



Urban Morphology of Eighteenth Century Jaipur

Dissertation

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By

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Certificate

This is to certify that the Dissertation "Urban Morphology of Eighteenth Century Jaipur" by Farhat Kamal is the original research work of the candidate, and is suitable for submission as the partial fulfillment for the award of the Degree of Master of Philosophy in History.

Sumbul Halim Khan

Dr. Sumbul Halim Khan

(Supervisor)



DEDICATED

TO

AMMI AND PAPA

*“Whose blessings have
sustained me through
this work”*



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Farhat Kamal
Farhat kamal

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INTRODUCTION

Morphology is the study of inner structure of towns or cities. The physical form and structure, and the developments add to the understanding of the cities. Knowledge of morphology of urban areas facilitates the understanding of the general characteristics of the town activities. This entails significant elements like the route, plan of housing and also the street system, plot pattern and building fabric within the town.¹

One has to agree that town planning is a modern concept, however some prototype seems to have been followed in medieval times which determined the location of forts, temples, gardens and other public edifices.²

In the context of urban history broadly speaking, one can discern, there are two strands of approach___ firstly that adopted by Francoise Bernier and repeated by Marx in his letters that cities in India were mere military camps. The other approach adopted by Henry Pirenne in the context of Europe giving a more wholesome and comprehensive outlook viz assigning significance to trade, overall development of society, which would include assured water supply by canal network, improvement of horticulture, establishment of gardens etc.³ The latter genre' appears to be applicable in our context.

Commendable research has been pursued on the aspects of Urban History. Nurul Hasan in his pioneering work on the morphology of Shahjahanabad, deals with shrines, monuments, various localities, districts, layout, streets, bazaars, residential houses and chowks. The city of Shahjanabad centered basically round the fort, and the Jama masjid.⁴

Certain morphological features of Shahjahanabad can be in Jaipur state. The peripheral areas were occupied by the serving class. *Rasta* and *Marga* terms

¹ Grewal, Reeta, *Urban Morphology Under Colonial Rule*, eds., Banga, Indu, *The City in Indian history*, Manohar Publication, Delhi, 1991, p. 173.

² Naqvi, Hameeda Khatoon, *Urban Centres and Industries in Upper India, 1556-1803*, Asia Publishing House, Calcutta, 1968, p. 87.

³ Chandra, Satish, *Some Aspects of Urbanization in Medieval India*, eds., Banga, Indu, *The City in Indian history*, op. cit., p. 83-84.

⁴ Hasan, S. Nurul, *The Morphology of a Medieval City: A case study of Shahajahanabad*, eds., Banga, Indu, *The City in Indian history*, op. cit., p. 87.

were used for streets in Jaipur. Even the lanes and streets were named after the occupation of the inhabitants such as *Vidhyadhar ka Rasta*, *Hanumanji Ka rasta*, *Kothyawalo Ka rasta* and *Bara gangaron ka rasta*, *Khajanawalon ka rasta*, *Dinanath ki Gali*, *Gopal ji ka rasta* and *Jailal Munshi ka rasta* etc.⁵ Sawai Jai Singh also adopted names from Shahjahanabad for instance, *Tripolia* (three gates), *Chandni Chowk*, *Ajmeri gate* and *Motikatla*. Our document refer to the main buildings of the city which were completed within seven years and became prosperous.

Another author, Stephen Blake has discussed the cityscape, society and economy of Shahjahanabad.⁶ Raza Ali Khan has conducted an empirical study of Hyderabad city, and he also describes the structures or buildings of the city with its illustrations.⁷

Lewis Mumford opines about the city that- the city as one finds it in history is the point of maximum concentrations for the power and culture of a community. The city is the form and symbol of an integrated social relationships, it is the seat of temple, the market, the hall of justice and the academy of learning. Here in the city the goods of civilization are multiplied.⁸

K. M. Ashraf also makes brief comments on the cities' appearance that the site of a town was carefully chosen as a reason of security, defense and supply of water and roads were connected with the main gates of the city wall, providing main bazaar or shopping centers of the city. Different wings of the bazaars occupied by special classes of tradesman. The city was divided into separate quarters for various social groups on the basis of occupation, caste and race. The leather dressers and scavengers lived on the outskirts of towns and cities. Social differentiation was reflected in the structure and size of the houses.⁹

⁵ Funo, Shuji, et al, *Space Formation of Jaipur City, Rajasthan India, An Analysis on City Maps (1925-28) made by survey of India, Journal of Asian Architecture and building Engineering*, March 2002, p. 267; See also, *History of the Jaipur City*, op. cit., p. 47.

⁶ Blake, Stephen p., *Shahjahnabad The sovereign City in Mughal India 1639-1739*, Cambridge University Press, 1991.

⁷ Khan, Raza Ali, *Hyderabad: A City in History*, Hyderabad, 1986.

⁸ Mumford, Lewis, *Culture of Cities*, London, 1938, p. 3, Cf; Misra, S.C., *Urban History in India: Possibilities and Perspectives*, eds., Banga, Indu, *The City in Indian history*, op. cit., p. 3.

⁹ See, Grewal, J S., *Historical Writing on Urbanisation in Medieval India*, eds., Banga, Indu, *The City in Indian history*, op. cit., pp. 70-71

So far as our area of research is concerned before the foundation of Jaipur city Amber had served as the capital of Kachhwahas. The question arises, as to why the capital was shifted from Amber to Jaipur. The issue can be addressed from various angles such as firstly, on account of its location it is an inaccessible tract of the Aravalli hills. It was unsuitable for further expansion at Amber at the beginning of the 18th century. Secondly administrative and commercial activity was shifted away from the small hill girt valley of Amber. Jaipur, a newly founded city had ample space with adequate drinking water and drainage system. Notably, from the point of view of defence, the location of Jaipur city was most suitable because it was protected by the natural boundary.¹⁰ S.C. Misra also observes that town had emerged because of high density of population concentrated within a limited space.¹¹

Jaipur city was laid out on grid pattern with its streets as a fine example of a well planned city in Northern India and gained prosperity from its earlier time. Urbanization in the Indian subcontinent dates to about 2150 B.C.¹² Mohenjodaro and Harappa cities were also planned in the proto-historic time. The cities featured gridiron patterns, elaborate drainage system, barracks-like blocks of houses and the buildings for shops and crafts.¹³

Sawai Jai Singh had carefully chosen the site of Jaipur as a reason of defence and water supply. Its main roads were connected with the small streets and gates of the city. The Jaipur city's division into wards was in conformity with Hindu caste system which necessitated the segregation of people belonging to different communities. The social planning pattern enumerated in *Arthashastra* that Brahman will live in the north, Kshyatriyas in the east, Vaisya in the south and Sudras, the lower class of the society in the west may be considered to have concrete manifestation in the city of Jaipur.¹⁴

¹⁰ Jain, Shikha, *Princely Terrain- Amber, Jaipur and Shekhawati*, Gurgaon, 2004, p. 47.

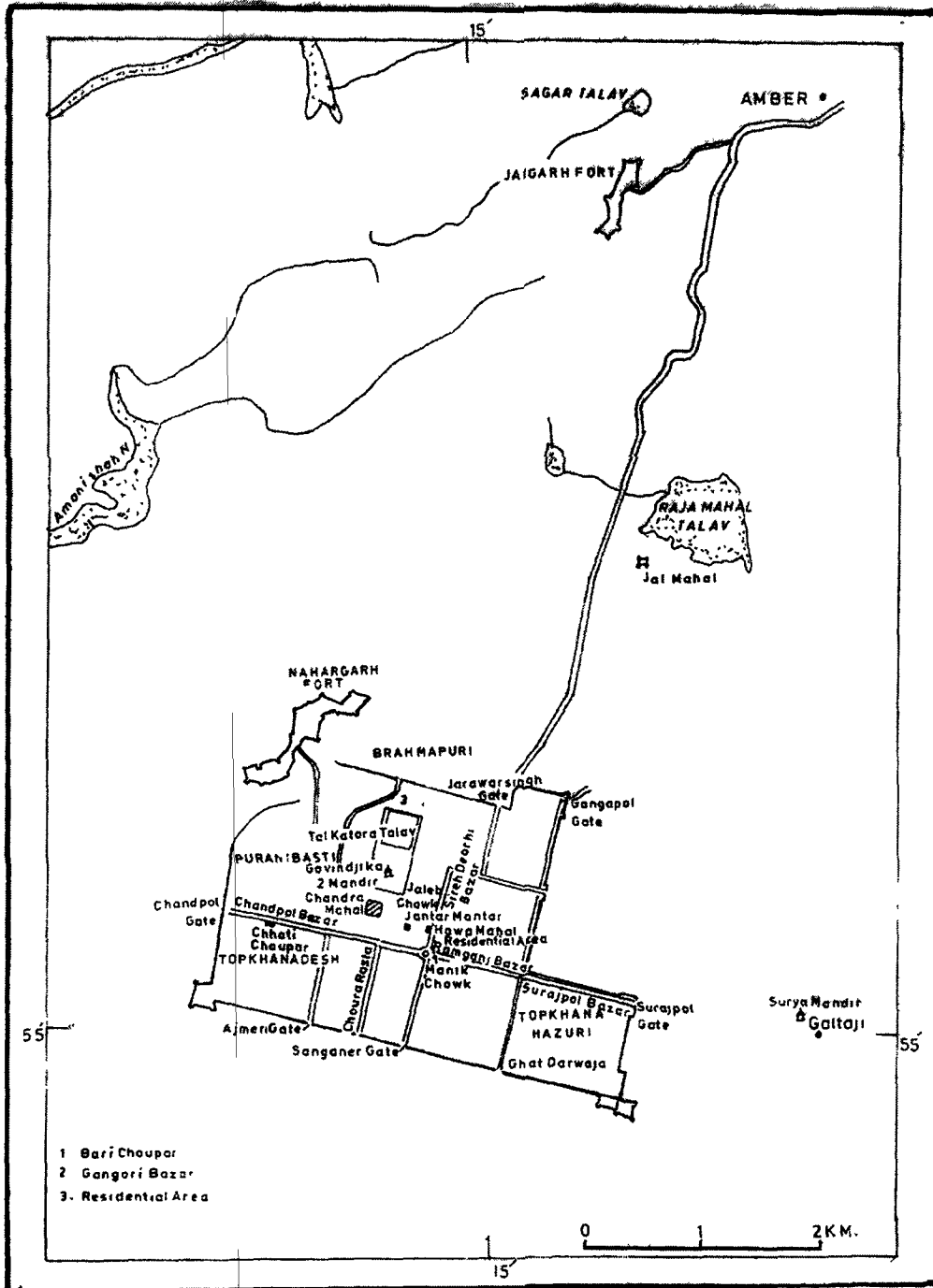
¹¹ *Urban History in India: Possibilities and Perspectives*, op. cit., p. 1.

¹² Bridget and Allchin, Raymond, *The British of Indian Civilization* (Baltimore: Penguin books, 1968, pp. 126-55, 238-311; Cf, *Shahjahnabad The sovereign city in Mughal India 1639-1739*, op. cit., P. 2.

¹³ *Shahjahnabad The sovereign city in Mughal India 1639-1739*, op. cit., p. 3.

¹⁴ *Space Formation of Jaipur City, Rajasthan India, An Analysis on City Maps (1925-28) made by survey of India*, op. cit., p. 266.

PLAN OF JAIPUR CITY



PLAN-A: SOURCE SURVEY OF INDIA

Published under the direction of Dr. Hari Narain, Surveyor General of

India 45 $\frac{N}{13}$, 1970

Sawai Jai Singh (1699-1744) was a renowned scholar statesman of his time; he was determined to build a new town according to a carefully prepared plan. He was also a great patron of mathematics and astronomy and many treatises of great merit were written by several scholars of his court. Jai Singh's love for astronomy is well reflected by constructing the five observatories at Delhi, Jaipur, Ujjain, Mathura and Banaras.

When Sawai Jaipur formally founded, the three structures Chand Mahal (Political Centre), Govind Mahal or Surya Mahal (Religious Centre) and Badal Mahal were complete.¹⁵ This is the groundwork for the planning of the city. The plan of the city also shows the Chandra Mahal and Govind Deva temple in the centre of the city. The Jaipur plan shows that Palace area occupied two blocks and seven blocks known as Purani basti, Topkhana Desh, Modikhana, Vishesverji, Ghat Darwaza, Ramchandra colony and Topkhana Hazuri. Brahmapuri was also the part of the city. Nahargarh and Jaigarh fort are distinctly marked in the plan. The Jaipur plan also clearly indicates the water reservoirs and route which connect the Jaipur with Amber.

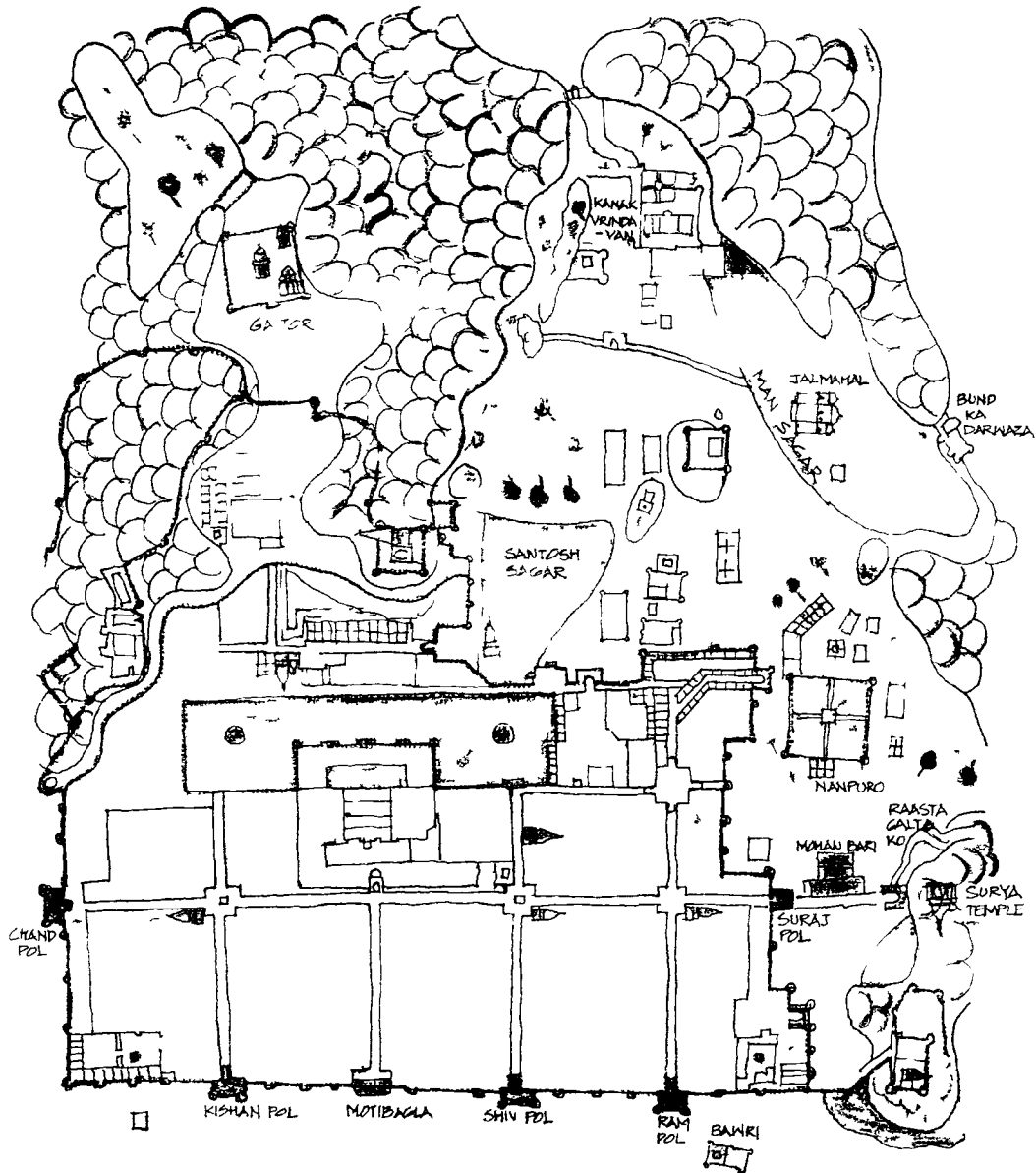
The main builder of the main buildings was the state. It was supposed to be the immediate duty of any ruler to build temples, mosques, fortresses, palaces, caravan sarais, water reservoirs, roads and bridges etc, as well as to construct new town or cities and to rebuild the old one.¹⁶ Sawai Jai Singh had given much attention to build Jaipur city. He constructed temples, palaces, water reservoirs, caravan *sarais* and roads etc. There is earlier map adapted from Susan Gole¹⁷ which clearly indicates the temples with *Shikhars* and water reservoirs like Mansagar dam, Santosh Sagar etc. Mansagar dam was built by Sawai Jai Singh. This map has been dated in the reign of Pratap Singh. In the bottom of the map Surya temple was constructed on the hills by Sawai Jai Singh. The map shows three memorial *Chatris* at Gaitor. However the underlying factors to be noted are the city wall. The map also shows the neighboring areas like Nand Puro and Kanak Vrindavan etc. The town of Jaipur with its straight roads, and squared








¹⁵ *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 115.

¹⁶ Vanina, Eugenia, *Urban Crafts and Craftsmen in Medieval India (Thirteenth-Eighteenth Centuries)*, New Delhi, 2004, p. 61.

¹⁷ Gole, Susan, *Indian maps and plans*, Delhi, 1985, p. 195.

blocks of buildings are depicting in the map. Due to the extreme significance of this map it has been improved and attached here. (see enclosed map)



-  - Temple
-  - Chatri (Gator)
-  - Gate
-  - Hill
-  - Plain Area
-  - Water
-  - Tree

MAP - 1
Adapted from "Indian Maps & Plans"

Lands or site were selected even before the construction of the city. Our document reveals that land was allotted to the prominent persons for the construction of *Havelis*.¹⁸ The residential quarter surrounded by *marga* or streets is thus further divided into lane units.¹⁹

Thousands of workmen were employed in the constructional activities for instance diggers, stones mason, brick layers, clay workers, lattice workers, painters, lime mortar makers, brick burners and carpenters.²⁰ Fortunately, our document provide a glimpse in the colossal constructional activity by furnishing us with intricate details on the workers who were engaged in the constructional activity of Jaipur for instance, carpenters (*khati*), *beldars* (brick layers) and lime mortar makers etc as also the raw material they utilized.²¹

A city might emerge as a fortified residence of a chief or as a pilgrimage place and it was situated on the bank of the river or seaports and trade routes. In case, it failed to emerge as an economic centre --it can be due to lack of fillip trade and industry.²² However, in case of Jaipur, we find that from its beginning it had become a centre of banking and exchange and continued to be so for more than a century.²³

Girdhari in his *Bhojansara* describes its business "Elephants, Arab horses, Camels from Kutch, bullocks and buffaloes are being brought and sold. In this beautiful town built by the Rajadhiraj, embroidered cloth from many countries, plain cloth and jewelry are being transacted. Hundies of lacs and crores of rupees are current here. Thirty two kinds of weights are all used correctly here."²⁴

¹⁸ Bahuria, Gopal Narain and Singh, Chandra Mani, Eds., *Catalogue of Historical Documents in Kapad-Dwara*, Vol. II, Jaipur, 1990, *Maps and Notes* No- 47, 54.

¹⁹ *Space Formation of Jaipur City, Rajasthan India, An Analysis on city Maps (1925-28) made by survey of India*, op. cit., p. 267.

²⁰ *Urban Crafts and Craftsmen in Medieval India (Thirteenth-Eighteenth Centuries)*, op. cit., p. 61.

²¹ *Arhsatta Imarti*, Bundle No, (henceforth, B.N.) 8, 12, 13.

²² *Urban Crafts and Craftsmen in Medieval India (Thirteenth-Eighteenth Centuries)*, op. cit., P. 5.

²³ Roy, A.K., *History of the Jaipur City*, New Delhi, 1978, p. 56.

²⁴ Girdhari, *Bhojanasar*, Preserved in the Bhandarkar Oriental Research Institute, Poona. The relevant portions along with the translation were published by P.K.Gode in his essay "Two contemporary Tributes to Minister Vidhyadhar the Bengali Architect at the court of Sawai Jai Singh of Amber (1699-1744 A.D)" in C. K. Raja presentation Volume, Madras, 1946. This work is written 12 years after the foundation of Jaipur city. Cf., *History of the Jaipur City*, op. cit., pp. 58, 235.

जरीजरवाव पटंबर न्रंबर—जरायकै भूषन बिसाहै
राजाधिराज बसायोसु जैपुर कतं तहां तेषरीदिकै ल्यावे ।।197।।
जैसैं देस देस के न्राय हैं बहु साह ।
लाष करोरि नकीसुरौ हूंडी चलत सुताह ।।199।।
कौऊं कांहते कछु हन नाहक नहीं बोल ।
गिरधारी या सहर मै कस्यो बतीसहितोल ।।201।।

Jaipur city had become famous in India within two decades of its foundation. In 1751, “Some four thousand Marathas had entered the city of Jaipur to see the temples and other sights of this newly built town, unique in India for the regularity and artistic beauty of its construction and to buy horses, camels and saddlery for which Jaipur was famous.”²⁵

The bazaar was a nerve centre of every city. Medieval literary works offer vivid descriptions of urban market areas; a poet would praise the wealth and abundance of the bazaar. Urban centres of Medieval India, big as well as small towns or cities, hosted all kinds of manufactures, like carpet making, jewellery, production of dyes, oils, sugar, scents, soap, all kind of metal, wood, stone, leather works and construction etc.²⁶ The main markets, shops, temples and *havelis* were constructed by the state and uniformity of the buildings was maintained. Our document give ample information of market area and manufacturing of different products for instance, sweet, oil, dye clothes, embroidery and tinsel work etc.²⁷

The population and prosperity of Jaipur emerged at a rapid pace since its foundation. Many rich merchants settled down here in the early years of its growth. They were given some concessions for carrying on business and some remission on the tax levied on goods carried from one place to another place.²⁸ According to a study undertaken by S.P. Gupta printers were shifted to Sawai

²⁵ *History of the Jaipur City* op. cit., p. 56.

²⁶ *Urban Crafts and Craftsmen in Medieval India (Thirteenth-Eighteenth Centuries)* op. cit., p. 6-7.

²⁷ Bakht Ram Shah, *Buddhi Vilasa*, eds, Padma Dhar Pathak, Rajasthan Oriental Research Institute Jodhpur, 1964, pp. 17-19 This work mainly deals with Jaina rituals. It was written in 1770 in Jaipuri dialect. It contains a description of the contemporary Jaipur city.

²⁸ *History of the Jaipur City*, op. cit., pp. 51-52.

Jaipur from Amber. Goldsmiths also came from neighboring areas and they became money lenders in Jaipur.²⁹

Jaipur city soon evolved into an urban centre because the capital of Jaipur was much larger than Amber. The administrative staff and the standing army formed the substantial part of the population. It seems that it was obligatory for all the important *Jagirdars* of the state to build their houses in the city. An order was issued to all *jagirdars* regarding the completion of their residential area. The *jagirdars* were therefore order to submit the payment for the buildings in instalments by sending 10/ of their annual income to Diwan Vidhyadhar.³⁰

The rich merchants came from neighboring areas like Delhi and Agra and built their houses in the Jaipur city. Eighteenth century was a period of decline for Mughal Empire. There were constant attacks on Delhi. Nadir Shah sacked Delhi in 1739, only 12 years after the foundation of Jaipur. Ahmad Shah Abdali looted the India a number of times and sacked the Delhi and Mathura city. Jaipur was not very far from this area and many merchants sought refuge here fleeing from Delhi, Agra and Mathura. Oswals of Jaipur claim that their forefathers had come from Delhi and settled down here.³¹

Towns and cities played a vital role in trade and commerce. Number of roads were kept in good condition by the state for administrative purposes, facilitated these commuting of the traders.³² Trade routes were also shifted to western and north-western India through the Jaipur city in the eighteenth century. Trade flourished because the city itself was a big consuming centre. It also flourished due to favorable circumstances in close vicinity. Earlier there was only one route which passed through Jaipur.³³

The main Mughal routes passed from Agra to Burhanpur through Gwalior and Malwa. The military routes of the Mughal capital to the Deccan passed via

²⁹ Gupta, S.P., *Evidence for Urban Population and its composition from 17th -18th century Rajasthan, Indian History Congress*, Calicut, 1976, p. 181.

³⁰ Sharma, Hanuman, *Nathawaton Ka Itihas*, p. 163; Cf., *History of the Jaipur City*, op. cit., p. 58.

³¹ *History of the Jaipur City*, op. cit., p. 60.

³² *Historical Writing on Urbanisation in Medieval India*, op. cit., eds., Banga, Indu, *The City in Indian history*, op. cit., pp. 70-71.

³³ Boileau, A.H.E., *Personal Narrative of a Tour through the Western States of Rajwara in 1835*, p. 213, 220, 221 and 222. Cf, *History of the Jaipur City*, op. cit., p. 60.

