



## METALLURGICAL ADVANCEMENT IN HARAPPAN CIVILISATION - GS I MAINS

**Q.** Trace the metallurgical advancement of Indus Valley civilization with suitable examples. (10 marks, 150 words)

### What's in the news?

- The people of Harappa developed some new metallurgy techniques and produced copper, bronze, lead and tin.

### Metallurgical Advancement:

- Although the Harappan civilisation started using metals from the early Harappan phase, the metallurgy has advanced to the great perfection in the mature Harappan period. According to the evidence in the excavations, they used gold, silver, copper, lapis lazuli, turquoise, amethyst, alabaster, jade, etc.

### 1. Bronze casting:

- Bronze casting was a widespread practice during the Indus Valley Civilization, particularly at Harappa. Bronze statues were made by the **“lost wax technique”**.
  - Lost-wax process is also called *cire-perdue*, it is a method of metal casting in which a molten metal is poured into a mold that has been created by means of a wax model.
  - Once the mold is made, the wax model is melted and drained away.
  - A hollow core is filled with molten metal which is solidified to get the casting.
- Harappans were masters in bronze sculpting through the lost wax technique or *Cire perdue* technique.
- The **'Dancing Girl' from Mohenjodaro** is one of the earliest lost wax bronze figurines.
- Many Harappan copper implements were made by the casting method and vessels were made out of a single sheet of bronze by hammering.

### 2. Alloying:

- Minor metals like **tin, arsenic, lead, antimony etc.** came to be used for alloying.
- Although about 70% of the copper objects of the Harappan period are unalloyed, a judicious alloying pattern as per requirements may be discerned in the metal repertoire.
- Arsenic was found to be present in several statues probably with a specific reason.

### 3. Metal smiths:

- Several metallurgical innovations like the intricate *ciré perdue* or lost wax technique, true saw and the eye needle go to the credit of the metal smiths of that period.



- Exclusive objects of copper, gold, and silver came to be used.

#### 4. Golds and other ornaments:

- Exquisite gold jewellery and silver ware, though rare, has been found from Harappan sites.
- A stone touching gold streaks was found at Banawali, which may have been used to test the purity of gold, a technique still used in parts of India today.

#### 5. Arms and armaments:

- The sharp-edged cutting tools like razors, knives or daggers, arrowheads, spearheads, drills etc show a distinct alloying pattern with alloying of tin up to 12- 13%.

#### 6. Transactions:

- Harappan weights and measures in the context of ancient long distance trade shows that several metals such as gold, tin, silver and bronze were used for transactions for trade and other purposes.

Thus, the Indus Valley civilization was pioneers in the art of metallurgy which further provides the roadmap to the scientific art developed in the Iron age.

