



Jaipur: Journey From Sand to City

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ABSTRACT- Jaipur was declared the heritage city of Rajasthan in February 2020, earlier there had been heritage sites in Rajasthan. Jaipur is famed in history as pink city. It is believed this name was derived from the pink paint applied to it as a mark of welcome to Prince Albert's visit to Jaipur. Later a law was passed for the residents to paint their houses pink to keep the colour scheme intact. Jaipur was the first planned city of India. The Jaipur city and its marvellous town planning is a living legacy of Indian heritage. It testifies the glorious engineering tradition of Indian subcontinent.

Keywords: heritage sites, Jaipur city

I. INTRODUCTION

Bearing in mind such a pivotal position of the city, one has to probe as to how this city came into being. It would be interesting to explore its geographical spread and significance of its locale. Considering its perfect plan structure – how was the idea generated? Were there external inputs from across the world? How far Hindu sacred texts were applied? It would also be interesting to consider the bulwark power and resources of Sawai Jai Singh-how and what he contributed, the vision he outlined, the men and material he employed. One would also investigate the contribution of chief architect and also considering the colossal planning and building spree undertaken within the constraints of medieval resources how was the idea of Jaipur translated to reality.

In this paper an attempt is being made to highlight the planning of Jaipur (Journey from Sand to City), and its main features in the light of original documents like *Kapaddwara maps* and notes, *Arhsattalmarti*, *JamakharchImaratkhan*, *Baghayatkharh* documents and *Buddhivias*. These documents provide the information regarding the step by step development of the city.

We are fortunate enough to possess the *Kapaddwaradocuments* as a valuable source of information. They are collection of an exceptionally large mass of maps, plans and notes on the planning of the Jaipur city. These documents belong to 1589-1803 and are presently preserved in the city palace Museum, Jaipur. These map plans and notes are in Persian and Rajasthani language. These maps and notes reveals the detail information which is related to step by step development and construction of the city. These maps and notes are classified into may categories like map of Royal buildings, map of specific localities, map of prominent houses and Havelis of Rajput Thakurs, traders, Rajawat, Nathawat, artisans, map of bazars, chowks, choupars, map of gardens and map of water reservoirs. *Kapaddwara* also reveals that the regularity and uniformity of buildings was maintained by the state.

The other documents like *Arhsattalmarti*, *JamakharchImartiPapers* contains statistical information on building construction, renovations, repairing's, raw material and wages of artisans. *Baghayatkharh* documents contain the information about bostan, gulistan and orchard garden of Jaipur city and also gives the detail account of its expenditure which incurred on its maintenance.

The Visionary Sawai Jai Singh

Sawai Jai Singh was not only a statesman but also a visionary. He was aware that Amber did not have enough space for further growth and experienced severe water scarcity therefore he founded the new city in a nearby region which was covered with lush forest used for hunting purpose. He consulted Greek treatises, Arabic and European architecture for planning the new city. Large number of such maps, literature and plans from other cities are now housed in *pothikhana* (library).

Embarking on the new project, firstly the Amber city was repaired, then working charts, plans and maps or plans (*trah*) were meticulously prepared for the new city- Jaipur. This was how the Sawai Jai Singh's dream city was given a practical shape. Extensive research resulted in charting maps and plans. These can be classified into many categories like map of residential area, water resources, markets, main buildings which were constructed during 18th century. These maps had detailed literary notes attached to it. They provide information on town planning and guided to step by step progress of construction of the buildings of Jaipur. The regularity and uniformity of the buildings was maintained by the state and meticulous instruction regarding the construction of the buildings was given, as can be inferred from each map. A number of *trahs* or plans were prepared before the construction of any buildings. These *trahs* or plans give the dimensions and measurement of each building.

These maps also include specific instruction for constructions such as *-tibakichotiutari-* given for laying these streets by pulling down the sand dunes. These principle streets converge at right angles, and minor streets also align at right angles, in order to subdivide the wards. The instructions are constantly recorded to maintain the width (*chaursai*) of the streets. Main streets were connected with the small streets (*barharastasuchhotarasta tai rastahamwarkiyo*). Bazaars and wells were provided in these street plans. The map also shows that the city gates were connected with these streets. These streets were lined with bricks (*rastoithase hamwarkiyo*). These precious documents are extant to us in *Kapaddwara* collection.