Malwa. The significant route was closed because Maratha raids started on the Mughal Empire through Malwa. Maratha invasion disrupted communication and trade between northern and southern India for three months.³⁴

The route between Gujarat and Agra passed through Pali, Sojat, Ajmer and Jaipur.³⁵ Tod mentions the list of various articles traded in Pali and various clothes and sugars from Jaipur.³⁶

A significant factor which brought Jaipur on the main trade of north-west India was the rise of Sikh power. They made safe conduct difficult in trade routes from Delhi to Lahore which ran through their areas. They regarded highway robbery as their profession. It was the eighteenth century, after the invasion of Nadir Shah that trade shifted southwards through Jaipur.³⁷

Studies on buildings and town planning of Jaipur have been conducted by eminent scholars like History of the Jaipur city by A K Roy. He has discussed the planning pattern of Jaipur, growth of the city, some important secular and religious buildings. He has utilized cursorily, the archival source and his treatment of the entire city is extremely sketchy. Jadunath Sarkar posthumous work was revised and edited by Raghubir Singh. He has consulted some rare original works like Jaipur Pargana Records, Hindi, Sitamau Collection and French scholar Victor Jacquemont's work. His treatment is general in nature but insightful, this work can be treated as the groundwork on Jaipur city.³⁸

Nand kishore Parikh was primarily a Journalist so he adopted the same approach of discussing the visuals of modern buildings as well as old buildings. V.S. Bhatnagar treatment is general in nature. Basically he writes about the political history of Jaipur. Shikha Jain is yet another scholar who discussed the

³⁴ Cf., *History of Jaipur City*, op. cit., p. 61.

³⁵ Tod, James, *Annals and Antiquities of Rajasthan*, First published in London in 1829, Vol. II, London, 1957, p. 128.

³⁶ *Ibid.*, Vol. I, p. 554.

³⁷ *History of the Jaipur City*, op. cit., p. 62.

³⁸ *Ibid.* See also Sarkar, Jadunath, *A History of Jaipur*, eds. Raghubir Singh, Hyderabad, 1984.

planning of Jaipur and has given beautiful visuals of the city. She has divided the book into three sections, 1) before Jaipur, 2) Jaipur, 3) beyond Jaipur.³⁹

Tillotson also gives the description of Jaipur palaces like Chandra Mahal, Hawa Mahal, Badal Mahal, Sisodia Rani Mahal, Diwan-i-Khas, Jal Mahal, Talkatora tank, Jaleb Chowk, Ganesh Pol, Tripolia Bazar, Sireh Deorhi Bazar, five observatories built by Sawai Jai Singh and regularity of its plan.⁴⁰

However in the light of fresh material now extant in form of maps and plans in the *Kapad dwara* collection has unleashed new vistas of investigation on the theme. These maps can be classified into many categories like map of residential area, map of water resources, map of markets, maps of main buildings which were constructed during 18th century. Some map shows houses of prominent persons. *Kapad dwara* also contains the maps of environs and the Darbhavati river. Interestingly these are in maps form and notes attached to it. It reveals the information on town planning and the information related to step by step development and construction of the buildings of Jaipur. This document contains the many drawings, illustrations and plans of Jaipur buildings.

Sawai Jai Singh was aware with the problems; he had to settle for planning his dream city. Tapping of water resources was the focal concern for him. *Kapad dwara* maps show that Jai Singh planned the canal from the Darbhavati river and Banganga river. These maps are the testimony for his concern and the technique of canal construction of that period. Some maps give detail information about the measurement for the proposed construction of a canal. It goes into such details like level of the water is to be kept constant by pillars. The height of these pillars (*paya*) varying from four to eight. One can easily estimate the depth of water from these pillars.⁴¹

³⁹ Parikh, Nand Kishore, *Rajdarbar and Raniwas*, Rajasthan Patrika, Jaipur. Bhatnagar, V.S., *Life and times of Sawai Jai Singh*, Delhi, 1974. *Princely Terrain- Amber Jaipur and Shekhawati*, op. cit.,

⁴⁰ Tillotson, G.H.R., *The Rajput Palaces 'The Development of an Architectural Style*, Singh, Chandramani, *Protected monuments of Rajasthan*, Jaipur, 2004.

⁴¹ *Kapad-dwara*, Map and Notes No- 312.

Historians were ignorant of Darbhavati River. But *Kapad dwara* reveals its running course, for instance this river flows from the Saiswara gate which was highlighted in recent research.⁴² Our information endorses the latter view.⁴³

Besides the *Kapad dwara* document other Rajasthani sources like *Buddhi Vilasa* by Bakhat Ram Shah, *Ishvarvilasa* by Krishna Bhatt (court poet of Ishvari Singh), *Sawai Jai Singh Charitra* by Atmanram and Girdhari's *bhojansara* (composed twelve years after the foundation of Jaipur city by the court poet of Jai Singh) utilized in this dissertation. These documents give information of buildings and architect of Jaipur.

Unfortunately, two most important source of Jaipur city have been completely ignored by the historians viz *Arhsatta Imarti* and *Baghayat Kharch* document. In the present dissertation I have culled unique details on raw material and wages from *Arhsatta Imarti* document. The *Arhsattas* are very useful revenue records. It was compiled from the daily entries. *Arhsatta Imarti* is in the nature of statistical data of expenditure incurred on buildings. Fortunately, *Arhsatta Imarti* preserved in Rajasthan state Archives, provides exhaustive details on the raw material, used in construction, repairing, whitewashing and renovations of Jaipur buildings and also contains information about wages of the workers.

Another rare document *Baghayat Kharch* provides details of Jaipur gardens like orchard (*Bostan*) and *Gulistan* garden. The document contains information about the maintenance of gardens and its expenditure. The document provides information on name of *Mali* (gardener) and their wages. This document is so comprehensive in details that it supplies details on furnace (*Bhatti*) which was designed for extracting the perfumes of different flowers and rose water (*Gulab Jal*). This document is also preserved in Rajasthan state Archives Bikaner.

⁴² Khan, Sumbul Halim, *Planning the Pink City*, Maps and Documents, *Indica*, 1998, p. 33.

⁴³ *Kapad-Dwara*, Map and Notes no- 116.

CHAPTER-1

Geography and Water

Resources of Jaipur

City

This chapter is an attempt to highlight the geography of Jaipur city. Scarcity of water was borne in mind while planning the Jaipur city. We are fortunate enough to possess the *Kapad dwara* documents as a valuable source of information. *Kapad dwara* is the 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 maps plans and notes are in Persian and Rajasthani language. It reveals that Jai Singh Sawai conducted systematic planning for water harvesting while planning the Jaipur city.¹ As the subsequent details would indicate that water resources were studied carefully before tapping it for the city. Interestingly these ventures were properly chalked out as well as documented. Projects on Hydraulic technology are still intrigued by the efficiency of these surviving marvels.

Jaipur city is located between 26° 43' and 28° 30' north latitude and between 74° 60' and 77° 18' east longitude. The total area of the region was 16260 Sq Km.² Jaipur is criss-crossed by the hill ranges, isolated peaks and raised table land. Most part of the eastern Rajasthan is open and leveled. If one minutely observes the geography of eastern Rajasthan especially the Jaipur city, one comes across a complex physiography.³

Looking at the physiography of Rajasthan, it had the most varied and diverse physical features. In this region we see lofty mountains, shifting sand-dunes, fertile plain and forest in the land of scorching heat, freezing cold.⁴

The region of the Jaipur city lies in the eastern part of Rajasthan, it has unique features, the centre is an elevated table land of triangular form 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

¹ *Kapad-Dwara*, op. cit., p. 11.

² Shyamal Das, Kaviraj, *Vir Vinod*, Vol. II, Reprint, Delhi, 1986, p. 1246.

³ Sharma, H. S., Sharma M. L. and Bhalla, L. R., *Rajasthan A Unique State*, Ajmer, First Edition, 1992-93, p. 14.

⁴ *Ibid.*, p. 14.

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.⁵ 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.⁶

When one looks at the base of the central plateau of the Jaipur city, the region gradually slopes to the south-east towards the Banas River, there are only some hills seen above the plain. But at some distance or extreme south the hill ranges reappear, and where the Banas river have passed itself through the range, near the Raj Mahal, the scenery is very beautiful.⁷ The city rises gradually towards the Kishangarh border in the western side and consists of broad open plains area and the wide fields have fragments of hillock.⁸

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.⁹

There was a varied kind of crops production. The crops were grown according to the fertility of the soil. In Shekhawati, which is located on-side, mainly two kinds of crops were grown like *mung* and *bajra*. In the northern part of Jaipur city Bajra, wheat and *Jawar* were cultivated. Towards south-east, *Jawar*, corn, cotton, maize, wheat, sesame (*til*), barley, sugarcane, indigo, tobacco, and Linseed

⁵ *Vir Vinod*, op. cit., p. 1246.

⁶ *Ibid.*, p. 1246.

⁷ *Ibid.*, p. 1247.

⁸ *Ibid.*, pp. 1246-47.

⁹ *Ibid.*, P. 1247.

were cultivated because of black or a rich alluvial loam. Water melon was also sown in the sand dunes of streams. There were green vegetables cultivated in the east viz, *Lady Finger, Onion, Brinjal, Soya, and Cucumber*.¹⁰

Crop production of Jaipur included *Bajra, Jawar, Moth, Urd, Mung, Sesame* and *Chola* are *Kharif* crops and Barley Wheat and Gram are the rabi crops. Sugarcane, Cotton and *Makka* were the crops grown in large areas of Jaipur. Recent researches indicate the increase of revenue in conformity with the production of wheat.¹¹

Jaipur has no big forest. There are few valuable trees for instance, *Babul* (Acacia), *Jamun* (syzygium cumini), *pipal* (Ficus religiosa), *Nimb* (Azadirakhta), *Timber, Dhak* (Butea monosperma) and *Imli* (tamarind) in Jaipur. However, in Shekhawati two types of trees were found like *Khejri* (prosopis spicigera) and *Siris* (Albizzia labbek).¹²

Sawai Jaipur previously occupied the new *qasba* known as *Chhap Ki Bawri* alias Jai Niwas. It became afterwards became the seat of the Amber ruler in 1727. Sawai Jaipur covered the area Amber, Tappa haveli, Khoh, Kakkarh, Ramgarh, Hastera (Astera), Chandwajji, Jaitpur and Shahpur.¹³

Kapad dwara graphically outlines the area from Jaipur to Manoharpur. The significant landmarks are stated thus Nibaru, Jaisa-ko-Nagal, Harnathpur, Jhotwara, Parsarampur, Jhowtwara dam, Sawai Jaisagar, Kishan bagh, Kishanbas, Harmada, Badharan, Nidar, Benar, Khori, Sirano, Basri, Babri, Ramla walo, Udaipur, Akheda, Papri, Jaam doli, Nagal Narayan, Dolatpur, Bishangarh, Sisyawas, Sindpur, Kotro, Khair hadi, Vadwari, Sindwano, Place of Bhagwandas, Kukas, Bhowgarh Budhano, Toda Meena, Basno samrair, Chainpur, Charanwas, Dantal, Baanya walo, Achrol,

¹⁰ *Ibid.*, p. 1252.

¹¹ *Arhsatta Pargana Sawai Jaipur*, Rajasthan State Archives, Bikaner, Cf; Gupta, S. P., *The Agrarian System of Eastern Rajasthan*, (c.1650- c. 1750), Delhi, 1986, pp. 51, 60.

¹² *Vir Vinod*, op. cit., p. 1252.

¹³ *Arhsatta Pargana Sawai Jaipur*, V.S. 1786/ 1729, Rajasthan State Archives, Bikaner, A parwana of Zafar Quli Khan, dated Zialqad 15 Regnal Year/28 April 1733 orders the use of Name Sawai Jaipur in Imperial Records also. Cf; *The Agrarian System of Eastern Rajasthan*, op. cit., p. 36.

Anhi, Argahi, Dheegpur, Lawano, Jaitpur, Purohit Temple (*dehro*), Tala peer, Chandarwaji, Manjipur, Salair, Ruhado, Sirohi, Rodal, Bilpur, Macheri, Manpur ghatwari, Bilochi, Kali Ghati, Bhimpur, Pohkarya walo, Chitohari, Samod, Mahar, Gholi, Chhoti Amlodi, Way (gailo) towards Ajmer, Raherawas, Govindpur, Chacheri, Chokrawas, Mamarkho, Harbolyo, Amarsar, Andmari, and Morija.¹⁴

Susan Gole gives the concentric map, which clearly demarcates the area of Jaipur city directionwise such as, Ragnath garh, Bagai ka garh, Baksakho garh and Madhav garh in the east, Sudarshangarh, Jhotwara, Kalgarh in the western side, Achrol, Amber and Jaigarh in the north, Sankargarh and Chandoli in the south, Ambagarh, Jhalana, Ghat-ka-Naka, Vataka, Shivdaspura, and Sambharna in the south-east, Lavangarh, Guwaligarh and Junmarigarh in the north east, Nandar, Chomu and Morinja in the north-west and Hathroi and Auti Bagru in the south-west of Jaipur city. The map is partial translation of an earlier revenue map of Jaipur.¹⁵

According to the *Tehsil* records, the site of the Jaipur city was covered by the six villages viz, Nahargarh, Talkatora, Santosh sagar, Moti katla, Galta ji and Kishanpol.¹⁶

Water Resources:-

Rajasthan being a semi-arid area, there is scarcity of water due to less rainfall. The natural source of water is rainfall. 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.

Shyamal Das in 19th Century observes that the annual rainfall of the state averages a little less than 26 inches. In Jaipur water is seen at different levels in the soil. At some places water is seen only by digging some 30-40 feet in the soil

¹⁴ *Kapad-Dwara, Map and Notes No-244.*

¹⁵ *Indian Maps and Plans, op. cit., p. 53.*

¹⁶ *Tehsil Records of Jaipur, Cf., History of the Jaipur City, op. cit., 1978, p. 45.*

between the Jaipur and Shekhawati towards southern portion, while mainly at Shekhawati, it is found at a great depth of 90-100 feet below the surface of earth. Water is mostly salty in this region except for the south-east where water is sweet.¹⁷

The natural resources for water supply of the Jaipur city according to *Kapad-dwara* documents were Banganga, Banas, Darbhavati, Bandi and Badodiya rivers.

Banganga River ran from the north and the south near Ramgarh and entered into the hilly tracts region of Jaipur state.¹⁸ *Tarah Banganga ki*. The river course consisted of stream (*nallo*) of Durheda, Stream of Sahiwal, River Dhund, Indragarh, Palhado, stream (*nallo*) of Narpatyawas, Nangal of Malha, Dangarbado, Nagdiwas, River Sunkh, Malpuryo, Sumel, Kuthanedo, Rahori, Rupwas Bamanwas, temple (*dehro*) of Natni, hillock (*dungri*) of Sahuwas.¹⁹

Banas- River Banas flow a long course in the city of Jaipur. Flowing through the hills of Aravalli range at Semel and from the north-east of Udaipur enters into Jaipur at the place of Deval at the distance of 100 miles.²⁰

Gambhiri- It passed through the hills from Hindaun, enters into the north-east of Jaipur and it runs 25 miles in Jaipur city, then enters into Baharatpur. It meets with Banganga at Rupwas and moves ahead.²¹

Amani Shah Nala- It starts from the northern side of Jaipur city. Water was diverted into tank (*howd*) through the channels.²²

Besides the above rivers water was also diverted towards Jaipur by Sabi, Katli, Dhund Khari and Meetha. Morel and Mashri are the tributary rivers of Banganga.²³

¹⁷ *Vir Vinod*, op. cit., p. 1251.

¹⁸ *Ibid.*, p. 1248.

¹⁹ *Kapad-Dwara*, Map and Notes No-128.

²⁰ *Vir Vinod*, op. cit., p. 1248.

²¹ *Ibid.*, p. 1249.

²² *Ibid.*

²³ *Ibid.*, p. 1250.

Interestingly enough Darbhavati River is not acknowledged in *Atlas of the Mughal Empire*. It was later brought to notice in a study of Jaipur city.²⁴ *Kapad dwara* maps indicate the running course of its river which is as follows, "Tarah Darbhavati Ki" (Plan show the route of Darbhavati river). Darbhavati river flows from the Saiswara gate and there were sand dunes due to which the water can be drawn by two *charas*, this water gets dry during the month of March (*chaitra*). Water from Bhavsagar is brought from the Pali river and its length 17000 gaz, places which touched the water course are listed as Home of Ascetics (*Jogi Ko Asrag*), Bishangarh, Udaipuryo, Gangarampuro, Akhailpuryo, Lunyawas, Nagal-Narain-Ko, Chouri-Ka-Bas, Raja Rampuro. Similarly water flowed into Bandi river by ten *charas* (water lifting device) and also canal starts. The area which benefited was Rajwas, seat of Ramchelas, Har Ramayan-Ko-bas, Chouki of Budharan, Nindar, Nagal-Sirasra-Ko and Govindpur.²⁵

Ishwar Vilas Mahakavya identified Darbhavati river with Bandi river.²⁶ It has been observed that water was not tapped to the city from Bandi river but from the Amani Shah *nala*.²⁷

The system of water supply was always given prime importance for the growth of city. Human efforts developed the building of tanks, artificial reservoirs, wells, stepwells, dams and canals to conserve the scanty water of the region and this water was used for irrigation as well as for domestic purposes. Water is primary need and most important in desert area like Rajasthan and it is also important for agro-economic growth. This need -was fulfilled by rivers, tanks, *howd*, pond (*talab*), well (*Kuan*) and rivulet (*nala*).²⁸ The maps reveal that many water bodies were constructed for

²⁴ *Planning the Pink City*, op. cit., p. 33.

²⁵ *Kapad-Dwara*, Map and Notes No-116.

²⁶ Bhatt, Sri Krishna, *Ishvaravilasa Mahakavya*, p. 133, This work is in Sanskrit language written by the court poet of Ishvari Singh (1743-1750) in about 1749. It describes Jaipur during the time of Sawai Jai Singh and Ishvari Singh. This book was published by Rajasthan Oriental Research Institute Jaipur, 1958.

²⁷ *Nathawato Ka Itihas*, op. cit., p. 166., Cf., *History of Jaipur City*, op. cit., p. 142.

²⁸ Khan, Sumbul Halim, *Agrarian Landscape of a Mughal Pargana, Stydying Udehi from Taqsim, Sufis Sultans and Feudal Orders*, eds. Mansura Haider, New Delhi, 2004, p. 175.

preservation of water for Jaipur like, Jal Mahal, Bishan Sagar and Bhagwant Sagar.²⁹

Canals:-

Canal is a water way or channel that is built for irrigation, drainage and water supply. The first Delhi Sultan who constructed many canal was Firoz Shah Tughlaq he was a pioneer in the history of canal irrigation. He built the canals from the river of Jamuna and Sutlaj for the city of Hissar.³⁰

Water management was taken up so seriously that as many as ten canals were planned. Sawai Jai Singh planned the canals from the river of Darbhavati and Banganga. One can gauge his concern and also the technique of canal construction of that period. The related maps reveal that entire route was surveyed and plans prepared showing the depth of water and the height of the pillars (*paya*). The details of these ten canals are mentioned thus in the text of the map.

"*Tarah Banganga Ki Nahri Ki*" (Plan of a canal from Banganga in the first quarter of 18th century). A canal originated from the Banganga river. Water ran from the Bishanpur, Ramgarh and *Jogi Ko Asrag*. The length from mound at Ramgarh to Dhund 6800 *gaz* and height was 45 *gaz*, water route touched Narpatyawas, village Hirawalo, slope (*dhal*) was 9 *gaz*, Naradpuro, Bhatiya wall gate (*Kot darwaza*), length was 1400 *gaz* and slope (*dhal*) was 4 *gaz*. Pitambar bohra Ki baoli, place of Kalyandas, Motiya Kot (From Mud wall to big gate length was 1650 *gaz*), slope was 19 *gaz* from big gate to opening (*Mori*) for Jaisagar, the length was 1480 *gaz* and slope was 19 *gaz*, Raised edge (*Pali*) of Jai Sagar Ki.³¹ Map No. 28 "*Tarah Banganga Ke Nanka Ki*". Sawai Jai Singh also brought a canal from the Banganga river in the second quarter of 18th century. The content of the map are extremely significant. The text in Devnagri script entails measurements of structure to be constructed,

²⁹ *Kapad- Dwara, Maps and Notes Nos-198, 111, 245.*

³⁰ *Mate, M.S., A History of Water Management and Hydraulic Technology in India (1500 Be to 1800 AD), Delhi, 1998, pp. 45-46.*

³¹ *Kapad-Dwara, Map and Notes No-130.*

names of villages and important landmarks on the route are stated, and thus “the gate near Swami Pemdās Atala the height of the pillar was 17 *gaz*. The small gate of the fortified wall of Amber near it was the village Ladipura, The height of the pillar was 8 *gaz*, 6 *gīrah*, Devi Banki Ki temple, Balerh, Lalhato, Mathasula, Rajsar, Rajsar mound was 10 *gaz*, Sambhar small (*Chhoti*), Sambhar big (*Barhi*) Dev blehra, Bhuvavas, Anuppuro, Akhalya-walo, Bas of Bananvas. The bank (*ghat*) was 50 *gaz*. Temple of Devji, Bas, passage to Guni (*Guni Gela*) was 1440 *gaz*, hillock of Salhad (*Salhadi Ki dungri*), dam of Selhadi (*Bandh Salhadi*), track to hillock (*dungri gela*) was 17 *gaz*, height was 6 *gaz* Bandho Medhola *gaz* 50, rivulet (*nalo*) Narpatyawas was 50 *gaz*, height 4 *gaz*, Rampura, Indargarh, Sahiwal, Nangal, from here *chhota darwaza* of *pansal* opened. The pillar (*Paya*) has depth of 461 *gaz* and 1 *gīrah*.” The other pillar was 8 *gaz* and 13 *gīrah* deep, from this pillar of small gate the *pansal* was directed towards Mansagar which was 2 1/2 *gaz* deep. The kalyanpura, khori, the embankment (*kagva*) was 13 *gaz* high, near the Pemdās Atala and near the village like Charanwas, Shyampuro, Manjipuro, A *talab* was constructed in front of Banganga river.³²

Regarding canal from Darbhavati the text says, this map shows that the canal was derived from Darbhavati, its length was 60 *gaz*, width was 15 *gaz* and height was 8 *gaz*. Water runs into Jhotwara and the nearby village from this canal. By means of thirty *charas* water was drawn into villages. Ten *charas* were utilized to draw water into Jai Niwas Garden. This map clearly shows that it was intended for cultivation and irrigation. When water overflowed into rivulet, it flowed into Sanganer and touched some places such as Rampuro, Gopalpuro, Bhojpuro, Bas of Meranga. Sikarbadi, Kotarpuro, Dehoi and Sodhawalo.³³ Other maps also indicate the plan of canals from the river of Dharbhavati. These canals were made or planned during the reign of Sawai Jai Singh (1699-1743). A Map supplies the name of the villages, which were fed by the canal like, Nidar Parsrampuro,

³² *Ibid.*, Map and Notes No-28.

³³ *Ibid.*, Map and Notes No-232.

Jhowtbado, Machedo, harmado and Budhan. This canal ran towards Bishan Sagar and its water touched places such as *Kukad Ko Math*, Kubhonad, Jaisalyo, Kishan *bagh*. Water came into Mansagar via *choti ki nahar*, the river and other canal. Another Map also gives the name of villages and measurements. Samarpura dam upto Badal Mahal Ko plinth (*daso*) depth was 43 *gaz*.475 feet (*foot*), Bishangarh, Samarpura water upto Madia tank height 11 *gaz* 325 foot. Sutnarpura dam water upto well of Jaisalya height 18 *gaz*, 425 foot, Akaida, Nidar, Harmado, Budhan, Samarpura water up to the raised edge (*pali*) of Bhavsagar depth 23 *gaz*, 275 feet (*foot*) was Bishangarh, Akhailpuryo, Bhathi, Lunyawas, Udaipur, Big village (*Bado Gaoun*), Gangarampuro, Baddarpur, Pokharyawalo, Isarwalo and Bilochi.³⁴

Yet another map shows that a canal came from Jhotwara, north-west of Jaipur in the second quarter of 18th century. These maps show the depth of Jhotwara canal. There are 18 pillars (*paya*). Height of each pillar is given in the map. The height of these pillars varies from 6 to 8 *gaz*.³⁵

A map was entitled "*Tarah Nahri Brahmapuri wa talab Jagannath Sagar Ki*". The descriptions contained in the notes are stated thus "a canal was constructed in Brahmapuri near Jagannath guru place". It was prepared in the second quarter of 18th century. It was named Jagannath Sagar after the name of Samrat Jagannath, *Guru* of Sawai Jai Singh.³⁶

Kapad dwara document also entail a canal was especially constructed for the Gardens (*bagh*) entitled "*Nahri Bagh Ke Baste*". The map shows the work was in progress. The canal catered to prominent gardens these are graphically detailed in this map as follows, *Bagh* of Purohit Gangaram, *Bagh* of Samratji, Garden of Malji, Garden of Malukpuri, Garden of Naulakha, Garden of Chandraphul, Garden of Prahlad Das, Garden of Narad Purohit, Well of Ansar (*Ansar Kunaw*), Garden of Brajbhushan Swami, Nand Garden,

³⁴ *Ibid.*, Maps and Notes No- 300, 301.

³⁵ *Ibid.*, Maps and Notes No-119, 312

³⁶ *Ibid.*, Map and Notes No- 249.

Garden of Bandarji.³⁷

A canal was constructed for Jainiwas Garden in the second quarter of 18th century entitled "*Tarah Nahri Bagh Jainiwas me Awai*". Water flowed from the canal into some prominent places such as Minawalo-Ka-bas, Bhawani Shankarpura, Bhojhpuyo, Kolanar, Harsarpuro.³⁸

Kapad dwara also indicates that a canal was constructed to carry the water in Jai Sagar which is entitled as "*Tarah Mori Sawai Jaisagar Ki*" implying a narrow canal of Sawai Jaisagar. The water of the canal touched the Burj and Sawai Jaisagar.³⁹

Sawai Jai Singh had planned many reservoirs. There are some maps pertaining to the area of Jaipur fed by new water reservoir construction. Its water runs through the villages like Jotwara, Parshurampur, *Kukar ko Math*, Nidar, Machhero, Harmara ki *Ghati*. A dam was constructed here (*athe bandhe bandhelo*), Vasi, Jai Salio, Papri, Ramalia Walo, Narayan ko Nagal, Chetawalo, Badanpuro, Khora, Choop, Pokhar walo, Isarwalo, Samarpuro, Bilochi, Vadaipur, Sibapuro, Daultipuro, Khaivari, Kushalpur, Samot, Mahar, Akhera, Akheypur, Bisangarh, Vaas, Bhati, Sidpur, Bhaosagar. At Samarpuro the depth of water (*teer pani*) is 17.50 gaz. The new pond between Bhati and Sidpur, has raised plinth of 22.50 gaz.⁴⁰ The other maps of *Kapad dwara* indicate the water reservoirs and hills range.⁴¹

The map illustrates villages situated on the course of the canal water from Darbhavati river and these villages were as follows viz, Harsharampur, Sawai Jaisingh pura, Bas basaipura, Salhawas, Kiranjali and Jwotwara. Measurement

³⁷ *Ibid.*, Map and Notes No- 107.

