CHAPTER I

DEVELOPMENT OF BRASSWARE INDUSTRY IN U.P.
DEVELOPMENT OF BRASSWARE INDUSTRY IN U.P.

Since time immemorial India has been a prominent centre of arts and crafts. Even in the past India had achieved skilled art in metal manufacture. This is proved by the remains of pottery excavated from Mohanjodaro and Harappa which reveals a high degree of skilled art and since then it is not very difficult to trace the chain of development in shape, form and usage.

During the seventh century the famous Chinese traveller Hieun Tsang took with him some statues of Lord Buddha which were made of metal. The metal pillar standing in the vicinity of Qutub Minar in Delhi and even after a lapse of a period of over 1500 years the inscriptions thereon are still very clear. These are the notable examples of the great skill of Indian artisans.

Indian rulers of ancient times gave encouragement to the art of statues in metal. Gupta era excelled in casting huge statues in different types of metals which have such physical characteristics as slim figures, extra leads and arms. Most of the ancient metal figures which are in existence even today, are made of copper and brass. The characteristics poses, dimensions of figures, especially of gods and goddesses were laid in the ancient
time a metal casting. It is certain that the creation of aesthetic images and figures was ideal rather than copies of actual human figures. For example, the image of Buddha rises above contemplation and goes straight to depict perfect calm and happiness.

So, it is clear that over centuries, it has gained international reputation for the exquisite beauty of its handicrafts considering the vital significance of foreign exchange resources for the accelerated pace of India's economic development on one hand, and given the existing state of widespread and disguised unemployment prevailing in the country followed by capital scarcity on the other. Indian handicrafts industries in general and brassware industry in particular, offers vast promises to share these problems in a big way. The rapid development of labour-intensive and export-oriented cottage and small scale industries is inevitable not only from the standpoint of its contributions to the national income and foreign exchanges but also from the point of view of controlling the existing unemployment in the country.

So, the rational of development of small scale and cottage industries in India may be established in terms of four arguments - employment, decentralisations, equity and
unutilised resources. The small scale and cottage industries have vast potential to create enormous employment opportunities in India, which is characterised by higher incidence of unemployment, resulting in mass poverty. Almost 75 percent of work force in India depends on agriculture. Evidently, small scale and cottage industries being labour intensive have potential for absorption of the additional labour force.

If necessary opportunities and assistance is extended to a large number of small entrepreneurs, who are capable of running industrial units efficiently, would make it possible to fully utilise the existing manpower capacities and channelise the idle savings into productive use.

Development of small scale and cottage industries in India is also justified on the basis of decentralisations of industrial activity which is inevitable for preventing congestions in large cities resulting from concentrations of industries in such cities. Decentralisations of industrial activity not only helps to tap the local resources, but also improves the standard of living in backward regions.

It is in this context that the handicrafts industries in India offer vast potentials and vast promises to solving the existing problems of unemployment unequal distribution of economic power, congestions in a few industrialised cities and balanced economic development of the country.

Factor of Location

The Brassware industry of the country is mostly located in the North-eastern part of Uttar Pradesh, and in that too at Moradabad. Other places of secondary importance are Varanasi, Mirzapur, Jalesar, Almora and Bahraich. Moradabad alone accounts for nearly 80 percent of the total Brassware production in the country. The main factors responsible for the location of this industry in North-eastern Uttar Pradesh are two fold.

1. Geographical and Social factors

Moradabad is one of the most important districts of North-eastern Uttar Pradesh. It is famous, specially for its brassware production. It has popularised items not only in India but also out side India. It accounts for about 75 percent of the total export of brassware.

2. Ibid.
articles. It is situated at a distance of about 160 km. from Delhi, the capital of India and at a distance of 320 km. from Lucknow, the capital of Uttar Pradesh. It is situated on the right bank of the river Ramganga in latitude 28.51° and longitude 78.45°E. It has a strategic position from the point of view of trade and commerce. Geographical surroundings of Moradabad are very favourable for the Brassware industry.

Varanasi is a city of Pilgrimage, where all the year round lakhs of pilgrims come to pay their homage to God and have a dip in the holy ganga. Thus, being a prominent city of worship, there is a great demand for those items of brass which are used for religious purposes such as Panchapalia, Gangajali, Hawankund, Ghanti, Aarti and so on.

Availability of a good market, therefore, seems to be the main reason for the location of this industry here, specially for producing utensils used for Puja Purposes.

The soil of Mirzapur is also favourable for the production of brasswares. The quality of the soil is most favourable for the moulds, as it neighter cracks nor melts. That is why Mirzapur is famous for the domestic brass articels which require heavy moulds such as, Balti, Kalsa, Parat, Tamri etc.
Jalesar is a small tehsil of District Etah having an area of 3,988 square mts. It is 41 km. from Etah and 64 km.s from Aligarh. Jalesar has its importance for the production of Ghungroos of different types being used in dancing, and for tying round the necks of animals. The reason behind the production of Ghungroos at Jalesar is hereditary. There is a Mohalla named Hataura where a community known as Thatharas is residing. These thatharas are engaged in the production of Ghungroos of different types.

At Almora and Bahraich, it was found that existence of this industry is not for any geographical factor. Here the industry might have developed as a result of the unemployment among the community known as Thatheras. This community earns its livelihood by manufacturing brass articles of domestic use. Though they have started manufacturing artistic and fancy articles to some extent, yet they are confined to local markets and other neighbouring districts.

2. Economic Factors

Besides the geographical and social factors, there are a number of economic factors which are responsible for the location of the industry. They are as follows:
(A) Finance

Finance plays a very important role for the location of an industry. The Brassware industry of Moradabad is a cottage industry and is scattered from door to door. At Moradabad neither the institutional finance nor the state finance has made any remarkable progress. The unique feature of Moradabad is its money lenders. The individual artisans are financed by these money lenders. Most of the units manufacturing brasswares are independent units which generally run at the houses of the artisans who are poor and always need finance. That is why this industry is still scattered and is being financed by money lenders.