The chief Architect Vidyadhar

The manner in which Jaipur was built earned the positive appraisal of travellers and scholars. Vidyadhar's landmark contribution to Jaipur architecture during foundational period is noteworthy. Vidyadhar was a Bengali Brahman. In 1718 he was appointed Naib Darogha of Mustaufikachehri (deputy of Accounts department), later in 1729 he was made the *deshdiwan* (judicial and executive minister). He is credited to have accomplished the task of constructing the Jaigarh fort in 1726, he also constructed the city palace in 1734 and was responsible for tapping the Darbhavati river to Jaipur in 1735. He was duly rewarded by special honours for these memorable feats.

The Jaipur city was built according to the plan made under this chief Architect Vidyadhar. Tahvildars were also appointed by Desh Diwan Vidyadhar to ensure regular supply of raw material which was used in the construction and also responsibility of the wages of the workers were responsibility of tahvildars.

Prastara plan

The city was designed with streets and lanes intersecting with each other at right angles. The map shows the irregularity in the North-Western portion of the city. There is variance of opinion regarding the planned city, some scholars tend to think that it was fully planned based on Prastara, others reject this thesis. Chandarmani Singh mentions that Sawai Jai Singh planned the city in geo-astronomical form of navagraha columns.

But we cannot deny that Sawai Jai Singh made the plan on paper before the construction of every area and apart from the irregularity in the north-west part of the city (because of uneven terrain of hills) other blocks of the city are square or rectangular in shape. A close study of Jaipur city indicate that the city was based on Prastara plan mentioned in the Shilpa Shastra.

Grid pattern

Streets of Jaipur firmly laid out in a grid pattern was a fine example of a planned city in India. The plan of the city can be comprehended by keeping in mind the central street running from west to the east end of the city. This street is intersected at right angles by a couple of other streets. The cross roads are further

intersected and yet again intersected to end up in rectangular grid pattern. The centre at which streets aligned were termed chowk, the oft repeated chowks were *manikchowk*, *chandnichowk* etc. Four such chowks were part of initial plan of the city. *Chaupar* was the term applied to further bifurcation of chowk like *badichauparchotichaupar*. These chaupars contained bazars like *Johri bazar*, *Ramganj bazar* etc.

One has to acknowledge certain deviations in the grid pattern towards northwest and southeast sector. At the north-west portion the hill of the Nahargarh was possibly the cause for the incomplete grid, while at the southeast a whole *chowkri* breaks away from the square. The central part of the city is occupied by the palace and JantarMantar.

Geographical condition

Sawai Jai Singh has carefully chosen the site which is in the plane area in South of Amber. The Geographical condition of the city was most suitable and the city was protected by the natural hills from three sides and these hills acted as a natural barrier which safeguarded the city. According to the Tehsil records, the site of the Jaipur city was covered by the six villages viz, *Nahargarh*, *Talkatora*, *Santoshsagar*, *Motikatla*, *Galtaji* and *Kishanpol*.

The region of the Jaipur city which lies in the eastern part of Rajasthan, has unique features, the centre is an elevated table land of triangular form from 1400 to 1600 above the sea level. On the southern side, the city of Jaipur is bound by a base line running west from the city. The eastern boundary of the city consists of hills stretching from the north to the south along the Alwar border, towards the North and the west of the region is beautifully bound by a broken terrain of hills, which is a portion of the Aravelli range, there is triangle near Khetri. The hills on the north-west, forms a natural boundary between the Shekhawati (sandy desert tracts) and Bikaner on the one side and the fertile soil of Jaipur on other side. In the east of Jaipur city beyond the range of hills, there is a rapid fall of three and four hundred feet in the two or three miles and in the extreme east there is a gradual fall along the Banganga River to the Bharatpur city border. The eastern portion of the city consists of many low ranges of the hills and there are many ravines near the Karauli border.

The soil of Jaipur is sandy but still it varies from one place to another. In the west, north and east, of the Jaipur city the soil is generally sandy but in some places it is mere barren sand. In the west ward region especially along the Banganga valley, the soil is rich and fertile. The southern part of the Jaipur is very fertile and soil is highly productive and the tract to the extreme south which included Banas river is the most fertile portion of the state.

