

## Abstract

Chanakya, also known as Kautilya, has been regarded as one of the finest political mind and strategist in the world. During his lifetime, he penned down Arthashastra, a complete guide of administration and governance of a State. Chanakya using the same principles uprooted the Nanda dynasty and, in its place, formed a formidable Mauryan empire at Magadha in 3rd century BCE. In a similar fashion, much later in time i.e., around 17th century CE, on the western coast of India, under the guidance of his mother Jijabai, Chhatrapati Shivaji Maharaj rose to power against the crumbling Adilshahi and emerged as a benevolent king who was a master of military strategy and under whose command, the naval forces were at their zenith. The vision of both was a unified self-ruled welfare State called 'Bharat'. A thought does ponder in one's mind, were there any similarities in their vision, mission, strategies, planning and the events that transpired. One of their common ideologies was about importance of Forts. They were considered to be immensely significant for defence and sustaining the empire, by both Chanakya and Chhatrapati Shivaji Maharaj. This paper tries to delve into the comparison of military strategy specifically in relation to the construction and management of forts, as mentioned in Arthashastra and as seen from the life and times of Chhatrapati Shivaji Maharaj. The research focuses on analysing the verses in the chapter 'Construction of Forts' with respect to a prominent fort in the Maratha Empire.

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Keywords: *Chanakya, Arthashastra, Chhatrapati Shivaji Maharaj, Maratha Empire, Construction of Forts*

# ‘Comparative Analysis of Maratha fort Architecture and Principles of Arthashastra’

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## 1. Background Study

### 1.1. About the Source [Kautilya’s Arthashastra]

Chanakya alias Kautilya, a king maker and visionary has left behind for us, a treasure of guidelines for the administration and the governance of the Kingdom or the state or, the ‘Rashtra’. Kautilya’s principles laid down the strong foundation of the Mauryan Empire in the 3rd century B.C. (Rajadhyaksha, 2009). Kautilya's Arthashastra is an excellent treatise on statecraft, economic policy and military strategy. The scope of Arthashastra is, however, far wider than statecraft, and it offers an outline of the entire legal and bureaucratic framework for administering and defending a kingdom.

**Arthashastra Book 2, Chapter 3, Verses 01 to 32**, gives adequate information on Construction of Forts. It gives an in-depth description about fortification, defence mechanism, dedicated elements and spaces within the fort.

### 1.2. Maratha Kingdom under the Rule of Chhatrapati Shivaji Maharaj

Chhatrapati Shivaji Maharaj (“CSM”) was the founder of the Maratha Empire in western India. With his valour and great administrative skills, CSM carved out an enclave from the declining Adilshahi sultanate. It eventually became the genesis of the Maratha Empire. After establishing his rule, CSM implemented a competent and progressive administration with the help of a disciplined military and well-established administrative set-up. (Rajadhyaksha, 2010)

CSM is well-known for his innovative military tactics that centred around non-conventional methods leveraging strategic factors like geography, speed, and surprise to defeat his more powerful enemies.

In the process of founding the Maratha empire, CSM conquered, built and re-built several forts along western India. He was in possession of around 370 Forts at the time of his death. Many forts like Panhala Fort and Rajgad existed before him but others, like Sindhudurg and Pratapgad, were built by him from scratch. Also, the fort of Raigad was built as the place of throne, i.e., the capital, of Maratha Empire by Hiroji Indulkar on the orders of the Chhatrapati.

In Chhatrapati Shivaji Maharaj’s own words, ‘*The forts ought to be so impregnable that even*

*if Mughal emperor Aurangzeb fights for a year to conquer one fort, then to capture the total three hundred and sixty forts in Maharashtra, it should take him a three sixty years (which was humanly impossible)'. (Rajadhyaksha, 2011)*

### **1.3. About the Fort under reference (Raigad)**

The Raigad Fort, formerly known as Rairi, was built by Chandraraoji More, the King of Jawali. It was then seized by CSM in 1656. CSM renovated and expanded the fort of Rairi and renamed it as Raigad, i.e., King's Fort. It became the capital of CSM's Maratha Empire in 1674. The Maratha Empire eventually covered much of Western and Central India. The fort rises 820 meters (2,700 ft) above the sea level and is located in the Sahyadri mountain range. (Deshpande, P. N. (1995). *Raigad Darshan*. Pune, Maharashtra: Government Photozinco Press), (Raigad Fort Maharashtra, n.d.).

