



Konark Sun Temple: Structure, Problem and Conservation

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Abstract

Sun temple Konark is famous world heritage sites as well as also known for Bhasakar , Aditya and Padam Kshetra from religious point of view. It's has outstanding architectural characteristics features of transitional phases between ancient to medieval architecture. In Delhi early phase of Islamic architecture where initiated in a form of mosque, tomb and mehrab. On the other hand the Sun temple Konark is the finest example of Indian temple architecture among all the temple architectural styles like Nagar , Vesara and Dravidian style which has been used of different technology, material, interlocking, innovation and first time use of iron as a building material Sun temple Konark. Here I am trying to focused on Structural anatomy, holistic conservation approaches, maintenance and find out the fact of Conservation and Consecration of the Sun Temple Konark. The fact and figures probing by literary as well as physical remains

Key Words: Consecration, Pidhha Deul, Rekha Deul,Sahn, Jagmohan, mithuna, iha mirg.

Introduction:

Sun worship in India dated back to time immemorial. Barth says that there was the popular tradition of Sun Worship in ancient India (Barth, 2002). We have large number of sun temples in India including the Sun Temple at Modhera, Kashmir, and Multan etc. The Sun temple at Konark is one of the most spectaculars among all the Sun temples in the world Konark Sun temple was the most massive and impressive in terms of plan, geographical location, material, and technological innovation in the art and architectural history of India. (Mathur, 1950, P 11). It is the highest achievement of Kalinga style of temple architecture. Percy Brown says, 'in Orissa so many fine examples of temple construction activities persisting over such a period of time, make it possible to trace the gradual evolution of this particular movement without

difficulty, an opportunity from various causes not presented in anything like the same continuity elsewhere' (Brown, 1942, P-101). The Konark temple complex is surrounded by big *prakara* (wall) which is bigger than the prakara of Jagannath temple, Puri. The wall around the compound are 261.21 metre from east to west and 164.59 metre from south to north. There are two gates, one on the eastern side facing the *nat mandir* and the other on the southern side facing the porch of the Sun temple ((Behera, 2005, P 70). is existing and the gate from the south direction. Temple complexes also comprise six other Temples also existing and there is an Archeological remains inside the temple there is a kitchen, bathing mandap are in dilapidated condition, there are too big wells. (Behera 2005, P 70).

The Sun Temple, located on the seashore of Bay of Bengal, is at a distance of 43 kilometers from Jagannath Temple, Puri in the north-east. It was constructed by Narasimha Dev- I from 1238 CE to 1264 CE. The temple is assimilated as horse chariot or *ashwa ratha* driven by seven horse (Rai, 2000, P. 236). There are 12-12 wheels on both sides of the temple, which have 12 spokes. The 24 wheels are the symbol of time cycle. According to Alice Bonner, 12 Wheels are 12 Zodiac symbols which is 12 months, showing a cycle all seasons (as quoted in Donaldson, 2003. p.37). The wheel circumference is 2.9 meters and has eight main spokes and 8 small spokes. This season cycle depicted like complete medallion form and theme based on religious, cultural, and day-to-day work of the society and scriptures. The pabhaga of the adhisthan are differently divided in different structure like Rekha deul , Bhogmandap and Nat Mandap with different measurement and different stories depicted like, snake girl there are numbers of Mithunas is a very famous idols art exhibit, Jagmohan height is 39 meters from the ground floor and it is a huge Jagmohan in *Pancharath*¹ style, the outer width of which is 28meter. Its plinth height is 7 meters and

¹ The temple plan have five projection is termed as Panchrath.



Figure 1 General view of the Pida Deul of the Sun Temple Konark

inside it is 18.3 meters Jagmohan²'s thigh is divided into two floors, whose height is 2.5 meters (Donaldson, Oxford University Press, P-37). The specialty of this temple is that its sanctum sanctorum, Jagmohan and Bhoga mandapa are built on a line but Nat Mandap are on the second line. Nat Mandap is additional features of orissan temple architecture. Almost all others temples of Odisha *Garbha Griha* or *Rekha Deul*, *Jagmohan*, *Bhoga Mandap*, and *Nat Mandap* in the same line but other hands in Konark it is different due to gigantic size of *Rekhadeul*³ and *Jagmohan*.

Every inch from top to bottom of the exterior/*sanvaran* part has depiction of historical, social, mythological, scientific, philosophical, psychological, commercial, *Kamasutra*, and religious stories. The landscape, art and architecture has outstanding universal value for which it was declared a World Heritage Site in the year 1984. (Donaldson, Oxford University Press, 2003.p-V)

² Jagmohan has pyramidal roof and function as a Bhogmandap.