So far as finance to the industry at Varanasi is concerned, that is also being flourished by local finance. At Varanasi the industry is also unorganised and totally scattered. The artisans get finances from the dealers from whom they get orders for their products. The same is the case at Mirzapur.

So far as Jalesar is concerned, it is also a centre of individual artisans making Ghungroos and Ghantis for Pooja etc. These artisans always need finance. The dealers of their products finance these artisans when they place their orders with them.
Almora and Bahraich brassware workers are not being financed by any outsiders. They purchase their raw material themselves and manufacture finished products for sale. They are not in a capacity to have stocks. Sometimes it is seen that they are financed in the form of advances made by near by dealers who place orders with them.

No doubt finance is responsible for location of an industry at a place to a very great extent. The brassware industry at Varanasi, Mirzapur, Jalesar and Bahraich has no correlations with finance. As far as Moradabad is concerned, this fact is applicable to some extent. At Varanasi the industry has localised only because of the greater demand for the religious articles and at Jalesar and Mirzapur there is no any reason for the locations of this industry except hereditary. The same is the case of Almora and Bahraich. Ultimately we reach to the conclusions that this industry is more or less traditional in most of the centres, but at Almora and Bahraich the industry is in its infancy and is flourishing steadily. At these two places the main products are the domestic articles such as Kalsa, Parat, Thali, Balti, Patili, Lota etc. Recently, artisans of Almora have also tried to mould their productions towards artistic and fancy articles such
as flower vases, Ashtrays, boxes, candle stands, Pooja articles etc.

(B) Raw Materials

Locating of any industry depends to a great extent on the availability of necessary raw material at reasonable price. The chief raw materials being used in the Brassware industry are copper, zinc, lead, tin, nickel etc. Besides these raw materials, the production of brassware requires a particular type of clay known as 'chikni mitti' which is available in bulk at Moradabad in the plain of the river Ramganga. The production of brassware is not possible without moulds and moulding is only possible with the help of this particular clay as far as other materials are concerned, they are to be purchased either from the private dealers of Bombay, Calcutta and Minerals and Metals trading corporations, New Delhi.

The production of brassware at Varanasi is confined to the production of religious articles and idols making only which are made of lower quality brass. Most of the raw materials being consumed at Varanasi are also brought from Bombay and Calcutta, Mirzapur and Jalesar also have the same positions. Almora and Bahraich also use lower quality of brass. The scrap is abundantly available at these places for production.
Another important factor which is responsible for the location of this industry is the supply of skilled labour. The process through which brassware manufacture passes is so tough, tendious and complicated that it requires a great deal of skill, training and experience. At Moradabad this work has been of hereditary nature. Every child of brassware workers sees his parents engaged in brassware manufacturing. Instead of going to school, these children start helping their parents in their work and till maturity they accumulate a vast amount of training and experience and thus become fully skilled. Besides this women also help in the work. So, the availability of skilled labour is an indispensable factor for the location of this industry at Moradabad.

Varanasi is confined to Puja articles and idols making. It requires a particular type of labour. Past history reveals that with the increase in demand for religious brass articles, the market for such things went on expending. Till that time all such articles were brought to Varanasi usually from Moradabad, but now the skilled labour for all these articles is enough at Varanasi.
Mirzapur is famous for brass articles of domestic use which are being produced by a community known as 'Thatheras', who are there in good number. Same is the case of Jalesar where the Ghungroos are being made by Thatheras who also learn this art from their parents. In Almora and Bahraich also this industry is confined to the doors of Thatheras who get training and experience in heritage and do not employ outside labour.

(D) Market

Availability of Market is very important to an early disposal of the products and Moradabad has an easy approach to all the important commercial centres of the country. It is one of the most prominent junctions of Northern Railways having a distinct approach to Delhi, Lucknow, Bombay, Calcutta etc. In almost all the cities of India we find market of Moradabad 'Kalai Ke Bartan'. Nearly two third of the products of this industry are exported to various countries of the world such as Saudi Arabia, U.S.A., U.S.S.R., West Germany and Middle East countries.

At Varanasi, the manufacturing units of brassware by and large are linked with the local dealers who place orders with them and buy their products when offered for
sale. It is seen that producers carry their finished products once in a week to the dealers and get their payment. The dealers shops at Varanasi are located in prominent localities of the city. The main market for religious articles and idols is Vishwanath Gali which is the centre of Pilgrims to visit. Besides the local sales the manufacturers also trade with other parts of the country. Varanasi has got a direct link of railway lines with almost all the cities of the country.

Mirzapur is famous for the products of brassware of domestic use which are marketed in almost all the parts of the country, particularly, Bihar, Madhya Pradesh and Uttar Pradesh. Most of the goods produced at Mirzapur are transported through railways and some are sent through road transport agencies which have been established there in large number.

Jalesar is the Producer of ghungroos, ghanties for Pooja etc. which are sold directly to Aligarh, Hathras, Agra, Mathura, Moradabad, Kanpur, Delhi, Calcutta etc. which in turn supply them to other parts of the country. The dealers of these cities have their contacts with the dealers of finished products of brassware. Jalesar itself has no scope for these products and is not so evenly linked with rail and road transport as other centres of Uttar Pradesh which produce brass artcicles.
Almora and Bahraich sale their products in fairs, festivals and local markets. Almora also supplies its products to nearby hill districts namely, Nainital, Uttar Kashi and Pithorgarh etc.

Origin and Development of Brassware Industry

The Brassware industry was located at Moradabad only, and gradually it started developing in other parts of the state in Uttar Pradesh. There is no precise information regarding the origin of the industry, but it is generally believed to be a few centuries old. We come across different informations about the origin of this industry at Moradabad. First, it is said that there was a carpenter named Parshadi Lal in a Mohalla known as 'Diwan ka Bazar'. He use to make frames of doors and windows. He also knew the art of engraving on wooden frames. Subsequently, the idea of engraving the same art on brass utensils - came in his mind and he started engraving flowers and leaves on utensils like Thali and Lota with tools which he had been using for wooden work. Thus the industry came into being at Moradabad.