## **2. Objective of the Research**

**The study can be broken down into following sub-objectives:**

- 1.To decipher the verses from Book 2, Chapter 3- 'Construction of forts' of Kautilya Arthashastra.
- 2.To make a comparative analysis of the description of forts from the same with the structure of the Maratha forts. (fort in context- Raigad)

## **3. Methodology**

The research is based on a mix of primary and secondary data.

Kautilya's Arthashastra was a compilation prepared by Chanakya himself and it is in its original form. As such, it is a primary data. The information regarding Maratha forts has been obtained by inferences drawn from personal visits, books and other sources which also analyse the forts and as such, are secondary in nature.

A chapter about 'construction of forts' from the book 'Kautilya Arthashastra' is chosen as the source. The verses from the chapter are deciphered with respect to language, terminologies, architectural elements mentioned, their function and certain standards of defence. The Chapter is then interpreted and analysed in context of a Maratha fort, so as to generate and understand the relationship between the theory mentioned in the chapter and the implementation of the Maratha king, Chhatrapati Shivaji Maharaj.

The comparative analysis led to an inference that there are a lot of similarities between the principles of Arthashastra and Maratha fort building techniques, however there are certain modifications and adaptations due to topography and technological advancements.

## Verse 01: Types of Forts

चतुर्दिशं जन.पद.अन्ते साम्प्रायिकं दैव.कृतं दुर्गं कारयेत्, अन्तर.द्वीपं स्थलं वा निम्न.अवरुद्धम् औदकम्, प्रास्तरं  
गुहां वा पार्वतम्, निरुदक.स्तम्बम् इरिणं वा धान्वनम्, खञ्जन.उदकं स्तम्ब.गहनं वा वन.दुर्गम् ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** On all the four quarters of the boundaries of the kingdom, defensive fortifications against an enemy in war shall be constructed on grounds best fitted for the purpose: a water-fortification (audaka) such as an island in the midst of a river, or a plain surrounded by low ground; a mountainous fortification (párvata) such as a rocky tract or a cave; a desert (dhánvana) such as a wild tract devoid of water and overgrown with thicket growing in barren soil; or a forest fortification (vanadurga) full of wagtail (khajana), water and thickets.

(Kautilya, 1915, *Kautilya's Arthashastram*)

Note: Meaning of terms from the above verse:

Type of Fort	Meaning
Audaka	Jala durga
Parvat	Gad, Dongri killa
Dhaanvan	Bhuikot
Vanadurga	Jungli Chavni

### Analysis:

The principles of state craft evolved by Shivaji have been recorded in a book Aadnyaapatra ascribed to Ramachandra Amatya who served on the Council of 8 (Ashta Pradhan) as the Finance Minister (Amatya) to Emperor.

Some of the thoughts in Aadnyaapatra seem to run parallel to Chanakya 's Arthashastra. Amongst which, are their thoughts about management of forts.

#### **It states:**

'Sampoorna rajyaache saar te durg. Gadkot hetch raajya, gadkot mhanje raajyaache mool, gadkot mhanje khajina, gadkot mhanje sainyaache mool, gadkot mhanje raajya laxmi, gadkot mhanje aapale praan sarakshan'

– Aadnyaapatra by Ramchandra Pant Amatya, the Chief Minister of Rani Tarabai.

**Translation** – Forts are the very basis of a kingdom. Forts themselves are the kingdom, forts are the origin of the kingdom, forts are the real treasure of the kingdom, forts are the basis of an army, forts are the wealth of the kingdom, forts are our best form of defence.

