

TOWN-PLANNING IN ANCIENT INDIA, AS DEPICTED IN ARTHAŚĀSTRA

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Abstract

Although there are problems in dating the *Arthaśāstra* precisely, the period it refers to is of considerable importance in the settlement history of ancient India. The work usually regarded as a source for political and constitutional history but contains a great deal of significance to the historical geographer, and this paper highlights its contributions on urban planning, rural-urban relationship, and the spatial organization of early Indian city-states. The question is raised of whether it remained simply a plan-image or can be regarded as a guide to reality.

Keywords: Settlement, Ancient India, Urban planning, spatial organization, City-states

INTRODUCTION

This article has been developed around the descriptions about civil architecture by Kautilya in *Arthaśāstra*. The extensive and intricate monumental designs, the scientific and modern planning of cities and forts are so relevant even in this technology savvy age that it attracts the attention of modern day architects as well. It is of so much importance that new age researcher has been constantly trying to reveal further details of the civil architecture of ancient India. The science of architecture in ancient India not only formulates fundamental canons of the planning, what may be termed as the engineering of architecture, but also extensively deals with the major patterns of architectural planning – the towns, the temples, the forts, the royal palaces or the common residential houses. Architectural planning in ancient time was so very scientific and modern and ahead of time that architects and town-planners were much concerned about the preliminary matters like selection of sites, testing of soil, testing of geographical situation of sites and planning and designing as well. This article has attempted to present a bird's eye view on the town-planning of ancient India as depicted in *Arthaśāstra*.

Some interesting extracts relating to Town and Country planning in *Arthaśāstra* composed by Kautilya:

- Town, which is congested, should be freed of surplus population, which should then be housed in a new location. The towns should be as located as they would be in a position to help each other.
- There should be a 'sangrahan' among ten villages, a 'sarvatik' among two hundred, a 'dronamukha' among four hundred and a 'sthāniya' among eight-hundred villages.
- People who come to stay at the time of a new settlement or those who come to reside later in this new settlement should be exempted from payment of taxes for some years. In the new village, there should be higher proportion of agriculturists and *śūdras*. There should be a market provided for the sale of goods received from traders on highways.
- Dams should be built over rivers and *nālās*. Temples and gardens should be provided.
- Arrangements should be made for looking after the aged, the children and informal persons.
- Cereals and wealth will grow if the agriculturists are kept busy. Attempts should be made to protect and increase quarries, forests and canals.

Arthaśāstra of Kautilya may be regarded as the first datable work on civil architecture. Besides the numerous references scattered throughout the work, this monumental treatise by the pen of the renowned author, contains scientific definition of *Vāstu*, houses, fields, gardens, buildings of any kind, lakes and tanks are each called *vāstu*. Disputes concerning *vāstu* are dependent for settlement on the evidences to be furnished by people living in the neighborhood, from each house a water-course of sufficient slope at a distance of three *padas* or 1.5 *aratnis* from the neighboring site shall be so constructed that water shall

either flow from it in a continuous line or fall from it into the drain. Violation of this rule shall be punished with a fine of 54 *paṇas*, if a pit, steps water course, leather, dung-hill, or any other parts of a house offer cause annoyance to outsiders, or in any way obstruct the enjoyment of others, or cause water to collect and thereby injure the wall of a neighboring house, the owner shall be punished with fine of twelve *paṇas*. If the annoyance is due to feces and urine, the fine shall be double, the same fine shall meted out not only to a tenant who, though asked to evacuate, resides in the house but also to the owner who forces out a renter who has paid his rent from his house, unless the renter is involved in such act as defamation, theft, robbery, abduction, or enjoyment with false title. Which includes buildings and their engineering both: 'Houses (or the sites of houses), pleasure-gardens (*Ārāmas*), *Setubandhas* (embankments and bridges) and lakes etc. are called *Vāstu*'. If we compare this definition to those given in *Śukra's* or *Maya's*, works, we find resemblance between them. The technical words like '*Vāstuhṛdaya Navabhāga*' - central plot of nine-plot sites etc. are the proofs of the existence of a developed science of architecture in that time.