During the rule of famous Mughal emperor Shahjahan, Subedar Rustam Khan founded the city of Moradabad after the name of Shahjahan's third son Murd in 1713. It is said that, with the caravan of subedar Rustam Khan there
came one carpenter and one black smith. The art of Parshadilal gave them inspirations to do engraving work on brass utensils. It has remained famous since then for handicrafts.

According to another information in the beginning, the industry was in the hands of a class of people known as 'Thatheras'. Their range of production was limited to utensils only. However, soon after wards brassware industry was truly set up with the entry of few enterprising muslim families. They introduced new tools and diversified productions. The market for the handicrafts items of Moradabad was widened with the impact of their knowledge of muslim culture as well as the need of the foreign countries. Different varieties and shapes of house-hold articles that were in demand in the foreign markets were produced.

From the pregoing information we reach the conclusion that the art of brassware existed at Moradabad before the rule of Mughals in India. It is a well known fact that the Mughal Emperors gave their utmost preference to different types of arts and did all possible for their

2. All India Handicraft Board, Research Sections, New Delhi.
development. Prior to Mughal, the industry was confined to the manufacturing of simple and domestic utensils of brass like Parat, Jhagar, Thali, Lota etc.

Apart from the above information it is also said that a few Afghans came to Moradabad and copied the Persian and Kashmiri art of engraving on Hukka and Frashis. Some others say that the Bidar work of Lucknow and artistic figures of swords in Jaipur gave birth to the art of engraving and colouring the designs over the brass articles. This industry has become famous not only in India but also abroad for its artistic articles. The engraving and enamelling work at Moradabad is the best of its kind and distinguished it from other centres of the industry either in Uttar Pradesh or in other parts of India.

Thus the Brassware industry which was confined to the manufacturing of domestic articles took turn to its artistic character and the work of engraving and enamelling came into existence. Later Mughals took keen interest in the art and new pattern and designs with different colours were patronised. During this period these artistic items were also exported to some Muslim countries like Afghanistan, Iran and some other Arab countries when the shahi personalities came to visit
India, they were presented such types of articles by Mughal emperors.

During the British rule in India, the industry remained at stand still. The state Nawabs were the only lovers of the art. As such there was no progress in the manufacture of artistic utensils. As per the estimates of the industries department, Uttar Pradesh, the annual production of this industry was rupees one crore and more than 10,000 workers were engaged in this industry during the British period.

**Progress of the Industry After Independence**

After independence the government of India recognised the importance of cottage industries for economic development of the country. The Industrial Policy 1948 assigned proper place to the cottage industry and some efforts were made for the development of Brassware industry, as it was one of the most important cottage industries at that time. So, we may consider it as the first step taken by the government for the development of the industry after independence.

During the first five year plan All India Handicrafts Board was set up in 1952, with its Head office at New Delhi. It has five regional offices - Delhi,
Bombay, Calcutta, Madras and Lucknow. The Lucknow office of the board is in i., i., after the working and progress of the Brassware industry of the state, especially at Moradabad. During the second and third five year plan periods also efforts for the development of the industry were made by All India Handicrafts Board. The main achievement of this period was the appointment of a study penal by the government of Uttar Pradesh for making recommendations for the progress of the industry. The study penal went through the conditions of the artisans and the scale and standard of production and submitted its report with the recommendations to set up a government body to assist the industry at Moradabad. The government of Uttar Pradesh accepted this recommendation and established the U.P. State Brassware Corporation Ltd., in February 1974 at Moradabad. The Corporation has taken up the work of increasing production and export of brassware.

Besides Moradabad, Brassware industry is spread over at many other centres in Uttar Pradesh like Varanasi, Mirzapur, Jalesar, Almora, Bahraich and Aligarh. The following table shows the working of this industry in Uttar Pradesh:
### TABLE NO. 11

**WORKING OF BRASSWARE INDUSTRY IN (1990-91)**

<table>
<thead>
<tr>
<th>City</th>
<th>Production (in cv.)</th>
<th>No. of workers</th>
<th>Items of productions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moradabad</td>
<td>200</td>
<td>110000</td>
<td>Brass Utensils, Artwares &amp; decorative items.</td>
</tr>
<tr>
<td>Varanasi</td>
<td>50</td>
<td>20000</td>
<td>Puja articles, idols, modern arts.</td>
</tr>
<tr>
<td>Mirzapur</td>
<td>12</td>
<td>15000</td>
<td>House-hold Brass utensils.</td>
</tr>
<tr>
<td>Jalesar</td>
<td>10.80</td>
<td>2800</td>
<td>Ghungroos, Bells, Thali, Kalchi.</td>
</tr>
<tr>
<td>Almora</td>
<td>5.80</td>
<td>500</td>
<td>Domestic articles, few fancy items.</td>
</tr>
<tr>
<td>Bahraich</td>
<td>3.50</td>
<td>200</td>
<td>Domestic articles</td>
</tr>
<tr>
<td>Aligarh</td>
<td>2.10</td>
<td>175</td>
<td>Door handles, Brass figures and animals.</td>
</tr>
</tbody>
</table>

Source: Information collected by Research Scholar from All Handicrafts Board Research Sections, New Delhi.