The primary reason of building forts was that in the early years of the Maratha empire,

Shivaji Maharaj was in a defensive stance. Defending the territory, safeguarding his subjects and being prepared for enemy attacks were utmost important. Forts were a stable mode of defence.

### Verse 02 & 03: Strategic location of the Capital of the kingdom

तेषां नदी.पर्वत.दुर्ग जन.पद.आरक्ष.स्थानम्, धान्वन.वन.दुर्गम् अटवी.स्थानम् आपद् अपसारो वा ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Of these, water and mountain fortifications are best suited to defend populous centers; and desert and forest fortifications are habitations in wilderness (atavisthānam).

(Kautilya, 1915, *Kautilya's Arthashastram*)

जन.पद.मध्ये समुदय.स्थानं स्थानीयं निवेशयेत्, वास्तुक.प्रशस्ते देशे नदी.सङ्गमे हृदस्य\_अविशोषस्य\_अङ्के सरसस्  
तटाकस्य वा, वृत्तं दीर्घं चतुर्.अश्रं वा वास्तु.वशेन वा प्रदक्षिण.उदकं पण्य.पुट.भेदनम् अंसपथ.वारि.पथाभ्याम् उपेतम् ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Or with ready preparations for fight the king may have his fortified capital (sthāniya) as the seat of his sovereignty (samudayāsthānam) in the centre of his kingdom: in a locality naturally best fitted for the purpose, such as the bank of the confluence of rivers, a deep pool of perennial water, or of a lake or tank, a fort, circular, rectangular, or square in form, surrounded with an artificial canal of water, and connected with both land and water paths (may be constructed).

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

- It is a hill fort that abuts the Sahyadri ranges.
- The fort rises at a height of 2700 ft above sea level. (Deshpande, P. N. (1995). *Raigad Darshan*. Pune, Maharashtra: Government Photozinc Press)
- Surrounded by subsidiary forts like Rajgad, Pratapgad, Torana fort. (image: Location of Major Maratha Forts)
- There is no easy access to the fort from any of the surrounding mountain ranges, as the mountain stands on its own.
- The main fort has natural fortifications from all sides, making it difficult to access.
- It is not easy to lay siege to the fort as the perimeter (ghera) of the fort is over 40 kms. (*land forts on the other hand are easy to besiege. – The Arthashastra, page 580*)
- Two villages, Pachad and Raigadwadi, were located in the base of this fort.
- Around ten thousand cavalries were always kept standby in the Pachad village during the Maratha rule.
- Water sources for the fort were its natural and artificial lakes and rock cut cisterns (tanks).

## Verse 04: Trenches

तस्य परिखास् तिस्रो दण्ड.अन्तराः कारयेत् चतुर्दश द्वादश दश\_इति दण्डान् विस्तीर्णाः, विस्ताराद् अवगाढाः पाद.ऊनम् अर्धं वा, त्रिभाग.मूलाः, मूल.चतुर्.अश्रा वा,पाषाण.उपहिताः पाषाण.इष्टका.बद्ध.पार्श्वी वा, तोय.अन्तिकीर् आगन्तु.तोय.पूर्णा वा सपरिवाहाः पद्म.ग्राहवतीश् च ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Round this fort, three ditches with an intermediate space of one danda (6 ft.) from each other, fourteen, twelve and ten dandas respectively in width, with depth less by one quarter or by one-half of their width, square at their bottom and one-third as wide as at their top, with sides built of stones or bricks, filled with perennial flowing water or with water drawn from some other source, and possessing crocodiles and lotus plants shall be constructed.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

Trenches are essential defence mechanism in forts at ground level (Bhuikot killa) because as compared to hill forts, there is lesser advantage of altitude and hence the field of view is restricted. It was to make access closer to the fort difficult and to facilitate defensive moves.