³ Sanctum of sanctorum of Odishan temple Architecture is called *Rekha Deul* and it's roof has vertical fluting/ strings.



Figure 2 King Narsingh Dev I Visit during Construction work in Progress

The artists and architects worked together on two different aspects and performed their best they can, they did lively visualization in a very spectacular way despite the stone is the Khandolite, and Chlorite sculptors has beautifully decorated with *Gandharva*, animals, plants battle scene, band parties, *ihamrig* and *sarp kanya* etc. Artist and Architect both work together, The architectural work executed separately for the sake of maintaining a duality in unity, balance, rhythm symmetry, aesthetic, and proportion etc. The different artists had different specialisations such as, *Chitrakar*, *jarikaar*, *chunuar*, *pathuriya*, *karigaar*, *Bakhaniya* and *Silpi nayak* did their defined jobs separately but work together to achieve the architectural marvel of temple Architecture. (Rai, 2008, P-212). European historians had given the different name of Sun temple and termed as Black Pagoda because it appears like a black structure from the sea. There are a lot of mythological stories related to the Black Pagoda from its ruins to restoration. Some of the legends say that rays of sunlight cure skin disease leprosy. There is legendary references to many person who has who were cured by worship of Sun, examples are One was the ambassador of King Harshavardhana, a person named Mayura who was a poet, and the other is the son of Krishna, due to the curse by the sage, each one was cured by worshipping the sun.

Building Materials and Techniques

Different stones have been used to construct the Sun Temple Konark as laterite, Khondalite, and Chlorite and about their building material. KS. Behera mentioned in his monograph that all the stones are quarried from Mahanadi. *Kushabhadra* River and Chilika lake area. Chlorite stone was quarried from the coast of Lagur hot mountain which falls in Ganjam district. Door jambs and shrines were constructed of chlorite stone Arun Stambha which is present-day aligned at Main gates of Jagannath Temple Puri, is also constructed of chlorite and laterite stone and has been used in the foundation. When ever khondalite stone is freshly quarry out it is in plastic state and softer, later hardened by natural drying

processes and it becomes hard. The Sun temple Konark showing the architectural evolution and technological history of 700 years of Orissa architecture (KS Behra, 2005,P 71). Parshav Devta inside Main Deity and other valuable sculpture produced of Chlorite stone, Laterite stone used to fill up the invisible gap of the platform, staircases, and foundation and the rest all the part of the Sun Temple Konarak was constructed of khondalite stone the stone quarry from Khurd and the another stone is black Chlorite stone quarried from Nilgiri area which is about 400 kilometers from the Konark(KS Behra, 2005, P-76) the most important part of the temple which is first time in architectural history the use of iron as a building material and used as beam and it's length 6.1meter (Donaldson, Oxford University Press, 2003,P-31). One monolithic the stone which length is 15 meters long and 29 meters in diameter and weight is 200 mon or 8.56 metric ton in weight.



Figure 3 Desalination work under progress with Paper Poultice Method

Architectural dispute :

Various Foreign Scholar attempts to proved that the temple had not been Consecrated ever. The theory propagated by Percy Brown is one of the scholars among them who highly propagated the theory of not consecration of Main Sun Temple Konark. The temple still exists in a dilapidated condition with its original ambience and landscape.

Dr Ganguly an engineer, who studied the indigenous and traditional knowledge system of temple architecture in Orissa and he has written the book Bhuvan Pradeep. Construction of temple architecture of the Manmohan Ganguly wrote a book on the basis of Bhuvan Pradeep

entitled element of and Orissa and her remains ancient to medieval in 1912 C.E. the book covers- the temples of Bhubaneswar.

Another engineer Nirmal Kumar Bose also studied about the temple in Odisha and did a comprehensive survey on the temples and structure of Odisha and based on his survey and experience wrote a book titled *Canons of Origin Architecture* and the book was published. In 1932 C.E. The next scholar also wrote about the prevalent practices of temple architecture in Orissa. In 1932 C.E. Dr. Boss also discovered a large number of manuscripts of Bhubaneswar, Puri, and Cuttack, where he found artists and guilds besides the three cities. His mentors who decided to write a book on the architecture of Orissa, Alice Bonner, and Sada Shiva Sharma have also discovered the *Silpatra* manuscript which tells about the art and sculpture of Orissa. This manuscript is originally from Sada Shiva Sharma and his ancestors were used for construction work. Based on the architectural practices of temples, Alice Bonner published in *Indian Temple Architecture*. In 1975, this book, published by Pramod Chandra in the American Institute of Indian Studies by the University of Chicago, focused on the architecture and Orissan Temple Architecture characters Alice Bonner and Sadashiv Sharma, about the book has also published a book *On Sun temple of Konark*, about which he was told the Sun temple architect of Konark another scholar and architecture make Devla Mitra temple, who let the *Encyclopedia of Indian temple architecture* Written in volumes and 1988 and 1991 published by the American Institute of Indian Studies and by Oxford University Press Delhi on the basis of all the published book, It is established to a great extent that all temple architecture in Kalinga Kshetra has been built on the basis of this law on the basis of craftsmanship, which ancient art 750 C.E. than. 500 is more years from 1250 C.E.