It is obvious from the table under study that Uttar Pradesh covers more than 90 percent\(^1\) of the total brassware productions in India and the share of other states in quite insignificant. In the same way Moradabad is the biggest production centre of the brasswares in Uttar Pradesh and accounts for nearly 80 percent\(^2\) of the

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1. Manufacturers/Exports Associations, Moradabad.  
2. Ibid.
total brassware productions in the country - while Varanasi holds second and Mirzapur third positions in this field but their production is not so significant because figures of production at Varanasi include the production of Puja items and Idols which are generally made of copper and the artisans of Mirzapur use Kashut and copper as their raw material. Jalesar, a small tehsil of Etah district in Uttar Pradesh is actually an important centre of brasswork and holds dominance in the production of ghungroos and bells.

At present the industry can be divided into two main parts on the basis of brass items being manufactured in Uttar Pradesh:

1. Production of Utility Utensils and Other Utility goods:

   It is spread over different parts of the state with special concentrations at Moradabad, Mirzapur, Almora and Bahraich. Although these items are meant for domestic use, they have export potentialities to Nepal, Malaysia, Indonesia and some African countries.

2. Brass Articles of Fine Arts and Novelties

   This work is chiefly concentrated at Moradabad, Varanasi and Jalesar to some extent. About 90 percent of product of such items of Moradabad is meant for export
only. So, this industry has earned a niche for itself in the international market because of the excellence of engraving ware. The engraving has been such an asset that it has helped the industry in its growth. This trend reflects that the products feature is playing dominant role in the marketing of the product.

It is needless to say that after independence there has gone a thorough change in the pattern of demand for brassware. The researcher, while contacting the brassware manufacturers has come to the conclusion that gradually the use of bigg domestic brass article in going down. Same is the position of brass utensils of daily use, as their place has been taken by the utensils of steel on the other hand, that the demand for fancy and Novelty items has been increasing, therefore, the manufacturers of brass articles are diverting towards the manufacture of the decorative and artistic brass articles. Moradabad which was famous for its 'Kalai Ke Bartan' now is famous for the brassware of fine Arts and novelty items all over the world. There has come a significant change in the percentage of different types of brass items being sold.
PERCENTAGE OF DIFFERENT TYPES OF BRASSWARES

<table>
<thead>
<tr>
<th>Items</th>
<th>Percentage, before Independence</th>
<th>Percentage at present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass utensils &amp; other utility goods</td>
<td>80</td>
<td>14</td>
</tr>
<tr>
<td>Puja &amp; Religious wares</td>
<td>05</td>
<td>06</td>
</tr>
<tr>
<td>Fine Art and Novelty wares</td>
<td>15</td>
<td>80</td>
</tr>
</tbody>
</table>

Source: Data collected by Research Scholar from Manufacturers/Exports Associations, Moradabad.

It is clear from the table 1.2, that the demand for brass utensils and other utility goods has reduced after independence. On the other hand the demand for Fine Arts and Novelty items has gone up nearly four folds of the demand prior to independence. There has been no significant increase in the demand for religious wares. In fact, the demand for these items has gone down but the increase is recorded due to the demand for idols made of brass. The idols are demanded in India for religious purposes while they have demand abroad for their artistic and decorative value.

In this industry the 'Karkhanedari' system is fundamentally prevalent where Karkhanedar is not a trader
TYPES OF BRASSWARES
(percentage of total production)

Before Independence
- Brass utensil: 80.0%
- Puja wares: 15.0%
- Novelty wares: 5.0%

Present position
- Brass utensil: 14.0%
- Puja wares: 6.0%
- Novelty wares: 80.0%
but an actual organiser of production. The supply of raw material and the sale of finished product is controlled by private traders. The raw material supply is controlled by big businessmen who have the financial capability of large investment in the manufacturing.

Division of labour is prevalent at all the centres, where processes are done by different sets of people. There are pattern makers, moulders, scrappers, solders, engravers, polishers and electroplaters. In this industry men, women and children all constitute their share of labour in different ways. The artisans in this industry are mostly illiterates. They are devoid of the sense of decent and clean living, family planning and balanced habit of spending. This adversely affects their socio-economic conditions, which has resulted in high incidence of serious ailments which naturally affect the working capacity of the artisans greatly.

Organisational Structure of the Industry

The pattern of ownership in this industry is predominantly sole proprietary. Only 15 percent of the units were run on the partnership basis. Although sole

1. District Industry Office, Moradabad.
proprietory form of organisation is the dominant form of organisation of the Brassware industry at Moradabad, yet a large majority of units have to depend for supply of both work and material on dealers. Their mode of operation is, usually speaking, of servicing nature rather than organisation of their own independent production.

There is a special class of workers at Moradabad, known as contractor. They do not have workshops of their own nor do they undertake the risks of production. Mainly they function as a middleman taking orders from the dealers and exporters and forming out the work to small manufacturing units on contract basis.

At Varanasi, units engaged in the production of brassware have been organised mostly on single ownership basis.

At Mirzapur nearly one fifth of the total number of units are of partnership nature and the rest proprietory concerns.¹

At Jalesar the industry is confined to the houses of artisans and almost all the units are sole proprietory concerns. Same is the position of Almora & Bahraich also.²

1. All India handicrafts Board, Moradabad Office.
2. Ibid.
Venue of Work

At Moradabad the Brassware industry is running from house to house. A special feature of different units is that they carry on only one process of manufacture and the children and women help in this work. Most of these units give orders to the artisans for shopping the items and get the work of engraving, electroplating, polishing etc. done in their own factories through the hired labour. But such units are usually confined to the cottages of the exporters and looked after by their families. Besides, there are also some exporters who have set up their own factories in which all the processes of production are done. The total number of units engaged in the production of brasswares is about 3,372.¹

At Varanasi the industry is also running on the same patterns as at Moradabad. The total number of manufacturing units of brassware is about 230.²

The Brassware industry at Mirzapur is mainly confined to the manufacturing of utensils. Besides, there are 40 rolling mills which produce brass sheets. The number of units manufacturing brass utensils is about 350

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¹ Survey report of the U.P.S.B.C. Ltd., Moradabad.
² Ibid.
and are purely cottage as being run by the Thathera families in their huts.\(^1\)

Jalesar is famous for the manufacturing of ghungroos and ghanties. The total number of manufacturing units of brassware is about 200. All these units are cottage based.\(^2\)

The Brassware industry at Almora is engaged in the manufacturing of domestic brass utensils and some fancy items. This industry is also cottage one and confined to the houses of the artisans. The number of these units is about 120.\(^3\)

This industry at Bahraich is located at the houses of Thatheras who manufacture the utensils. The number of such units is about 30.\(^4\)

**Period of Work**

Except the weekly holidays and festivals, the units are engaged in production for whole of the year. Except during the rainy season, the production activity maintains the tempo throughout the year. People working in

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2. Ibid.
4. Ibid.
moulding, polishing and engraving sector find work for about nine months in the year while workers engaged in making silli gulli and lacquering find work for about eight months. In the remaining sector the number of working days do not exceed 275 days.