Raigad being a hill fort, the field of vision was much farther due to high altitude and the thick forest in itself coupled with the steep mountain slopes negated the requirements for any additional trenches to be dug.

## Verse 05 & 06: Ramparts

चतुर्दण्ड.अपकृष्टं परिखायाः षड्दण्ड.उच्छ्रितम् अवरुद्धं तद्.द्विगुण.विष्कम्भं खाताद् वप्रं कारयेद् ऊर्ध्व.चयं मञ्च.पृष्ठं कुम्भ.कुक्षिकं वा हस्तिभिर् गोभिश् च क्षुण्णं कण्टकि.गुल्म.विष.वल्ली.प्रतानवन्तम् ॥

पांसु.शेषेण वास्तुच्.छिद्रं राज.भवनं वा पूरयेत् ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** At a distance of four dandas (24 ft.) from the (innermost) ditch, a rampart six dandas high and twice as much broad shall be erected by heaping mud upwards and by making it square at the bottom, oval at the centre pressed by the trampling of elephants and bulls, and planted with thorny and poisonous plants in bushes. Gaps in the rampart shall be filled up with fresh earth.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

- The Rampart (Tatabandi) of the Raigad fort is approximately 10 m to 12 m high. Though it varies at certain points as according to the level difference and topography.
- The ramparts resemble the claws of the lion (curved and staggered) to reduce the impact of the attack on one single face.

### Verse 07: Patrolling place/ Parapet

क वप्रस्य\_उपरि प्राकारं विष्कम्भ.द्विगुण.उत्सेधम् ऐष्टकं द्वादश.हस्ताद् ऊर्ध्वम् ओजं युग्मं वा आ चतुर्विंशति.हस्ताद् इति कारयेत् – ख रथ.चर्या.संचारं ताल.मूलं मुरजकैः कपि.शीर्षकैश् च\_आचित.अग्रम् ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Above the rampart, parapets in odd or even numbers and with an intermediate space of from 12 to 24 hastas from each other shall be built of bricks and raised to a height of twice their breadth.

(Kautilya, 1915, *Kautilya's Arthashastram*)

#### Analysis:

- Fanji (patrolling place) is a place on the rampart of the fort.
- In case of Maratha forts, the Fanji was continuous, running parallelly to the line of *Tatabandi* (rampart).

### Verses 08 & 09: Passage for Chariots

पृथु.शिला.संहतं वा शैलं कारयेत्, न त्व एव काष्ठमयम् ॥  
अग्निर् अवहितो हि तस्मिन् वसति ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** The passage for chariots shall be made of trunks of palm trees or of broad and thick slabs of stones with spheres like the head of a monkey carved on their surface; but never of wood as fire finds a happy abode in it.

(Kautilya, 1915, *Kautilya's Arthashastram*)

#### Analysis:

The above verse relates to use of chariots. As the Maratha forts were all mainly on hills and the Marathas did not use any chariots but rather rode on horseback, the feature was not necessary to be included in the forts.

Further, the forts were meant to be difficult to access and as such a passage for chariots would act as a weakness in their defence mechanism.

### Verses 10 & 11: Towers and Staircases

विष्कम्भ.चतुर.अश्रम् अट्टालकम् उत्सेध.सम.अवक्षेप.सोपानं कारयेत् त्रिंशद्.दण्ड.अन्तरं च ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Towers, square throughout and with moveable staircase or ladder equal to its height, shall also be constructed.

(Kautilya, 1915, *Kautilya's Arthashastram*)

द्वयोर् अट्टालकयोर् मध्ये सहर्म्यद्वि.तलाम् अध्यर्धयि.आयामां प्रतोलीं कारयेत् ॥

Kautilya, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

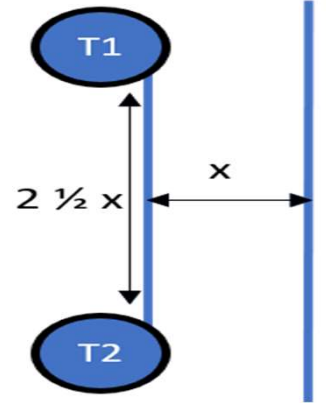
**Translation:** In the intermediate space measuring thirty dandas between two towers, there shall be formed a broad street in two compartments covered over with a roof and two-and- half times as long as it is broad.