*trayaḥ prācīnā rājamārgāstrayaḥ udīcīnā iti vāstuvibhāgaḥ. sa dvādaśadvāro yuktyodakabhūmicchannapathaḥ.*¹

Durga-Niveśa - Demarcation of the ground inside the fort shall be demarcated by six royal roads, three running from east to west and three, from north to south, with twelve gates. The city shall be provided with water, drainage and covered passages. The royal buildings shall be erected, facing north or east, on a good building size, in the middle of the residential areas of the four *varṇas*, to the north of the centre of the fortified city, occupying on ninth of the residential area.

As it was evident from *Arthaśāstra*, royal residence to be built, with a rampart, a moat and gates and provided with many halls.

*kośagravidhānena madhye vāsagrham, gūḍhabhittisaṃcāraṃ mohanagrham tanmadhye vā vāsagrham, bhūmigrham vāsannacaityakāṣṭha- devatāpidhānadvāramanekasuruṅgāsaṃcāraṃ tasyopari prāsādam gūḍhabhittisopānaṃ suṣirastambhapraveśāpasāraṃ vā vāsagrham yantrabaddhatalāvapātaṃ kārayet, āpatpratīkārāthamāpādi vā.*²

The royal house should consist of a living chamber in the centre in accordance with the procedure laid down for the treasury, or a maze- house with concealed passages in walls and in its centre a living chamber, or an underground room with its opening covered by the wooden image of a deity in a nearby sanctuary and having many subterranean passages and above it a palace with a stair-case concealed in a wall or having an entrance and an exit through a hollow pillar as a living chamber with the floor fixed to a mechanism capable of sinking below, in order to counteract a calamity or when a calamity is apprehended.

*prṣṭhataḥ kakṣyāvibhāge strīniveśo garbhavyādhisamsthā br̥kṣodakasthānaṃ ca. bahiḥ kanyākumārapuram. purastādalaṅkārabhūmirmantrabhūmirūpasthānaṃ kumārādhyakṣasthānaṃ ca. kakṣyāntareṣvantarvaśikasainyaṃ tiṣṭhet.*³

In a part of the apartments at the back should be ladies' rooms, establishments for maternity and sickness and places for trees and water. Outside should be quarters for princesses and princes. In front should be the dressing room, the council chamber, the assembly-hall and a place for the ministers in charge of princes. In the open spaces between the apartments, the palace guards should be stationed.

The fort shall be surrounded by three moats, either filled by natural springs or by water brought in from elsewhere; they shall have adequate drainage and be filled with lotuses and crocodiles. There shall be a rampart all round the fort, built up by earth obtained in digging the moats. The rampart shall be planted, (on the outward side) with thorny bushes and poisonous creepers. Surplus earth shall be used to level up low lying areas (inside the fort) or the palace grounds. The top of the rampart shall be covered with rounded stones with chariot tracks made of trunks of palm trees.

caturdiśaṃ janapadānte sām̐parāyikaṃ daivakṛtaṃ durgam kārayet, antardvīpaṃ sthalaṃ vā nimnāvaruddhamaudakaṃ, prāstaraṃ guhāṃ vā pārvataṃ, nirudakastamvamirīnaṃ vā dhānvanam, khañjanodakaṃ stamvagahanaṃ vā vanadurgam. teṣāṃ nadīparvatadurgam janapadārakṣasthānaṃ, dhānvanavadurgamaṭavīsthānaṃ, āpadyapasāro vā.

daṇḍāntarā dvidāṇḍāntarā vā cāryāḥ kārayet. agrāhye deśe pradhāvītikāṃ niṣkuhadvāraṃ ca.

¹ K. A.2.4.1.

² K. A. 1.20.1

³K.A. 1.20.3

*vahirjānubhañjanītrīśūlaprakarakūpakūṭāvapātakaṅtakapratisarāhiprṣṭhatālapatraśṅgāṭakaśvadamṣṭrārgalopaskandanapādūkā'mvarīṣodapānakaiḥ channaptham kārayet.*⁴

In all four quarters, on the frontiers of the country, he should cause a nature-made fortress, equipped for fight, to be made: a water-fort an island in the midst of water or high land shut in by water, a mountain fort consisting of rocks or a cave, a desert fort one without water and shrubs or a salty region, or a jungle fort a marshy tract with water or a thicket of shrubs. Among them a river fort and a mountain fort are places for the protectors of the country, a desert fort and a jungle fort are places for foresters or places of retreat in times of calamity.