Motive Power

In the brassware industry, much of the work is done by hand. Nearly 90 percent of the units carry out their work manually. It is only in polishing, sheet work, carapining and electroplating where we find the use of electric power.

Wages to the Workers

The piece rate system is prevalent in the industry. The average daily wages of a workers range between Rs. 15/- and Rs. 40. Labour charges for each manufacturing process are mostly pre-determined by prevailing trade practices and also by Karkhanedars, engravers and manufacturers. In fact, wages for similar work differ according to weight and size of the article made and the skill of the artsans.

1. District Industry Office, Mordabad.
2. District Labour Office, Moradabad.
Government Policy towards the Industry

The Government of Uttar Pradesh is assisting in the promotion of the Brassware industry. Various government agencies assisting the development of Brassware industry of U.P. are:

2. State Directorate of Industries.
3. All India Handicrafts Board.
5. Small industries development organisations.

The principal agency responsible for the development of small and cottage industries is the State Directorate of Industries in Uttar Pradesh. It registers units, checks and enforces various rules and regulation formulated by U.P. government from time to time.

U.P. State Brassware Corporation Ltd., is another State level agency which solves various problems faced by the Brassware industry.

Quality marking centre working in U.P. is under the State Directorate of Industries keeper. This centre has been set up to test quality of tin plating on brassware.

All India handicrafts board looks after the design
and development requirements of certain industries in U.P. including the Brassware industry. Keeping in view the export potentialities of the Brassware industry of U.P., it is desirable that the design and development centre of all India handicraft board should devote more attention to this export oriented industry.

PRODUCTION TECHNOLOGY OF BRASSWARE INDUSTRY

Raw Material

Raw material is an indispensable necessity for any industry. That is why availability of raw material is the primary factor determining the location of an industry. The major cause of location of this industry at Moradabad is the availability of special clay called 'Chikni Mitti' at the banks of river Ramganga which is used by the artisans of brasswares for moulding purposes. Other raw material being used in the Brassware industry can be classified into two categories:

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<table>
<thead>
<tr>
<th>Raw Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main</td>
</tr>
<tr>
<td>- Copper</td>
</tr>
<tr>
<td>- Brass Sheet</td>
</tr>
<tr>
<td>- Zinc</td>
</tr>
<tr>
<td>- Aluminium</td>
</tr>
<tr>
<td>- Lead</td>
</tr>
<tr>
<td>- Tin</td>
</tr>
<tr>
<td>- Nickel</td>
</tr>
<tr>
<td>Subsidiary</td>
</tr>
</tbody>
</table>
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Main Raw Material

Copper:

Copper mines in India are located in Kangra and Kullu in Himachal Pradesh, Garhwal and Almora in Uttar Pradesh, Jaipur, Ajmer and Alwar in Rajasthan. Singhbhum in Hazarilagh district in Bihar and Mysore in Karnataka. Among all these places Bihar is the largest copper producing centre in India, but the production of copper in India is still not enough to meet the demand of the country, as it is not only used for brasswares but also in many other ways. Its annual requirement is about 1,00,000 tons. That is why India has to depend upon imports of copper to a very great extent and its demand is met by imports from various countries of the world.

U.S.A. is the largest copper producing country of the world, while U.S.S.R. is the second largest one. India has to make imports of copper from U.S.A., U.S.S.R. and some other South African countries. Only U.S.A., and U.S.S.R. account for more than 2/3 of the total imports of copper by India.

Zinc:

Zinc production in India is also short of demand and as such India imports zinc also. It imports zinc from
U.S.A., Canada, Japan and Australia. But the major import is from U.S.A.

The brassware dealers and artisans do not care for the purchase of copper and zinc but they purchase either brass sheets or brass scrap.

**Brass Sheet**

Brass sheet is bought to brassware centres from places where non-ferrous mills are set up or from markets of brass sheet. Among these Delhi, Bombay, Calcutta are prominent for brass sheet markets.

**Brass Scrap**

Brass Scrap refers to old brass which has turned into brass billet. Almost at all the centres of Brassware industry, the brass scrap is received from important cities of the country concerned with scrap. Most of the brass sheets, brass scrap are taken by the big dealers who deal in the non-ferrous metals. Such dealers get the supply of copper, zinc and brass sheet etc. from all the important centres of the country and from the importers also.

**Subsidiary Raw Materials**

Brassware industry also requires Aluminum, Lead, Tin and Nickle as the subsidiary raw materials for
manufacturing. These are used to a little extent and are generally purchased by the dealers from the local market. The use and availability of these metals is discussed below:

Aluminium

In the brassware manufacturing process aluminium is mixed in brass to a very little extent to give brightness and shine to brass. In India it is available at Calcutta and Bombay markets in enough quantity.

Lead

In the manufacturing of brasswares lead is used to make the moulding process easier and to avoid the risk of breakage of the moulds as the use of lead makes them hard. Lead is obtained from Bombay, Gwalior, Calcutta and Gorkhpur.

Tin Nickel

The use of these metals in the industry is also not very significant. Either of these metals is used for polishing the brasswares. Artisans get these from the local markets.

