

Sri Krishnadevaraya's Contribution to Science and Technology

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Abstract: Vijayanagara kings were great builders of temples and patrons of arts and architecture. Building of large temples started particularly during the times of Devaraya II and climaxed during the reign of Krishnadevaraya. Temples and other buildings constructed during the Vijayanagara era had distinctive architectural embellishments, usually referred as the "Vijayanagara style."

Srikrishnadevaraya's Contribution to Science and Technology, was noticed in different aspects:

I. Medicine

II.Irrigation and Water Management

III.Painting Techniques

IV.Mines & Metallurgy

Sri Krishnadevaraya is a benevolent king who succeeded in all his endeavors in all aspects. He is not only interested in warfare and welfare but he is a full knowledge about in Science and Technology. This article highlights the Krishnadevaraya's knowledge in different angle.

Keywords: Sri Krishnadevaraya- Contribution –Science and Technology- Knowledge in different angle.

I. INTRODUCTION

Vijayanagara Architecture: "It is a record in stone of a range of ideals, sensations, emotions, prodigality's, abnormalities, of forms and formlessness and even eccentricities, that only a Super – imaginative mind could conceive and only an inspired artist could reproduce" -----Percy Brown in Indian Architecture

Hampi, traditionally known as Pampa – kshetra, Kishkinda- kshetra or Bhaskara- kshetra, has an unbroken tradition of sanctity from ancient days and still continued to be an important pilgrimage centre. Pampa, the earlier name of the Tungabhadra River, on European travelers have written about the Vijayanagara Empire prominent among them were Portuguese traveler because of Portugal's strong presence in after Vasco da Gama's landing near Calicut in 1498. one of them, Domingo Paes, a Portuguese horse trader, He wrote: The size of the city I do not write here, because it cannot all be seen from any on spot, but I climbed a hill whence I could see a great part of it; I could not see it all because it lies between several ranges of hills. What I saw from thence seemed to me as large as Rome.¹

Krishnadevaraya ascended the throne of Vijayanagara more than 170 years after its foundations were laid. The third dynasty, the Tuluvas, came into effect in 1505 A.D. The name suggests that these rulers hailed from the coastal part of Karnataka called Tulu. Krishnadevaraya, hailed from this dynasty. Krishnadevaraya was a scholar and poet of considerable merit. He was described by his countries as Sahiti – Samaranganas-Sarvabhauma, an emperor in the realm of literature as well as the battlefield.²

Vijayanagara kings were great builders of temples and patrons of arts and architecture. Building of large temples started particularly during the times of Devaraya II and climaxed during the reign of Krishnadevaraya. Temples and other buildings constructed during the Vijayanagara era had distinctive architectural embellishments, usually referred as the "Vijayanagara style." There was a strong influence of early chola and late pandya tradition in its temples. Percy Brown says, "The country gradually became enriched with buildings in a style showing that the people had been aroused to a life of greater fullness and one which moved them to express with marked freedom and fluency their aesthetic aspirations. The architectural trends of the Vijayanagara style peaked during Krishnadevaraya's reign. He took fanatical interest in reconstructing and enhancing old and damaged temples all over South India apart from building several large and beautiful temples in the capital city."³

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II. MEDICINE

Krishnadevaraya in his Amuktamalyada says that a king should maintain scientists in his court. Rayavachakamu signifies the Raya's court attended by learned men, purohiths, acharyas, jiyangars, ascetics, astrologers, physicians, scientists etc. Krishnadevaraya feel that the responsibility of the scientists to safe guard

the society and at the same time, he expected them to be self less in public service and committed to their investigations for the promotion of Scientific Knowledge.

Medical works: Arogya chintamani of Damodhara Bhatta deal with many aspects of medical and botanical knowledge. Sayanacharya composed Ayurveda Sudhanidhi. Another work namely Netradarpanam in telugu on Opthamalogy of Panakalaraya, explains many advances in diagnosis and theraphy. He explains 96 eye – diseases. The fact that wearing glasses also was in practice by the 16th century in Andhradesa can be known from this work.

The Rasa system of medicine, generally known as tantric, saivite and siddha systems also gained much popularity during the Vijayanagara period. Nityanatha siddha and Gourana of 14th century A.D. mentions that Srisailam (Kurnool district) was a great centre of Rasa – siddhas and many medicines were prepared by the siddhas. Rasaratnakara, Rasapradipika were the noted works in Sanskrit & Telugu etc, written during this period. Srisailam and Amalapuram were the famous centers where many Rasasiddhas lived and continued research in chemico mineral operations of their posterity.

The pharmacopeia of the siddha system is very voluminous. The chemical substances used in their therapy are classified into minerals, salts, poisons, sub – metals, mercury and sulphur. The fine varieties of salts, two varieties of poisons, nine metals and 17 sub – metals were explained. The description of Sodhana (purification) and Marana (incineration) of metals and sub- metals is very useful in tracing the technological development.