(Kautilya, 1915, *Kautilya's Arthashastram*)

**Analysis:**

**Buruj (Watch Tower):**

- These towers were built on rampart on specific distance.
- They used to be in semi-circular, triangular or hexagonal shape.
- Raigad has hexagonal towers.
- These towers were spacious. That is why cannons were kept on them.
- It is said that the tower had 8 floors, of which now 3 floors still exist.



*Schematic representation of proportion of the passage between two towers*

*Source: Author*

**Verse 12: Shooting/ Peeping holes:**

अट्टालक.प्रतोली.मध्ये त्रि.धानुष्क.अधिष्ठानं स-अपिधानच्.छिद्र.फलक.संहतम् इन्द्र.कोशं कारयेत् ॥

Kautilya, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Between the tower and the broad street there shall be constructed an Indrakōsa which is made up of covering pieces of wooden planks affording seats for three archers.

(Kautilya, 1915, *Kautilya's Arthashastram*)

**Analysis:**

Indrakōsa in the above verse means Jangya i.e. an embrasure within the Charya i.e. a merlon.

**Verse 13: Paths for Gods**

अन्तरेषु द्विहस्त.विष्कम्भं पार्श्वे चतुर्.गुण.आयामं देव.पथं कारयेत् ॥

Kautilya, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** There shall also be made a road for Gods which shall measure two hastas inside and four times as much by the sides, and eight hastas along the parapet.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

In the present state of Raigad, it is not clear whether such provision existed. However, there were various temples within the fort walls as per the religious beliefs and positioned accordingly. The temples were stand along structures and **modest in nature and not huge temple complexes.**

### Verse 14: Merlons (*Charya*)

दण्ड.अन्तरा द्वि.दण्ड.अन्तरा वा चर्याः कारयेत्, अग्राह्ये देशे प्रधावनिकां निष्करि.द्वारं च ॥

Kautilya, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Charya, at a distance of one or two danda shall also be made on the side of parapet, also in an unassailable part (of the rampart), a passage for flight (pradhavitikam), and a door for exit (nishkuradwaram) shall be made.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

- The stones carved in shape of flower petals are kept on ramparts and towers. These are called “Charya”. Soldiers used to hide behind them and target the enemies.
- Raigad, partly being in ruins in the present day, the Charya are not distinctively visible in most of its parts.
- Charya here are continuous along the parapet without gaps in between.

### Verse 15: Obstructions

बहिर्.जानु.भञ्जनी.शूल.प्रकर.कूप.कूट.अवपात.कण्टक.प्रतिसर.अहि.पृष्ठ.ताल.पत्त.शृङ्ग.अट  
क.श्व.दंष्ट्र.अर्गल.उपस्कन्दन.पादुक.अम्बरीष.उद.पानकैः प्रतिच्छन्नं छन्न.पथं कारयेत् ॥

Kautilya, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Outside the rampart, passages for movements shall be closed by forming obstructions such as a knee-breaker (jānubhanjani), a trident, mounds of earth, pits, wreaths of thorns, instruments made like the tail of a snake, palm leaf, triangle, and of dog's teeth, rods, ditches filled with thorns and covered with sand, frying pans and waterpools.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

- In case of hill fort like Raigad, topography and especially the three-tier fortification itself provided for the obstructions.
- A gate at each level of this fortification obstructed the attacker multiple times and led to low chances of capture of the entire fort at once.