In the centre of the country, a *sthānīya* should be laid out, which is the head-quarters for revenue, on a site recommended by experts in the science of buildings, at the confluence of rivers or on the bank of a lake that dries up, either a natural lake or a man-made tank, round, rectangular or square or in accordance with the nature of the building site, with water flowing from left to right, a market town, served by a land-route and a water-route. The *sthānīya* should be encircled with three moats to be dug round it, at a distance of one *daṇḍa* from each other, fourteen, twelve, and ten *daṇḍas* broad, three-quarters or a half of the breadth deep, one-third at the bottom or square with the bottom, paved with stones or with the sides only built of stones or bricks, reaching down to water or filled with water coming from elsewhere, with draining excess water, and stocked with lotuses and crocodiles.

Midway between two turrets, there should be a tower to be built, with two stories inclusive of a hall, one and a half times in length. Between each turret and tower, in the centre, to be erected a board, compact with planks having holes with coverings, as a place for three archers. In the intervening spaces, a 'gods way' to be made, two *hastas* in breadth and four times that in length, at the side.

Occupying one-fifth part of the ground floor should be a hall, a well and a border-room, and occupying one-tenth part and in between two doors and a room, and at half the height of the floor, there should be a structure with pillars. There should be an upper chamber measuring half the built-in area or having a space one-third of it, with sides constructed with bricks, with stair-case on the left running from left to right and on the other side a stair-case concealed in the wall. There should be a side-door five *hastas* in height. There should be four elephant-bars. The 'elephant nail' should be half the structure.

caturdaṇḍantarā rathyāḥ. rājamārgadroṇamukhasthānīyarāṣṭravivītapathāḥ
saṃyānīyavyūhasmaśānagrāmapathāścāṣṭadaṇḍāḥ. caturdaṇḍaḥ setuvanapathāḥ. dvidaṇḍo
*hastikṣetrapathāḥ. pañcāratnayo rathapathāścātvarāḥ paśupathāḥ dvau kṣudrapaśumanūṣyapathāḥ.*⁵

The fort shall contain twelve gates, provide with both a land and water-way kept secret. Roads should be of a width of four *daṇḍas*. The royal highway and roads in a *droṇamukhā*, a *sthānīya*, the countryside and pasture-lands as well as paths in a harbor town, a battle array, a cremation ground and a village eight *daṇḍas*, paths for elephants and along fields two *daṇḍas*, five *aratnis* the chariot path, four the cattle-path and two the path for small animals and men.

In the midst of the houses of the people of all the four castes and to the north from the centre of the ground inside the fort, the king's palace, facing either the north or the east shall, as described elsewhere, be constructed occupying one-ninth of the whole site inside the fort is a most systematic presentation of royal palaces and forts. As regards the dedication of temples in the centre of a city, our author remarks that in the *Koṣṭhakālayas*, the *Vāstu-devatās* should also be set up according to their allotted positions. This gives us to conclude that *Pada-vinyāsa*, a very developed canon of town-planning was a stereotyped canon in Kautilya's age. Road-planning, planning of forts and palaces along with folk-planning and that connected with professionals were all well established. The word '*protolī*' occurs for the first time here in the extant works on *Vāstuśāstra* both architectural proper and non-architectural adjuncts. Popular residential houses like *Śālā*-buildings and religious types like *caityas* and *Stūpas* are also delineated upon. But the most copious descriptions and the presentations thereof, pertain to forts and the palace-architecture. If a comparative and critical study is made of Mayamatam and the *Arthaśāstra*, it may find a very valuable clue in reconstructing our past history of Architecture. At a distance of four '*daṇḍas*' 24 feet from the ditch, a rampart, six *daṇḍas* high and twice as much broad, shall be erected by heaping mud upwards and by making

⁴ K. A.2.3.1,5-6.

⁵ K.A. 2.4.2

it square at the bottom, oval at the centre, pressed by the tramping of elephants and bulls, and planted with thorny and poisonous plants in bushes. Gaps in the ramparts shall be filled up with fresh earth.

Above the rampart, parapet 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.

*rathacaryāsañcāraṃ tālamūlamūrajakaiḥ kapiśr̥ṣakaiścācitāgram. pṛthūsīlāsamhatam vā śailam kārayet, na tveva kāśṭhamayam agniravahito hi tasmin vasati.*⁶

The passage for chariots shall be made of trunks of palm trees or of broad and thick slabs of stones with spheres like head of a monkey carved on their surface, but never of wood, as fire a happy abode in it. Towers, square throughout and with moveable staircase or ladder equal to its height, shall also be constructed. In the intermediate space, measuring thirty *daṇḍas*, between two towers, there shall be formed a broad street with two storied buildings covered over with a roof, and two and half times as long as it is broad.

