



# INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT

Volume 9, Issue 11, November 2022



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 7.580**



+91 99405 72462



+9163819 07438



ijmrsetm@gmail.com



www.ijmrsetm.com



# Socio-Economic Impact of Stone Craft Industry on Labours in Sikandra, Dausa (Rajasthan)

Dr. Abhishek Vashishtha

Assistant Professor, Geography, SPNKS Govt. PG College, Dausa, Rajasthan, India

**ABSTRACT:** Sikandra is home to magnificent sculptures and crafts made of stone. The recent ban on sand mining has given body blow as construction business is badly hit. The people who had to bear the brunt of these decisions are the labourers who are employed in the stone sculpture. The slump in demand hit employment as hiring of labourers is drastically reduced. Stone craft industry is one of the main stay in Sikandra, Dausa. Stones are heavily taxed. Royalty, GST and harassment by the police and the transport department in the name of overloading have hit hard the industry. A number of tourists passing through the area often ask the driver to stop the car as a large number of artefacts is spread out by these artisans who create wonders in sandstone sourced from the various quarries near Sikandra. Sikandra, once a backward area, has now become a centre for trade in artefacts and a large number of buyers from various north Indian States come here to buy not only small artefacts, but also stone pillars, stone fences, chairs and various garden accessories. The artisans also export to Australia, Canada, the Middle East and South East Asia. The items are lattice work, pots, idols of gods and goddesses, animal figures, lamps, pillars, temple models, fountain and furniture. The booming business has brought prosperity to the people of Sikandra who earlier depended only on agriculture for a living and the rows of huts have all been turned into concrete structures. The switch from agriculture to stone craft brought prosperity to the locals, who depended heavily on the monsoon for agriculture. Sikandra was poor and backward, but its fortunes changed when masonry and traditional home-building metamorphosed into a thriving artefacts industry. Sikandra is situated at 25 km on NH-11 towards Agra. This place has made its mark in the domestic as well as international market for its sandstone carvings from districts adjoining Dausa.

**KEYWORDS:** Sikandra, Dausa, Stone craft, artefacts, pillars, industry, gods, idols, labourers, tax, GST

## I. INTRODUCTION

Masonry comprised carving stone beams and chaukhats for the homes of the affluent residents. The maalīs, who are the gardening community, took to stone carving with gusto about five decades ago using traditional tools like chisel. Later the artisans began acquiring a range of tools and the sawing machine; motorized stone cutters were also used. In addition to local stones, the artisans started using various colours of sandstones. Thus good stocks of stone from the adjoining districts of Bharatpur, Dholpur and Karauli started reaching Sikandra. But the transformation was ably aided by the adoption of new technologies.[1] The combined turnover of the entire Sikandra cluster spread over a 50 km-radius could be anything from Rs.150 crore to Rs.200 crores now. There are more than 400 small and medium sized units, which employ over 25,000 persons. The youth of the area opt to attend the industrial training institute (ITI) and learn to operate and maintain the machines. Tools and motors that are frequently used in the processing of stone earlier required one to go to Dausa or Jaipur for repairs. Thanks to the youth's interest, some of them acquired skills in not only carving stones, but also in handling and repairing small tools like cutters and motors.

The Centre for Development of Stones (CDOS), set up by the Rajasthan government, is a centre for excellence with state-of-the-art facilities with broad objectives to develop and promote and support the dimensional stones sector. "The CDOS has over the years helped the artisans of Sikandra to upgrade their tools and skills, and encouraged them to interact with buyers. Now they do business through showrooms and have built their websites and published their own brochures. The Rural Non Farm Development Agency (RUDA), another agency of the Rajasthan government, has also played a key role in the development of the stone-carving clusters in Sikandra by providing them with market support. The Rural Non Farm Sector (RNFS) holds the key to faster economic development of the country. It has potential and promise for generating employment and increased income in the rural areas. Hence, not only Rajasthan but also other states and also NABARD have identified financing, development and promotion of RNFS as one of its thrust areas. The strategy for the development