³⁸ *Ibid.*, Map and Notes No-112.

³⁹ *Ibid.*, Map and Notes No- 61.

⁴⁰ *Ibid.*, Map and Notes No-250.

⁴¹ *Ibid.*, Map and plan No- 239.

was made in *dori* and yards. The map contains depth of water and progress report.⁴²

A map in *Kapad dwara* is entitled “*Nahri-Ke-Naka-Ki*”. The map seems to have been prepared at the time of the foundation of Jaipur city and it indicates that the work is in progress upto Zorawar Singh place. Shyam Singh Rajawat wants a plot here for residence, for which order is solicited.⁴³

Lakes:-

Three significant lakes need to be mentioned here Viz Talkatora Lake, Lake Sagar and Maota lake. Maota Lake was located near the palace complex of Amber. *Buddhi Vilas* an 18th century account and *Sawai Jai Singh Charit* contains interesting information of Talkatora Lake and also other water reservoirs.⁴⁴ According to Vir Vinod, Sambhar Lake was also the main source of water supply.⁴⁵

Talkatora Lake was located in the north of the palace area. Another lake popularly called Raj-mal-ka *talab*, is located just east of Talkatora lake.⁴⁶ Nand Kishore Pareek informs us about the existence of Rajmal ka talab and Talkatora Lake prior to the foundation of Jaipur City. Even today we find *Rajmal ka talab* is available for the public use. It is called '*Jaisagar*' in contemporary accounts, however in popular parlance it is termed *Rajmal ka talab*, since it was near the palace of significant official of Sawai Jai Singh minister whose name was Rajmal. Water was tapped into *Raj Mal ka talab* from the Northern area and Nahargarh hills. When water overflowed, it ran 'into the pond (*talab*) of *Jal Mahal* from the western side of Madhovilas.⁴⁷

⁴² *Ibid.*, Map and Note No- 234.

⁴³ *Ibid.*, Map and Note No- 133.

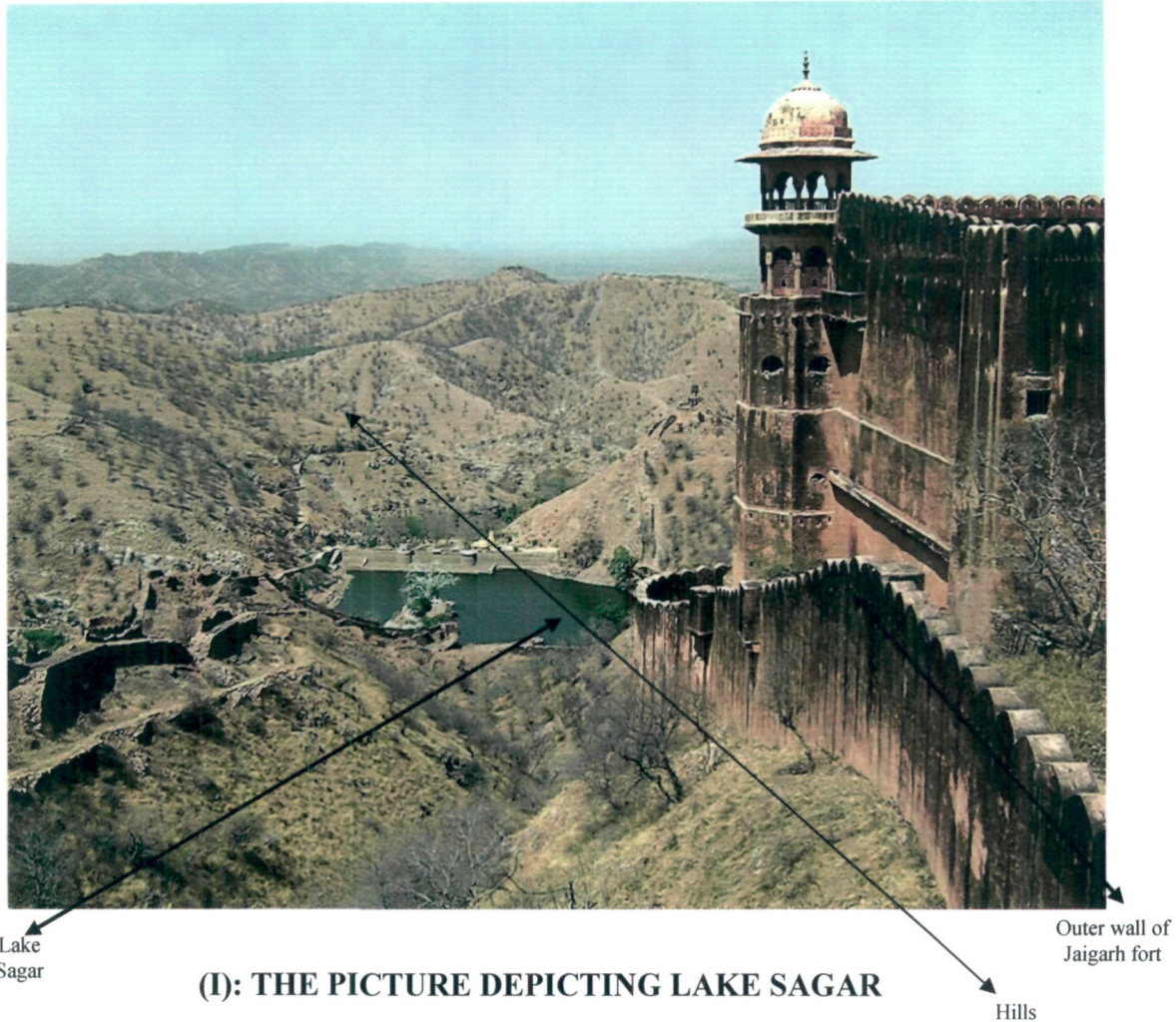
⁴⁴ *Buddhi Vilasa*, op. cit., p. 22., Kavi, Atmaram, *Sawai Jai Singh Charit*, Eds. Bhura, Gopal Narayan, p. 80. This work contain excellent account of Sawai Jai Singh. The manuscript was preserved in Maharaja Sawai Man Singh Museum, City Palace. Jaipur.

⁴⁵ *Vir Vinod*, op. cit., p. 1250.

⁴⁶ *History of the Jaipur City*, op. cit., p. 46.

⁴⁷ *Rajdarbar and Raniwas*, op. cit., p. 136.

The famous 'Lake Sagar' was the main source of water supply in the Jaigarh Fort. This lake was divided into two parts by means of Pucca dam. Rain water was collected in them and rain water entered from the slope of the southern hills and the western hills.

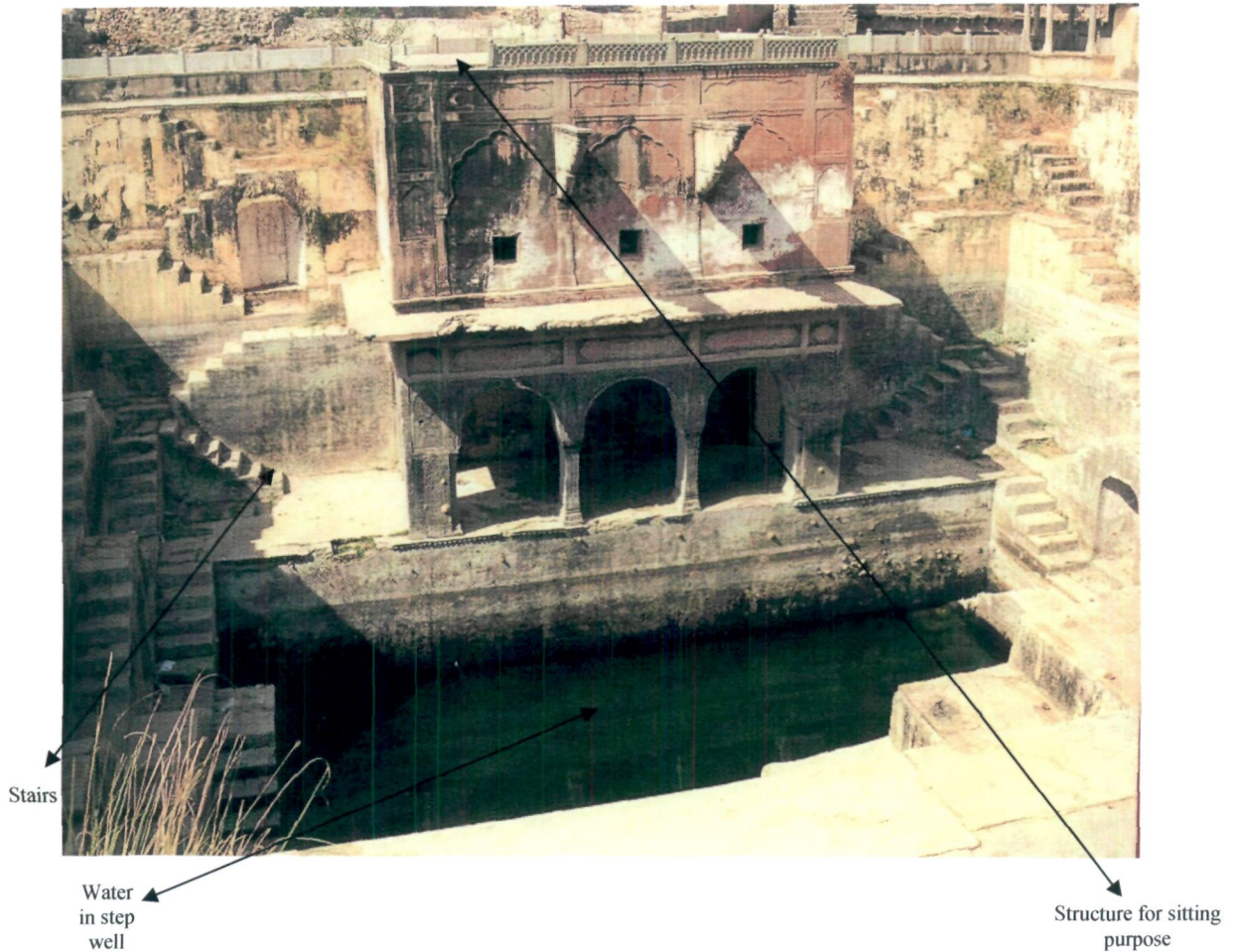


Wells and Step wells:-

Wells were used from the Harappan times as a source of fresh water.⁴⁸ Amber has numerous tanks, reservoirs and step well. Panna Mian Ka Kund is the significant water reservoirs or *baoli* in Amber. It has steps from three sides. Water may be easily accessed from these steps. There are platform provided for seating

⁴⁸ *A History of Water Management and Hydraulic Technology in India (1500 BC to 1800 AD)*, op. cit., p. 95.

purpose.⁴⁹ This was built by Mian Panna, who was in the service of Bishan Singh and Sawai Jai Singh.⁵⁰



(II): Photo depicting how dried up Panna Mian Ka kund or baoli
Adapted from “*Princely Terrain-Amber, Jaipur and Shekhawati*”.

⁴⁹ *Princely Terrain-Amber Jaipur and Shekhawati* , op. cit., pp. 80-81.

⁵⁰ *Ibid.*, p. 45.



Stairs

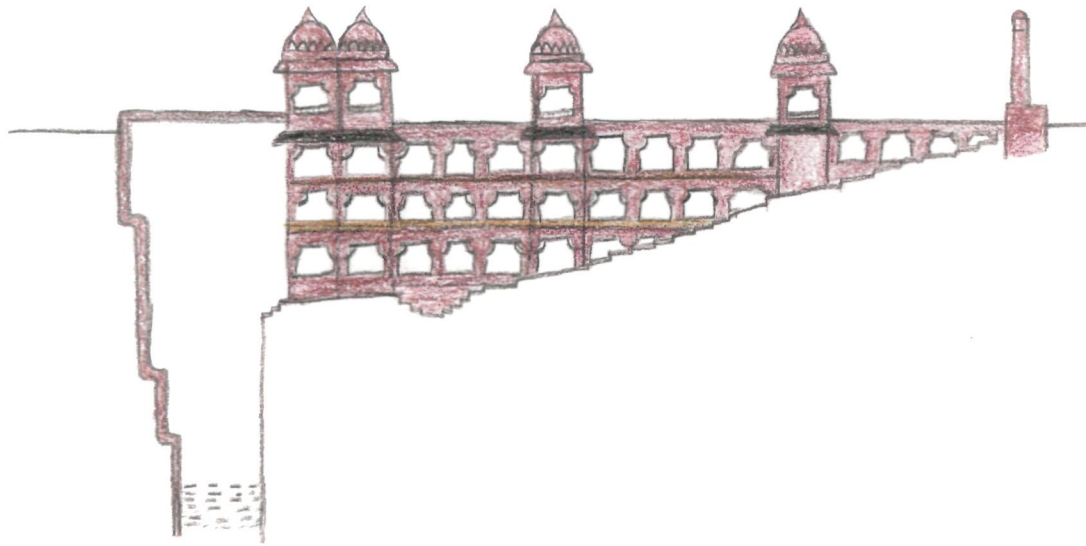
Grooves

(III): Stairs of *Panna Mian Boali*

Adapted from “*Princely Terrain – Amber, Jaipur & Shekhawati*”

Wells and step wells were constructed at a place where a constant flow of water is available. There were many step wells constructed in Rajasthan. Some baolis or step wells have pillars, statues of animals and deities. It was also used for protection of summer heat.⁵¹ Grooves were made in the step wells for fitting the *Pulley*.

⁵¹ *Ibid.*, p. 80.



Plan B: Elevation Section- Typical step-well- Line drawing

Adapted from “A History of water management and hydraulic technology in India.”

Kapad-dwara contains information of wells and *Nala* (rivulet) which were constructed to carry the water to Jaipur. Water of wells (*kuwa*) was mostly used for drinking purpose.⁵² There is information pertaining to wells viz, *Shyam Kuwa*, *Ram Kuwa*. *Kapad dwara* document reveals that a well (*kuwa*) was connected with the hammam of Raj Mahal.⁵³

A significant map is mentioned in *Kapad dwara* which pertains to the area of Galta, *babdi*. A well is also depicted in this map.⁵⁴

Tanks:-

Tank construction was considered to be a virtuous deed (*Punya Karma*). Tanks had to be made to accumulate water received during the rainy season. It

⁵² Singh, Y. D., *Rajasthan Ke Kuen Evam Bavadiyan*, Jodhpur, 2002, p. 312.

⁵³ *Kapad-Dwara*, Map and Notes No- 276.

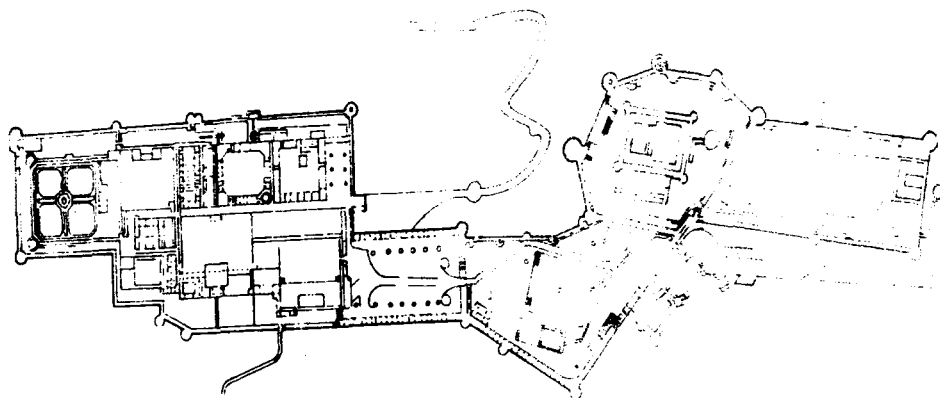
⁵⁴ *Ibid.*, Map and Notes No- 297.

was used for irrigation as well as for drinking purposes.⁵⁵ Tanks had their own water resources in the form of 'lake' or stream.

Kapad dwara document shows that a tank was constructed near Akaida in the second quarter of 18th century. It was bricklaid because of sandy soil. The measurements are also given in the records. The water of this tank was used for washing clothes at the *dhobi ghat*. *Dhobi Ghat* was in area of 45 *bigha*.⁵⁶

A map shows the detail of Bhagwant Sagar and its water coming from the hills (*dungri*). A pond (*talab*) was constructed and connected with the Bhagwant Sagar.⁵⁷

Nahargarh fort had large storage *kunds* or tanks which could be accessed by a steps and number of channels covered with stone slabs.⁵⁸

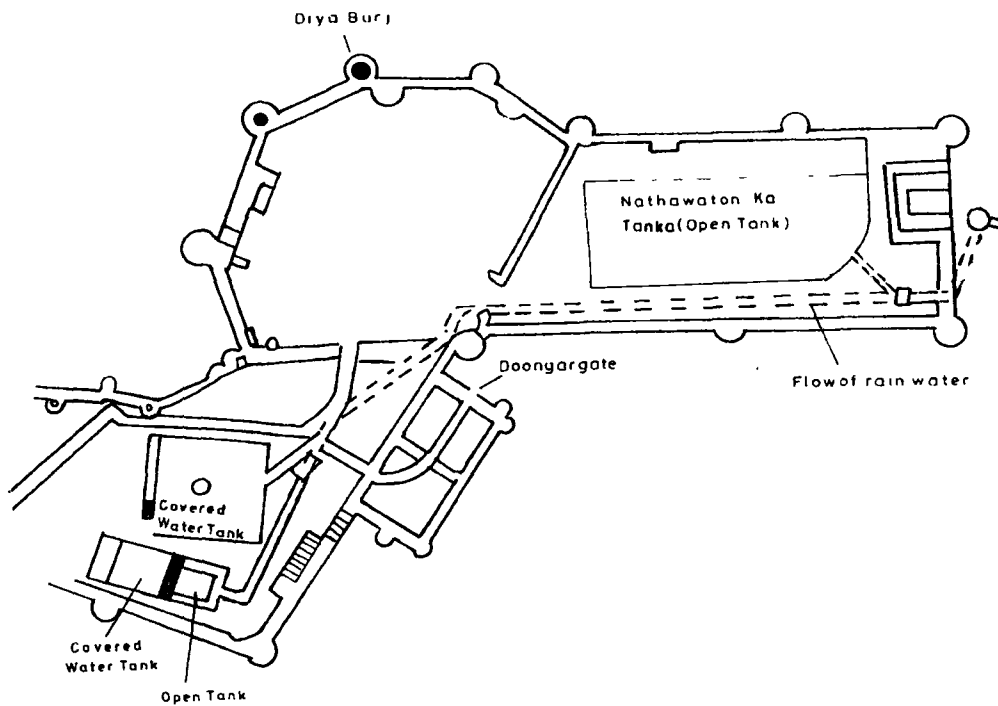


- | | | | | | |
|----------------------|--------------------|-------------------------|-------------------|-------------------|------------------|
| 1. BHAGWANT SAGAR | 6. SHIVA TEMPLE | 11. ARMOURY GALLERY | 16. SHEKHAR NIWAN | 21. BHAIRO NIWAN | 26. BHAIRO NIWAN |
| 2. NADIPARADON NIWAN | 7. DIVYA BARI | 12. RAMBHARHAR TEMPLE | 17. KISHOR NIWAN | 22. KALSH MANDIR | 27. TANKA |
| 3. WATER CANAL | 8. KISHOR NIWAN | 13. K. S. DHARMA TEMPLE | 18. LAXMI NIWAN | 23. GANESH MANDIR | 28. VILAS MANDIR |
| 4. JAINAN CANAL | 9. WATER RESERVOIR | 14. OFFICE | 19. TIBARA | 24. GARDEN | 29. SUDHA MANDIR |
| 5. NATHAN NIWAN | 10. JAINAN NIWAN | 15. COLLECTION GALLERY | 20. PUPPLE NIWAN | 25. BHAIRO NIWAN | 30. CANAL MANDIR |

Plan C: Inscribed on Jaigarh Fort

⁵⁵ *A History of Water Management and Hydraulic Technology in India (1500 BC to 1800 AD)*, op. cit., p. 34.
⁵⁶ *Kapad-Dwara*, Map and Notes No. 120.
⁵⁷ *Ibid*, Map and plan No- 308.
⁵⁸ *Princely Terrain, Amber, Jaipur and Shekhawati*, op. cit., p. 82.

PLAN OF THE WATER CHANNELS FOR JAIGARH FORT



Plan D:

The above plan shows that water is diverted to an open tank through an inlet and the same channel reached upto covered tank and provided water to it. The other channel was diverted from the main channel which goes to other smaller two tanks. These channels, tanks and reservoirs are constructed with rubble stones and plastered with lime mortar.

Jaigarh Fort consists of five *tankas* or tanks. This fort was self sufficient in water. There was a *haud* or tank below the western outerwall of the Jaigarh fort. Water from this Sagar was carried by elephants in leather bags which were emptied into this tank. When this tank or *haud* was filled with water it could be lifted up with the help of *Charas* (a popular water lifting device).⁵⁹ The fort has

⁵⁹ Khangarot, R.S., and Nathawat, P.S., *Jaigarh, The Invincible Fort of Amber*, Jaipur, 1990, pp. 63- 64 also, *Based on Physical Survey*.

three large tanks which were used for storing water. Pucca canals on the hills bring rain water to these tanks. These tanks are in the southern courtyard of the fort. The inmates of Jaigarh fort used water from the tank. The largest tank is 158 feet long, 138 feet wide, 40 feet deep. The tank is covered by roof. The roof rests on the arches. Eighty one pillars are constructed inside the tank. This tank can accumulate sixty hundred thousand gallons of water.⁶⁰ The second tank measures 69 ft length, 52 ft wide, its depth 52 ft. deep. This tank was just behind the large tank. There was a hole in the roof and there was one room under each hole. Legend says that the treasury was stored in these rooms until the reign of Maharaja Jai Singh Sawai. Besides the second tank is a small open tank. It is an open tank. This tank measured 61 ft. length, 52 ft. wide and 27 ft. deep.⁶¹



(IV): Photo depicting Outlet in Jaigarh Fort

⁶⁰ *Ibid.*, p. 65.

⁶¹ *Ibid.*, p. 65



(V): Photo depicting Water Channels in Jaigarh Fort



(VI): Open Tank in Jaigarh fort



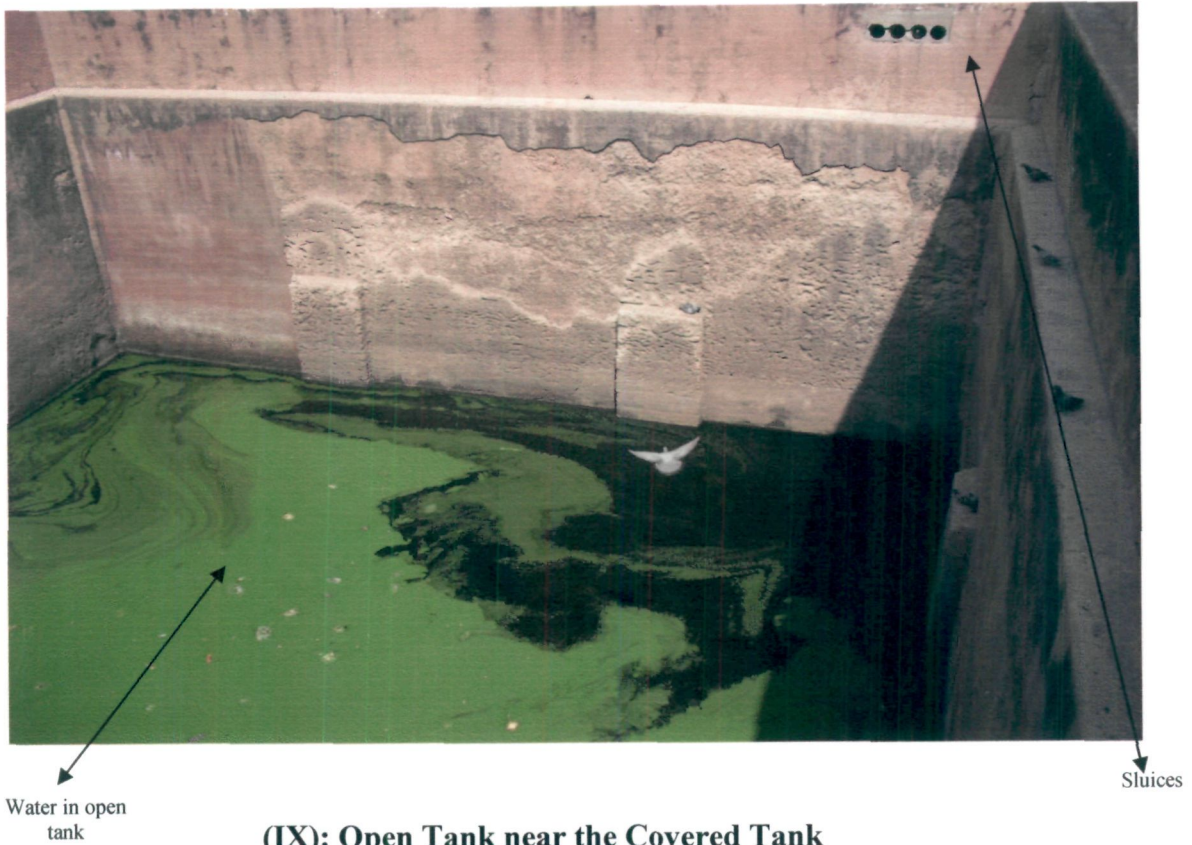
(VII): Full view of Open Tanks in Jaigarh for

Open
Tank



(VIII): Covered Tank of Jaigarh Fort

Covered Tank



(IX): Open Tank near the Covered Tank

Susan Gole has provided a map which indicates only the plan of the tanks however evidence of fort palaces is provided here. We do not get the idea of its builder from the map as it is undated but sources like *Kapad dwara* reveals that the tanks and other structures surrounding it were constructed by Sawai Jai Singh.⁶²

⁶² *Indian Maps and Plans*, op. cit., p. 191.