Susan Gole gives the concentric map which clearly demarcates the area of Jaipur city directionwise and this map is partial translation of an earlier revenue map of Jaipur. Maps of Susan Gole mark various important places such *Raghunathgarh*, *Bagaikagarh*, *Baksakhogarh* and *Madhavgarh* in the east, *Sudarshangarh*, *Jhotwara*, *Kalgarh* in the western side, *Achrol*, *Amber* and *Jaigarh* in the north, *Sankargarh* and *Chandoli* in the south apart from others.

Adequate Drinking water and Drainage system-Scarcity of water was borne in mind before planning the city. *Kapaddwara* documents is a valuable source of information which indicate the systematic planning for water harvesting and water resources carefully studied before tapping it for the city. Sawai Jai Singh was very concerned for the water supply of his newly built town. When he laid the foundation of the city, he closely studied the areas which needed to be catered and how they could be water fed. Availability and sustained water supply was the prime concern. The proposed city was intended to benefit from topographic features that allow natural drainage and storm water runoff by high percolation rate. After studying the maps of the *KapadDwaradocument* it appeared that he had the vision of the colossal task of tapping the different water resources. Related map show the pillar were built at different distances for estimating the depth of water.

The natural source of water is rainfall and nearby rivers. We find less rainfall in Rajasthan region so it is necessary to accumulate water by planning canals, step wells, tanks and dams. The other natural source of water was rivers. Understandably water seems to be the focal concern in both rural and urban areas. The

natural water resources according to kapaddwaraBanganga, Banas, Dharbhavati river,Bandi and Badodiya river.

Darbhavati River had hitherto escaped notice,was later brought to notice in a study of Jaipur city.Kapaddwara maps indicate the running course of its river. Darbhavati river flows from the Saiswara gate and there were sand dunes due to which the water can be drawn by two charas,Water from Bhavsagar is brought from the Pali river. Similarly water flowed into Bandiriver by ten charas (water lifting device) and also canal starts. The area which benefited was Rajwas, seat of Ramchelas, HarRamayan-Ko-bas, Chouki of Budharan, Nindar, Nagal-Sirasra-Ko and Govindpur.Ishwar Vilas Mahakavya identified Darbhavati river with Bandi river. It has been observed that water was not tapped to the city from Bandi river but from the Amani Shah nala.It starts from the northern side of Jaipur city. Water was flowed in to tank (howd) through the channels.

Tanks, artificial reservoirs, wells, step wells, Dams and canals constructed for tapping the water for the city. Sawai Jai Singh had planned many reservoirs for catering the need of water at the time of foundation. Amani Shah kanala,BishanSagar and JagannathSagar after the name of samratJagannath (guru of Sawai Jai Singh) and Mansagar were constructed for tapping the water for the newly built town.A canal especially constructed for gardens (*nahribagh k baste*). This canal's water flowed to the prominent gardens mentioned in Kapaddwara. The other canal especially constructed for Jai Niwas garden in the second quarter of 18th century (*tarahnahribagh Jai Niwas me awai*).

Kapad-dwara contains information of wells and andNala (rivulet) which were constructed to carry the water to Jaipur. Water of wells (*kuwa*) was mostly used for drinking purpose. There is information pertaining to wells viz, *ShyamKuwa*, *RamKuwa*.Kapaddwara document reveals that one such well (*kuwa*) was connected with the hammam of Raj Mahal. A significant map is mentioned in *Kapaddwara* which pertains to the area of Galta, *babdi*. A well is also depicted in this map.

Buildings and edifices forRoyalty

The nucleus of Jaipur city was the palace and Jai Niwas Garden which foundation was laid out in 1725 and then followed the building of Chandra Mahal but actual construction of the entire city is started from the year 1727. *SiyahHuzuri* papers give information that Sawai Jai Singh started construction of building below the Northern edge of the plane, with a palace which was constructed in 1726. The list of palace maps mentioned in *Kapad-dwara*includes the construction plan of *Chandra Mahal (Satsargha)*, *BadalMahal*, *Sarvatabhadra (Diwan-i-Am,Diwan-i-Khas)*, *MotiMahal*, *HawaMahalandMadhovilas*. *Budhi Vilas* and*GirdhariBhojansargives* the testimony that Sawai Jai Singh performed a ritual ceremony at the time of foundation of the city.

