

**Ques-Briefly discusses the technological advances that aided agricultural and craft production during the sultanate period.**

**Answer:** The establishment of the Delhi Sultanate not only brought transformative socio-political changes, but it also opened gates for the adoption of new technologies that impacted a diverse range of activities including agriculture, handicraft, construction, aesthetics, warcraft, etc. Many of these technological changes, in turn, brought social changes.

### Agriculture:

1. According to Irfan Habib, the introduction of the Persian wheel substantially increased agricultural productivity. But, there is some historiographical controversy regarding the stages in which this irrigation technology evolved.

Also, some historians argue that the large-scale transition from pastoral to agrarian society that it was supposed to bring happened in those areas where it could not have been adopted on a considerable scale.

1. The 'gaz-i-sikandari' introduced by Sikandar Lodhi was based on 39 digits. It was an instrument for measuring land.
2. The large-scale digging of the canal under Firuz Tughlaq must have been aided by some sort of technological advancement in a survey of the topography of the land.

### Craft Production:

1. Charkha (spinning wheel) was introduced in India in the 14<sup>th</sup> century. The first reference to charkha was made in Isami's 'Futuh-us-Salatin'. The use of the spinning wheel increased the production of yarn by six times.
2. Before spinning wheels, the use of carder's bow had started just after the invasions of Muhammad Ghori. This technology contributed to easing the process of cleaning cotton seeds. These changes transformed the cotton handicraft industry.
3. Use of paper and the technique of bookbinding started during this period. Books, *farmans*, *accounts*, etc. were now maintained on paper. According to Ma Huan, a 14<sup>th</sup>-century Chinese navigator, the paper was first introduced in Bengal.
4. Wine distillation started using the fermentation method during this period. Aligarh and Meerut were well-known centers of wine production.
5. From the 15<sup>th</sup> century onwards, silk production started in Bengal. Muslin was another famous product of Bengal.
6. In construction activities, the use of arch & dome started. It led to a massive boom in construction activities under the Sultans of Delhi. According to Barani, Alauddin is supposed to have employed 70000 people in construction activities of various kinds. New materials like gypsum and lime paste were used for plastering buildings. Lime as cementing agent (mortar) began.

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7. Turks also brought many technological changes in weaponry such as Navak (Persian bow), ribak (iron stirrup), nal (iron horseshoe) etc.
8. Gunpowder came to India during this period. It consisted of saltpeter, sulphur charcoal. But, it was mainly used for pyrotechnic instead of firearms.
9. Tin coating was another technology introduced during this period. A tin coating protects vessels from the chemical action of food inside them.
10. Glass was used for preparing vials for aesthetic and pharmaceutical products. The earlier glass was used only for making beads and bangles.

But, there is also a downside to these technological innovations. Firstly, there was a lack of technological diffusion during the medieval period. The earlier emphasis on social emancipation of lower castes due to their adoption of various new handicrafts has been proven to be an exaggeration. Secondly, Irfan Habib hints that these new technologies gave impetus to forced labor because sultans could not find ready workers to adopt these technologies and produce goods to their liking. E.g. Firuz Tughlaq had more than one lakh slaves who worked as skilled artisans in his karkhanas.

So, we can say that in spite of despoitations, these technologies not only boosted production and cultivation, they had many other spillovers. E.g. the pastoral Jats of the Punjab region settled down as agriculturists and later moved towards Sikhism and Islam.