Plan E: Adapted From “Indian Maps and Plans”

Dam:-

Dam construction appears to be the earliest water management work in India. We find some references from Ashokan edicts, carved on a rock near Girnar mountain. A dam was constructed by Chandra Gupta. His grandson Ashoka introduced sluices in it.⁶³

Dams were mostly created for irrigation purposes. In Rajasthan dams can be identified as gravity dam category. These were built on the trabeate method. Babur wrote in his Memoirs about his journey from Kalpi to Chanderi that he noticed three dams.⁶⁴

We have found the reference of Mansagar Dam from the *Kapad-dwara* documents. Besides the Mansagar Dam, there are dams of Samarpura and

⁶³ *A History of Water Management and Hydraulic Technology in India (1500 BC to 1800 AD)*, op. cit. p. 52

⁶⁴ See; Khan, Iqtidar Alam, and Kumar, Ravindra, *The Mansagar Dam of Amber: A Detailed Study of its Structure and Working*, Seminar, Technology in Medieval India, 16th to 18th Century, Calcutta, 1984, pp. 1, 5.

Tantyawas belonging to the villages of Jaipur City. Water came from both these dams to Jaipur.⁶⁵ Mansagar dam was constructed by Jai Singh Sawai. However it could be completed by M.S. Madho Singh I (1750-1767 A.D). It was situated between Amber and Jaipur. It is popularly known as Jal Mahal.⁶⁶ *Kapad dwara* maps show the plan of the embankment area of Mansagar and the work in progress in the vicinity of Mansagar. The text of the map records the process from the digging of the foundation.

Fortunately for us information can be substantiated from the project of Mansagar dam undertaken by Iqtidar Alam Khan and Ravindar Kumar in 1980. They have supplied details of the location and general features of the Mansagar Dam. They have noted that it was built on trabeate method with stone, rubble and mortar to plug a gorge. Its length along the downstream wall, and over the opening left for the spillway, measures about two hundred two meters and on the western side of the dam a reservoir exists. There are two sluices for the outflow of water, one on the left and the other to the south. The dam is divided into three parts. The first storey or plinth has two projections, added with masonry steps at some places. The next structure has three successive platforms plastered with lime mortar. The first platform of superstructure has ramparts. Second platform has five bastions erected from the plinth level. On second platform there is an opening leading to a staircase. Another staircase is there between third and fourth projection. All platforms are connected with each other by sloping carriage ways or stairs. On third storey, for security purpose the dam is provided with ramparts, bastions and fortified towers. The ramparts are similar to the battlemented wall that continues on the flanking hills.⁶⁷

We find some maps on the planning of Mansagar such as "*Tarah Sawai Jaisagar wa Mansagar beech Dungarya Kanai Bandho Bandhwa Ki*" i.e. Plan of the dam near the hills between Sawai Jaisagar and Mansagar. This map was prepared in the second quarter of 18th Century. The other maps are

⁶⁵ *Kapad-Dwara, Map and Notes No-126, 275.*

⁶⁶ *Ibid., Map and Notes No-198.*

⁶⁷ *The Mansagar Dam of Amber: A Detailed Study of its Structure and Working, op. cit., pp. 7-12.*

"*Tarah Sawai Jaisagar*" i.e. plan of Sawai Jaisagar. "*Sawai Jaipur me Sawai Jaisagar*" i.e. Sawai Jaisagar at Jaipur. These maps were prepared in 18th century. "*Tarha Mansagar ke Jalus ki*" plan of Mansagar was also prepared in the second quarter of 18th century.⁶⁸



(X): MANSAGAR DAM,

Source- "*Princely Terrain-Amber, Jaipur and Shekhawati.*"

"*Tarah Mansagar ki gaz*" i.e. Plan of Man Sagar in the third quarter of the 18th century. The maps shows the planning, digging and construction work in the vicinity of Man Sagar Dam.⁶⁹ "*Tarah Bhaow Sagar Sun Jhotwara taen*" relates plan of the area between Bhaosagar and Jhotwara. We find in this map that the water was channelized towards Mansagar from Jhotwara and this map also shows Bandi River from where other part of Dungri started and the places where water flowed such as Udaipur, way of Valley (*Ghati ka Gailo*),

⁶⁸ *Kapad-Dwara*, Maps and Notes Nos. 29,170, 201, 243.

⁶⁹ *Ibid.*, Map and Notes No- 243.

Budharago, Harmado, Nidar Ghati, Machedo, hillock (*Dungri*) of Malera, canal of Machabni, its water become dry or plenty because of its depth. So mound has been leveled and its slope (*dhal*) started towards Akaida and water flowed into Bhao Sagar and touched some area such as Akhalpuro, Talab (pond) Akhaido, *Kumhara ka Ghar*, Bishangarh, Jarasyo, Jogi-ka-Asrag. Canal water came into valley and touched Kishan Bagh (Garden), small well (*Kui*), Kishanpur, old temple & new temple, Gouni and Matol Canal which ran towards Saraswati, small pond (*choti talai*), monastery (*Kukar Ka Math*), Jaisa Ko Nangal Since in the four months water was plenty, therefore it was directed towards Mansagar.⁷⁰

Technique of Water Lifting:-

The Pulley and the Rahat were most important mechanical devices. A Pulley or wheel is set up in a wooden frame and bucket tied with a rope and the bucket or pot with its rope are thrown into the water level and its rope with pot came up by Pulley. This device facilitated water to be drawn in a very easy way.⁷¹ Irfan Habib has given the description of brick laid wells which were found in Mohenjodaro. Its water was used for irrigating fields. There was no evidence of Pulley therefore water had to be pulled up by hand. He also writes that the reference of Pulley Wheel (*ashmachakra*) found in Rigveda (c. 1000 B.C.)⁷²

⁷⁰ *Ibid.*. Map and Notes No-283.

⁷¹ *A History of Water Management and Hydraulic Technology in India* (1500 BC to 1800 AD), op. cit., p. 81.

⁷² Habib, Irfan, *Technology in Medieval India c.650-1750*, New Delhi, 2008, p. 9.

purposes.⁷⁴ This device obtained water from the greater depth and it is mostly similar to the Pulley. In this technique wooden drum is fixed with wooden frame. The spokes of the wheel served as handles through which the drum can be rotated. The rim or bucket tie with the rope and this rope is rolled around the drum. The system of rotation makes the task easier for obtaining the water.⁷⁵ *Kapad dwara* document gives information that *Charas* was mostly used in Jaipur for carrying the water from one place to other place.⁷⁶

Conclusion:

Thus a close scrutiny of the various water reservoirs indicate that when Sawai Jai Singh laid the foundation of the Jaipur, he closely studied the areas which needed to be catered and how they could be water fed. It would also appear that he had the vision of the colossal task of tapping the different water resources. In view of this massive task he recorded the step by step development in these *Kapad-dwara* documents. It is our good fortune that we possess these documents in literary and map form.

⁷⁴ *A History of Water Management and Hydraulic Technology in India (1500 BC to 1800 AD)*, op. cit., pp. 81-83.

⁷⁵ *Ibid.*

⁷⁶ *Kapad-Dwara, Maps and Notes No-300.*

CHAPTER-2

Planning Pattern and Buildings of Jaipur

The Jaipur city and its marvelous town planning is a living legacy of Indian heritage. It testifies the glorious engineering tradition of Indian subcontinent. The well planned and harmonious construction of the city made it distinct model of town planning. The manner in which Jaipur was built earned the positive appraisal of travellers and scholars. Vidhyadhar made a landmark contribution to Jaipur architecture during its foundation. He was the trusted *Deshdiwan* and chief architect.

Town planning implies the preparation and implementation of a suitable ground plan, to meet the needs of a particular type of town, or it means putting down on paper, the plan of roads, residential areas, sewage system, water supply system, education centers, office areas and recreational centers. The plan must be suitable for its climate. The plans vary, depending on the nature of the towns, for instance an administrative town, like Delhi or Chandigarh will have a plan, which is different from the plan of an industrial town like Durgapur.¹

Sawai Jai Singh is acknowledged, as a remarkable person of his age. Jai Singh with his trusted minister (Vidhyadhar) planned the city. Sawai Jai Singh had prepared several maps for planning this city, and collected literature maps and printed literature from all over the world.²

Vidhyadhar was the chief architect of Jaipur city and he became the *Desh Diwan* (minister) in 1729.³ *Ishvar Vilas Mahakavya*, written by court poet of Ishvari Singh provides, information pertaining to the contribution of Vidhyadhar. There are many passages in the tenth canto of this work which remind us of Vidhyadhar's role in the planning of city which are as follows.⁴

Jai Singh had minister named Vidhyadhar, a Bengali Vedic Guru by caste. He was well versed in Arts. The Rajadhiraj held him in high esteem for his pure wisdom. Sawai Jai Singh founded the beautiful city of Jaipur by indentation of his wisdom and knowledge. The beautiful city of Jaipur gives pleasure to the inhabitants of all the three worlds.

¹ *History of the Jaipur City*, op. cit., p. 30.

² *Kapad Dwara*, op. cit., pp. 10-11.

³ Vidhyadhar's Service Record as given in the *Dastur Komwar*, Appendix IX; See also *History of the Jaipur City*, op. cit., p. 41. See also, *Arhsatta Imarti*, Bundle No. 13.

⁴ *Ishvaravilasa Mahakavya*, op. cit., pp. 191-93.

Buddhi Vilas does not mention about Vidhyadhara (written in Jaipuri dialect in 1770 by Bakht Ram Saha).

Girdhari '*Bhojansar*' refers about Vidhyadhar as the architect of the city. An interesting couplet indicate role of Vidyadhar in the planning which is as follows;⁵

पुराकरे बहु हरष करि, मन महि मोद बढ़ाय ।
विद्याधर सौ बोलि कहि, सहर सु एक बसाय ।।

The Exact Date of Foundation Ceremony- The Foundation of the city was laid out on Pausha Badi 1, 1784 V.S. (29th November, 1727). Sawai Jai Singh conducted auspicious religious rituals at the time of Jaipur city foundation. The date of official foundation mentioned in *Budhi Vilas* and *Bhojansar* documents which are as follows;

डोल करार मिति जेढ सुदि 8 साल सम्वत 1784 पुन्य उदिक धरती बै0 जगनाथ जी समराट ने जो सवाई जयपुर बसायो ती नेमत मिति पोस बदि 1 सम्वत साल 1784 पने धरती वीघा 8 अंके आठ संकल्प करी सो वास्ते धरती के मिति माह सुदि 15 सम्वत 1784 मारफत किसन राम की अरज पहुँची हुक्म हुवा धरती वीघा आठ धोयो ती मघे वीघा 4 सवाई जयपुर की वाग के वास्ते व वीघा चार नजीक गाँव सवाई जयपुर का की स्यालु की दीज्यो वरसाले दीवान नारायरनदास किरपाराम दाखिल वाके करो धरती वीघा आठ मा0 तफसील सवाई जैपुर की वाग के वास्ते विघा च्यार 4 गाँव भोतपुर नजीक हथरोही मघे वा स्यालु की वीघा च्यार ४ ।

This work was assigned to Samrat Jagannath who was the priest or guru of Sawai Jai Singh. Eight *bighas* land was allotted to him near Hathroi.

डोल करार मिति फाल्गुन वदी । सम्वत 1784 पुन्य जो सवाई जयपुर नवौ बसायो तीढै मिति पोस बदि 1 सम्वत 1784 विन्दायक सांती, वा वासुत सांती, नोगिरह सांती करवाई त्याने लाग्या सौर रूपया 1083 ।- के वास्ते मारफत स्वामरास्ट नाथ जी की मिति माह बदि 11 सम्वत 1784 अर्ज पहुँची हुक्म हुवा सीगे पुन्य के दाखल कर तनखाह खजाना माल इतमाम खोज पता का परी तनखाह कर धो वरसोल दीवान नारायरनदास व किरपाराम दाखल वाके करो रूप्या वसुली एक हजार तीरासी आना पांच दीज्यो 1083 ।-

⁵ Girdhari, *Bhojanasar*, Cf., *History of the Jaipur City*, op. cit., p. 233.

The second document informs that Rs, 1083/5 were spent in the foundation ceremony.⁶

Girdhari in *Bhojansar* refers the date of foundation of Jaipur city was as 1727 A.D. which is as follows:⁷

करि असीस बिनती करी देहो बेग बसाय ।
संबत सतरेसे सुनीं चौरासी मनुलाय ॥ 190 ॥
पौसहि सुदि परिवाजहा बारसनी सरवरा ।
गिरधारी या सहरको जनम महासुभवार ॥ 191 ॥

Girdhari in his *Bhojansar* furnishes information pertaining to the rituals that were performed by Sawai Jai Singh at the time of Foundation ceremony.⁸

यज्ञ करै द्विज प्रातहितै फुनि बेद पढ़े अरु औरें पढावै ।
सुभ्रत साधिक है सब धर्म अधर्म की बात ही दूरि नसावै ।
घर ही धरंमाड कथा सुनियेरपुरान अठारहरुं सबगावै ।
राजा धिराज बसायौ सुजेपुर जै जै हरिनावं सुनावै ॥ 202 ॥

Buddhi Vilas also supplies information about the foundation Jaipur city.⁹

नगर बसायौ यक नयौ, जयस्यघं सवाई,
जाकी सोभा जगत मैं, दसहौं दिसि छाई ।
ताको वरनन करनकौ, हुलसी मति मेरी,
इंद्रपुरी हूजानियों, ताकि है चेरी ॥ 197 ॥

There is an interesting evidence contained in Parwana of *Kapad dwara* documents which shows that the Jaipur City was officially acknowledged and applauded by the Muhammad Shah in 1733¹⁰ the description runs as follows:-

परवाना अज जाफर कुली खाँ खानेजाद मोहम्मद शाह बादशाह बनाम चौधरी कानूगोयान
मुतसिद्दान व रियाया प्रगना सरकार आमेर सूबे अजमेर तारीख 15 जिल्दकाद सन् 15
जलूसी-

⁶ *Buddhi Vilas*, op. cit., pp. 8-9.

⁷ *History of the Jaipur City*, op. cit., p. 234.

⁸ *Rajdarbar and Raniwas*, op. cit., p. 213.

⁹ *Buddhi Vilas*, op. cit., p. 14.

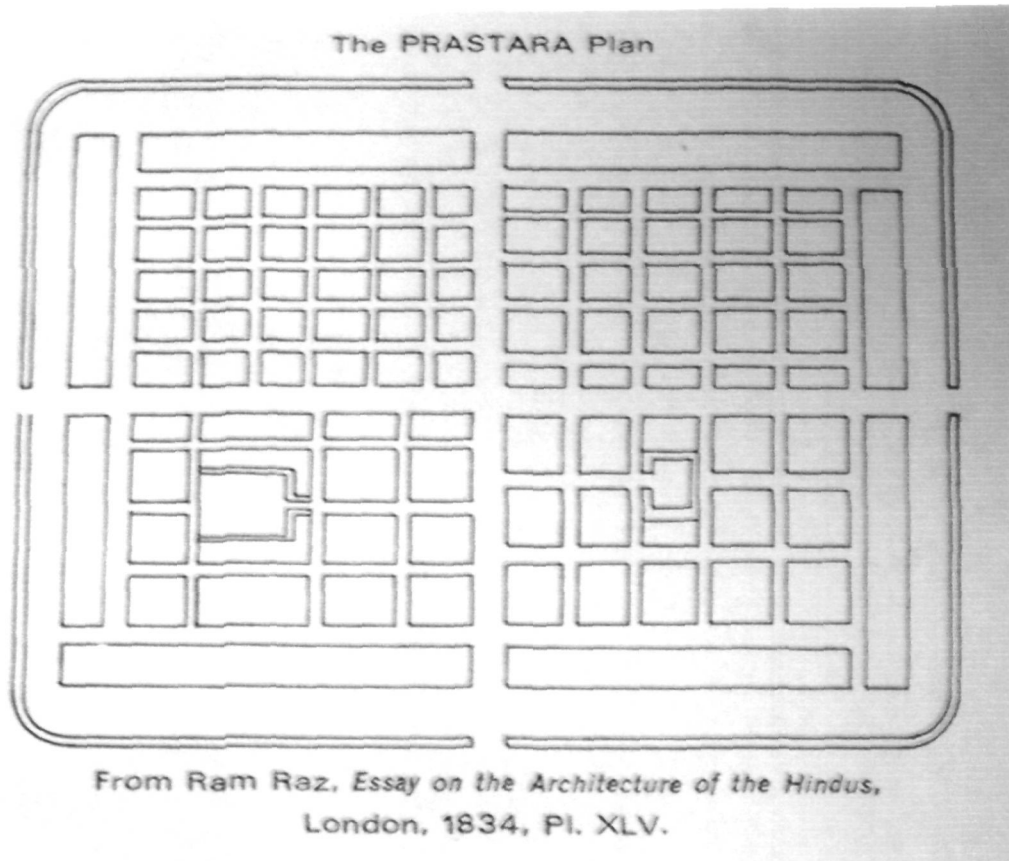
¹⁰ *Parwana* dtd, 1733 A.D. Cf, *History of the Jaipur city*, op. cit., p. 45.

महाराजाधिराज सवाई जय सिंहजी ने लिखा है कि अहद मुबारिक में एक नया शहर बइस्म सवाई जयपुर मत्तुस्सिल आमेर अबाद किया है इस लिये आमेर की येवज मोअत्रल्ला में सवाई जयपुर लिखते रहे सो मंजूर हुअ्रा सरिशेत में सवाई जयपुर लिखते रहें।

Recent researches indicate that Jaipur was built according to *Prastara* Plan.¹¹ The *Prastara* pattern of planning means that a village or town resembles a couch. Whereas, *Manasara* refers to a village or town which is square or oblong in shape. In such a planning *Paisacha* (space) is left between the town wall and buildings and this space is demarcated by a boulevard which goes all around it. The space or town is divided into either four, nine or sixteen wards by a network of appropriate highways. These highways are variously widened with different measurement viz, six, seven, eight, nine or eleven *dandas* (measurement). Roads are made in wards as on chess board form or pattern. The wards are not divided into equal number of plots. These wards are divided into varying plots viz, one is divided into nine, another sixteen, and the third into twenty five and so on. These plots were allotted according to the status and rank of the people. The village or town is enclosed by walls (*Sarhad*) with four principal gates on the sides and four subsidiary ones in the corners. *Paisacha* plots are posited in the borders. These are occupied by inhabitation of artisans and craftsmen. Vaishya class or lower class is quartered in the north of the village or town.¹²

¹¹ Acharya, P. K., *Architecture of Manasara* Vol I-V, Oxford University Press 1934. Acharya has edited and published the text of *Manasara*, though it was written in the Gupta Period; Dutt, B. B., *Town Planning in Ancient India*, reprint 2009, pp. 235-37. Shukla, D. N., *Vastu Shastra*, Vol I, p. 271; Havell, E. B., *Indian Architecture*, (1913, 1927 2nd Eds.) Johan Murray, London. Havell in his book mentions that the plan given by Ram Raz (*Essay on the Architecture of the Hindus* (1834), London,) is very similar to that of Jaipur. Havell also says that the orientation marked does not seem to correspond with quotation from the shastras given in the text. In the text also there is no quotation from *Shastras* about the *prastara* type.

¹² *Town planning in Ancient India*, op. cit., pp. 235- 237.



Plan G: An illustration of Prastara Plan

Source- “History of the Jaipur City”

Manasara gives detail of measurement system at the beginning of its second chapter. It is considered that ‘*danda*’ was the unit of measurement (one *danda* = 4 *hasta* = 6 feet approx.) for the town planning. Measurements are now done in feet or meters. Girdhari’s *bhojansar* mentions that “*Beg Bassai yak varsh mai barahaii kos hi pher*” which means that Sawai Jaipur should be populated in one year and should be 12 *kos* in extent.¹³ It can be inferred that tentative plan, predefined though this dimension is much more than the actual scale of the city. Regarding the measurement employed in Jaipur, we have varied information that a traditional mason Kalyan mentioned that *hasta* and *angula* was used as units of measurement.¹⁴ *Kapad dwara* map reveals that *gaz*, *sawaya* (a quarter extra) and *bigha* was used as units of

¹³ *Histry of the Jaipur City*, op. cit., p. 234. See also, *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 133.

¹⁴ *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 134.

measurement in Jaipur.¹⁵ According to E.R.K. Blenkinshop, the regional commissioner in 1924, the measurement value for Bigha varies, from 100 ft to 185 ft, depending upon a place.

It has been suggested that the plan of Jaipur was significant, not only because it was based on nine square *mandalas*, but in practice it embodied a secular adaptation. Nine square plan could be laid out as the ideal type and the explanation about north-west corner was that Sawai Jai Singh must have simply shifted that square diagonally across and relocated at the edge of the lower south eastern one.¹⁶

T. Ohji gives a unified explanation that the original form of the city was based on the tenets of *Arthashastra* and the principles of *Arthashastra* were not applied in entirety, but only idea derived for the division pattern of the city into urban blocks from the model of *prastara* plan. He further adds that the location of the Brahmapuri quarter to the north of the palace, suggest that the planning of the city was based on the Hindu ideal.¹⁷

According to Roy, Jaipur is neither a square, nor a rectangular in shape, and it does not correspond to the description of the *Prastara* plan.¹⁸ In the introduction of *Kapad dwara* catalogue Chandramani Singh mentions that Sawai Jai Singh planned the city in geo-astronomical form of *navagraha* columns.¹⁹

There is no extant record which shows that the city foundation was laid out on grid pattern. Numerous theories and interpretations have been put forward on the concept of the Jaipur city planning. These theories and interpretation have one thing in common that the idea for the city of Jaipur was based on ancient Hindu cosmology.²⁰

¹⁵ *Kapad-Dwara*, Map and Notes Nos- 45, 54.

¹⁶ Jain Kulbhushan, *Morphostructure of planned city, Jaipur India*, "Architecture, urbanism, August 1978, pp. 107-20.

¹⁷ Ohji, T., *The "Ideal" Hindu City of Ancient India as described in the Arthashastra and the Urban Planning of Jaipur*, East Asian Culture Studies, Vol. XXI, Nos. 1-4. Cf., *Space formation of Jaipur city, Rajasthan, India An Analysis on City Maps (1925-28) made by survey of India*, op. cit., p. 263.

¹⁸ *History of the Jaipur City*, op. cit., p. 39.

¹⁹ *Kapad-Dwara*, op. cit., p. 11.

²⁰ *Space formation of Jaipur City, Rajasthan, India An Analysis on City Maps*, op. cit., p. 262.

There was no planned city in northern India, having wide roads or streets like Jaipur. In the 17th century, Delhi had only two planned streets. Francois Bernier describes it thus “The two principal streets of the city leading into the square, may be five and twenty or thirty ordinary paces in width. They run in a straight line nearly as far as the eye can reach; but one leading to the Lahori gate is much longer. Houses of the two streets are exactly alike. As in our Palace Royale, there are arcades on both sides; with this difference however that they are only of bricks, and the top serves for a terrace and has no additional building.”²¹

Jaipur Buildings: -

The nucleus of Jaipur city was the palace and Jai Niwas Garden the foundation of which was laid in 1725. The building of Chandra Mahal followed the actual construction of the entire city.²² *Siyah Huzur* documents reveal that Sawai Jai Singh started the construction of building below the Northern edge of the plane. A palace was constructed in 1726.²³ The *Kapad-dwara* documents and maps entail plan of Chandra Mahal (*Satsargha*), Badal Mahal, Diwan-i-Aam, Diwan-i-Khas (*Sarvatabhadra*), Moti Mahal, Hawa Mahal and Madhovilas.

Chandra Mahal – This seven storeyed building is the most impressive structure in the city palace. Its perfect symmetry is remarkable. *Kapad dwara* maps contain the plan of Chandra Mahal. It had an entrance for the chariots and a slope which measured 1 *gaz* and two *biswa*. The construction of Moti Mahal was in progress at the time. Other environs were also mentioned in this map. The open area was made for the penetration of moonlight (*Chandni ke baste*) from which the palace derives its name.²⁴ The first stage of Chandra Mahal (*Satsargah*) was completed in 1726 AD.²⁵

²¹ Bernier Francois, *Travels in the Mughal Empire*, Oxford, 1914, p. 245.

²² *Buddhi Vilas*, op. cit., p. 8.

²³ *Siyah Huzur papers*, S. 1783, J.S.A. P. 331. Cf; Bhatnagar, V.S., *Life and Times of Sawai Jai Singh*, Delhi 1978, p. 331.

²⁴ *Kapad Dwara*, Map and Notes No -109, second quarter of 18th century, fig. 39.

²⁵ *Princely Terrain – Amber, Jaipur and Shekhawati*, op. cit., p. 117.