When Jaipur was formally founded, the three structures Chand Mahal (political centre), GovindMahal / Surya Mahal (religious centre) and *BadalMahal* were complete. This is the groundwork for the planning of the city. The plan of the city also shows the *Chandra MahalandGovindDev*temple in the centre of the city. The Jaipur plan shows that Palace area occupied two blocks and seven blocks vizPuranibasti, TopkhanaDesh, Modikhana, Vishesverji,GhatDarwaza, TopkhanaHazuri, Brahmapuri werethe part of rest of the city.

Residential Houses for other communities-

The other most important concern of Sawai Jai Singh was settlement of the communities. Some plots were reserved for Thakurs, Rajputs, Nathawat, kachwahas and traders and artisans in the newly built town. *Kapaddwara* documents reveals specific localities of these communities in Jaipur. Land was allotted to them for the construction of houses in the city.

We are fortunate to have *kapaddwara* documents provide evidence to settle down of most prominent persons in the city. The name of these prominent persons also mentioned with their havelis name.The grand havelis constructed after many prominent Rajput Thakurs for instance Samode Haveli in Jaipur.Girdhari refers that havelis were constructed in Jaipur after levelling the sand dunes.Kapaddwara indicates the construction of Thakurs havelis near the kot area of Jaipur. The map and notes of kapaddwara reveals about the Muslim havelis for instance Hakim jiki Haveli.

The prominent trader Karim Multani was invited from Sanganer likewise many other traders. Sawai Jai Singh also assigned free of cost land to prominent traders and also exempted from toll tax (*hasilrahdariwamapa*) for carrying their business for instance Ghasiram Murlidhar trader was invited to settle down in city with their family and concessions were also provided to entice him.

The map and notes of *Kapaddwara* documents clearly indicate the caste wise locality like *Mohalla* of Gujrati printers (*chippas*), colony of gujars, Brahmans, potters (*Kumars*), and houses of weavers (*julahas*). The locality also named Brahmapuri in which Brahmans settled. The other notes of *kapaddwara* also shows specific localities of artisans.

Bazars, Chowks and Chopars-

Kapaddwara documents contain the maps which pertaining to the construction of bazars. The map indicate that the area of bazar has been levelled (*tibakichotiutari*) for maintaining the width of bazar. The work of circular enclosed market (*Raoikakatla*) has been completed. Bricks were lined out for making the street from Ramganj to Rampol. The other map shows new *katla* was built and shops (*hatya*) were constructed on raised plinth (*kursya tai*). Streets and roads has been laid out from new *katla* towards *Topkhana* and Dungri (hillock). The map and notes no 204 shows plan of Ramganj bazar shows the foundation of shops (*hatya*) on both sides of roads after levelling the area. Small Roads were connected to big Roads.

Girdhari refers the information on the commercial activity in the market, shows that thousands of shop on *chopars* became famous for business and many traders who came from neighbouring areas started their business in the city.

Budhhi Vilas provides a picturesque description of market. It contains the description of gold shop, embroidery and iron tools. The artisans and traders were involved with their works like goldsmith smelting gold and iron-smith making iron tool by melting the iron. Jaipur market earned fame for embroidery (*paricha, jarwaf*) and tinsel work (*jardozi*). The traders were taking money in form of Mohar and rupees. *Mahmudi*, *Khasa* and *tansukh* variety of cloths were purchased by the traders in the market.

Kapaddwara contains the construction of chowks (*tarah Sawai Jaipur kechowk, bazar wagairah*). It refers the name of Ram chowk, Chandnichowk, Manikchowk and Paharganj Chowk. *Arhsattal marti* and *Siyah Huzur* Papers shows about Chandnichowk, Manikchowk, Paharganj Chowk, Ram Chowk.

Chaupars were made by the alignment of lanes and bazar streets. Chotichoupar, Bari choupar and Ramganjchoupar were constructed which connected with the market like Ramganj bazar, Surajpol, chandpole and Tripoliabazar by the passing streets.

Gardens-

Gardens were an important part in the planning of Jaipur. In order to accomplish this dream, the city was blossomed with gardens. The significance of these gardens in beautifying the newly built town is immense. Jai Niwas garden was the nucleus of Jaipur city which was founded in 1725. According to the account of *Bhojansar*, "Sawai Jai Singh instructed Vidhyadhar that Jai Niwas should come within the city."