## Verse 16: Entrance Gate

प्राकारम् उभयतो मेण्डकम् अधर्ध.दण्डं कृत्वा प्रतोली.षट्.तुला.अन्तरं द्वारं निवेशयेत् पञ्च.दण्डाद् एक.उत्तरम्  
आ.अष्ट.दण्डाद् इति चतुर्.अश्रं षड्.भागम् आयामाद्.अधिकम् अष्ट.भागं वा ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Having made on both sides of the rampart a circular hole of a danda-and-a-half in diameter, an entrance gate (to the fort) one-sixth as broad as the width of the street shall be fixed. A square (chaturásra) is formed by successive addition of one danda up to eight dandas commencing from five, or in the proportion, one-sixth of the length up to one eighth.

(Kautiyla, 1915, *Kautilya's Arthashastram*)

### Analysis:

- There are 4 gates to the fort i.e. the Maha Darwaja (Main door), the Nana Darwaja and the Vaagh Darwaja and the 'Chor Dindi' (door between Maha Darwaja and Takmak tok)
- The **Nana Darwaja** led the person to the Maha Darwaja.
- The **Maha Darwaja** consists of a smaller door called Dindi Darwaja (door for pedestrians).
- The access leading to the entrance door is purposely kept narrow such that elephants cannot go ahead to the entrance porch (weakening of attacker's resources).
- The wall of the Maha Darwaja is at a right angle to the floor to not be seen directly from the foothill.
- Vaagh Darwaja** was meant to be an escape gate. It is located at an intermediate level of the fort.
- As the name suggests, **Chor Dindi** was also an escape door (narrower and majorly for exit in case of attack).

## Verse 17 & 18: Floors/ Levels and Pillars

पञ्च.दश.हस्ताद् एक.उत्तरम् आ.अष्टादश.हस्ताद् इति तल.उत्सेधः ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** The rise in level (talotsedhah) shall be made by successive addition of one hasta up to 18 hastas commencing from 15 hastas.

(Kautiyla, 1915, *Kautilya's Arthashastram*)

स्तम्भस्य परिक्षेपः षड्.आयामो, द्विगुणो निखातः, चूलिकायाश् चतुर्.भागः ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** In fixing a pillar, six parts are to form its height, on the floor, twice as much (12 parts) to be entered into the ground, and one-fourth for its capital.

(Kautiyla, 1915, *Kautilya's Arthashastram*)

### Analysis:

- The rise in level in case of a hill fort **cannot be determined by floors; but by gradual levels in the topography.**
- There is a three-tier fortification** (first tier at the *Nana Darwaja*, second tier at the *Maha Darwaja* and third tier at the *Bale Killa* (citadel)).
- The topmost level of the fort is the *Bale Killa* (citadel consisting of palace, durbar) raised on a *Machi* (base level of the citadel).

### Verses 19 to 30:

आदि.तलस्य पञ्च.भागाः शाला वापी सीमा.गृहं च ॥ दश.भागिकौ द्वौ प्रतिमञ्चौ, अन्तरम् आणी.हर्म्यं च ॥ समुच्छ्रयाद् अर्ध.तले स्थूणा.बन्धश् च ॥ अर्ध.वास्तुकम् उत्तम.अगारम्, त्रिभाग.अन्तरं वा, इष्टका.अवबद्ध.पार्श्वम्, वामतः प्रदक्षिण.सोपानं गूढ.भित्ति.सोपानम् इतरतः ॥ द्वि.हस्तं तोरण.शिरः ॥ त्रि.पञ्च.भागिकौ द्वौ कपाट.योगौ ॥ द्वौ परिघौ ॥ अरबिर् इन्द्र.कीलः ॥ पञ्च.हस्तम् आणि.द्वारम् ॥ चत्वारो हस्ति.परिघाः ॥ निवेश.अर्धं हस्ति.नखम् ॥ मुख.समः संक्रमः संहार्यो भूमिमयो वा निरुदके ॥