Bhakhat Ram Shah describes the Chandra Mahal Palace. Seven storeys were separately mentioned thus *Pritam Niwas*, *Sukh Niwas*, *Chabi Niwas*, *Shobha Niwas*, *Sri Niwas* and *Mukat Niwas*.²⁶

प्रतिम-निवास फुनि सुष निवास
बैठक दीवानं सभा-निवास।
फुनि चन्द्र-महल आदि जु आवास,
कवि करै कहां लौ वरन तास ॥150॥

Kapad dwara map shows that Zenana Mahal of Chandra Mahal with 15 Court was planned before the foundation of Jaipur city.²⁷ Map shows the construction of Moti Mahal and Raj Mahal. The Raj Mahal was 51 yards long and *Chabutara* 112 yards long.²⁸



(XI): Chandra Mahal

²⁶ *Buddhi Vilas*, op. cit., p. 24.

²⁷ *Kapad Dwara*, Map and Notes No – 271.

²⁸ *Ibid.*, Map and Notes No – 276.

Map No. 228 shows the plan of *Sarvatobhadra* (Hall for private audience) in the city palace of Jaipur²⁹. Map No. 237 shows the plan of *Dewan khana* of Jaipur. The map shows the work was in progress. Lakshmi pol and Raj pol were constructed during the time of Madho Singh I.³⁰ Diwan-i-Am and Diwan-i-Khas (*Sarbatobhadra*) were made in Mughal style and one can discern the Mughal impact in the architectural details. Diwan-i-Khas is made square in plan, and it is situated in an adjoining court on the west. It is a pleasing structure in plan built on raised platform, and open from all sides. The Diwan-i-Am or Hall of Public Audience is open on all sides and it is now used for the purpose of Museum.³¹ Bishop Heber describes it as 'A noble open pavilion with marble pillars'.³²

Badal Mahal or Cloud place was situated on the Southern bank of Talkatora. Kali Nidhi Shri Krishna Bhatt was a famous poet at the time of Pratap Singh. He admires the beauty of Badal Mahal in Teej procession. He wrote about the teej procession in the following words.³³

उतै भूरि बादर हैं बादर महल इतै,
 चंचला उतै को इतै कचनियां लाखी हैं।
 जगुन जमात उतै, दीपन की पांत इतै,
 गरज उतै को इतै, नौबतियां आखी हैं।
 उतै साझ फूली इतै रंग रूली सभा सौभ,
 कवि जगदीश भल, भारती यों भाखी है।
 उतै इन्द्र इतै महेन्द्र श्री प्रताप न्भूप
 अद्भुत तीज को जुलूस रचि राखी है।।

Madhovilas- Madhovilas was built by Madho Singh I (1750-1767). It is situated in the north-eastern corner of Jaipur. It is supposed that the Maharaja used to relax here at times. Map no -79 indicate that golden hall was proposed to be constructed in front of Madhovilas. Other buildings with pillars, trellis windows,

²⁹ *Ibid.*, Map and Notes No – 228, second quarter of 18th century

³⁰ *Ibid.*, Map and Note No - 237.

³¹ *Life and Times of Sawai Jai Singh*, op. cit., p. 334.

³² Heber, Bishop, *Narrative of a Tour, Through the Upper Provinces of India*, first pub. 1827, reprint, 1993, Delhi Vol. II, p. 406.

³³ *Rajdarbar and Raniwas*, op. cit., p. 137.

garden and fountains were also part of the plan. Map no- 357 shows the extension of Madhovilas which was done by Pratap Singh.³⁴

Isar Lat- It is said that this tower was called the *Svarga Shuli* or Isar Lat, situated in Tripolia Bazaar. It was built by Ishvari Singh to commemorate his victory in this battle. It is seven storey high, and has the appearance of a watch tower.

He went back to Jaipur or Jainagar and constructed a victory tower. He called it Isar Lat in order to shrug the reputation of his enemies.³⁵ This finds mention in following lines,

जय नगरहि जाके जई, विजय स्तंभ बनवाय ।
इसर लट्ठडि नाम हल, दीधो अरि यश ढाय ॥



(XII): Isar Lat

³⁴ *Kapad-Dwara, Maps and Notes Nos – 79, 357.*

³⁵ Singh, Thakur Narendra, *Maharaja Shri Ishvari Singh Ka Jivan Charit*, Jaipur, 1917, p. 58. Cf; *Histry of the Jaipur City*, op. cit., p. 54.

Interesting anecdote regarding Isarlat finds mention in *Vamsa Bhaskar*. It is believed that the ruler Ishvari Singh this tower for watching his lady love (daughter of Hargovind Natani) from the top of tower. Hargovind's House was situated on the *chhoti choupar* and this tower was 400 meters away from Hargovind house.³⁶

Hawa Mahal – The Hawa Mahal is a remarkable structure in Jaipur. Pratap Singh was the builder of Hawa Mahal, (Grand son of Sawai Jai Singh). This building was dedicated to Radha and Krishna. It has been written by poets.³⁷

हवा महल याते कियो सब समझो यह भाव ।
राधे कृष्ण सिधारसी दरस परस को भाव ।।

Rasarasi Ram Narayan (court poet) had composed some lines about this structure. These lines confirm the same surmise as follows.

चहल पहल हवा महल फैला है आज
राधे गिरधारी प्यारे पाहुने पधारे हैं
आतुलित सोभा भरयो प्रफुलित प्रभा जामे
छहरित रीझ भीजे विहरत श्यामा श्याम³⁸ ।

Sir Edwin Ernold has also furnished beautiful description of this buildings, “A vision of daring and dainty loveliness of storeys of rosy masonry and delicate over hanging balconies and latticed windows. Soaring with tier after tier of fanciful architecture in pyramidal form a very mountain of airy and audacious beauty through the thousand piered screens and gilded arches of which the Indian air blows cool over the flat roofs of the very highest house³⁹.”

³⁶ Mishran, Surajmal, *Vamsha Bhaskar*, p. 3454. This work deals the history of Bundi state. It contains many adverse comments about the ruler of Jaipur, especially Jai Singh and Jagat Singh. Cf; *History of the Jaipur City*, op. cit., p. 54.

³⁷ *Brajnidhi Granthavali*, Allahabad, 1933, p. 184. Cf; *History of the Jaipur City*, op. cit., p. 63.

³⁸ From the MSS in the City Palace Museum Jaipur, Obtained Through the Courtesy of Shri G.N. Bahura. Cf; *History of the Jaipur City*, op. cit., p. 64.

³⁹ *A History of Jaipur*, op. cit., p. 210.



(XIII): Hawa Mahal

Gates:-

The city was surrounded by the city wall (*sarhad*) with four gates at the south and one each in the east, west and north.⁴⁰

The plan of the walled city shows seven gates. Surajpol in the east, Chandpol in the west, Shivpol (*Sanganeri gate*) on the north-South axis, on the southern end there were two other gates, Kishanpol (Ajmeri Gate), and Rampol or Ghat gate on the southern city wall. The Jaipur town walls were guided by the location of these gates. *Kapad Dwara* document mention the name of the gate as Chandpol, Surajpol, Kishanpol, Shivpol (*Sanganer Darwara*), Rampol (*Ghat Darwaza*), Gangapol and Tripolia⁴¹

There is also other published undated map of Jaipur, which was studied by Susan Gole, which clearly indicates the subdivision and location of the Jaipur city

⁴⁰ *Space Formation of Jaipur City, Rajasthan, India An Analysis on City Maps*, op. cit., p. 262.

⁴¹ *Kapad-Dwara, Maps and Notes Nos -113, 259.*

with eight gates. The eight gates are Surajpol, Chandpol, Shivpol, Dhruvpol, Rampol, Ganga pol, Kishanpol and Brahmapol.⁴² In recent times all gates can be seen in the Jaipur walled city, except the Brahmapol. It appears that perhaps Samrat Gate was the Brahmapol because the entry to Brahmपुरi is through the Samrat Gate.⁴³



(XIII): ZORAWAR SINGH GATE

Source – “*Princely terrain: Amber, Jaipur and Shekhawati*”

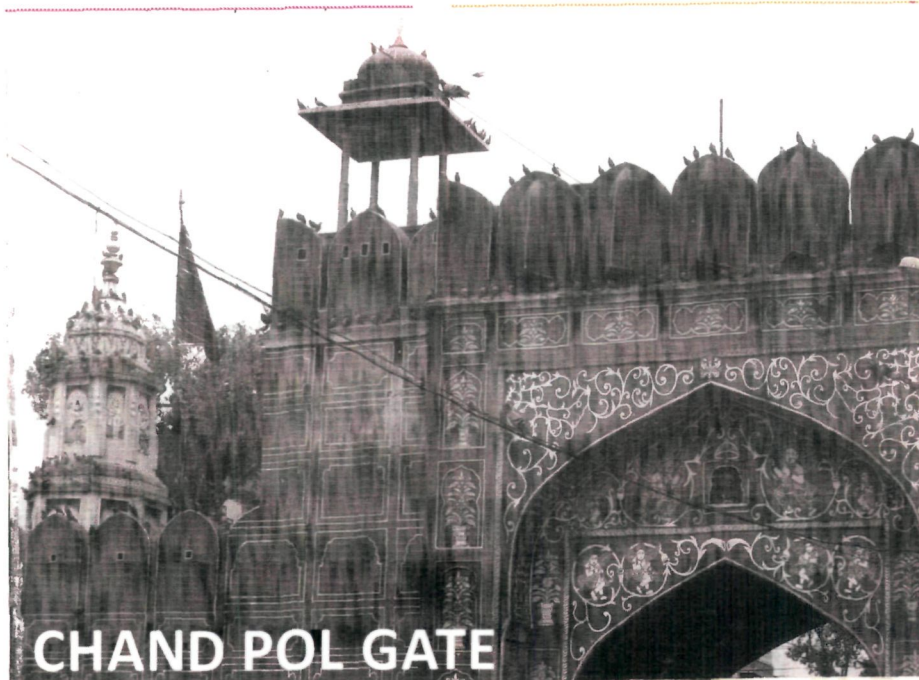
According to *Rajvallabha* there should be four Singhdwar (*Lion-gates*) and eight strong gates of entry in the city wall.⁴⁴ *Siyaha Hazur* entries show the tour visit of Sawai Jai Singh. When Jai Singh started city visit, then he passed through Chandpol, Surajpol, Shivpol and Rampol gates. This visit was made in 1733. This evidence helps us gauge the number and type of gates in the said date.⁴⁵

⁴² *Indian Maps and plans*, op. cit., p. 53.

⁴³ *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 118.

⁴⁴ Pandey Shailja tr. *Rajvallabhmandanam*, (Hindi translation) Varansi, 2001, pp. 45, 67, Cf; *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 122.

⁴⁵ *Siyaha Hazur papers*, S. 1790 J. S. A. Cf; *Life and Times of Sawai Jai Singh*, op. cit., p. 333.



(XV): Chand Pol Gate



(XVI): Source – “*Princely terrain: Amber, Jaipur and Shekhawati*”

Streets, Choupar and chowkris- Jaipur with its streets firmly laid out in a grid pattern was a fine example of a planned city in India. But we find certain deviations in the 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 Jantar Mantar.⁴⁶

The city has nine blocks and seven divisions of blocks known as *Purani Basti*, *Topkhana Desh*, *Modikhana*, *Visheshvarji*, *Ghat Darwaza*, *Ramchandra colony* and *Topkhana Hazuri*. It is believed that Modikhana and Visheshvarji originally belonged to a single block. Later it was separated into two blocks by the construction of *Choura Rasta*. If the area occupied by the palace is considered to include two blocks, then Ramchandra block, another colony at the north portion of the city, then the total number of the blocks will be nine.⁴⁷

Chowkri Modikhana and Visheshvarji can be considered as a square and it is situated at the south of palace. The other remaining blocks are not similar in size. There are irregularities in the streets grid also. The internal streets of Topkhana Hazuri are irregular. In the case of Purani Basti, the north-western sector is segmented, and the divisions are not clear in this *chowkri*. Regularity is observed in the above two chowkri. The secondary streets in other areas are much narrower than 50 ft. The *chowkri* Modikhana, Visheshvarji, Ghat Darwaza, Ramchandra all are divided into six blocks by the north-south streets. *Topkhana Desh*, Purani Basti and then Modikhana-Visheshvarji are the planned units at the initial stage. The street and block dimensions indicate that these three blocks and the royal palace constituted the originally planned area of the city. The ideal form of *Prastara* is discernable in the four *chowkris* shown in the LS/14 Map, preserved in the city palace.⁴⁸

A major street running east-west deviates 15 degrees towards the north. Chandpole bazaar, Tripolia bazaar, Ramganj bazaar and Surajpol bazaar line this street, connects Chandpole at the west side of the city, and Surajpol gate at the east. At the passing of this street and three major streets running north south, three urban squares, known as *chaupar*, viz, *choti choupar*, *Bari choupar* and *Ramganj choupar* were built.⁴⁹ *Chaupars* were made by the alignment of lanes and bazaar streets.⁵⁰

⁴⁶ *Space Formation of Jaipur City, Rajasthan, India an Analysis on City Maps*, op. cit., p. 262.

⁴⁷ *Ibid.*

⁴⁸ *Ibid.*, p. 264.

⁴⁹ *Ibid.*, P. 262.

Kapad dwara maps indicate that the instruction, given for laying these streets by pulling down the sand dunes (*tiba ki choti utari*). 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 (*choursai*) of the streets. Main streets were connected with the small streets (*barha rasta su chhota rasta tai rasta hamwar kiyu*). The map also shows that the city gates were connected with these streets. These streets were lined with bricks (*rasto itha se hamwar kiyu*).⁵¹ Jaipur streets were broad which could have been adapted pattern followed in the west.⁵²

Chowks- *Chowk* is a hindi term meaning ‘A central space of gathering that has four corners.’ It is central market place with many streets joining it. It also serves as a centre of professional entertainment.⁵³ Map and Note No. 113-*Tarah Sawai Jaipur ke Chawk, Bazar wagairah*’ contains plan of the *chowks* and *bazaars* of Jaipur. This map refers the name of *chowks* like Ramchowk and Chandni chowk, Manik Chowk and Paharganj Chowk. Sawai Jai Singh derived these names from Shahajahanabad⁵⁴. *Siyaha Huzur* paper, shows that Amber Raja went to Manik chowk, Chandni chowk, Ram chowk, Paharganj chowk for holi celebration on Chaitra Vadi 10, S. 1790 (29th March 1733).⁵⁵ *Arhsatta Imarti* also is replete with information pertaining to the repairing of Ram chowk and Chandni chowk area.⁵⁶

Bazaars of Jaipur:-

The seven blocks except the city palace contain residence within which are wrapped the commercial places. There was a difference between a commercial and residential street. Commercial streets contain shops on the ground floor that are shaded by an arcade running the length of the blocks, which also serves as a foundation for a terrace in front of the living quarters located on the first floor.

⁵⁰ *Planning the Pink City: Maps and Documents*, op. cit., p. 35.

⁵¹ *Kapad-Dwara*, Maps and Notes Nos – 199, 200; See also, *Planning the Pink City*, op. cit., p. 35.

⁵² *Ibid.*, p. 11.

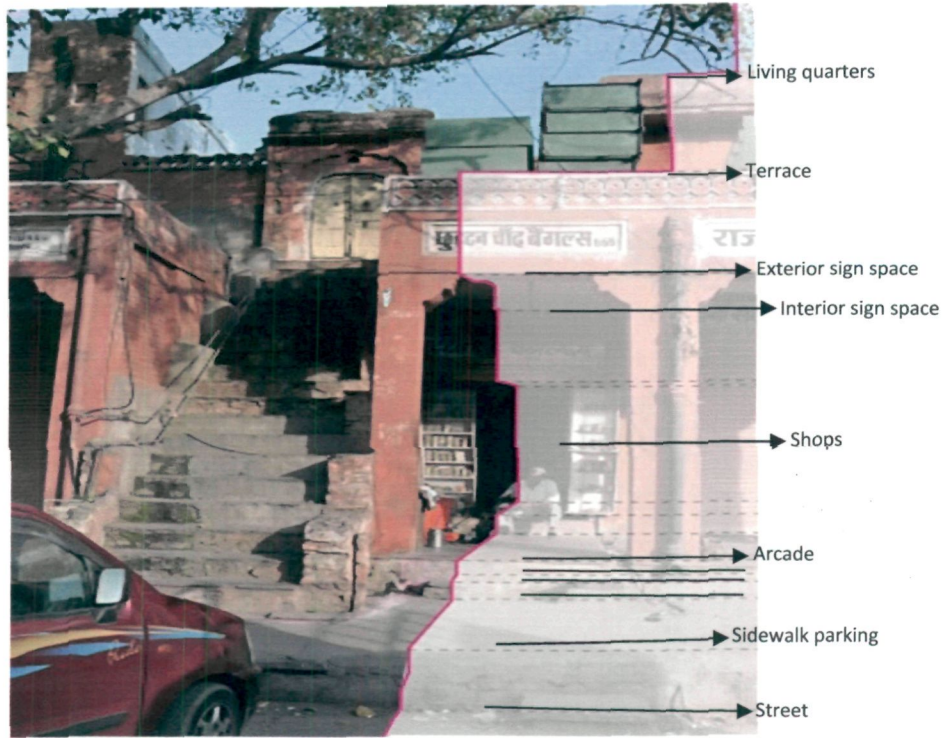
⁵³ *The Morphology of a Medieval Indian City, A Case Study of Shahjahnabad*, op. cit., p. 91.

⁵⁴ *Kapad-Dwara*, Map and Note No – 103,

⁵⁵ *Siyaha Huzur* paper, V S, 1790, J. S. A. Cf; *Life and Times of Sawai Jai Singh*, op. cit., p. 333.

⁵⁶ *Arhsatta Imarti*, B.N. 9.

Residential streets also include a shop, trade, sitting space, used originally for family business or trade.



(XVIII)



(XIX) Walkway Infront of shop

This walkway or commercial zone provides a protective edge around the residential areas of Jaipur. The main commercial areas were meant for specific goods while the daily provision shops inside the blocks maintain residents ease of access to normal goods.

Recent researches indicate that there were only four bazaars initially planned in Jaipur city and later it was named as Johri bazaar, Sireh Deorhi bazaar, Gangori bazaar and Kishanpol bazaar. Map No- L S/14:-This map indicates the progress of the 162 shops which were built by the state on each side of these bazaars. There were only 144 shops on the western side of the Kishanpol bazaar. A series of 162 shops (*hatiya*) covered 18 bighas area. Kishanpol bazaar shops were occupied in an area of 16 *bighas*.⁵⁷ According to Roy there was no provision of Ramganj bazaar on the eastern side of the city in the original plan.⁵⁸



(Map B): Map No. L.S./14 in the City Palace, Jaipur.

Source- “Sawai Jai Singh Charit”

⁵⁷ Cf; *History of the Jaipur City*, op. cit., p. 40.

⁵⁸ *Ibid.*

Our primary document *Kapad dwara* contain three maps pertaining to the construction of Ramganj bazaar. The maps are as follows:

Map No 199- Plan of Ramganj Bazaar. The map indicates that mound has been levelled (*tiba ki chhoti utari*) for the width of bazaar place. *Rooi Katla* (a circular enclosed market) has been completed. Bricks were lined out and streets were laid out from Ramganj to Rampol.⁵⁹

Map No 200- "*Tarah Sawai Jaipur ke bazaar ki Galta ke tai*". The map indicates that the instruction had been given regarding the construction of Ramganj Market. New *Katla* was built and shops (*hatiya*) were constructed on raised plinth (*kursya tai*). Roads had been levelled from New *Katla* towards *Topkhana* and *Dungri* (hillock). The map also shows the places which were connected with this market like *Kund of Galta*, old *Kund* and new *Kund*.⁶⁰

Map No 204- *Tarah Ramganj bazaar ki* (plan of the Ramganj market). The map indicates that the foundation to be laid out of Ramganj shops (*hatya*) on both sides of roads after levelling the streets. Small roads were connected with big roads. Front sides of the shops were almost completed; however work was in progress at the back portions on the south of bazaar.⁶¹

Buddhi Vilas mentions that Gold ornaments and *Jewelry*, costly textile such as *Mahmudi*, *Khasa*, *Tansukh* and various kinds of spices were sold in this city. These textiles find mention in *Ain-i-Akbari* also.⁶²

⁵⁹ *Kapad Dwara*, Map and Notes No-199.

⁶⁰ *Ibid.*, Map and Notes No- 200.

⁶¹ *Ibid.*, Map and Notes No- 204.

⁶² *Buddhi Vilas*, op. cit., p. 17.

कहुं महर रूपैया लेत देत,
जाँहार विकत सुवरन समेत
कहुं वस्त्र पाट के वहरि स्वेत,
मैहमूदी षासा तनसुषेत ।।114।।

Budhi Vilas provides a picturesque description of shops of gold, embroidery and iron tools. It describes goldsmith smelting gold and Iron-smith making iron tools by melting the Iron. Jaipur market earned fame for embroidery (*Paricha, Jarwaf*) and tinsel work (*Jardoz*).⁶³

Similarly Girdhari supplies information on the commercial activity in the bazaar. The following lines show that thousand of shops on *chopars* became famous for buisness and many traders who came from neighbouring areas, started their business.

चौपर केरु बजार है हाटैक ईहजार
देस देस के करते है व्योपारी त्यौहार ।।196।।

Residential Area:-

Our documentary evidence suggests that specific localities belonged to *chhippas* (for cloth printers) and *kumarvad* (potters).⁶⁴ The map of *Kapad-dwara* document clearly indicate planning of separate areas for different caste for instance, *Muhalla of Gujarati Chippas* (printers), Colony of *Gujars, Brahmans, Kumhars* (potters) and also houses of *Julahas* (weavers) at Sanganer.⁶⁵ In the context of south India, Silappadikara refers to separate streets for weavers.⁶⁶ It appears that lower caste lived at the outskirts or suburbs of city.

There was separate area for Brahmans in Jaipur, which was known as Brahmapuri, and Brahmans were invited by Sawai Jai Singh for performing the ritual ceremony from Banaras. Sawai Jai Singh also allotted gratis land to them for

⁶³ *Ibid.*, pp. 18-19.

⁶⁴ *Roznamcha of Potdar*, dated V.S. 1783/1726, R. S. A. Bikaner. Cf; *Planning the Pink City*, Maps and Documents, op. cit., p. 37.

⁶⁵ *Kapad Dwara*, Map and Notes No-69.

⁶⁶ See, Ramaswamy, Vijay, *Textiles and Weavers in South India*, 2nd edition, New Delhi, 2006, p. 1.

inhabitation in the newly built Jaipur city. *Buddhi Vilas* and *Kapad-dwara* contain information about Brahmapuri.

Arthasastra recommends specific direction for specific castes like Brahman will live in the north, Kshyatriyas in the east, Vaisyas in the south and Sudras, the class on the lowest echelon of society, in the west. This said planning may be considered to have existing manifestation in the city of Jaipur.

In Jaipur, Residential quarter is known as *rasta* or *marga*. *Rasta* is street in Hindi and *marga* is in Sanskrit. There are name of the street at the west of Johri Bazar (the eastern most street of Vishesverji chowkri) changes as one goes from north to south such as *Hanuman ji ka rasta*, *Kothyawalo ka rasta* and *Bara gangaro ka rasta*. Residential quarter is also made up of several lanes, which are called *gali* in Hindi. The *gali* width is usually narrower than the *marga* width. *Rasta* are named after popular Hindu deities and the occupation of the community or after some famous personality for instance *Vidhyadhar ka rasta* in the city.

There were number of artisans and businessmen invited by Sawai Jai Singh. Ghasiram Murlidhar trader was invited to settle down in town. He was allotted free of cost land, and was exempted from toll tax (*hasil rahdari wa mapa*) to carry on his business.⁶⁷

सिद्ध श्री माराजधिराज महाराजा श्रीसवाई जयसिंह जी देत्रो वचनात घासीराम मुरलीधर दिसेसू परसाद वांच्या। अप्ररंच तु अप्रनी खातिर जमा राख सवाई जयपुर में आय-हाट हवेली वद्याय विणज-व्योपार कीज्यो। हासिल राहधारी तथा मापा को सरकार की हद में तू कनां सैथानी सो अधिकारी लीजेलौ वा निकासू सदामन्दी माफ और परवानों विद्याधर ने इनायत हुयो छै सौ थारो गौर राखैलौ तूनें विद्याधर कहै तिण माफक कीज्यो। मिति मादवा सुदी ६, संवत १७८६ (१७२६ ए०डी०)

The above account clearly shows that artisans with their family were invited by Sawai Jai Singh, and they settled down in Jaipur city. Concessions were also provided to entice them.

⁶⁷ *History of the Jaipur City*, op. cit., p. 52.

The plots or land were allotted to the people according to their caste and professions or occupation. Some plots or areas were kept reserved for Brahmans, Thakurs and Kachwahas like Nathawat and Rajawat caste. They had built the dwelling house or havelis in the city.

Map no 274- *Havelis Sawai Jaipur mai baswa ka tazbeej ki chai* (Ground plan of the city to be built in the proposed city of Jaipur). The map furnishes the name of the *haveli* owner which were Nanigram, Devinath, Gulabchand, Sanghi Malukchand, Bhatt, Hari Kishan Mishra, Pokhran, Chippi, and out house (*Noharo*) of Nasigram.⁶⁸

Map no277- *Haveli Sawai Jaipur ki* (plan of the *havelis*). The map indicates that land or plots (*Jayega*) were allotted to Shri Chand, Nibol Chand, Sheonath, Mansaram Kayastha, Kesari Singh, Kesari Singh Saraogi and also shows *Noharo* (out house) of Nanigram and Izzatdas. They had built the *havelis*.⁶⁹

The following is tabular representation which shows land was allotted to prominent persons.