Jai Singh Sawai was inspired by the Mughal pattern of gardens, hence Jaipur gardens were laid out on symmetrical / *Chaharbagh* pattern with central water channels. Babur had introduced this pattern in India. According to this pattern, a square or rectangular area is divided into four quadrants with two axes which comprise water channels and pathways. These water channel, irrigate the gardens under gravitational pressure. The water channels and irrigation system was linked to the four fold plot. While planning Jaipur city number of gardens were laid out for Amber Raja and his nobles. Mentionworthy in this context are *Jai Niwas garden*, *VidhyadharkaBagh*, and *Sisodia Rani KaBagh*. *KarkhanaJamakharchBaghayat* document also provides interesting information about garden of periphery areas as well as Jaipur gardens.

Kapaddwara provides some maps of Jai Niwas garden, these indicate the provision of its luxurious setting having female quarter, dining area, and bath, wells and ponds details are as follows, Map No-276 *Tarah-Jai Niwas-ki* (Plan of Jai Niwas garden). The map shows the full view of the project. Some place names are also mentioned to it for example; *Kothi- Badwali -ki, MotiMahalki, KothiSiblaki, ZananiDeorhi*, length of the

Matiba Mahal-156, *Muratib* length-112 *gaz*, width 22 *gaz*, *Bagh* (garden) length 305 *gaz*, width 258 *gaz*, *Hammam*, *Kuwa* (well), *Sangin howd*, *Bhojansala*, length of *Raj Mahal* -58 and width 26 *gaz*, *Ram Kuwa*, *Shyamkuwa* (well), big *howd* length 88 *gaz*, width 58 *gaz*, *Chabutra* length 112 *gaz*, *Badal Mahal* length 32 *gaz* and width 21 *gaz*, *Talab* (pond) length 288 *gaz*, and width 286 *gaz*.

Techniques of Architecture

Climate was given due importance because of extreme heat of desert region, hence cooling and ventilation was taken into account otherwise it would have been inhabitable. Techniques for cooling palaces and forts by cross ventilations as in *Jaalis*, *jharonkas*, wind tower etc were applied. Shading device were also effectively employed. *Jaalis* (translated literally means window net) were like apertures in walls, made of stone which provided sun, wind and light and facilitated both view and ventilation. *Jaali* helps in lowering the temperature of the wind by compressing the air through holes when air passes through these openings its velocity increases giving a sense of cooling.

Inlets and outlet area in a room/halls are located opposite to each other for cooling effect while other rooms/halls were cooled by chimney effect. The latter is where cool air enters at lower level absorbs heat of room becomes lighter, rises and exits through windows or ventilators at the upper portion.

Building material

Studies on buildings and town planning of Jaipur have always aroused great interest of scholars therefore considerable researches have been conducted on these aspects. However an important aspect, the building material has been overlooked by scholars. *Jamakharchimaratkhanais* a record of such micro level daily entries of multifarious expenses incurred in the building constructions. Similarly *Arhsattaimarti* offer exceptionally comprehensive detail of raw materials used, and expenditure incurred, its construction and renovation.

As far as the building material is concerned bricks (*itha*), stones (*sang*), and woods (*choblakdi*) were the essential ingredients. Bricks are the basic need of buildings. Bricks used in walls were 400- 800 mm thick and this lent a thermal value which allows inherent cooling effect.

Bricks are called *Khista Jur* in Persian. Ain categorizes them into three kinds of bricks (1) *Pukhta* (burnt), (2) *Neem Pukhta* (half burnt) and (3) *Kham* (unburnt, unbaked) There is large quantity of bricks and its expenditure mentioned in *Arhsatta* like unbaked bricks (*Kalib*, *kachchiitha*), used in the construction of Market (*bazaar*) shops (*hatya*).

Tillotson has adequately surmised information about stones and mentions that the palace of Amber is mostly built of the local stone, rendered and painted cream. Though some individual parts of the palace were built of high quality. The *Diwan-i-Am* is built of red sandstone. As far as sand stone is concerned it is made of quartz and other minerals. Because of thermal resistant properties it was suitable for carving and making windows or *jaalis*. *Sang surkh* was extensively used in the structure of Jaipur. The expenditure incurred on *sang surkh* was Rs 3129 for *Jai Niwas Garden*.