of this sector aims at improving the skills of the workers engaged in the mineral processing industry. Also additional employment is being generated through programmes which impart skills in diamond cutting and polishing; gangsaw training; promotion of stone etching through design and market led inputs. A major intervention has been started for design up-gradation for potters in Dausa and Sawai Madhopur. The red sandstone cluster in Manpur and Sikandra has become a hub of economic activity and income levels of the artisan groups have increased manifold. The exports of handicrafts from Rajasthan in 2003-2004 stood at Rs 1800 crores as against 1200 crores in the previous year, with a growth rate of 33%. Every district has its distinctive handicrafts and over 7 lac craft persons are employed in this activity. The new policy must focus on revival of traditional dying crafts, heritage promotion and craft based livelihood for combating drought as well as expanding export earnings from this sector.[2] The share of Indian handicrafts is only 0.08% in the world market while China in just 5 years has cornered 56% of the export market. In Rajasthan the earnings have risen from 733 crores in 1990 to 1800 crores in 2003. Indian Institute of Crafts & Design (IICD) has been set up by the State Government with a mandate to create a new cadre of highly skilled and motivated Design-Techno Managers who can contribute towards sustaining modernisation and accelerating the growth of craft centres in the State. The Institute offers training courses to craft persons both at its principal seat at Jaipur and outreaches in the districts. It will also provide important inputs by way of designs, technological improvements, market intelligence and product innovation. RUDA networks with both IICD and NID (National Institute of Design, Ahmedabad) for conducting baseline research, design programmes and project preparation. In 2004 RUDA and IICD are partners in the 5-year bamboo-lantana project in Jhalawar district sanctioned by the office of DCH (Development Commissioner, Handicrafts, New Delhi). RAJSICO (Rajasthan Small scale Industries Corporation) also promotes handicrafts and has provided a single show-window for the crafts of Rajasthan and other parts of India alongwith tourism related facilities e.g. travel centres, exchange counters in Jaipur, New Delhi and other places. This enables tourists to have a complete package under one roof. In order to make the Indian handicrafts globally competitive in quality, RAJSICO is developing quality benchmarking in association with internationally experienced agencies. All Rajasthali goods would be brought under this benchmarking. The new proposal to set up a Rajasthan Handicraft Promotion Board will also energise this potential sector. Already Jodhpur has become a leading export zone for handicrafts. FORHEX (Federation of Rajasthan Handicraft Exporters, Jaipur) and RUDA are also working in the direction of taking up new craft clusters for revival and mainstreaming of traditional handicrafts in modern markets.

Carving stone into sculpture is an activity older than civilization itself. Prehistoric sculptures were usually human forms, such as the Venus of Willendorf and the faceless statues of the Cycladic cultures. Later cultures devised animal, human-animal and abstract forms in stone. The earliest cultures used abrasive techniques, and modern technology employs pneumatic hammers and other devices. But for most of human history, sculptors used hammer and chisel as the basic tools for carving stone.[3]

The process begins with the selection of a stone for carving. Some artists use the stone itself as inspiration; the Renaissance artist Michelangelo claimed that his job was to free the human form trapped inside the block. Other artists begin with a form already in mind and find a stone to complement their vision. The sculptor may begin by forming a model in clay or wax, sketching the form of the statue on paper or drawing a general outline of the statue on the stone itself.

When ready to carve, the artist usually begins by knocking off large portions of unwanted stone. This is the "roughing out" stage of the sculpting process. For this task they may select a point chisel, which is a long, hefty piece of steel with a point at one end and a broad striking surface at the other. A pitching tool may also be used at this early stage; which is a wedge-shaped chisel with a broad, flat edge. The pitching tool is useful for splitting the stone and removing large, unwanted chunks. Those two chisels are used in combination with a masons driving hammer.

Once the general shape of the statue has been determined, the sculptor uses other tools to refine the figure. A toothed chisel or claw chisel has multiple gouging surfaces which create parallel lines in the stone. These tools are generally used to add texture to the figure. An artist might mark out specific lines by using calipers to measure an area of stone to be addressed, and marking the removal area with pencil, charcoal or chalk. The stone carver generally uses a shallower stroke at this point in the process, usually in combination with a wooden mallet.