III. IRRIGATION AND WATER MANAGEMENT

Krishnadevaraya gave much importance to Agriculture. In Amuktamalyada Krishnadevaraya writes “Agriculture should be the main concern to the king. He provided many facilities to farmers.

1. Giving advances to purchase oxen.
2. To dig wells to cultivate additional lands.
3. Amount of tax levied depending on the agricultural income of the farmer. This method of taxation did not hinder the development and prosperity of farmer. This system was called as Rayarekha”. This system was also followed later by Bijapur, Maratha and British governments.

Paes, commenting on the irrigation system, “ The land has plenty of rice and Indian – Corn, grains, beans and other kinds of crops which are not sown in our parts, also an infinity of cotton. This country wants water because it is very great and has few streams; they make lakes in which water collect when it rains and thereby they maintain themselves. Kautilya in his Arthasastra says that “The king should construct reservoirs (setu) filled with water either perennial (or) drawn from other sources. This policy laid down by Kautilya in the 3rd century B.C. could be found put into practice the Middle Ages especially in Vijayanagara kingdom. Sri Krishnadevaraya emphasizes the importance of excavation of tanks when he declares that the extent of a state is the root cause of its prosperity. Vijayanagara kings bestowed great attention on excavation and renovation of tanks. The need of excavating tanks and irrigation canals as evidenced by the unique telugu work *Amuktamalyada*.

In the porumamilla inscription dated saka 1291 (1369 A.D) the construction of a good tank was mentioned.

1. The land where the tank is going to be constructed should be adorned with hard clay and there should be within a distance of three yojanas to the tank.
2. There should be a hill, part of which is in contact with the tank and the tank should have a strong dam.
3. The tank bed should be deep and extensive.
4. The principle of Jalasastra (Hydraulics) was strictly followed in constructing a tank.
5. The surrounding area of the tank is highly fertile.

Krishnadevaraya built a dam across the river Tungabhadra near Hampi. The water from this dam was supplied to the capital city Vijayanagara and also to irrigate rice fields. The Basavanna kaluva (Basava canal) and earlier canals built by the other kings of Vijayanagara are functioning even today. A huge water tank was built south of Tirupati, named as Rayalacheruvu, in the same way a huge tank was constructed at Masur (Dharwad district) during his reign. Sir Thomas Munro a British collector of 19th century said that there is no possibility for construction of new tanks as the Vijayanagara kings have built tanks in all the places where tanks can be built. Krishnadevaraya created an artificial lake to store water for the needs of the new town of Nagulapur. For this a huge embankment at the north – western end of the two ranges of hills, which enclose the valley of sandur, had to be erected. While both Nuniz and Paes wrote about this vast tank in their chronicles, the latter actually witnessed the work in progress. He comments that he saw 15,000 to 20,000 men work at the site looking like ants.

IV. PAINTINGS

Vijayanagara Paintings mainly executed on the ceilings and rarely on the walls, as in the case of Lepakshi, scholars are of the opinion that the carrier, the stone surface was smoothened by using stone rollers and then the base plaster was applied.

Thus the Vijayanagara painters followed the earlier traditions in preparing the carrier. There are three different layers viz, rough plaster, fine plaster and painted film in the painted stucco at Lepakshi, Sompalem.

The paintings applied in lime medium or in Fresco-Secco technique are very limited. The paintings were obtained from minerals and ochre, vegetables such as Indigo and few others such as lack-dye and carmine from insects. The minerals pigments are ochre, vermilion red, terre-verte, lime, carbon, grey of different shades etc. Gold as a coloring material is used as the decoration of borders of dhothis and saree in Lepakshi.

Interestingly series of circular pits with cup like formation have been carved into the living stone in front of the tulabhara mandapa of the Lepakshi temple. Perhaps, these cups were used as containers of or mixing colours for immediate application and as well as for grinding. The colours appears to have been mixed in lime water and applied on the dried up surface. This techniques has a great advantage as the wet in the air form as a protective transparent thin layer over the surface of the paintings. The paintings on the ceilings of the ardhmandapa of the Virabhadra swami temple at Lepakshi are superior in technique and style when compared to the paintings found in the Natya- mandapa of the temple. A row of geese, a border decoration, is found on the ceiling of the ardhmandapa in the temple at Lepakshi. C. Sivaramamurthi, rightly observes about these geese. The skill of the painter in design can be judged by the numerous drawings of scrolls and patterns and particularly from scroll of geese a whole length of which is represented with unerring draftsmanship.

V. MINING & METALLURGY

Mining and metallurgy were very prosperous industries. Diamonds were mined from Vajrakarur. Many precious stones were also mined. Gold, Silver, Copper, Brass, Bronze, Iron, Lead were produced in various places of the empire. Manufactures of perfumes also had grown as an industry. Perfumes from sandalwood, aloes, musk and saffron were manufactured.⁴

VI. CONCLUSION

Finally the paper concludes with the appraisal of Sri Krishnadevaraya not only in Warfare, Poetic sense, Writer of a Charismatic Personality never seen after him. But he contributed much of the important technical aspects regarding to Science &Technology.

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