Conservation Problem and Analysis:

Protection work Modern techniques to preserve it as all structural style is broken in south window Has been used and also repaired in steps Done and using the degree of conservation intervention and international Nara charter that authenticity and integrity of the monument should not be disturb (Lemaire & Stovel, n.d.), the reproduction method is used in the south and in the north and east direction the elephant has a very giant statue called *Gaj Kranta*/ (elephant over lion), it's arch is multi-foliate and decorative . The first drawing of this ornamentation was made by A. Sterling in 1825 C.E. and other scholars prepared reports on Konarak such as Ferguson in 1837C.E. and Ramlal Mitra in 1868 C.E. There is a Navagraha here, but it does not have the planet Mercury in it. The roof of this temple is pyramidal and it is called *pidha*⁴ *deul* , one *pidha* over other *pidha* were kept on top. The Navagraha is engraved on a single stone which is placed

⁴ Pyramidal roof of the Structure of Jagmohan of Orissan Temple Architecture.

on an iron beam and is located in the eastern part, it is 6.1 meters in height and height. 1.1 meters in these planets are built above the Purna Mundi with an average height of 7.5 meters and 3 meters is all nine zodiac signs are exquisite Sun, Moon, Mars, Jupiter Saturn, Rahu, and Ketu Rahu is in the shape of Ketu Snake in bust shape, all the remaining cross-legged planets are sitting and the lion hairstyle of all the planets is worth seeing, the Europeans wanted to take it to their



Figure 4 Measuring Developing Crack by Cement TALE TELL

country but it could not happen. its stone panel were sliced to reduce the weight and accordingly, truck was Fabricated but it had to be abandoned due to local opposition.

- I. Site analysis. The site lies on the sea shore area and was built in the 13th century but conservation started from the 19th century. (Archeological Survey of India.) the earliest work was initiated by the marine board to ascertain the cost of conservation in 1806 C.E. The next attempt for conservation was made by king of Khurd in 1838C.E.. but Governor of Bengal declined due to life threat for the worker. The navgraha of the temple has to be shifted in other place but local people oppose leads the project failure in
- II. Conservation analysis: major and minor conservation history of the temple is more than 200 years old, it is a big challenge to maintain the preservation status in terms of material. Interlocking system , local environmental threat to the structure.

General Conservation Measures :

Numbers of conservation measures has been taken up to till date recently Archeological Survey of India has taken several step to mitigate the impact of saline action, water logging, erosion and vegetative intrusions such as cleaning of the surface by paper pulp method, consolidation and strengthening of stones wherever needed, plantation of trees in surrounding area to prevent mechanical erosion by wind action, removal of water by installing pumping sets, and periodic biocidal treatment for control of vegetative intrusion. Conservation work of monuments, including Sun Temple, Konark is a continuous process and the said monument, also a World Heritage Site, is in a good state of preservation due to regular care by ASI.

ASI has introduced plain stones only where original stones were missing or for filling of gaps to ensure structural stability and to prevent water ingress. All conservation work is carried out as per ASI's conservation policy, 2014. Annual Conservation Plan is regularly drawn by ASI every year, for review of the requirements at the monument for its appropriate preservation (Patel, 2021).



Figure 5 Fitted Sculpture by Consolidation Method

Conclusion :

The Sun Temple is the latest and last versions of Kalinga style. It belongs to medieval period i.e. 1256 C.E. at the same time Sultanate dynasty established in Delhi and initiated the Islamic architecture. Therefore the sun temple Konark is the highest achievement in temple architecture of their time. Its style were skyscraper and use of fresh varieties of building materials but in other hand Islamic architecture in Delhi had been initiated in different style of Islamic architecture such as mosques, tomb, and graves. There are changes of architectural character like low sky line, use of

razed building material, congregational prayer, and sahn. These features first time introduced in india. So Sun temple is not only important for their architectural marvel but it is a landmark achievement during the transitional phase of indian architecture. Conservation, and Consecration it's all part are important and made controversial by domestic and international scholars, so more fresh research paper also may be produced on Conservation challenges, original anatomy of Sun Temple Konark..

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