Kurand is a white stone or corundum stone. An amount of Rs 6/- was incurred in *Jai Niwas*. Yellow stone (*Pilapaththar*) was used in the *haveli* of Fateh Singh. It is also called *sang zard*. *Sang safaid* (white stone) was used in the construction of *Raj Mahal* and also other buildings for instance Rs 360/- was incurred on it for the structure of *Jai Niwas*.

We have information indicating that woods were brought from neighbouring areas like *Ambli* (*Tamarindus Indica*) and *Nimb* (*Azadirakhta Indica*) were brought from *Sanganer* and *Mohanpur* in 1727 A.D for the construction of *Santoshram Haveli*. *Arhsattaimarti* also refers to types of wood such as the *Babul* and *Gul* (*bassialatifolia*) etc. These were used for making the doors (*kibad*) and *Barsa* (door frame) were procured for the purpose of *hatiya* (shops) of *katla* market. The big and small bamboo stick (*ballibadi*, *ballichhoti*) were used for roofing purposes.

Other building material include iron, cement and plaster products, products of white washing and painting, string and ropes for tying purposes, resins for adhesion of whitewash, paints and pigments for colouring is

exhaustively dealt in records. The document also refers the iron tools which were used in the digging purpose for buildings such as *kusi*, *saklikudal*, *taki*, *khardi*, *cheeni* etc. *Arhsattalmarti* gives information of tiles used in the construction of roofs and states that it was brought in large quantities from neighbouring area like Pohkar.

Good quality of cementing material was used in order to strengthen the construction of the buildings and develop very delicate architecture of that time. *Mithigach* was the mortar for brick laying and plastering is often mentioned in *Arhsattalmarti* Document. It is mostly boiled out of *kangur*, a kind of solid earth resembling stone in hardness. *Mithigach* was used in the repairing of *Jai Mandir* and *Jai Niwas* garden in 1733 A.D.

The information of different stages of finishing for example plastering (*rekhta*), stone work (*sangkari*) and white washing for walls and ceilings (*gajkari*) and the area where they were used in the portion of the buildings are also mentioned in *Arhsattalmarti*. *Chuna* (lime) was extensively used for whitewashing of temples and Havelis. 22540 *man* lime was procured for the purpose.

The colour pigments used for whitewashing purpose were Indigo (*Nili*) which was used in *Gourai Baal Kishan* and *Gokul Nath haveli*. *Multan mitti* clay is a soft saponaceous earth varying in colour, is employed as a pigment colour. There is the example of one *haveli* of *Budh Singh Kumari* in which *Gadimitti* and *nalimitti* were used.

The raw material which were used for paintings and white washing were also mentioned in our documents. *Hirmich* (*geru* or red ochre coloured earth) was also mixed with an improved effect of white washing. *Nousadar* (Ammonium chloride) was frequently mentioned in the documents with raw material of colouring and it was used in the white washing of Jaipur buildings such as *Dila Ram Bagh* and *Jai Niwas garden*.

Ajwain was used with colour or whitewashing for resinous purpose. The expenditure incurred on it according to the *Arshattalmarti* was Rs. 62.50/. It is also used for brilliant colour and lend gloss to the surfaces of the buildings.

Hinglu (Mahogany tree) yields a gum which produce liquid and this was extensively used in the buildings of Jaipur. *Jasat* (zinc pewter), *suhaga* (borax) *tamba* (copper) *jangar* (oxide of copper) and *maida* (fine flour) were used in Jaipur Buildings for renovations and white washing.

The personnel involved in building construction

Imaratkhana (building department) dealt with construction of private and public building. There were officers and master builders under whom building construction was carried out. Apart from advanced knowledge of construction these personnel's were well versed in accountancy. They had to ascertain the number of bricks (*Khist*) required according to the fixed units of measurement, and were aware of the builder's wages (*Me'mar*) as also prices of building materials.

