities in India. In a country where the present large-scale paper industry needs 460 bamboo plants or 270 eucalyptus trees to produce one ton of paper, they can without a doubt stand the test as keepers of their environment. The international organisations are right in supporting this industry. In a growing economy and a society where illiteracy is on its way down, the industry might even prove to be indispensable for the local market.

An industry of at least 500 years old has survived in spite of heavy competition, in spite of industrialisation, in spite of religious and national warfare, in spite of their own resistance to change and in spite of global economics. It is thanks to Indian practical philosophy and not in the least of its most outstanding representative Mahatma Gandhi that the kagaj survived till this present day.

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