Sources of Supply

Proper supply of raw material required by the industry at reasonable price is most important for un
intrupted production. But it has always been a problem for artisans and manufacturers. The various sources of supply of brass to the artisans and dealers engaged in this industry in the State are discussed below:

**Direct Purchases**

The common source of getting raw material by any industry is direct purchase from the market. But as far the Brassware industry is concerned, the artisans are always short of funds and cannot purchase their raw material from markets. It is only in the case of a few big manufactures who purchase the raw material from the markets not only in the State but also from out side the State. In most of the cases the small manufacturers purchase the raw material from dealers. These dealers are doing business on a large scale at different brassware centres in the State.

**Through Brassware Exporters and Dealers**

Exporters supply the raw material to the artisans. Whenever they get foreign orders, they get the articles manufactured through artisans by supplying them the raw materials. This system is more prevalent at Moradabad and it accounts for more than 75 percent of the total exports of brassware in the country.
The artisans and small Karkhanedar do not take risk of marketing their products themselves and sale their products to the local brassware dealers. Such dealers supply raw material for the brassware for which they place orders with the artisans.

Through National Small Industries Corporation

National small industries corporation is also helpful in the supply of raw material to the actual users. This corporation supplies brass scrap, boring and turning from factories to the actual users on the recommendation of the Directorate of industries, Uttar Pradesh under certain condition. At the time of filling application for such raw materials, the party concerned has to deposit 2 percent of the notified value of the material required and further has to deposit the entire amount in advance before the corporation issues the final release from the factories. It is very difficult for small manufacturers to make their own arrangement for taking the material from these factories at far off places like Nagpur, Calcutta etc. It adversely affects the industry, because the merchants who purchase the release orders again sell the raw material to the actual users at high prices.

Through Minerals & Metals Trading Corporations

This corporation supplies only zinc to the actual
users in Brassware industry. The production of acquiring the supply of raw material through this corporation is too complicated and as such not very beneficial to the small manufacturers.

Through U.P. State Brassware Corporation Ltd.

The U.P. State Brassware Corporation came into being in February 1974 at Moradabad with the objective to assist this industry corporation provide raw material to the small manufacturers and provide facilities in the procurement of raw materials purchased through National Small Industries Corporations and Minerals and Metals Trading Corporations. The Corporation charges only 2 percent of the value of raw material as the service charges to meet its over head expenses. It also gives the facility to the manufacturers to make payment in installment according to their convenience.

In this regard the researcher contacted the small manufacturers and artisans with the object of finding out the source of supply of raw material. It was found that even now most of the small manufacturers have to depend upon the exporters and dealers to whom they supply their products. The government's contributions in this regard is negligible. The following table shows the percentage
of raw material being supplied through different sources to the brassware manufacturers:

TABLE No. 1.3
SUPPLY OF RAW MATERIAL FROM DIFFERENT SOURCES TO THE BRASSWARE MANUFACTURERS

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage of Material Supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchases from Exporters &amp; Dealers</td>
<td>55%</td>
</tr>
<tr>
<td>Purchases from Traders</td>
<td>35%</td>
</tr>
<tr>
<td>Purchase through Govt. agencies</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: Information gathered by research scholar from U.P. State Brassware Corporation Ltd. Moradabad.

It is clear from the above table that the artisans and small manufacturers depend upon the exporters and dealers who compel them to supply finished products at lower prices. The direct purchase made in the market is also a drawback because these traders get the supply of raw material from the government quota at cheap rates but sell it at exorbitant prices. The government's contribution in this regard is not significant being only 10 percent of the total raw material.

Techniques of Production

The process of manufacturing of brasswares is
mostly technical. It is very difficult for a lay man to understand the name. There is division of labour and each establishment specialises in a particular process only. An object passes through various processes before it becomes finished. For this purpose the researcher contacted a number of artisans engaged in different processes and tried to understand the techniques. The following chart shows the processes through which the brassware pass:

**PROCESS OF MANUFACTURE**

Pattern Making and Shaping of Wares

- **Moulding**
  - Para casting
  - Beating Method
  - Pressing Method
  - Spinning Method
- **Sheet work**
- **Scraping & Soldering**
- **Engraving**
- **Polishing**
  - Brass Polish
  - Nickel
  - Kalai
  - Chromium
  - Lacquering
  - Electroplating

The details of processes involved in each stage of production, are given below:
Pattern Making and Shaping

The first stage of the manufacturing process is to make patterns accordingly to shape the wares. This process is different for articles made of brass sheet and articles made by way of asting.

1. Moulding

In this process, before preparing moulds, wooden patterns are made out of the sample available, on the basis of which master moulds are prepared. Moulding involves four different operations - making pattern, preparing mould, heating the metal and handling the metal. Moulding may be classified as:

(i) Para Casting

In the para casting method, the pattern of the article to be manufactured is made of wood and these form a few model pieces are cast which are to be used in making moulds on a large scale.

A mould is divided into two cores - the inner core and the outer core. The farmer is first one made on inner side of a block sample. It is taken out when dried and is allowed to cool. The outer shall is made on the outer side of the same and it is out into two after it has dried. The inner core is inserted in side the hollow of
the outer shell already cut into two. The two parts of
the outer shell are joined at the top, leaking hollow
space between the two structures. At the bottom of the
structure, a Tikli there in, is affixed to allow the
matter metal to pass inside the hollow space. when
absolutely dry, it is put in the furnace downwards. The
artisan known as furnace man calculates by his experience
that the raw material has reached a point of fusion, he
takes out the moulds from the furnace quickly and puts
them in row having Kothali position upwards and para
downwards. The metal thus runs into para. As the whole
thing gets cooled the para is broken and the sample comes
out which look rough in appearance.