Eventually the sculptor has changed the stone from a rough block into the general shape of the finished statue. Tools called rasps and rifflers are then used to enhance the shape into its final form. A rasp is a flat, steel tool with a coarse surface. The sculptor uses broad, sweeping strokes to remove excess stone as small chips or dust. A riffler is a smaller variation of the rasp, which can be used to create details such as folds of clothing or locks of hair.





The final stage of the carving process is polishing. Sandpaper can be used as a first step in the polishing process, or sand cloth. Emery, a stone that is harder and rougher than the sculpture media, is also used in the finishing process. This abrading, or wearing away, brings out the color of the stone, reveals patterns in the surface and adds a sheen. Tin and iron oxides are often used to give the stone a highly reflective exterior.

Sculptures can be carved via either the direct or the indirect carving method. Indirect carving is a way of carving by using an accurate clay, wax or plaster model, which is then copied with the use of a compass or proportional dividers

## II. DISCUSSION

Stone carving is an activity where pieces of rough natural stone are shaped by the controlled removal of stone. Owing to the permanence of the material, stone work has survived which was created during our prehistory or past time.

Work carried out by paleolithic societies to create stone tools is more often referred to as knapping. Stone carving that is done to produce lettering is more often referred to as lettering. The process of removing stone from the earth is called mining or quarrying.

Stone carving is one of the processes which may be used by an artist when creating a sculpture. The term also refers to the activity of masons in dressing stone blocks for use in architecture, building or civil engineering. It is also a phrase used by archaeologists, historians, and anthropologists to describe the activity involved in making some types of petroglyphs.

Stone has been used for carving since ancient times for many reasons. Most types of stone are easier to find than metal ores, which have to be mined and smelted. Stone can be dug from the surface and carved with hand tools. Stone is more durable than wood, and carvings in stone last much longer than wooden artifacts. Stone comes in many varieties and artists have abundant choices in color, quality and relative hardness.[4]

Soft stone such as chalk, soapstone, pumice and Tufa can be easily carved with found items such as harder stone or in the case of chalk even the fingernail. Limestones and marbles can be worked using abrasives and simple iron tools. Granite, basalt and some metamorphic stone is difficult to carve even with iron or steel tools; usually tungsten carbide tipped tools are used, although abrasives still work well. Modern techniques often use abrasives attached to machine tools to cut the stone.

Precious and semi-precious gemstones are also carved into delicate shapes for jewellery or larger items, and polished; this is sometimes referred to as lapidary, although strictly speaking lapidary refers to cutting and polishing alone.

When worked, some stones release dust that can damage lungs (silica crystals are usually to blame), so a respirator is sometimes needed.

Government of Rajasthan established the Rural Non Farm Development Agency (RUDA) in November 1995 as an exclusive agency to promote the rural micro-enterprises in the State. Its primary mandate is:

- Create alternative avenues of employment
- Generate incremental incomes

RUDA is registered under the Societies Registration Act giving it a certain autonomy and flexibility in its functioning. Over the last 9 years, RUDA has evolved as an innovative, creative and a highly professional agency to achieve its daunting but challenging mandate

RUDA is perhaps the only agency of its kind, promoting rural microenterprises on sub-sectoral basis. Initially, 3 sub-sectors viz. Leather, Wool & Minor-Minerals (Stone, Ceramics and Pottery) had been identified. During the 10<sup>th</sup> Five Year Plan three new sub sectors namely Handicraft, Khadi & Village Industries and Handloom have been added. RUDA works through a cluster based approach. It adopts a truly integrated strategy to promote the sector and all its interventions are based on the felt needs of the producers. Among others, RUDA's package of interventions include:

- Sub-sectoral analysis
- Capacity audit of artisan clusters



- Identifying operational constraints
- Organising artisans
- Microfinance for SHGs and CIGs
- Microenterprise development
- Skill development training
- Technology dissemination
- Design support
- Product development
- Credit facilitation
- Market facilitation

The management of RUDA is vested in its Governing Board appointed by the State Government. Official members from the State Government include heads of various State corporations, financial institutions etc. While the Secretary, Industries Department is the Chairman of the Agency and Commissioner Industries is the Vice-Chairman, the Managing Director is a senior civil servant from the state government. RUDA was conceptualised as a new generation organisation. It developed as an agency with a difference because people from both inside and outside the government were inducted right at the beginning and created a happy mix of experience and energy. They brought with them progressive ideas, professionalism, innovative and proactive work style and RUDA still retains this character as the public – private teamwork still continues.[5] There are presently 1 Project Manager, 3 Project officers, 8 field coordinators from the private sector working for RUDA and campus search for 3 positions is underway.