1-Table showing area allotted to *havelis* of Thakurs

Name of the owner	Land (measurement in terms of <i>bighas</i>)
Budh Singh dudwa	4 <i>bighas</i>
Kanhai Singh	Three quarter
Bakhhat Singh	Three quarter
Sabal Singh	1 <i>bigha</i>
Sheo Singh	Quarter
Sahajram	Three quarter
Gokul Singh	Three quarter
Chatr Singh	Three quarter
Maha Singh Solanki	1 <i>bigha</i>

⁶⁸ *Kapad Dwara*, Map and Notes No-274.

⁶⁹ *Ibid.*, Map and Notes No.-277.

Dayaram Naruka	One and quarter
Dhiraj Singh Naruka	One and quarter
Keerat Singh Naruka	Half <i>bigha</i>
Jodh Singh	Half <i>bigha</i>
Sawai Ram Naruka	Three quarter
Sur Singh etc. Naruka	Two <i>bighas</i>
Sangram Singh Naruka	Half <i>bigha</i>
Vijay Singh Naruka	Half <i>bigha</i>
Dhiraj Singh etc, Sultanote	Three quarter
Samvat Singh Chauhan	4 and quarter <i>bighas</i>
Dhiraj Singh Khangarot	Half <i>bigha</i>
Mohbat Singh	Six <i>bighas</i>
Jagmal Roop Singh	One and quarter <i>bigha</i>
Shyam Singh Khangarot	Five <i>bighas</i>
Akhai Singh and Jagat Singh Khangarot	Three and half <i>bighas</i>
Devi Singh Badgujar	One and half <i>bigha</i>
Guman Singh Rathore	One <i>bigha</i>
Jalam Singh	Two <i>bighas</i>
Durjan Singh Rathore	One <i>bigha</i>
Amar Singh Rathore	One <i>bigha</i>
Rai Singh Rathore	One and quater <i>bigha</i>
Harnat Singh Panchanot	Three <i>bighas</i>
Maha Singh etc, Panchanot	Three and half <i>bigha</i>
Amar Singh Jogo	One <i>bigha</i>

2 -Table of the *havelis* beyond the Talkatora Lake

Owner of the land	Land (measurement in terms of <i>bighas</i>)
Raja Mal Ji	4.25 <i>bighas</i>
Hakim Ji	1 <i>bigha</i>
Jagram	4 <i>bighas</i>

Kushal Singh Rajawat	2.75 <i>bighas</i>
Deep Singh Kumbhani	4 <i>bighas</i>
Rawat Sheo Singh Kumavat	4 <i>bighas</i>
Zorawar Singh (Sheobrampota)	5 <i>bighas</i>
Mohan Singh Nathawat	3 <i>bighas</i> and yards 7
Bhup Singh and Jujhar Singh	1 <i>bigha</i>
Surat Singh Rajawat	1 <i>bigha</i>
Sheo Singh and Bhao Singh etc, Shekhawats	8 and a half <i>bighas</i>
Rajawat Dip Singh	2 <i>bighas</i>
Sheo Singh etc, Shekhawats,	8 and a half <i>bighas</i>
Chuhad Singh and Dip Singh etc,	8 and a half <i>bighas</i>
Jait Singh	Half <i>bigha</i>

The regularity and uniformity of the buildings was maintained by the state is an example which shows that meticulous instruction regarding the construction of the buildings was given, as can be inferred from map.⁷⁰

पायाली सामराटजी कैलानी – बीघा 63-3/4; हवेली का दासा बराबरी नीव चौड़ी गज-1-1/2, ऊँची गज -2-1/2 दूसरी भीत चौड़ी गज-1, ऊँची गज -2-1/2, अरजो बाड़ गज -1, नीव ऊपर चौड़ी गज-1, ऊँची गज-7; नीव सुद्धा ऋद्ध = 9-1/2.

These lines indicate that building construction was state controlled. *Arhsatta Imarti* reveals that Vidhyadhar was *Deshdiwan* and all records of building construction and repairing were to be delivered to him.⁷¹

Girdhari mentions that there were mounds of sand dunes which were pulled down and after levelling it, *havelis* were constructed on these areas.⁷²

कुचे टीवे रेत नले बहुत है पुर!

तिनकौ दुरिकरवाय कै करो हवेली सूर ।।188।।

⁷⁰ Map No. LS/17 in the City Palace Museum, Cf; *Histry of the Jaipur City*, op. cit., p. 42.

⁷¹ *Arhsatta Imarti*, B.N. 13.

⁷² Girdhari, *Bhojanasara*, op. cit., Cf; *Rajdarwar and Raniwas*, op. cit., p. 212.

The metaphorical description in *Ishvaravilasa Mahakavya* mentions in the third canto (sanskrit) Jaipur become famous with many tall and palatial buildings and the flag staffs on the roofs of these buildings were so high that they were a hindrance to the movement of the moon.⁷³

We find that lower portion of the buildings were used for business purposes, and these business men lived in the upper portion of the buildings in Jaipur. *Buddhi Vilas* also mentions that space was left between the shops (*hatin*). *Havelis* were constructed in this space. *Havelis* were connected with the shops and constructed on the main roads or in market area.⁷⁴

The Rajput *havelis* can be categorized into two forms; one belonged to the thakurs, and the other kind belonging to military officials. However many *havelis* belonged to the traders. Karim Multani was invited from Sanganer likewise many other traders were invited by Sawai Jai Singh from neighbouring areas to settle down in Jaipur city. Rajput Thakurs were very prominent in Jaipur city, and they had grand *havelis* in capital for instance *Samode haveli* in Jaipur.⁷⁵ We have a map in *Kapad dwara* documents, which indicates that the *havelis* of thakurs were constructed in the extreme of the city wall (*Sawai Jaipur ke kot neeche thakur logna ki havelo*).⁷⁶

There were also impressive *havelis* of Hindu subcaste such as *Bhandaris* (stores Bhandar), *Kotharas* (treasures) and *Dhabhais* (devotes of Krishna).⁷⁷

Our document mentions Muslim *havelis* also. They were royal physicians (*Hakim*).⁷⁸ These *havelis* were mostly situated on the main steets for example, 'Nawab Sahab Ki haveli' at Chandpol Bazaar in Jaipur.⁷⁹

Brahman class also occupied significant political position for instance Pandit Shiv Din who was the prime minister of the Jaipur ruler.⁸⁰ Jagannath Samrat was the official priest of the ruler and his *haveli* was located in Brahmapuri.⁸¹

⁷³ *Ishvarvilas Mahakavya*, op. cit., p. 70.

⁷⁴ *Buddhi Vilas*, op. cit., p. 15.

⁷⁵ Jain, Shikha, *Havelis: A Living Tradition of Rajasthan*, Gurgaon, Haryana, 2004, p. 25.

⁷⁶ *Kapad Dwara*- Map and Notes No-54.

⁷⁷ *Havelis: A Living Tradition of Rajasthan*, op. cit., p. 31.

⁷⁸ *Kapad Dwara*, Map and Notes No- 45.

⁷⁹ *Havelis: a living tradition of Rajasthan*, op. cit., p. 32.

Jaipur had garden and temple *havelis* also. The garden *havelis* concept was derived from Mughals. *Arhsatta Imarti* alludes that garden was laid out in the male and female section of the *haveli*, but this record does not indicate the name of *haveli* in which garden was constructed.⁸² There was Johri *haveli* in Ghat Ki Guni which had garden. This *haveli* belonged to the rich trader. It was richly ornamented and decorated. In this *haveli* marble and embellishment were used in abundance.⁸³ The plots of *havelis* in Jaipur are regular, rectangular and square and its settlement is based on grid iron pattern with perfect symmetry. The *havelis* of Jaipur have one or two and many courtyards as can be discerned in Natani *Haveli*, Nawab Ki *Haveli*. The *havelis* of eastern Rajasthan have a concentric layout with a large square courtyard, rituals were performed in this court.⁸⁴

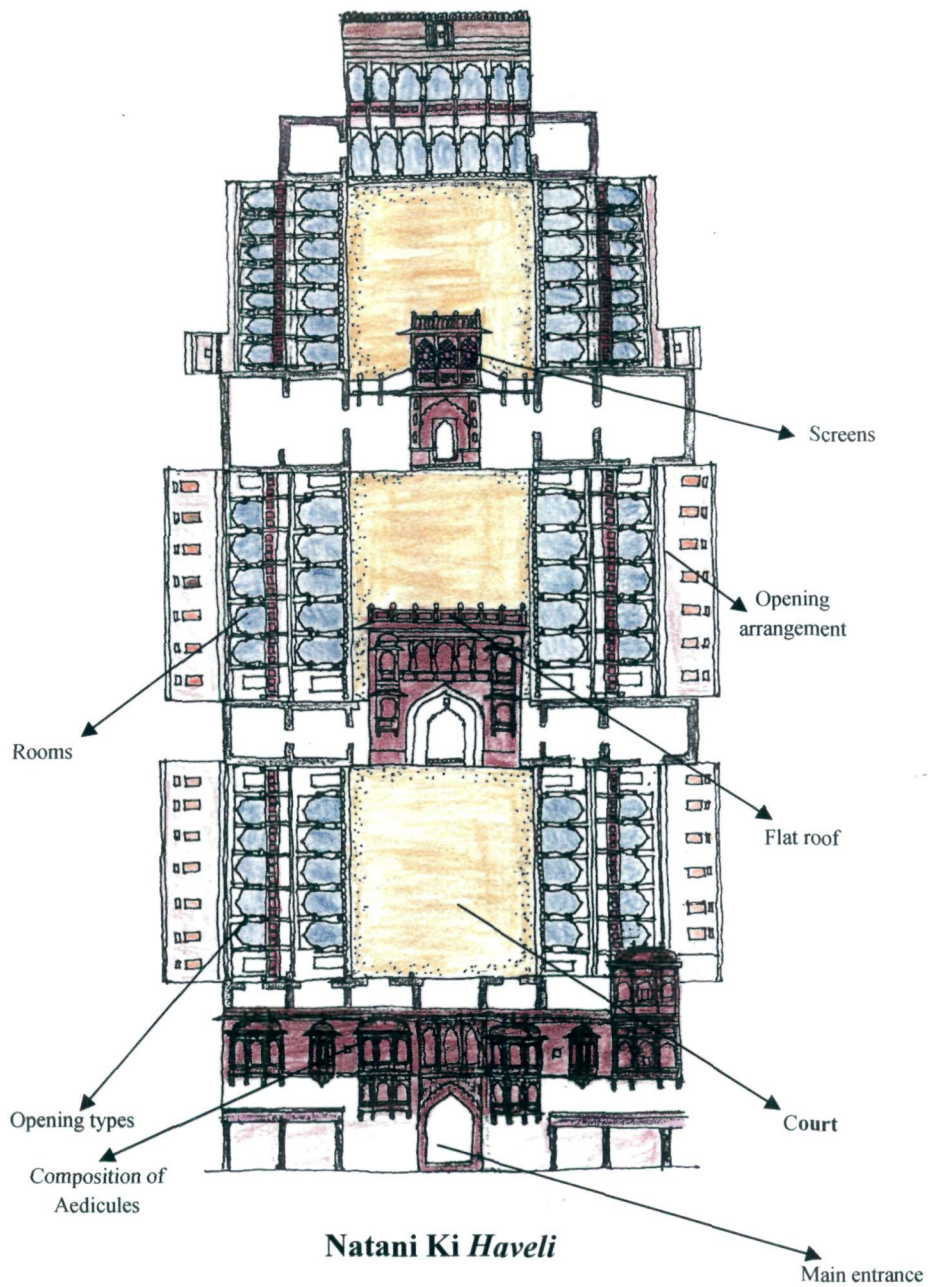
⁸⁰ *Ibid.*, p. 24.

⁸¹ *Kapad Dwara*, Map and Notes No- 249.

⁸² *Arhsatta Imarti*, Bundle No-12, pp. 30-32

⁸³ *Haveli: A Living Tradition of Rajasthan*, op. cit., p. 35.

⁸⁴ *Ibid.*, p. 52.



Natani Ki Haveli

Plan H: Adapted from "Havelis: A Living Tradition of Rajasthan"

The *haveli* plan evolved around the centre of the court. *Chowk* is the primary space. All ritualistic activities were conducted in *chowks* or courts like birth, marriages, death and festival ceremonies and religious festivals took place in the courtyard. There were separate court in the *haveli* for male and female. *Zanana* court was for the purpose the morning *puja*, cooking activities, washing and drying of the clothes.⁸⁵

Infact, in Hindu families, before the commencement of construction, *Bhumi puja* was conducted in the court, and *Griha pravesh* or *Vastu Shanti* was also held before entering the new house. In Muslim families, *Qurankhawani* was conducted in the court. All these activities were performed in the central space or courtyard.⁸⁶

There were two types of entrance, direct and indirect entrance. The indirect entrance is to protect the privacy of the female or the inner court. In Rajput and Brahman *Havelis*, *Kul-Devi* (clan goddess) occupied the place of niche at the top of the entrance and in Marwar *haveli*, the niche is reserved for Lord Ganesh. This element was absent in Muslim *havelis*. The entrance of Muslim *Havelis* was usually decorated with floral styles or patterns. Nawab Sahab Ki *Haveli* at Jaipur was the only one that had the name engraved at the entrance gate.⁸⁷

Our document also mentions the *Nohara* (out houses). *Noharo* were also made in *havelis* and it was occupied by the servent and also used for parking the chariot (*Rath*) and palanquins (*Palakis*). The corner rooms in the *haveli* were mostly used for storing grains.⁸⁸

Baithak (literally place to sit) was built in the outer section of the *haveli*. The *baithak* is the place where male relax, sleep, and receive guests. It was also used for official purposes.⁸⁹

⁸⁵ *Ibid.*, p.p. 57-59.

⁸⁶ *Ibid.*, pp. 59-60.

⁸⁷ *Ibid.*, pp. 60-62.

⁸⁸ *Kapad dwara*, Map and Notes No-274; see also, *Havelis: A Living Tradition of Rajasthan*, op. cit., p. 69.

⁸⁹ *Havelis: A Living Tradition of Rajasthan*, op. cit., p. 67.

Observatory:-

Sawai Jai Singh built five observatories in India namely at Delhi, Jaipur, Banaras, Ujjain and Mathura. Jaipur observatory is the largest and best preserved. Samrat Jagannath was the official tutor who initiated the subject of astronomy to Jai Singh. Samrat Jagannath was a Maratha Brahman and a great scholar of Astronomy. He was well acquainted with Arabic system of astronomy and European astronomical works.⁹⁰ He wanted to derive correct methods to find the true positions of planets. In this context three significant books-*Rekhaganita*, *Siddhanta Sara Kaustubha* and *Samrat Siddhanta* were written. *Rekhaganita* is a translation of *Euclid's Elements* an Arabic work. *Siddhanta Sara Kaustubha* is translation of *Almagut* and *Samrat Siddhanta* – it is an original contribution of the author.⁹¹

Sawai Jai Singh was acquainted with the astronomical works of his predecessors and cotemporaries such as works of Ptolemy's *Almagest*, the astronomical tables of Ulugh Beg, some treatise on the Astrolabe, *La Hire's Tabulae Astronomicae*, and Flamsteed *Historica Coestis Britanica*, as well as some western mathematical works such as Euclid's *Elements*, a treatise on plane and spherical trigonometry and on the construction of logarithms.⁹²

Sawai Jai Singh both studied Indian works on astronomy, like *Jyotish Vedanga*, *Surya Siddhanta* etc; and obtained a thorough knowledge of the science, as well as works of Arab astronomers like *Abdul Rahman b. Omar Abul-Hussain al-Sufi* (d.986) *Nasir al-Dinal – Tusi*, *Alib Mohammad al-Sayyid al-Sharif*, *Jamshed b. Masud Jijal al-Dinal-Kashi* (circa 1440 A.D), *Ulugh Beg* (d 1449 A.D) and *Maulana Chand*. Jai Singh was highly influenced by Muslim astronomers, especially of Ulugh Beg.⁹³ Samrat Jagannath says that Jai Singh sent a scholar named Mohammad Sharif to several western countries. He also sent Mohammad Mahandi to collect

⁹⁰ *Buddhi Vilas*, op. cit., p. 8; See also, Sharma, M. L., *Jagannath Samrats Outstanding Contribution to Astronomy*, *Indian Journal of History of Science*, 1982, p. 244.

⁹¹ *Ibid.*, pp. 247-248.

⁹² Kaye, G.R., *A Guide to the Old Observatories at Delhi, Jaipur, Ujjain, Benaras*, Reprint Gurgaon, 1985, p. 3.

⁹³ *Ibid.*, *The Astronomical Observatories of Jai Singh, Banaras*, 1973, Reprint Delhi, pp. 2-5.

astronomical data at different islands and similarly other scholars were sent in different countries to observe planets.⁹⁴

Jaipur became a centre of learning, frequented by foreign astronomers, and number of scholars and poets came from all parts of country, especially from Banaras, Karnataka and Maharastra.⁹⁵

Buddhi Vilas mentions:

आरे निजमी जोतिगी, वहर्यौं फिरंगी कौतिगी।
तिन रच्यौ जत्रं विसाल है, तामें ग्रहों की चाल है।।105।।

The word *Feringi* used in the above lines refers to *Padre Manuel de Figeirodo*, who came to help Sawai Jai Singh in his work related to astronomy.⁹⁶ Jai Singh became aware of the progress in astronomy in some European countries and was impressed by Flamsteed work- *De la Hire's Tabulae Astronomicae* (a catalogue of stars).



(XX): The picture showing Padre Manuel de Figeirodo, gifting maps & books to Sawai Jai Singh which is related to astronomy (1729 A.D.)

Source- "Sawai Jai Singh Charitra"

⁹⁴ *Jagannath Samrats Outstanding Contribution to Astronomy*, op. cit., p. 249.

⁹⁵ *Life and Times of Sawai Jai Singh*, op. cit., p. 314.

⁹⁶ *Buddhi Vilas*, op. cit., p. 116.

Zij Muhammad Shahi:- *Zij Muhammad Shahi* (Muhammad Shah's astronomical tables) was prepared by Sawai Jai Singh under Emperor Muhammad Shah. *Zij Muhammad Shahi* contains tables which provided the position of planets, Sun and Moon. Kaye obtained an incomplete *Devnagri* manuscript from Jaipur. The author said that it is not the original itself but Ulugh Beg's catalogue, updated and improved by Jai Singh, and included Jai Singh's table based on his actual observations.

The Jaipur manuscript begins as follows, "Homage to holy Ganesh, Catalogue of 48 constellations. From the time of Ulugh Beg's table A.H. 841 (1437) to the present date A.H. 1138 (1725-26) 297 years the mean motion is 4 degrees 8 minutes. In the *Zij – Muhammad Shahi* the estimates of declination etc; are taken from globe. Right ascension divided by six is apparent time....."

The British Museum Manuscript entitled *The Zij Jadid Muhammad Shahi* (new Muhammad Shah tables) indicates that Sawai Jai Singh was its author.

The British Museum Manuscript starts as follows, "Praise be to God, such that the minutely discerning genius of the profoundest geometers in uttering the smallest particle of it, may open the mouth in confession of inability; and such adoration, that the study and accuracy of astronomers who measures the heavens, on the first step towards expressing it may acknowledge their astonishment and utter insufficiency⁹⁷

Wanting to improve the Indian calendar and the ability to precisely locate the Sun, for purposes of map making, Sawai Jai Singh built five astronomical observatories in India. The instruments, probably inspired by Uzbekistan astronomer Ulugh Beg, were large masonry structures equipped with protractors and marked grids designed for precise measurements of the location of celestial objects.

The Astrolabe (Yantra Raj): The astrolabe appears to have played a very important part in Jai Singh's work. Jai Singh used flat astrolabe. It was called *Zat al-Safa-in* (consisting of tables) in Arabic. The *Yantra Raj*, is an adaptation of an

⁹⁷ *The Astronomical Observatories of Jai Singh*, op. cit., pp. 8-15.

Astrolabe a medieval instrument for the measurement of time and the position of celestial objects. Sawai Jai Singh compiled and studied astrolabe in different language available in his era and fabricated a comprehensive astrolabe for Jaipur observatory. This circular instrument is marked with 360 degrees on it with division in *ghatis*. Likewise, 90 altitude circles, prominent stars, constellations and celestial circles are also marked on it at their respective proper places. It has a separate attachment for a sighting tube to be fixed in the centre of the instrument. The instrument is used for measuring ascending altitude, time and position of the sun and some other celestial objects in the Sky. It can also be used in the computations of celestial positions and their changes

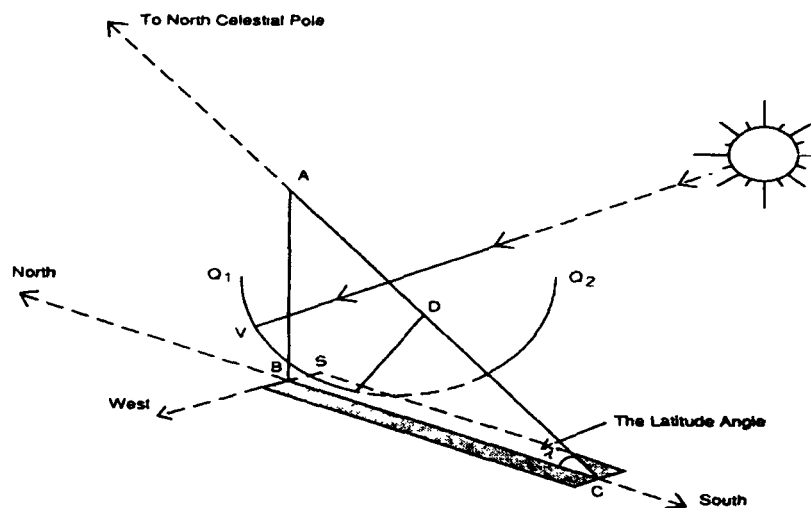
Sawai Jai Singh had designed (actually improved) the masonry instrument like the Samrat Yantra, the Jai Prakash and the Rama Yantra. These instruments were peculiar in Jaipur observatory.⁹⁸



(XXI): The Astrolabe (Yantra Raj)

⁹⁸ Based on *Physical Survey*.

Samrat Yantra: Samrat Yantra is an equinoctial sundial .Sawai Jai singh turned this ancient sundial into an accurate instrument for measuring time, hour, angle, and declination of celestial objects. It is nearly 90 feet high and 147 feet long. The radius of quadrant is 49 feet 10 inches. The dials are graduated to read the seconds but it is not possible because the shadow is not clearly defined. It is situated on the South East of observatory in Jaipur. The primary object is to indicate solar time or local time. It can be used to measure time in both day (based on shadows of Gnomon) as well as night (based on distance between stars. Like any other sundial. Samrat gives local time and not “standard time”.⁹⁹



Samrat Yantra: Principle and Operation

⁹⁹ *The Astronomical Observatories of Jai Singh*, op. cit., p. 52.

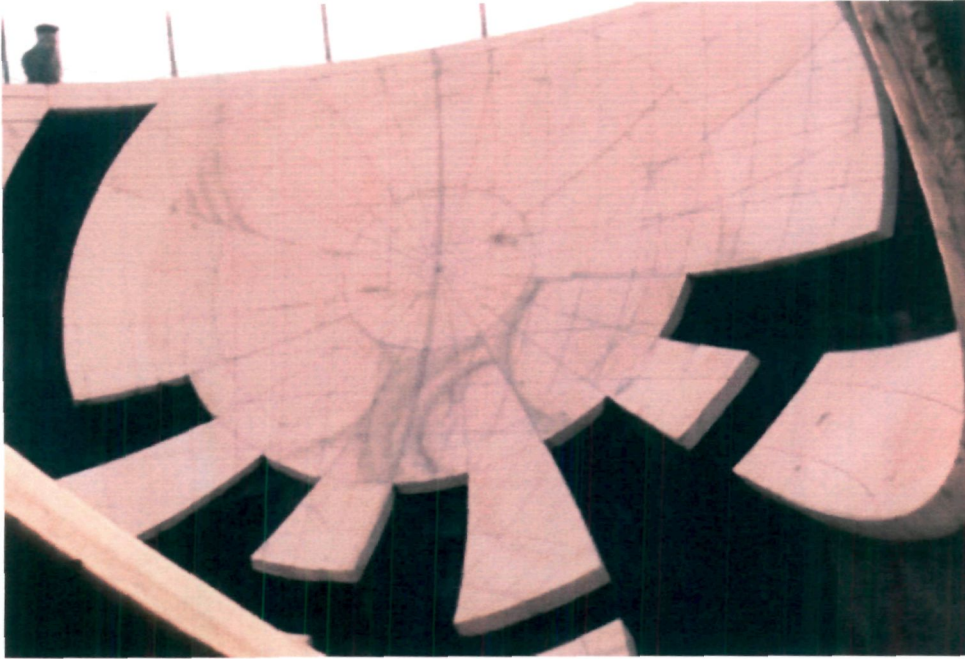


(XXII): The large Samyat Yantra, equatorial sundial, at Jaipur.