Kautilya, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** Of the first floor, five parts (are to be taken) for the formation of a hall (sálá), a well, and a boundary-house; two-tenths of it for the formation of two platforms opposite to each other (pratimanchau); an upper storey twice as high as its width; carvings of images; an upper-most storey, half or three-fourths as broad as the first floor; side walls built of bricks; on the left side, **a staircase circumambulating from left to right; on the right, a secret staircase hidden in the wall; a top-support of ornamental arches (toranasirah) projecting as far as two hastas;** two door-panels, (each) occupying three fourths of the space; two and two cross-bars (parigha, to fasten the door); an iron-bolt (indrakila) as long as an Aratani (24 angulas); a boundary gate (ánidváram) five hastas in width; four beams to shut the door against elephants; and turrets (hastinakha) (outside the rampart) raised up to the height of the face of a man, removable or irremovable, or made of earth in places devoid of water.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

- There were several **wells and water tanks** along with **natural & artificial lakes** (Gangasagar & Kushvarta Talao etc.) These were built on watertight soil and rocks that do not allow much percolation of water. Also, at the hills, the rate of evaporation is also slower.
- There were **staircases** leading to the parapets. Also, **secret staircase** to the *Khalbatkhana* (underground room where secret meetings were held) and bale killa.
- Door panels** of the Maha Darwaja have bolts upto an average human height say, 6.5 ft. and nails above that.
- The schematic diagram shows the direction, placement of the throne to facilitate view of the sun on a particular day.

- The peculiarity of this ‘Darbar’ is, if any person speaks in a whispered voice, it is audible at *Sinhasan*, even if the person is standing as long as near the entrance. It is an example of great architectural acoustic arrangement.
- Meticulous study of the sun path is evident from the placement the of throne, its direction, distance from the Nagarkhana (entrance of the durbar).
- The Throne faces the east such that two forts- Torana and Rajgad are visible from it through the entrance archway.

This view is especially clear on a particular day (between 7 am to 8 am) when sunrays fall on the imaginary line (shown in fig.) between throne and Nagarkhana and the sun can be seen on the background of these forts. (Limaye, P. (Ed.). (2020). *Marathyanchi Sphurtitirthe*)

### Verse 31: Turret

प्राकार.समं मुखम् अवस्थाप्य त्रि.भाग.गोधा.मुखं गोपुरं कारयेत् ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** A turret above the gate and starting from the top of the parapet shall be constructed, its front resembling an alligator up to three-fourths of its height.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### Analysis:

Turrets in the Maratha forts were purely functional and minimalistic yet huge in nature unlike the elaborate “gopuram” style as mentioned in the above verse. They were built only for defence purpose i.e. to keep a watch and for immediate attack/ counter attack.

### Verse 32: Canals for weapons

प्राकार.मध्ये वापीं कृत्वा पुष्करिणी.द्वारम्, चतुः.शालम् अर्धध.अन्तरं साणिकं कुमारी.पुरम्, मुण्ड.हर्म्य.द्वि.तलं मुण्डक.द्वारम्, भूमि.द्रव्य.वशेन वा निवेशयेत् ॥

Kautiyla, 2017, *Kautilyam Arthshastram*, (V. Garolia Trans.)

**Translation:** In the centre of the parapets, there shall be constructed a deep lotus pool; a rectangular building of four compartments, one within the other; an abode of the Goddess Kumiri (Kumáripuram), having its external area one-and-a-half times as broad as that of its innermost room; a circular building with an arch way; and in accordance with available space and materials, there shall also be constructed canals (kulyá) to hold weapons and three times as long as broad.