Outside the rampart, passages for movements shall be closed by forming obstructions such a knee-breaker, a trident, mounds of earth, pits, wreaths of earth, 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 water pools. Having made on both sides, the rampart bulge out to the extent of a *daṇḍa* and-a-half, an entrance gate one-sixth as broad as the width of the street shall be fixed. A square is formed by successive addition of one *daṇḍa* up to eight *daṇḍas*-commencing from five, or in the proportion, one-sixth of the length upto one-eighth.

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

Of the first floor, five parts for the formation of as hall, a well, and a boundary; two-tenth of it for the formation of two platforms opposite to each other, an upper storey twice as high as its width; carvings of images; an uppermost storey, half of three-fourth as broad as the first floor; the 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 or ornamental arches projecting as far as two *hastas*; two door-panels, occupying three-fourth of the space; two and two cross-bars to fasten the door, an iron bolt as long as an *aratini* (24 'anguals' or fingerbreadths); a boundary gate five *hastas* in width; four beams to shut the door against elephants; and turrets outside the rampart raised up to height of the face of a man, removable or irremovable, or made of earth in places devoid of water. A turret above the gate and starting from the top of the parapet shall be constructed, its front resembling an elevator upto three-fourth of its height.

*prākāramadhye kṛtvā vāpīm puṣkariṇīdvāram catuḥśālamadhyardhāntarāṇikam kumārīpuram, muṇḍaharmyam dvitalam muṇḍakadvāram bhūmidravyavaśena vā.*⁷

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 *Kumārī* (*Kumārīpuram*), having its external area one and half times as broad as that of the innermost room; a circular building with an archway; and in accordance with a available space and material, there shall also be constructed cannals (*kulyā*) to hold weapons, and three times as long and broad. In those cannals, there shall be collected stones, spades, axes (*kuthāri*), variety of staffs, cudgels, hammers, clubs, discus, machines (*yantra*) and such weapons as can destroy a hundred persons at once (*śataghñis*) together with spares, tridents, bamboo-sticks with pointed edges made of iron, camel neck, explosive and whatever else can be devised and formed from available material.

The Governor-General of the city shall make all those who work with fire live in one locality.

*Aparājītā'pratihatājayantavaijayantakoṣṭhakān śivavaiśravaṇāśviśrīmadirāgrhāṇi ca puramadhye kārayet. koṣṭhakālayeṣu yathoddeśam vāstudevātāḥ sthāpayet. brāhmaindrayāmyasaināpatyāni dvārāni. bahiḥ parikhāyā dhanuḥśatāpakṛṣṭāścaityapuṇyasthānavanasetuvandhāḥ kāryāḥ, yathādiśam ca digdevātāḥ. uttarah pūrvo vā śmaśānavātāḥ, dakṣiṇena varṇottarāṇām. tasyātikrame pūrvaḥ sāhasadaṇḍaḥ pāṣaṇḍacaṇḍālānām śmaśānānte vāsaḥ.*⁸

⁶K.A. 2.3.4

⁷ K.A. 2.3.10.

⁸K. A. 2.4.5-6

In the centre of the city the apartments of gods, such as *Aparājita*, *Apratihata*, *Jayanta*, *Vijayanta*, *Śiva*, *Vaiśravan*, *Aśvanis*, and the abode of Goddess *Madirā* shall be situated. In the corners, the guardian deities, of the ground shall be appropriately set up.

Either to the North or the East, burial or cremation grounds shall be situated; but that of the people of the highest caste shall be to the south to the city. Heretics and *cadālas* shall live beyond the burial grounds. Violation of this rule shall be punished with the first amercement.

Oils, grains, sugar, salt, medicinal articles, dry or fresh vegetables, meadow, skins, charcoal, tendons, poison, horns, bamboo, fibrous garments, strong timber, weapons, armor, and stones shall also be stored in the fort in such quantities as can be enjoyed for years together.

Kauṭilya's *Arthasāstra* is one book that is applicable even in today's world. The principles in the book are eternal. Our country can once again use this text as a roadmap to rebuild a model town which is the dream of every citizen by providing them the basic necessity of life. This should be supported by an effective Law and order machinery. It will help each individual to feel safe, secure and also contribute to the nation building process.

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