Jai Prakash Yantra: Jai prakash Yantra is made up of hemispherical dials. It is made of two parts. One part of the instrument is a hemisphere, fashioned of mortar, sunk in the ground, sliced with passages so that the instrument reader can be close to the remaining segments of the hemisphere. The second part of the instrument is another hemisphere, again fashioned of mortar, sunk in the ground, sliced with passages to compliment the first instrument.¹⁰⁰ The parts of the hemisphere in the first instrument which are missing because of the passageways are present in the second and visa versa. The hemisphere surfaces are of marble and are scribed with celestial latitude and longitude lines. A small marker is suspended at the center of each hemisphere by wires. Cross wires are stretched from North to South and east to west and the shadow of the intersection of these wires falling on the surface of the hemisphere (bowl) indicates the declination and its zenith distance in the heavens. Its rim or upper edge represents the horizon and graduated in degrees. This instrument is a very efficient dial, shows local time, the sun's declination and the sign of the meridian. This instrument was constructed at Delhi and Jaipur.¹⁰¹

¹⁰⁰ *Based on Physical Survey.*

¹⁰¹ *Ibid.*



(XXIII): Jai Prakash Yantra

Ram Yantra: The Ram Yantra can measure zenith distance and attitude of the sun. It can also measure the local coordinates of altitude and azimuth of a celestial object. The azimuth is the relative angular position of the object measured eastwards, starting from the direction north. The complementary units are so designed that the shadow of the gnomon falls on a sector of one of the instrument, if it falls in the gap for the other instrument. The main feature of this instrument is that it gives direct readings.¹⁰²

When the shadow falls at the top of the wall of the instrument, the altitude of the sun is zero. When the shadow is at the junction between the wall and the floor, the altitude of the sun is 45 degrees. Altitude between 45 to 90 degrees can be read in a radial direction on the floor of the instrument. There are twelve stone triangles that are fixed to the ground. These stone slabs are divided from 90 to 45 degrees.¹⁰³ These divisions help calculate movement of stars. Ram Yantra is mentioned in the preface to

¹⁰² *Ibid.*

¹⁰³ *Ibid.*

the *Zij –i- Muhammad Shahi*. The Sources say that it was named after Ram Singh (a predecessor of Jai Singh).¹⁰⁴

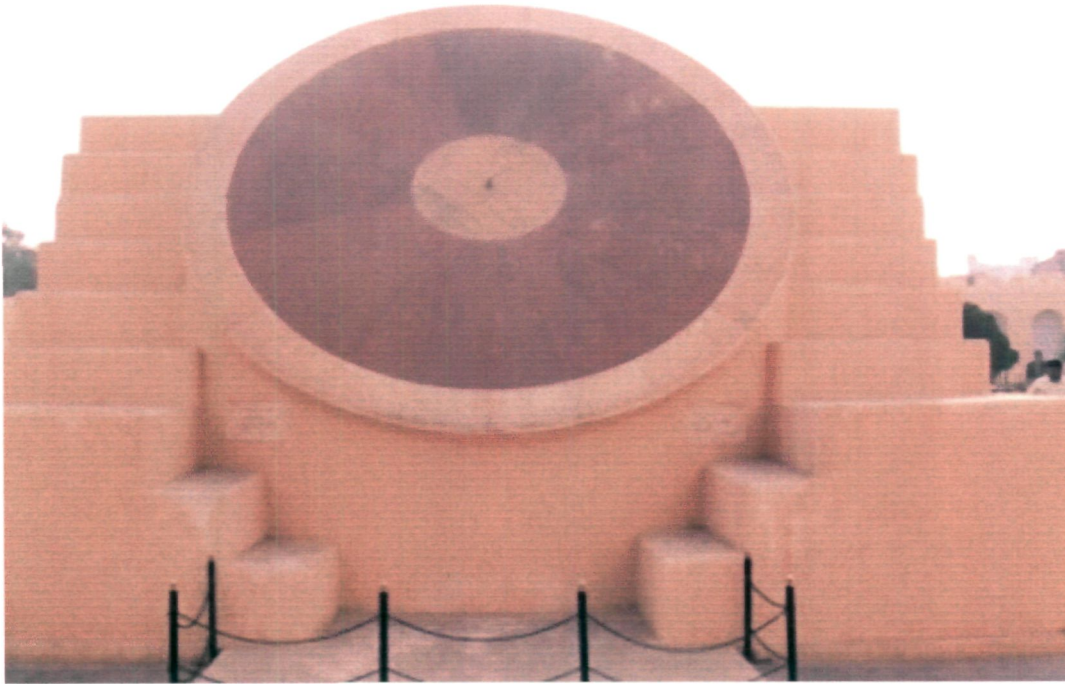


(XXIV): Ram Yantra- Jaipur

Nadivalaya Yantra: This instrument is designed to measure time. The instrument has two circular plates (dials), facing north and south. Only the northern part (*Uttari Gola*) was built originally, the southern part and the storage chamber was added before the reign of Maharaja Pratap Singh, when the whole building was rebuilt (1771). The wall of the dials is inclined towards the south at such an angle that the instrument remains parallel to the plane of the earth or equator. The rods (gnomon) emerging perpendicularly from the plates are parallel to the axis of the rotation of the earth. The Shadows of the rods move along the scales on the dial plates indicating the local time. Earth dial plate is jointed into three circular scales, two of which have marking for the hours and minutes. The third scale is marked for the determination of the *ghatis* and *palas* (zenith distance). The time is indicated by the circular scale, and

¹⁰⁴ *A Guide to the Old Observatories at Delhi, Jaipur, Ujjain, Benaras*, op. cit., pp. 28-29.

a correction factor is displayed by the day at the observatory, which needs to be added to obtain the clock time.¹⁰⁵



(XXV): Nadivalaya Yantra (Equinoctial Dial) Uttari Gola

Rasivalaya Yantra: It is used for measuring the latitude and longitude of celestial bodies. There are 12 instruments which represent the twelve signs of the zodiac; one for each instrument to be done which the corresponding signs of the zodiac transits the meridian.

Each unit consists of a triangular gnomon and a quadrant perpendicular to it, analogous to the Samrat Yantra. However, these differ with each other regarding the shape size and the angle of the gnomon. Celestial longitude of an object is measured along the ecliptics (hence it is also called Ecliptic dial) while the angular distance of an object to the north or south of the ecliptic is celestial latitude. Ecliptic is the annual apparent path of the sun in the sky.

The gnomon of a *Rasivalaya* instrument points to the ecliptic poles, when the zodiacal constellation corresponding to that *Rasivalaya* transits the meridian. The

¹⁰⁵ Based on *Physical Survey*.

Rasivalaya instrument is found only in the Jaipur observatory. It is believed that *Rasivalaya* was not designed by Jai Singh as it was not a part of list of Sawai Jai Singh's time.¹⁰⁶



(XXVI): Rasivalaya Yantra (Ecliptic Dial)

Chakra Yantra (Circle Instrument): The *Chakra yantra* is a ring instrument which measures the global co-ordinates of declination and the hour angle of a celestial object.

Declination is the angular distance north or south from the celestial equator. The hour circle of celestial object is a great circle that passes through the object and the celestial poles. The angle between an observer's meridian and the hour circle of the celestial body is the hour angle.

The ring is pivoted about a polar axis, at the southern end of the instrument. A sighting tube, passing through the centre of the ring is mounted using the movement

¹⁰⁶ *Ibid.*

of the whole ring about the polar axis and the movement of the sighting tube about the perpendicular axis, a celestial object can be sighted.¹⁰⁷

The rim of the circle has scale of 360 degrees with each degree division is divided into 10 subdivisions. The plate around the polar axis pivot has scale of 60 ghatas. Once the celestial object is sighted the position of tube on the two scale, can be used to read the declination and the hour angle.¹⁰⁸



(XXVII): Chakra Yantra (Measures Declination of a Celestial Body)

Dakshinottara Bhatti (Meridian Wall): Dakshinottara Bhatti consists of graduated quadrant or a semicircle placed exactly in the north-south direction. At the center of the arc is fixed a horizontal rod. It is used for measuring the meridian altitude or zenith distance of a celestial object. The instrument measures the altitude or the angular height of the celestial object when it crosses the meridian. The meridian is the arc defined by the north-south and Zenith. When an object crosses this arc in the sky, halfway between its rising and setting times, it is said to transit the meridian. The instrument uses either the semi-circular arc built on the west facing wall or the

¹⁰⁷ *Ibid.*

¹⁰⁸ *Ibid.*

intersecting arc's of the east facing wall to measure, the meridian altitude of a celestial object.

The circular arc of the west facing wall and the intersecting quadrant of the east facing wall have 90 degrees of altitude marked at the bottom of the scale and 0 degree altitude marked at its top. Altitude is measured with the help of the shadow of gnomon fixed on either side.

The marking on the scale are in unit of degrees that have been further subdivided into 10 main divisions each with further subdivision of the 3 small units which yield a least count of 2 minutes of arc for the instruments. Sawai Jai Singh built Dakshinottara Bhatti yantrs at all of his observatories and there are six of them till date(Varanasi had 2, rest one each).¹⁰⁹



(XXVIII): Dakshinottara Bhatti yantra

The Sasthamsa Yantra (Sextant Instruments): Sasthamsa Yantra is used for measuring the declination and zenith distance of Sun. This instrument uses semi-circular concave arcs laying in the meridian. There are two identical units of *Sasthamsa*, one each inside the eastern and western supporting structures of the *Samrat yantra*. Each unit of the instrument has two semi-circular scales for measuring the declination and Zenith distance respectively. It also has two pin holes placed high above. A circular image of the sun is projected into the scale for the some time

¹⁰⁹ *Ibid.*

(approximately 2 minutes) through the pinholes, when the sun transits the meridian. The altitude and Zenith distance are measured on the scale as per the image location. When this image is captured on the white paper sheet, the black spot of the sun and vibrations in its image as it moves, are clearly visible.

The circular scales have markings to note the declination and angular distance from the equator, as well as the Zenith distance or the angle away from the Zenith. The declination scale of the *Sasthamsa* read values between $23^{\circ}30'$ north and south. The Zenith distance scale is marked from 0 to 60 degrees. The scale of the *Sasthamsa* is divided into degrees and minutes with least count of 1 minute.¹¹⁰



(XXIX): Sasthamsa Yantra (60 deg. Meridian Chamber)

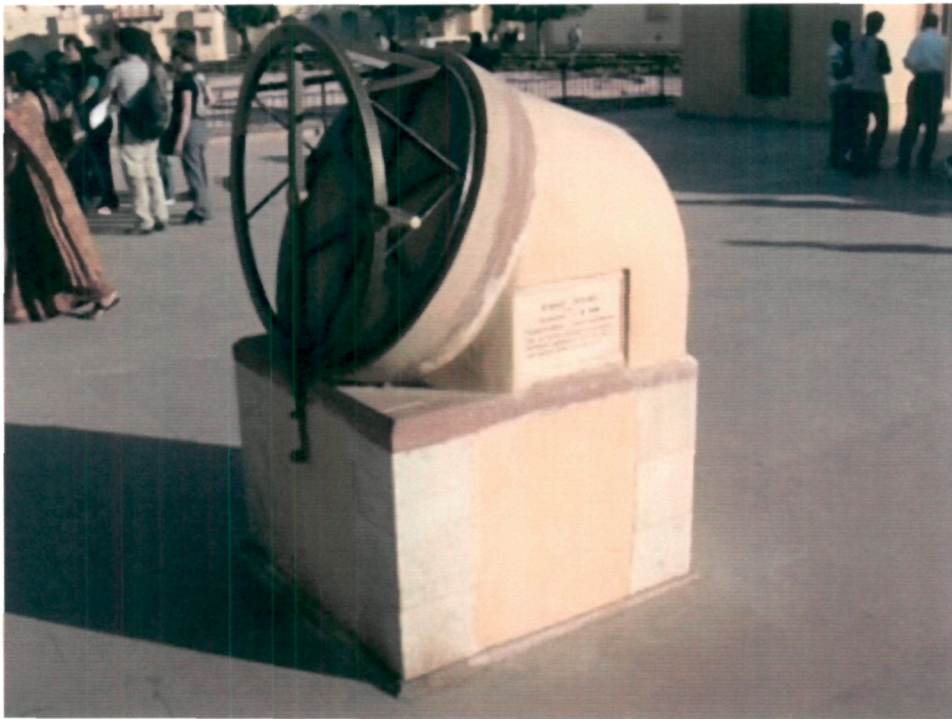
Krantivrtta (declination circle or ecliptic): The Krantivrtta is an instrument that means to measure the celestial latitude and longitude of an object in the sky. It is also used for measuring solar sign of the sun in day time.

Krantivrtta consists of two brass circles of equal diameter pivoted together at one point on their circumference. The base circle made up of stone is called Nadivrtta. It always remains parallel to the equator of the earth, while the outer brass circles can be rotated so as to be parallel to the ecliptic, at any given movement. The

¹¹⁰ *Ibid.*

Nadivratna has 60 degrees marked on its circular scale likewise, degrees of 12 Zodiac sign are marked on the outer brass circle.

A sighting bar is pivoted to the outer ecliptic circles, when the outer circles is parallel, can be rotated around the ecliptic pole. When the sighting bar rests, the readings on the quadrant of sighting bar and brass circles, gives the latitude and longitude of the object. This instrument is said to have been built according to instruction of Pandit Jagannath (under Maharaja Sawai Jai Singh II, before 1743) and never have been completed, with superstructure missing.¹¹¹



(XXX): Krantivritta II (Measures Celestial Latitude & Longitude)

Digamsa (Digamsa: azimuth): Digamsa determines the azimuth of a celestial object. This instrument is a cylindrical instrument that has a simple method of determining the azimuth of a celestial object. *Digamsa* or the azimuth of a celestial object is the relative angular position of the object measured eastwards, starting from the direction north.¹¹²

¹¹¹ *Ibid.*

¹¹² *Ibid.*

The instrument consists of a small knob (gnomon) placed in the centre of three co-axial cylinders. To determine the azimuth of a celestial object at night, an ordinary string is needed to be attached to the central knob. The other end of string is suspended over one of the outer cylinders, using conventional weights. The circular rim of the cylinders is marked into 360 degrees and further subdivisions to indicate the azimuth.¹¹³

The string is moved over the rim of either of the outer cylinders and aligned to sight the celestial object. By this process, a vertical plane is defined that contains the object and a point on the horizon. The azimuth can be read from the marking scale on the rim of the cylinder where the string is resting.¹¹⁴

Likewise, to measure the azimuth of the Sun, cross wires are stretched on the outer cylinder in East-West and North-South direction. Shadow of the centre of cross wires on the circular scale tells the azimuth.¹¹⁵



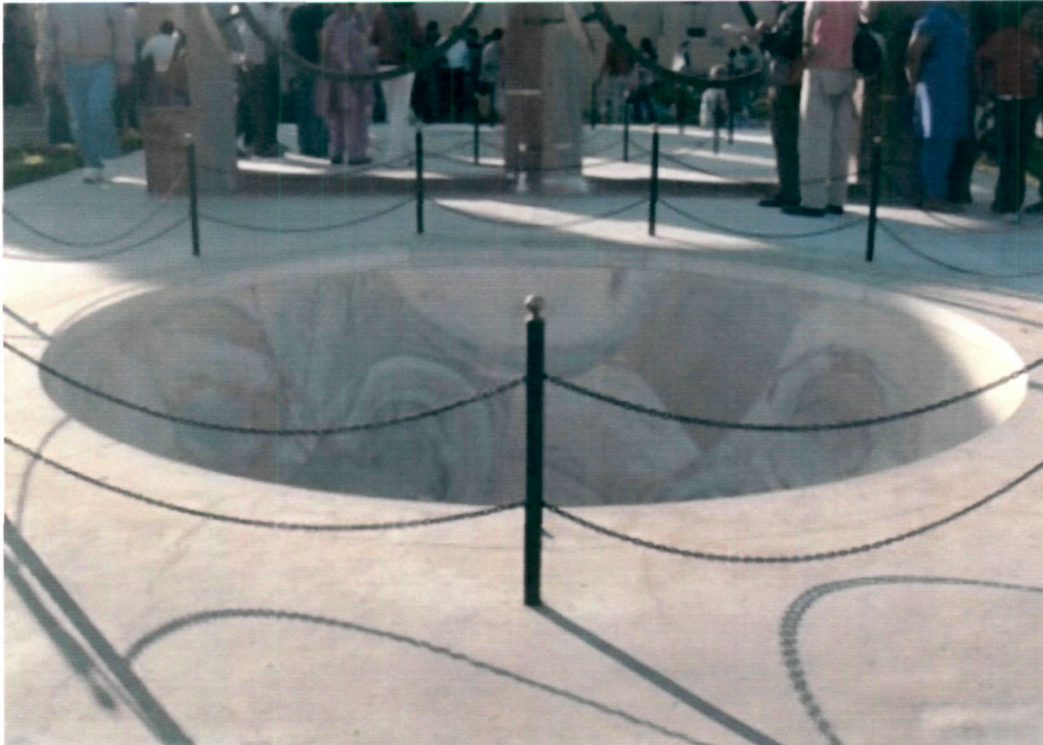
(XXXI): Digamsa Yantra (Azimuth Circle)

¹¹³ *Ibid.*

¹¹⁴ *Ibid.*

¹¹⁵ *Ibid.*

Kapala (A bowl, Hemispherical Dial): It used for measuring the ascendant and zodiacs. It is a peculiar instrument and only Jaipur observatory contains this instrument. This instrument shows the rising signs. Each Kapala has a diameter of $11\frac{1}{3}$ feet and is a complete hemisphere. This instrument is like a Jaiprakash Yantra. The edge of the hemisphere corresponds not to the horizons, but its rim represents solstitial colure.¹¹⁶



(XXXII): Kapala Yantra (Hemispherical Dial)

FORTS- Jaipur city was protected by Forts like Jaigarh and Nahargarh. Jaigarh was situated on the top of the hills. This was earlier known as *Chilhi ka tola*. *Kapad dwara* documents are replete with the information that Sawai Jai Singh had built some places and *tanka* in Jaigarh.

Map No 163- "*Chilhi ka tola ki tarah*" (Plan of *Chilhi ka tola* or Jaigarh). The map consists of the information regarding the construction of rampart, *tanka* and residential palaces. This addition was done by Sawai Jai Singh.¹¹⁷ *Siropao* (dress of

¹¹⁶ *The Astronomical Observatories of Jai Singh*, op. cit., p. 52.

¹¹⁷ *Kapad Dwara*, Map and Notes No – 163., second quarter of 18th century.

honour) was conferred on Vidhyadhar for the construction of the palaces in Jaigarh fort.¹¹⁸

There is a controversy regarding the construction of Jaigarh fort. Some researches indicate that this fort was built by Mirza Raja Jai Singh. However V. S. Bhatnagar believes that Jai Singh built this fort. But Kapad-dwara and other documentary evidence does not show that this fort was built by Sawai Jai Singh.

In the context of *Jaigarh Fort* Kavi Atman Ram says in the following lines,

पहुँचत भो आमेरि मै, हुकुम भूप जय सिंह ।
महल चीतह ठौरँ बनै, बासर उत्तम चाहि ।।684 ।।
जै गढ़ ताकौ नाउँ यह, भाष्यौ फेरि नरेस ।
करनी अधिकाई जितै, बरनी जाति न सेस ।।684 ।।

The above lines show that Sawai Jai Singh had built a palace complex. Jai Singh ordered that a palace should be added on *Chilhi ka tola*, Jaigarh, name of this fort was given by later rulers.¹¹⁹

There are several gates, towers and bastions in Jaigarh Fort. The main gate are Ghati gate, Delhi gate, Kheri gate and Barhi gate. The highest tower is Diwa Minar in Jaigarh.¹²⁰

Nahargarh – It is 500 high from the foot of the hills and situated in the north-west of Jaipur. It is known as Sudarshangarh or Tiger fort and constructed in 1734 by Sawai Jai Singh. Maps of *Kapad dwara* show the palaces, bastions (*burj*) and 45 gates in six *bighas* of Nahargarh fort.¹²¹ The outer walls of Nahargarh are lower in height and less in breadth than the walls of Jaigarh.¹²²

Buddhi Vilas refers to the name of forts and area of Jaipur city.

¹¹⁸ *History of the Jaipur City*, op. cit., p. 220.

¹¹⁹ *Sawai Jai Singh Charit*, op. cit., p. 77.

¹²⁰ *Jaigarh, The Invincible Fort of Amber*, op. cit., pp. 48-49.

¹²¹ *Kapad Dwara*, Maps and Notes No -106, 203, 224 and 316.

¹²² *Jaigarh, The Invincible Fort of Amber*, op. cit., p. 25.

चहुधा पुर के गिर है उत्तंग,
तिनपै गढ़ बनवाए उत्तंग ।
पूरब दिसि गढ़ रघुनाथ नाम,
तलि तीरथ गलता है सु ठामं ।।161।।

दक्षिण दिसि संकरगढ़ अनूप,
वनवार्यो माधवस्यंघ भूप ।
हथरोही कौ गढ़ दुतिए जानि,
पछिछम हि सुदरसन गढ़ बषानि ।।162।।
उत्तर अंवावति है सुथानं,
तापै सवाई जै-गढ़ महानं ।
उत्तर दक्षिरग की कूरंग पाय,
इक ब्रम्हपुरी दीन्ही वसाय ।।163।।

The above lines indicate that Raghunathgarh was situated in the east and sacred place of Galta was also situated in the east. Shankargarh was situated in the south which was constructed by MadhoSingh. These lines also shows Hathroi was situated in the south, Sudarshangarh in the north-west and Sawai Jaigarh was located in the north. The author also mentions about Brahmपुरी (residential block).

Religious buildings:-

Temples- Jai Singh was the follower of vaishnavism and devotee of Govind Deva. He had built number of temples in Jaipur. The most famous temple is Govind Deva which was built in c. 1734. Jaipur city was dedicated to Govind Deva diety with Sawai Jai Singh as his minister. Jai Singh seal stated, “Jai Simha Sharanam, Govind Deva charnam”. This text implies that Jai Singh takes shelter at the feet of Govind Deva.¹²³

Jai Singh started the construction of buildings after installing the idol of Govind Deva at Jaipur. This temple is named as Govind Mahal.

¹²³ Bahura, Gopal Narayan., *SRI Govind Deva Gatha Service Rendered to Govind by the Rulers of Ambera and Jayapura*, eds. Case, Margaret H., Govind Deva, *A Dialouge in Stone*, New Delhi, 1996, P. 209.

There is a controversy regarding the construction of this temple. It is said that Roop Goswami discovered the image of Govind Deva, from a site called Goma Tila in Vrindaban.¹²⁴ Govind Deva temple was first built at Vrindaban in 1590 by Raja Man Singh. There is a one inscription on stone inside the temple. The translation of this inscription is as follows, “In the 34th year of the reign of Emperor Akbar, Maharaja-Dhiraj Shri Man Singh, descendent of Maharajadhiraj Shri Prithvi and son of Maharaja Shri Bhagwantdas built this temple of Govind Deva in the Yoga Pitha Sthana of Shri Vrindaban. The chief builder was Shri Kalyandas, the architect was Manikchand Chopang and the mason was Govind Deva, a resident of Delhi (signed) Ganesh Vimal.”¹²⁵

It seems that the image of Govind Deva was taken out from the temple for fear of destruction by the Mughal Emperor Aurangzeb and this image was hidden in other place of Vrindaban, as it is believed by the priest family in Kama (Bharatpur district).¹²⁶

R Nath provides the information of Govind Deva’s itinerary from Vrindavan to Jaipur in the following manners: 1530 to 1590- First temple of Govind Deva at Vrindavan, 1590 to 1669 – Second great temple was at Vrindavan, 1669 – Desecration of the temple, 1669 to 1671 – Third temple at Radhakunda, Fourth temple of Kaman, 1675 to 1700 – Ajnatavasa and fifth temple at Govindgadha, 1700 to 1707 – Sixth temple at Khava (Jamva Ramgadha), 1707 to 1713 – Seventh temple at Govindpura (Rupaheda), 1713 to 1715 – Eighth temple at Kanak Vrandavan, 1727 – Ninth temple at Surya Mahal (Jai Niwas garden)¹²⁷ Jayapura.

Sawai Jai Singh contemplated and studied the books of the other Vaishnava Sampradaya and offered his veneration to Govind Deva ji. In the last days of his life Jai Singh devoted himself entirely to God. A description is given by his court poet and

¹²⁴ *History of the Jaipur City*, op. cit., p. 161.

¹²⁵ *Ibid.*

¹²⁶ *SRI Govind Deva Gatha Service Rendered to Govind by the Rulers of Ambera and Jayapura*, op. cit., p. 204. See also, *A History of the Jaipur City*, op. cit., p. 162.

¹²⁷ Nath, R., *Shri Govind Deva's Itinerary from Vrandavan to Jayapura*, eds, Case, Margaret H., Govind Deva, *A Dialogue in Stone*, New Delhi, 1996, p. 161.

companion, Shri Krishnana Bhatta Kavikalanidhi in his poem, *Ishvaravilasa* which is as follows,¹²⁸

गोविन्द देवस्य मुखारविन्द निरन्तम् प्रेम भरेण पश्यन् ।
आनन्द माधुर्यमरन्दपानमिलिन्द भूतो नितरां आनन्द 210 ॥

“Continually having the sight of Shri Govind Deva ji’s lotuslike face with great love, having tested the bliss of the highest loving emotion like a bee, he always remained in great bliss”.

A *Patta* dated V. S. 1772/1715 A. D. shows that Shri Govind Deva’s deity was installed to the Jai Niwas Garden in this year. We can infer from this *Patta* that this was just a temporary arrangement, and the construction of the *Barahdari* had been started in 1715.¹²⁹

Shri Govind Deva and Radha were installed in Govind Mahal and a companion deity (*Sakhi*) of Radha was also installed with her. Maharaja Pratap Singh was also a devotee of Sri Govind Deva and was called Vrajanidhi. It is said that the Govind Deva used to appear to him in his dream and gave him his nickname “Vrajanidhi”.¹³⁰

दिल तडपता हे हुस्न तेरे को
कब मिलेगा मुझे सलौना स्याम ।
अब तो जल्द से आ दरस दीजे
जे इनायत किया है ‘ब्रजनिधि’ नाम ॥

There were two companions deity (*Sakhi*) installed in Govind Deva temple for the serving of Radha. One *Sakhi* was donated by Pratap Singh.¹³¹

Map no 287- This literary map indicates the Govind Deva temple and other temples also like temple of Natwarlal ji, and temple of Shri Mansamata etc. The map

¹²⁸ *Ishvarvilas Mahakavya*, op. cit., p. 175, cf; *SRI Govind Deva Gatha Service Rendered to Govind by the Rulers of Ambera and Jayapura*, op. cit., p. 209.