(Kautilya, 1915, *Kautilya's Arthashastram*)

### **Analysis:**

- The term Canals can be interpreted as the rock cut room or ditches alongside the parapet to hold/store weapons (ammunition). They were called the Daar Kothar.
- The place was to be easily accessible from the parapet and could hold ample cannons and weapons so as to facilitate quick response during defence. (Deshpande, P. N. (1995). *Raigad Darshan*)

### **5. Inference**

Various factors govern the similarities and differences between the source data (construction of forts: Kautilya Arthashastra) and structure under reference (a Maratha fort: Raigad)

#### **5.1. Geographical Factors:**

The observations and methods of Chanakya were mainly keeping in mind the vast plains in the northern Kingdoms. He mentions that the best type of forts are the hill forts and the same has been the founding principle of the Maratha Empire. Arthashastra was generic in the principles and the requirements as well as layout of construction of forts, however, it leaned towards the description as required for forts in the northern plains or over plateaus. Maratha Empire was built on the foundation of Sahyadri mountain range and therefore we see certain minor distinctions and modifications made according to the terrain in the fort building techniques to adapt to the topography of the region. However, the major principles of defence and construction remain strikingly similar as seen from the above comparison.

#### **5.2. Economic Factors:**

The Maratha Empire came to power in light of a declining Adilshahi sultanate. The empire was in its nascent stage and it was essential to defend whatever territory that was acquired aggressively and swiftly. The empire was built and expanded with the main aim of defence from external attacks and as such, all the structures were strictly functional and minimalistic in nature. There was no unnecessary expense made on ornate structures but pure military requirements. However, the defence mechanism mentioned in the Arthashastra was followed and developed to suit the requirements of the empire.

#### **5.3. Socio- Cultural Factors:**

The basis of Maratha empire was on the premise that everyone is an equal "*Shiledaar*" of the Swarajya. As such, there were no palatial structures or excessive creature comforts for any person in

the forts, including for the king himself. The architecture is also influenced by the said principle and we can see mosques alongside temples in various places which are functional and not ornate. This was done for the sole purpose of defence and to avoid desecration of temples by attackers. Even the residences were placed strategically as per military requirements and not for creating luxurious palaces, however, the basic elements were similar to the ones mentioned in Arthashastra.

#### **5.4. Technological Advances:**

Chanakya presented the Arthashastra in around 3 century BCE. Maratha empire was around 16th-17th century CE. As such, there were various technological and architectural advances during the said period. The Arthashastra provided for forts to be constructed taking into account the topography which was duly done for the Maratha forts. The basic design elements remained the same in essence, however, the terminology to refer to them was different on account of language. Certain changes were adapted considering the policies of the empire such as in respect of absence of ornate palace, dance complexes, etc. The Marathas also did extensive work in acoustics and implemented the same in the fort. Certain additional features over and above as mentioned in Arthashastra were implemented as required. Eg. Double fortification of Pratapgad.

#### **6. Outcome and Recommendation**

Comparison of the elements as mentioned in Arthashastra to Maratha Forts, in light of Raigad, shows a striking similarity and adaptation. The location of the Maratha Empire's capital, Raigad is congruous with the prescribed location as mentioned in Arthashastra. There were certain changes made in reference to the topography, geographical conditions and availability of materials and resources. However, from a broad perspective, it appears that the Fort may have been constructed keeping the principles of Arthashastra in mind with modifications wherever deemed necessary in consonance with each Fort's requirement

**Hence, it can be deduced that the Arthashastra laid the foundation and basic principles of Fort construction, and Chhatrapati Shivaji Maharaj may have acted in accordance with it but, with his own vision, unconventional methods and a thorough knowledge of region-specific fort construction.**

Further comparative analysis can be done by studying the architecture of other hill forts constructed by CSM with the principles as mentioned in Arthashastra. The said comparison can be used to arrive at a conclusive opinion as to whether the principles of Arthashastra were used as reference in construction of majority of forts of the Maratha Empire.

## 7. Terminology

<b>Terminology</b>	<b>Meaning in English</b>
Tatabandi	Rampart
Buruj	Tower/ Watch Tower
Darwaja	Door/ Gate
Fanji	Parapet
Charya	Merlons
Jangya (Indrakosa)	Peeping/ Shooting holes
Payrya/ Jina	Steps/ Staircase
Bale Killa	Citadel
Machi	Base of Citadel
Durbar	Hall
Khalbhatkhana	Secret meeting room
Daaru Kothar	Ammunition storage

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