There were number of *ustager* (architect) mentioned in *Arhsatta* like *Dayaram*, *Kushpal Kumar* and *Sitaram Kumar* etc. These men were fairly literate to chart out and follow a blue print (*trah*) of buildings, canals and bazars etc. Literary notes were appended on the map for their convenience. The detailed working chart of these *trahs* confirm that they had considerable knowledge of draftsmanship, engineering and architecture. On the administrative side *Khan samaan* was the highest officer of the *buyutat* and one of his duties to oversee the plans and building belonging to the state. Besides these there were the *darogha* and *Mirimarfat*. There were also other officers under whom the construction carried out such as *asmushrif* (accountant) and *mustaufi* (auditor) etc. The Superintendent (*darogha*) took the raw materials and the unfinished articles from the *tahvildar* and distributed them to the artisans. They kept the records of regular entries of artisans work besides the articles or building material which provided to the artisans for the building construction by them. After completion of the work of artisans, calculations were made of total number of days for its completion and on the basis of their work the wages of artisans were paid.

It is interesting to note that *tahvildar* and *darogha* sent all records to *diwan*, whether it is related to artisan wages and raw material. The wages were distributed under the supervision of *tahvildar* and superintendent

(*darogha*) as we have an example of *MohanramTahvildar* who was responsible for wages distribution in 1738 A.D and *Santoshram* was in 1739 A.D. The name of artisans and also the name of *darogha* and *tahvildar* under whose supervision work has been done was recorded for instance artisans *Shah Pratap Singh and Sahab Bula Ram* had worked under the supervision of *Vijay RamDarogha* and *Vijay Anand Ram* and *Jagramhad* worked under *Shah Sahib Ram Darogha*.

When the construction of building was completed, *tahvildar* and *darogha* kept records of expenditure incurred on the wages of artisans and on the raw material used for a particular buildings. For instance Rs 20.34 was incurred on the wages and Rs 21.8 on raw material for the renovation of *SawaiMahalBarahdari*.

Other officers who are listed in the document like *potdar* and *kotwal*. They also noted down the detail of wages, the number of bricks (*itha*) and tiles (*thokra*) as well as the variety and size of stones and the quantity of other material used for particular dimension. Screens (*jali*) and raised plinth at entrance (*gokha*) were built of sang danau in the haveli.

ArhsattaImarti refers to the various types of artisans (*karigar*), carpenters (*khati*), labourers (*majur*), brick layers (*beldar*) and lime mortar workers (*chunagars*) that are engaged in the construction, repairing, renovations and whitewashing of Jaipur buildings. The daily (*rozinadar*) and monthly wages (*mahinadar*) were paid in cash to the artisans and labourers. They were separately recorded in the document either in the names of individual or sometimes recorded for group of labourers (*majur*).

The system of *dadni* was applied to disburse wages to labourers and artisans. According to this system, the *tehvildars*, who belonged to merchant class provided money to artisans in advance on behalf of the state. Labour class were also paid in advance wages (*dadni*), for instance 18 rupees was paid to 29 men (*nafar*) for carrying the stone. This amount was given under the supervision of *ManohanramDarogha*. The document refers that labourer class were paid in the last 10 days of the month and most appropriately on the 25th day of the month.

The document contains the rich information of expenditure which was incurred on wages for particular buildings and the amount was fixed (*mukarrar*). We have an example of *Haveli of GopaldasRajawat* was repaired and renovation has been done in this haveli. Interestingly, the available document meticulously records the absent days of *Karigars* for example *Ramji* had absented for 1 day out of 27 days so the amount 6 rupees and 7 takka was paid to him for 26 days. The month in which wages were paid also mentioned in the document. The wages of the workers varied according to the nature of their work. The wages had been paid in the form of *rupees* and *taka*. The *khati* (carpenter) was also employed in the construction site. The carpenter's wages were also fixed for example 1.25 rupees were paid to the carpenter of *Veerpur* for 7 days.

II. CONCLUSION

The above investigation indicates that Jaipur did not mushroom into a city because of overcrowding of Amber instead it was meticulously planned, way ahead of time by the visionary Sawai Jai Singh. The idea was generated after in depth inquiries with external inputs from contemporary world and ancient Indian sacred text. One has to consider that immense vision, bulwark power and resources at various levels were invested by Sawai Jai Singh to shape Jaipur into reality. Various maps and plans were charted in detail and they classified the city into many categories like residential area, water resources, markets, main buildings, gardens etc on which it was constructed. Building material, and building personnel etc were inducted from areas far and wide. Topography of the area, rainfall, groundwater runoff was taken into account when water resources for storage and irrigation was planned. Even buildings were planned in such a way that they are properly aerated and stay cool in hot and humid conditions of desert.

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