(ii) Darza Casting

Under this process two flat dishes with raised rim
are used. The dishes when put together leave a whole on
the side which is meant for pouring metal. One dish is
filled with masala which consists of the fine sand mixed
with lubricant oil etc. After this the pattern is placed
on a wooden plate and the darza is put above it and is
filled with masala and then pressed very hard by the
artisan. Thereafter, the pattern is taken back from darza
and channel is made in the masala opening out to the hole
between the dishes. The melted metal is poured through the hole into darza. After a few minutes darza is opened, the pieces of darza are separated and moulded pieces are taken out. Articles like candle stands, ash trays, flower vases etc. are manufactured by this method.

2. Sheet Work

For making sheet works, the round billets are heated in a furnace and pressed in a rolling mill. Outline of the flat articles to be manufactured is marked on the sheet and flat pieces are cut from these out lines. The exact shaping of the flat pieces into desired articles is done with either hand operated or power lathes. Another method of making round sheet wares is to spin flat pieces of brass in a spinning lathe operated by hand or by power. Thus the sheet items are manufactured by the following methods:

(i) Beating Method

It is a traditional method being used by the community known as 'Thatheras'. In this method brass sheet first cut according to size and shape, then these sheets are heated in a furnace and then beaten by hammer. When the sheets are heat they are taken out from the furnace and then put to hammering and are beaten in the lots of two, four, six or more sheets together as the case
may be. These sheets are now again put into furnace when red with heat, are taken out and placed on anvil one by one. Subsequently they are hammered at different points by turning the template on the anvil as soon as a template gets cold, it is replaced in the furnace. An outline of the article to be produced is marked on the template. Articles like Kalsa, Parat, Tasla etc. are manufactured by this method.

(ii) Pressing Method

This method is used to manufacture the items having hollow space in their shapes such as cups, Katora, Tiffin etc. first of all brass billets are cut in a suitable size as per the article to be produced and then pressed either by electric power or hammer. Pieces of sheets are affixed with die and pressed by the power press which shapes them accordingly.

(iii) Spinning Lathe Method

This method is used for the manufacturing of Thalis, Trays etc. Under it, first of all a die either of iron or wood is prepared and put on the thick iron roller which is usually driven by power. The brass sheet in proper size is placed between the die and the roller in such a way that the sheet is fully covered by it leaving side edge which are to be raised or turned.
3. Soldering and Scraping

Soldering is the process of joining parts of metal with another metal called solder. The solder is generally of a low melting point than the metal being joined. There are two processes of soldering hard and soft. It is the latter process which is more in use. This involves the use of easily melted solder. The tools and equipment used for soldering consist of oxy acetylene gas torch, Kerosene burners, etc. The material used in comprises of fluxal ammonia, a solder and emery cloth. Soft soldering is done either with direct heat or with a soldering bit. The surface to be joined is cleaned thoroughly with emery cloth. The different pieces of the brasswares to be soldered are put in a proper form. Then a lux san ammonia is applied at the place to be joined. The flux san ammonia is applied at the place to be joined. The flux helps in cleaning, reduces the oxide, helps the solder to flow and assists the solder to combine with the metals. The work place for soldering operation consists of one man and will cost between Rs.200/- to Rs.1,000/- depending upon the type of equipment purchased.

Scraping is a cleaning operation, and the process consists of scraping the field surface to make it smooth. The process is known locally as chillan. Scraping is done
in four ways - by hand, by charakh, by kanta and by machine. Scraping by hand is one of the oldest methods and is simple too. Chisel is one of the important tools. The scraper with chisel in one hand and the article in the other hand or between two feet, scrap the article. The second method of scraping by charakh is an improvement over the first. The article is mounted on a rod on one side and to charakh on the other side. The charakh is worked by with a scrap, as a result of which the article revolves. The tool scrapes the rovelving article to make its surface smooth. In the case of hand driven or power driven lathe, the article is fixed with lathe to the end of the roller.

4. Engraving

Engraving is the cutting of a design into the surface of the metal. After the product has been scraped, it is passed on to the engraver for engraving. The engraver imprints the design on the ware. In case of ordinary work, the design to be carved may be transferred by the engraver from his memory. In the case of 'Siahkalam work' where intricate designs are involved, the designs are prepared on paper and outlined on the article to be engraved before engraving. This type of work
requires high order of skill and workmanship which is attained by patient apprenticeship for a few years.

5. Polishing

Polishing is the last step of giving final touch and lustre to all types of brasswares. But the process of polishing differs from item to item. All types of polishes are done as under:

(i) Lacquering

Lacquering is done on the engraved brassware by filling up with the shellac the depressions created by engraving. The article is heated on burning char-coal and the engraved designs are filled with painted shellac and the excess of lacquer is then removed.

(ii) Electroplating

Electroplating is the process of giving a coating of a metal on the article by the process of electrolysis. Under this, Potassium cyanide is dissolved in a tank of water, along with nickel, charged with electric current. The article to be polished with nickel is dipped into the tank for a few minutes. When the nickel is plated on the article, it is taken out from the tank and washed and rubbed against lathe buffing machine charged with power.
An electroplated article gives more shining than the article polished with Kalai, but this shining does not last long.

(iii) Kalai

Kalai is done on articles by heating it and then applying tin and spreading it thereon with a rag dipped in Nausadar. The article is then washed to remove Nausadar and again heated and cleaned. After this the article is polished with Kurand. Kurand is rubbed on the article with a rag with some pressure. Subsequently shining is given by rubbing the article on lathe.

(iv) Chromium

Chromium on an article is done in the same way as nickel is plated. Instead of nickel, chromium is dissolved in water. Chromium may also be plated on article already polished with nickel. In the later case the polish lasts long and gives more shining then nickel polish whether it is done on article with or without nickel.

Modification of the Product in the Manufacturing Process

The traditional process of the Brassware Industry has undergone a number of technological changes and new
process is of manufacturing are being applied in different jobs in the industry. The Brassware industry of the state has been a handicrafts industry and the artisans have been manufacturing the products by hand in different jobs.