Over the last 9 years, RUDA has developed its brand image as a distinctive agency working for the promotion of traditional rural crafts and facilitating their participation in national and international market events. Successive successes in STONEMART and STONA events, SARAS CRAFT FAIRS and a host of other fairs and festivals has established RUDA's image both in India and abroad. In the recent Buyer – Sellers meet held in Jaipur, foreign buyers from Japan and Spain visited RUDA to explore and engage with RUDA developed artisan groups for business offers. Some accessed the RUDA website for business queries and RUDA has since developed product catalogues and dedicated websites for pottery, leather and stone products. It is on account of this image that a complementary stall has been offered in the Import Shop Berlin Fair in November 2004. RUDA has also arranged space in the IITF New Delhi in November, STONEMART 2005 in Jaipur

### III. RESULTS

The earliest known works of representational art are stone carvings. Often marks carved into rock or petroglyphs will survive where painted work will not. Prehistoric Venus figurines such as the Venus of Berekhat Ram may be as old as 250,000 years and are carved in stones such as tuff and limestone.

These earliest examples of the stone carving are the result of hitting or scratching a softer stone with a harder one, although sometimes more resilient materials such as antlers are known to have been used for relatively soft stone. Another early technique was to use an abrasive that was rubbed on the stone to remove the unwanted area. Prior to the discovery of steel by any culture, all stone carving was carried out by using an abrasion technique, following rough hewing of the stone block using hammers. The reason for this is that bronze, the hardest available metal until steel, is not hard enough to work any but the softest stone. The Ancient Greeks used the ductility of bronze to trap small granules of carborundum, that are naturally occurring on the island of Milos, thus making a very efficient file for abrading the stone.

The development of iron made possible stone carving tools, such as chisels, drills and saws made from steel, that were capable of being hardened and tempered to a state hard enough to cut stone without deforming, while not being so brittle as to shatter. Carving tools have changed little since then.



Modern, industrial, large quantity techniques still rely heavily on abrasion to cut and remove stone, although at a significantly faster rate with processes such as water erosion and diamond saw cutting.[6]

One modern stone carving technique uses a new process: The technique of applying sudden high temperature to the surface. The expansion of the top surface due to the sudden increase in temperature causes it to break away. On a small scale, Oxy-acetylene torches are used. On an industrial scale, lasers are used. On a massive scale, carvings such as the Crazy Horse Memorial carved from the Harney Peak granite of Mount Rushmore and the Confederate Memorial Park in Albany, Georgia are produced using jet heat torches.

Dausa's Sikrai tehsil has a stone market and artefacts and artworks of craftsmen of this place have been always front runners in the stone carving in all stone marts and have left even the foreign craftsmen behind. Rajasthan's Dausa district has internationally carved a niche for itself in stone carving. Craftsmen from Sikandra have earned their fame not only in the country but outside the country as well.

Dausa's Sikrai tehsil has a stone market and artefacts and artworks of craftsmen of this place have always been front runners in stone carving in all stone marts and have left even the foreign craftsmen behind. Sikandra's stone engraving is dominating the international market. Around 20,000 craftsmen are engaged in this trade in more than 600 units of this area and provide desired shapes to the stone pieces.

The flourishing business of craftworks in this area has already crossed ₹300 crore annually. Engraving on the stone is hazardous work and the craftsmen must take many precautions. Due to stone carving, many people associated with this work suffer from silicosis disease and many have died due to this.

Basic stone carving tools fall into five categories:

- Percussion tools for hitting - such as mallets, axes, adzes, bouchards and toothed hammers.
- Tools for rough shaping of stone, to form a block the size needed for the carving. These include feathers and wedges and pitching tools.
- Chisels for cutting - such as lettering chisels, points, pitching tools, and claw chisels. Chisels, in turn, may be handheld and hammered or pneumatic powered.
- Diamond tools which include burrs, cup wheels, and blades mounted on a host of power tools. These are used sometimes through the entire carving process from rough work to the final finish.
- Abrasives for material removals - such as carborundum blocks, drills, saws, grinding and cutting wheels, water-abrasive machinery and dressing tools such as French and English drags.

More advanced processes, such as laser cutting and jet torches, use sudden high temperature with a combination of cooling water to spall flakes of stone. Other modern processes may involve diamond-wire machines or other large scale production equipment to remove large sections of undesired stone.[7]

The use of chisels for stone carving is possible in several ways. Two are:

- The mason's stroke, in which a flat chisel is used at approximately 90 degrees to the surface in an organized sweep. It shatters the stone beneath it and each successive pass lowers the surface.
- The lettering stroke, in which the chisel is used along the surface at approximately 30 degrees to cut beneath the existing surface.

There are many types and styles of stone carving tools, each carver will decide for themselves which tools to use. Traditionalists might use hand tools only.

- Lettering chisels for incising small strokes create the details of letters in larger applications.
- Fishtail carving chisels are used to create pockets, valleys and for intricate carving, whilst providing good visibility around the stone.
- Masonry chisels are used for the general shaping of stones.
- Stone point tools are used to rough out the surface of the stone.



- Stone claw tools are used to remove the peaks and troughs left from the previously used tools.
- Stone pitching tools are used to remove large quantities of stone.
- Stone nickers are used to split stones by tracing a line along the stone with progressive strikes until the stone breaks along the line.

Powered pneumatic hammers make the hard work easier. Progress on shaping stone is faster with pneumatic carving tools. Air hammers (such as Cuturi) place many thousands of impacts per minute upon the end of the tool, which would usually be manufactured or modified to suit the purpose. This type of tool creates the ability to 'shave' the stone, providing a smooth and consistent stroke, allowing for larger surfaces to be worked.

Among modern tool types, there are two main stone carving chisels:

- Heat treated high carbon steel tools - Generally forged
- Tungsten carbide tipped tools - Generally forged, slotted, and carbide inserts brazed in to provide a harder and longer-wearing cutting edge.

Masonry is the craft of shaping rough pieces of rock into accurate geometrical shapes, at times simple, but some of considerable complexity, and then arranging the resulting stones, often together with mortar, to form structures.

- Quarrymen split sheets of rock, and extract the resulting blocks of stone from the ground.
- Sawyers cut these rough blocks into cuboids, to required size with diamond-tipped saws. The resulting block if ordered for a specific component is known as sawn six sides (SSS).
- Banker masons are workshop-based, and specialize in working the stones into the shapes required by a building's design, this set out on templets and a bed mould. They can produce anything from stones with simple chamfers to tracery windows, detailed mouldings and the more classical architectural building masonry. When working a stone from a sawn block, the mason ensures that the stone is bedded in the right way, so the finished work sits in the building in the same orientation as it was formed on the ground. Occasionally though some stones need to be oriented correctly for the application; this includes voussoirs, jambs, copings, and cornices.

The basic tools, methods and skills of the banker mason have existed as a trade for thousands of years.

- Carvers cross the line from craft to art, and use their artistic ability to carve stone into foliage, figures, animals or abstract designs.
- Fixer masons specialize in the fixing of stones onto buildings, using lifting tackle, and traditional lime mortars and grouts. Sometimes modern cements, mastics, and epoxy resins are used, usually on specialist applications such as stone cladding. Metal fixings, from simple dowels and cramps to specialised single application fixings, are also used. The precise tolerances necessary make this a highly skilled job.
- Memorial masons or monumental masons carve gravestones and inscriptions.[8]

The modern stonemason undergoes comprehensive training, both in the classroom and in the working environment. Hands-on skill is complemented by an intimate knowledge of each stone type, its application, and best uses, and how to work and fix each stone in place. The mason may be skilled and competent to carry out one or all of the various branches of stonemasonry. In some areas, the trend is towards specialization, in other areas towards adaptability.

Types of stonemasonry are:

Fixer masons

This type of masons have specialized into fixing the stones onto the buildings. They might do this with grouts, mortars, and lifting tackle. They might also use things like single application specialized fixings, simple cramps, and dowels as well as stone cladding with things like epoxy resins, mastics, and modern cements.