Following are the modifications of the products in the process of manufacturing:

1. In case of brass sheet items for shaping and pattern making power processes are being used for some articles. While previously the whole of this work was done by hand operated tools and equipments.

2. Scraping is also done by hand operated tools, but for the last few years the use of machines for this purpose has been in practice. Now the scraping of the heavy items is done with the help of machine, but the use of scraping machines is very limited.

3. Soldering process has also been mechanised to some extent. Now the brass items which are manufactured in pieces, are soldered by gas plant just like welding process.

4. The whole of the process of polishing except Kalai has been completely mechanised and nickel and silver polishes are done with the electroplating technique.
5. Introduction of various types of new designs and patterns of fancy and novelty in brasswares is a modern trend. With the increase in exports of such items, this industry has turned to the production of items of new designs and shapes.

From the foregoing points, it is clear that the Brassware industry in the state has been adopting new techniques in the process of manufacturing. Following are some important reasons which are responsible for the adoption of these new techniques of manufacturing.

(a) The labour cost in the process of manufacturing has been increasing regularly with the rising trend of prices and increasing standard of living. The main reason behind it is that the industry is almost hand operated. Therefore, it is essential that the industry should be mechanised to the maximum possible extent and all the new techniques of production must be adopted. It will not only bring down the labour cost but also reduce the monopoly of the particular class of artisans required for the process concerned.

(b) Brassware industry has been facing a great competition in foreign markets with some other brassware manufacturing countries like Taiwan, South Korea and Japan
because of their prices being cheaper. They are able to do so because of lower manufacturing costs due to adoption of mechanised processes and low rates of raw material which they use. Therefore, the use of modern techniques of brassware manufacturing is desirable to bring the industry in a position to face the competition with other countries, as it will bring down the cost of manufacturing.

(c) The falling demand for domestic brass items can be recovered by the adoption of new techniques of Brassware manufacturing. It will bring the prices of such wares down and as such the industry will be in a position to revive the demand for brasswares as stainless steel wares would be comparatively very costly. People would be attracted towards brasswares on account of their cheapness.

Thus the technological changes in the process of brassware manufacturing will increase the production but it will require more capital and more skilled labour. It will not only increase the quantity but also improve the quality of production and reduce the cost of manufacturing. The consequences of the adoption of new techniques are more capital, skilled labour and more production.
1. More Capital

The adoption of new technological devices requires more amount of capital which itself is a problem for those engaged in the Brassware industry in the State. The artisans who are already short of finances do not find themselves in a position to adopt new techniques in their manufacturing process. Therefore, the state government or the financial institutions should come forward and provide the necessary capital to the industry.

2. More Skilled Labour

The new techniques and machines in the manufacturing of brasswares require more skilled labour. An industry like brassware, where most of the labour is hereditary, the use of machines and new techniques will make the problem of labour. It is possible only if the labour is imparted training. So the government should arrange for a regular training in different jobs and processes under new techniques so that the industry may flourish on the same line as in other brassware manufacturing countries like Taiwan, South Korea and Japan.

3. More Production

The new techniques will result in the increase of
production which will require new markets in the country and abroad. The increase in the production of brasswares is very much essential because the demand for fancy and novelty items has been going up regularly in foreign markets and the industry is unable to meet the increasing demand well in time. If some efforts are made, the demand for such items can be increased to a great extent. It is therefore, essential that the use of new techniques of brassware manufacturing should be adopted in the industry so that the production may be increased to a desirable extent.

On the basis of the above discussion it can be concluded that the Brassware industry in the state has hundreds of varieties of items and designs. These varieties go on changing at frequent intervals as per specific tastes and needs of the consumers. This industry has been working in two categories namely the production of brass utensils and brass items of fine arts and novelties.

Units engaged in the first category are few and mostly units are engaged in art wares. Production of different types of utensils in the first category is against anticipated local sales while the productions of
art wares is mostly done against the orders of the exporters.

Except a few units which are engaged in the manufacturing of utensils, no unit undertakes all the manufacturing process to bring out the finished products. Usually one process is performed by one unit. Under each process the work is undertaken either at piece rate or contract basis. The entire industry is based on cottage and most of the units are located in the homes of the artisans.

In this industry, much of the work is done by hand. Nearly 90 percent of the units carry out their work manually. Only for polishing, electroplating and sheet work. Electric power is used.

The exporters are having their hold over this industry. They receive orders from abroad and then get the articles produced by artisans.

The government of India has been pursuing the development of this industry and a number of measures have been taken to assist the growth of such industries in the country.

The sources of supply of raw material that the artisans and manufacturers with limited finance have to
depend on traders and brassware dealers, who invest their funds in purchasing and storing large quantity of raw material for retail selling. These traders and dealers always try to exploit the situations in their own interest. Besides, the small manufacturers and artisans purchase the raw material on credit for which they have to pay exhorbitant rate of interest.

The production of brasswares involves a number of processes undertaken by individual establishments specialising in each of them. These processes include ingot making, pattern making, sheet work, moulding, soldering, scraping, electroplating, engraving, lacquering and polishing for obtaining the end product ready for sale.

After scraping and soldering the articles are given final finish and can be sold after polishing. As far as the engraving is concerned, this is done to make the items more fancy and artistic. A wide range of brasswares are being produced at Moradabad and other centres in the state in hundreds of shapes and designs. These go on changing from time to time according to tastes and needs of the customers. The main items of production are flower vases, candle stands, ash trays, table lamps, jewellery boxes, jars, planters, beer mugs, lighting fixtures, tea sets, and other miscellaneous items.
After going through all the process of brassware manufacturing it is observed that most of the work is done by hand and the mechanised work is only in case of sheet work and to some extent in scraping and polishing in the industry. Hence the Brassware industry is facing a number of problems which will be described in the next chapter.