Memorial masons

These are the masons that make headstones and carve the inscriptions on them.



Today's stonemasons undergo training that is quite comprehensive and is done both in the work environment and in the classroom. It isn't enough to have hands-on skill anymore. One must also have knowledge of the types of stones as well as its best uses and how to work it as well as how to fix it in place.

#### Rubble masonry

When roughly dressed stones are laid in a mortar the result is a stone rubble masonry.

#### Ashlar masonry

Stone masonry using dressed (cut) stones is known as ashlar masonry.

#### Stone veneer

Stone veneer is used as a protective and decorative covering for interior or exterior walls and surfaces. The veneer is typically 1 inch (2.54 cm) thick and must weigh less than 15 lb per square foot ( $73 \text{ kg m}^{-2}$ ) so that no additional structural supports are required. The structural wall is put up first, and thin, flat stones are mortared onto the face of the wall. Metal tabs in the structural wall are mortared between the stones to tie everything together, to prevent the stonework from separating from the wall.

#### Slipform stonemasonry

Slipform stonemasonry is a method for making stone walls with the aid of formwork to contain the rocks and mortar while keeping the walls straight. Short forms, up to two feet tall, are placed on both sides of the wall to serve as a guide for the stonework. Stones are placed inside the forms with the good faces against the formwork. Concrete is poured behind the rocks. Rebar is added for strength, to make a wall that is approximately half reinforced concrete and half stonework. The wall can be faced with stone on one side or both sides.[9]

## IV. CONCLUSIONS

The president of the Stone Market Association, Khairati Lal Saini, said that the stone carving business in the district has touched ₹300 crore annually. Many foreigners visiting this place get impressed by the beauty of stone engraving and even buy their works. As per the craftsmen here, it takes them around 15 days to 1 month to finish the carving. On small pieces, they finish carving in 15 days but they take around 1 month to finish carving on big pieces of stone. Stones are brought to Sikandra from Gwalior, Sarmuthra, Bijoliya, Nagaur district's Khatu Bansi Pahadpur, Milti and other places and then they are used for engraving. The carved stones of this area are sold in Europe, Saudi Arabia, the US and Australia and in all nooks and corners of the country. Stone carving is very old but in Dausa, the carving is specially done on marble and statues of Hindu gods and goddesses are carved here. Around Sikandra, stone carving is very common and they have been doing this since time immemorial. The businessmen here say that craftsmen do desire carving on the stone while in Jaipur, the craftsmen use different chemicals and powders to decorate the stone. The carving done in Sikandra always remains the same and does not change. The stone carvings done in Sikandra are in great demand in the US, UK, France, Japan, Italy, Nepal and Pakistan where these carvings are used to decorate hotels and buildings. Earlier, to decorate a hotel in Delhi, stones were brought from Australia and carvings on it were done in Sikandra. People import stones even from Italy and get them carved in Sikandra to use in the decoration of their homes and hotels.[10]

## REFERENCES

1. Walters Masonry "History of Stonemasonry" Archived 2015-09-30 at the Wayback Machine
2. ^ Elpel, Thomas J. "Stone Masonry Construction: A Brief Overview", Accessed October 10, 2018.
3. Liebson, Milt (1991). Direct Stone Carving. Schiffer Publishing. ISBN 0-88740-305-0. Page 9.
4. ^ Liebson, page 20.
5. ^ Liebson, page 21.
6. ^ Liebson, pages 63-64.
7. ^ Cook, R.M., Greek Art, p. 147, Penguin, 1986 (reprint of 1972), ISBN 0140218661
8. ^ "Cloud Sourcing". Caltech Magazine. Retrieved 2020-02-27.
9. Man Mohan Stones, Post Pancholi, Near Manpur Chauraha, NH-1 1, Agra Road, Tehsil Sikrai, Dausa - 303509, Rajasthan, India
10. D.D. Kasana (Managing Director), Sikandra Stone Craft, 192, Taru Chaya Nagar, Tonk Road, Sanganer, Jaipur - 302029, Rajasthan, India





# INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT



+91 99405 72462



+91 63819 07438



ijmrsetm@gmail.com

[www.ijmrsetm.com](http://www.ijmrsetm.com)