¹²⁹ *Shri Govind Deva’s Itinerary from Vrandavan to Jayapura*, op. cit., p. 178.

¹³⁰ *Shri Govind Gatha Service Rendered to Govinda by the Rulers of Amera and Jayapura*, op. cit., pp. 210-11, *Rajdarwar and Raniwas*, op. cit., p. 162.

¹³¹ *Ibid*.

covers the area from Talkatora (near Jai Niwas) garden upto Kanak-Bagh.¹³² Map no 205- This map shows old and new temple of Govind Deva.¹³³

In the same context the account of Bhojansar as follows,

मंदिर अनेक जहां गोव्य दे गोपीनाथ
शिवरू गनेशरू दिनेस के दिवाले है
देवी देव घिमत गेह गेह झालरिसु घटा
झाझि दुंदभि के नादनी के चाले है।।195।।

Girdhari writes in the above lines about the two Vaishnava temples, which are Govind Deva and Gopinath. The temples of Shiva, Ganesha and Surya were separately listed. Jai Singh built a temple of Surya on a hill of eastern side under the supervision of Rao Kirparam.¹³⁴ The worship of Ganesh was popular among business families. A temple of Ganesh was situated just north of the city on hill range. Perhaps this temple was constructed by Sawai Jaisingh.¹³⁵

Sawai Jai Singh believed in Pauranika, but was not disrespectful towards the Non-pauranika Gods such as Shitala or Hanuman. *Touji* records shows that he was not very keen on them.¹³⁶ Worship of Krishna was popular prior to Sawai Jai Singh's time. Raja Man Singh had built two temples in Amber which were dedicated to Lord Krishna.¹³⁷

Arhsatta Imarti document are replete with information pertaining to number of temples repaired by Sawai Jai Singh such as Dehro Shri Mohan Rai ji, Dehro Shri Jagat Saroman Rai ji, Dehro Shri Suraj ji, Dehro Shri Mahadev ji and Dehro purohit Bihad-ko-Mahadev.¹³⁸

Map no 363- is a sketch map of Kishanpol market which shows Murlimanohar temple was built in 18th century. Map no 358- is about the Raj Rajeshwarji temple at

¹³² *Kapad Dwara* - Map and Note No- 287, second quarter of 18th century.

¹³³ *Ibid*- Map And Notes No- 205.

¹³⁴ *Bhojansar*, Cf; *Histroy of the Jaipur City*, op. cit., p. 21.

¹³⁵ *Histroy of the Jaipur City*, op. cit., p. 22.

¹³⁶ *Tauji Records*, V. S. 1792-1797 (1735-1740) R. S. A. C F; *Histoy of the Jaipur City*, op. cit., p. 20.

¹³⁷ *Life and Times of Sawai Jai Singh*, op.cit., p. 338.

¹³⁸ *Arhsatta Imarti*, B. N. 6, 7.

city palace. This map was prepared by Pratap Singh.¹³⁹ Map 294 shows the Ambikaji temple was also built in 18th century.¹⁴⁰

Lord Ram was popular in Kachwaha family and received special adoration because Kachwahas rulers claimed to belong to the same vansha. The idols of Sita and Ram led the procession when Raj Tilak ceremony of Kachwaha ruler, was held at Amber.¹⁴¹ Secondly Kachwaha rulers always used in their *Kharitas* the invocatory phrase “Shri Ram ji on the top and Shri Sita Ramji on the right side of their official letters”.¹⁴² Sita Ram temple was situated inside the Chandra Mahal and Zenana section of the palace.¹⁴³ *Arhsatta Imarti* provides details of the repairing of Sita Ram temple.¹⁴⁴

Female deities (*Devis*) were also worshiped in Jaipur state. Sawai Jai Singh worshiped Shiladevi of Amber. He regularly visited Jamwamata temple and Sitamata temple. He was also workshipped *Durga, Radhika, Saraswati, Parvati, Bhawani, Bhagwati* and *Pushkar*.¹⁴⁵ *Siaha Hazur* paper indicates that Jai Singh visited the temples which were dedicated to Brahma and other Gods and goddesses.¹⁴⁶

¹³⁹ *Kapad Dwara*, Map and Notes no- 363.

¹⁴⁰ *Ibid.*, Map and Notes No- 294.

¹⁴¹ *Dastur Kachwahas Papers*, J. S. A. Cf; *Life and Times of Sawai Jai Singh*, op. cit., p. 338.

¹⁴² *Jai Singh Kharitas in the Jodhpur*. Cf; *Life and Times of Sawai Jai Singh*, op. cit., p. 338.

¹⁴³ *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 118.

¹⁴⁴ *Arhsatta Imarti*, B, N. 3, 6, 7.

¹⁴⁵ *Siaha Hazur Papers*, S. 1790, J. S. A. Cf; *Life and Times of Sawai Jai Singh*, op. cit., p. 339.

¹⁴⁶ *Siaha Hazur*, Ashada Sudi 6, S. 1790 (June 6, 1790), Cf; *Life and Times of Sawai Jai Singh*, op. cit., p. 339.

CHAPTER-3

Gardens of the Jaipur City

Interest on Garden histories concerning Mughals have recently been focus of attention as can be gauged from the recent books and articles like Gardens of the Great Mughals, the Mughal garden: Interpretation, conservation and implications the Gardens of Mughal India, Early garden-Palaces of the Great Mughals, the Mughal garden: Gateway to Paradise and Mughal Gardens: Sources, Places, Representations and Prospects.¹ Unfortunately, Garden history of Rajasthan has escaped notice despite rich archival information preserved in the Rajasthan State Archives. The present chapter is an attempt to overcome this lacuna.

Gardens were an important part in the planning of Jaipur. In order to accomplish this dream, the city was blossomed with gardens. The Pink city has some beautiful landscaped gardens that truly give a contrasting look to the otherwise desert city. The significance of these gardens in beautifying the city is immense.

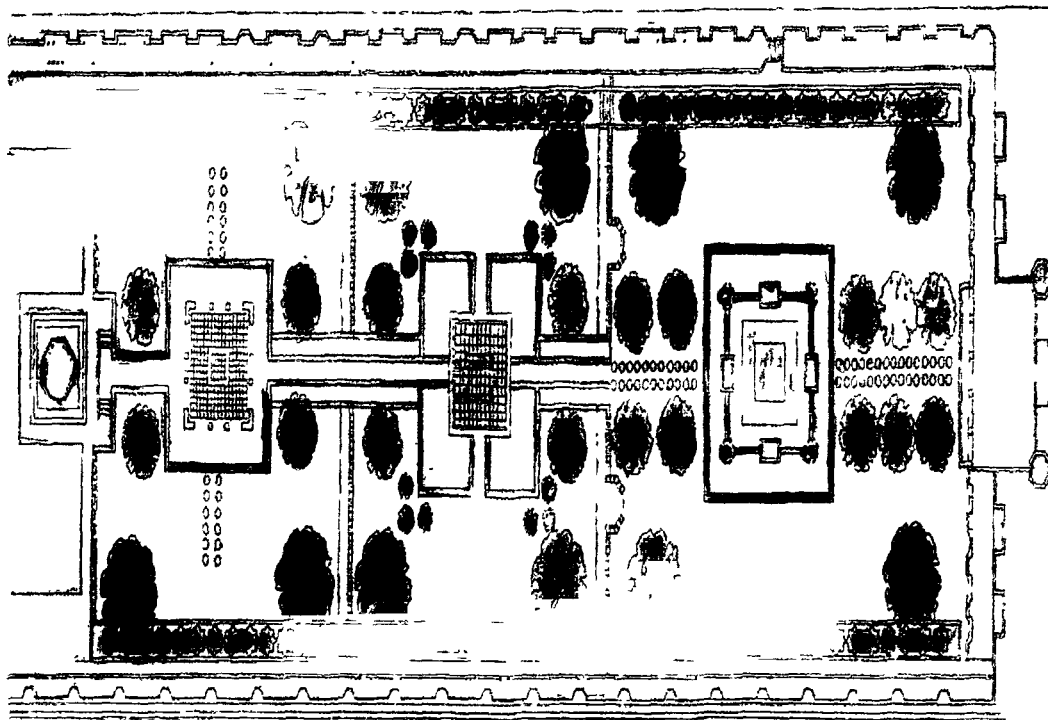
Plan of the Garden:- Jai Singh Sawai being a noble of the Mughal Empire was much influenced by the Mughal pattern of gardens. Jaipur gardens were laid out on the symmetrical *Chaharbagh* pattern with central water channels.² Babur introduced this pattern in India. The *Chaharbagh* pattern is a square or rectangular area, divided into four quadrants by two axes, which comprise water channels and pathways.³ These water channel, carry the water for the irrigation of the gardens (*Baghayat*) under gravitational pressure. The water channels and irrigation system was linked to the four fold plot.⁴






¹ Stuarts, Mary Villar, *Gardens of the Great Mughals*, London, 1913, Hussain, Mahmud, Rahman, Abdul and Jr. Wescoat, James L., eds. *The Mughal Garden: Interpretation, Conservation, Implications*, Lahore, 1996, Syivia Crowe et al, *The Gardens of Mughal India*, London, 1972, Jairazbhoy R., *Early Garden- Palaces of the Great Mughals*, *Oriental Art* 4 (1958). Dickie, James (Yaqoob Zaki), "The Mughal Garden: Gateway to Paradise," *Muqarnas* 3 (1986). Jr. Wescoat, James L., and Bulmahn, Joachim Wolschke, eds; *Mughal Gardens: Sources, Places, Representations and Prospects*, Washington, D. C. 1996.

² *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 18.

³ Dickie, James, "The Mughal Garden: Gateway to Paradise", *Muqarnas*, eds. Oleg Graber, Vol. 3, 1985, p. 13.

⁴ *Ibid.*, p. 12.



-  - Flower
-  - Fountain
-  - Tank
-  - Water Channel
-  - Water

**Plan I: of Jai Niwas Garden based on *Chaharbagh* pattern adapted from
*“Princely terrain: Amber, Jaipur and Shekhawati”***

In the present chapter an attempt is made to explore Jaipur Gardens, which have been constructed during the reign of Sawai Jai Singh and after him, in the light of *Kapad dwara* and *Jaipur Karkhana Jamakharch Baghayat*. The *Jaipur Karkhana Jamakharch Baghayat* document furnish rich information of expenditure, which was incurred on Jaipur gardens, and also gardens of periphery areas like *Sanganer*, *Chatsu* and *Baswa*. The information encompasses details on planning of flower beds, as well as masonry construction and irrigation.

Types of Gardens:- The large expanse of documentary evidence indicates that we can broadly classify the gardens of Jaipur into (1) *Bostan*, (2) *Gulistan*, (3) *gardens of royal house and nobles* and lastly (4) *gardens of periphery areas*. *Bostan* or orchards of Jaipur had fruits and vegetables like, Mango (*Aam*), Sour Lemon (*Nibu khatta*), *Narangi*, Banana (*Kela*), tree of *Grewia Asiatica*, and its berry (*Phalsa*), *Kharbuza* (muskmelon), Custard Apple (*Sitaphal*), Sweet Potato (*Shakarkandi*), Peach (*Aadu*), Snake Gourd (*Kakdi*), Citrus tree (*Chakotra*), (*Khirni*), *Kamarkh*, and Water nut (*Singhara*) etc. from *karkhana Jamakharch Baghayat* document.⁵

It is necessary to explain the basic features of some of the fruits which were commonly used during medieval period.

Muskmelon, Mangoes, plantains, watermelons, muskmelon and *Khirni* are the sweet fruits. They ripened during the rains.⁶

Sitaphal is also the sweet fruit of Hindustan. It is called *Sadaphal* in Persian.⁷

Mango (*Aam*):- Mango fruit was called *Naghzak*, as would appear from a verse of Amir Khusrau.⁸ Our document is replete with the information about mango plantation in Jaipur orchards.⁹ One gathers from the testimony of Jahangir that it grows well in Agra and its neighbourhood. Of all fruits, "I am very fond of Mangoes."¹⁰

⁵ *Jaipur Karkhana Jamakharch Baghayat*, List No (Fard.) 88, 1830 A.D (1887 V.S), pp. 27-29.

⁶ Abul Fazl, *Ain-i-Akbari*, eds. Nawal Kishore, Lucknow, 1882, Vol. I, pp. 45.

⁷ *Ibid.*

⁸ *Ibid.*, p. 49.

⁹ *Karkhana JamaKharch Baghayat*, op. cit., p. 29.

¹⁰ Nuruddin Jahangir, *Tuzuk-i-Jahangiri*, eds., Syud Ahmad Khan, Ghazeepore, 1863, p. 3.

Banana (*Kela*):- The plantain tree was straight like a spear. The leaves of this plantain are thick and soft. They resemble small Cucumber in shape.¹¹ Jahangir also mentions about this fruit.¹²

Snake Gourd (*Kakdi*), *Shakarkandi* and water-nut (*Singhara*) are vegetables. Gourd and *Singhara* are ripened during the rains.¹³

Singhara (Water nut):- A type of triangular fruit and its creeper grows in pond or tank and the fruit remains on the surface of the water. It is eaten raw or roasted.¹⁴ *Singhara* was found in the Jaipur orchards¹⁵ and this fruit grew in pond or tank. Pond or tank was also constructed in orchards (*Bostan*) for growing this fruit. It appears that water was carried from canals in this tank.

Kamrak, *Phalsa*, *Narangi*, *Ambla* and *Jaman* are subacid fruits. *Kamrak* and *Narangi* are come out during the winter season. *Ambla* and *Phalsa* ripened during summer and *Jaman* and *Karunda* are in season during the rains.¹⁶

Nibu is the sour fruit. It is to be had during the summer.¹⁷ Meetha is the form of lemon. The following table indicates the variety of fruits plantation taken up in Jaipur.¹⁸ The expenditure incurred is also provided in table.

¹¹ *Ain-i-Akbari*, op. cit., p. 45, 50.

¹² *Tuzuk-i-Jahangiri*, op. cit., p. 191.

¹³ *Ain-i-Akbari*, op. cit., p. 47.

¹⁴ *Ibid.*, p. 50, 52.

¹⁵ *Karkhana Jamakharch Baghayat*, op. cit., p. 27.

¹⁶ *Ain-i-Akbari*, op. cit., p. 48.

¹⁷ *Ibid.*, p. 48.

¹⁸ *Karkhana Jamakharach Baghayat*, pp. 10-12.

Expenditure was Incurred on Seasonal Fruits

Name of the garden	Fruits	Jan {Magha} Rs	Feb {Phalgun a} Rs	March {Chaitra} Rs	April {Baisakh a} Rs	May {jyeshth a} Rs	June {Ashadh a} Rs	July {Sravana } Rs	August {Bhadrapa da} Rs	September {Asvina} Rs	October {Kartika } Rs	November {Margshirs ha} Rs	December {Pausha} Rs
Shyam bagh	Narangi	26paise	45paise	16.50	11	"	"	"	"	"	25Paise	37Paise	49paise
"	Mango	-	-	-	-	30paise	1.60	-	-	-	-	-	-
"	Nimu khatta (Lemon sour)	20paise	-	-	-	-	-	-	-	-	-	7paise	2paise
"	Meetha	12paise	20paise	34paise	25paise	-	-	-	-	-	-	29paise	47paise
"	Dadu (unidentified)	30paise	59paise	90paise	1.6	-	-	88paise	4.78	-	16paise	-	8paise
Bagh chandra	Naaspati (Pear)	-	-	-	-	-	-	14.36	-	-	-	-	8.18
"	Ambla (Embllica)	1.60	2.24	-	-	-	-	-	-	-	-	-	1.46
"	Apple (Saib)	-	-	-	3.85	12.30	-	-	-	-	-	-	-
"	Andu (Peach)	-	-	-	-	9paise	68paise	-	-	-	-	-	-
"	Dakh (unidentified)	-	-	-	-	1.28	16.38	14.40	23.90	-	-	-	-
RamBagh kotwada	Nimu Khatta (Lemon sour)	38paise	25paise	-	-	-	-	-	10	-	-	-	-
"	Narangi	-	-	-	-	-	-	-	-	-	-	28paise	1.23
"	Aadu (Peach)	-	-	-	-	-	-	-	4.6	-	-	-	-
"	Khirmi	-	-	-	-	-	-	-	9.12	-	-	-	-
"	Meetha	-	-	-	-	-	-	-	11.89	-	-	41paise	-

This table shows that different kind of seasonal fruits were planted in Jaipur orchards (*Bostan*). Highest amount was spent on Dakh (unidentified) and the expense was lowest on the lemon. Dhak leaves are presently used to serve food (in pattal), it is however not clear whether our documents refer to these leaves or otherwise. Only Orange and Lemon were planted in two gardens. It is not clear from the amount mentioned, that whether the money was spent on the plantation of fruits or the fruits were sold in the mentioned amount.

One can gather from a stray *chitthi* that Jai Singh Sawai ordered *Diwan* Ram Narayandas and Vidhyadhar for lemon orchard to be planted in the city. Later, it was extended towards the Mansagar.¹⁹ This shows keen interest of Raja in the growing of particular fruits. According to Abul Fazl, the fruits of Hindustan are either sweet or subacid, for example, lime is a sour fruit and mango is very sweet and delicious fruit.²⁰

Flower Garden (Gulistan):- *Kapad-dwara* documents mention flower garden (*gulistan*) of Jaipur city for example, *Phul Bagh*, *Mohanbadi* and *Phulbadi*.²¹ Roses (*Gulab-ke-Phul*) and *Chameli flowers (Chameli-ke-Phul)* were planted in Ram Bagh and Bagh of Maji Shri Ranawat Ji.²² The other flowers which were planted included *Khas*, *Kewra* and *Padal*.²³ Jahangir also mentions about the *Kewra* flower.²⁴

Interestingly enough, we have information pertaining to perfume (*Itar*) distillation from these flowers. Furnace (*bhatti*) was made for distilling the perfume (*Itar*) from *Kewra* flower. Firstly, *Kewra* was boiled and then perfume (*Itar*) was taken from this flower. The expenditure incurred on this was 99 rupees 22 paise.²⁵ *Kewra* flower resembles the preceding and the Petals have thorns as they grow on different places.²⁶

It appears that these flowers catered to *khushbukhana* (perfumery department), because our document indicates that *Itar-darbar-ko* (perfumes for royal house), *Gulab Jal* (rose water) and *Chameli-ka-tel* were especially prepared for royal house.²⁷ Jahangir also mentions that sweet scented oil was extracted

¹⁹ *Chitthi* Jaipur, March (*Chaitra*) *Sudi* 14, 1733 A. D (V.S 1790), *Rajasthan State Archives Bikaner*. Cf., Sharma, Girija Shankar, *Sources on Social and Economic History of Rajasthan 17th-20th Century A. D.* Bikaner, 2005, p. 197.

²⁰ *Ain-i-Akbari*, op. cit., p. 49.

²¹ *Kapad-Dwara*, Map and Note No- 170, p. 100.

²² *Karkhana Jamakharch Baghayat*, List No (Fard.) 76, 1832 A.D (1889 V.S), p. 21.

²³ *Ibid*, p. 82.

²⁴ *Tuzuk-i-Jahangiri*, op. cit., p. 3.

²⁵ *Karkhana Jamakharch Baghayat*, op.cit., List No, (Fard.) 76, p. 79.

²⁶ *Ain-i-Akbari*, op. cit., p. 62.

²⁷ *Karkhana Jamakharch Baghayat*, List no., (Fard.) 88, op. cit., p. 64.

from *Chameli* flowers.²⁸ There are name of perfumes (*Itar*), which were made in Jaipur *Karkhana*, like *that* of *Kewra*, *Gulab*, *Padal* and *Khas*²⁹

Gardens For Royal House and For Nobles - In the planning of Jaipur city number of gardens were laid out for the personal use of royal house and nobles. Mention worthy in this context are *Jai Niwas garden*, *Vidhyadhar ka Bagh*, and *Sisodia Rani Ka Bagh*. The account of *Bhojansar* mentions, “Sawai Jai Singh instructed Vidhyadhar that a city should be founded here and Jai Niwas should come within the city.”³⁰

Kapad dwara provides some maps of Jai Niwas garden, which 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 for example; *Kothi-Badwali-ki*, *Khajano Moti Mahal ki*, *Kothi Sibla ki*, *Zanani Deorhi*, 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*, *Khajano*, *Shyam kuwa* (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.³¹

A garden was laid out in front of *Hawa Mahal* as is apparent from Map No-338; हवा महल को, श्री हजूरी सु हुकुम फुरमायो जो हवा महल के आगे बाग कररगो जी की तरह पड़ी लिख है मिति प्रथम सावरग सुदि 10 दीतवार संलत 1885 को लिष्यो छै। This shows that order was given by Maharaja for the construction of garden in front of *Hawa Mahal*. A ground plan was prepared on July 1778 A.D.³²

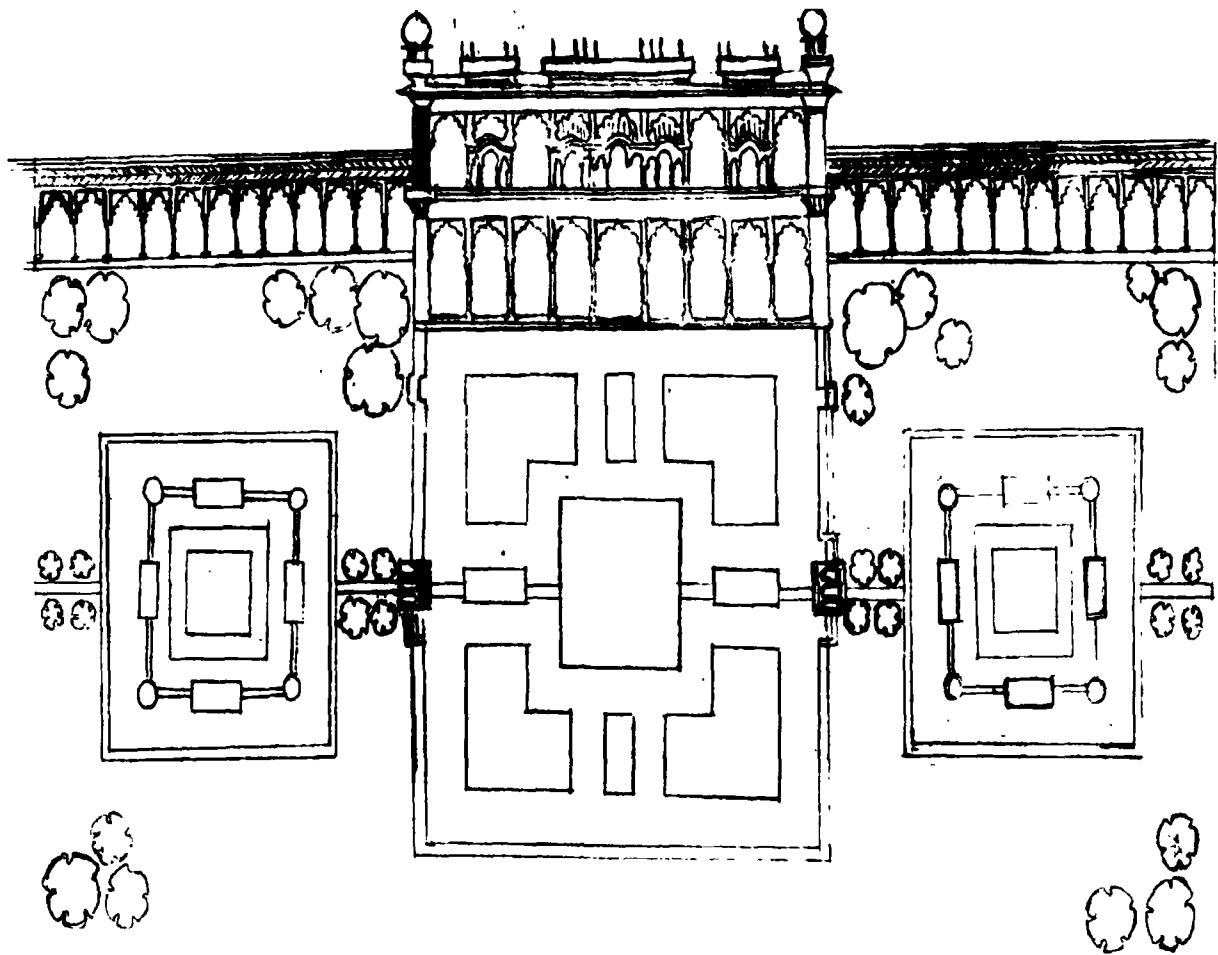
²⁸ *Tuzuk-i-Jahangiri*, op. cit., p. 3.

²⁹ *Karkhana Jamakharch Baghayat*, op. cit., List No., (Fard.) 76, p. 82.

³⁰ *History of the Jaipur City*, op. cit., p. 42.

³¹ *Kapad-Dwara*, Map and Notes No-276 – second quarter of 18th century

³² *Ibid.*, Maps and Notes No- 338, 358 – Late 18th century



Plan J: Sketch Plan- Plan of Garden in front of Hawa Mahal, Adapted from Kapad-dwara Document

There were number of gardens laid out for the personal use of nobles for example; *Vidhyadhar-ka-Bagh*. Vidhyadhar Bagh has long stretch of narrow space, with three equal square spaces, at three levels forming the garden and the fourth square forming a paved open area. A beautiful single storeyed structure forms the palace of Vidhyadhar at the higher end of the garden.³³ Garden layout reveals a perfect planning of Jaipur city. Mostly, *havelies* and temples were garden *havelies* and garden temples, for example; Johri *haveli*, Mahant *haveli* and the Sarraf *haveli* are typical garden *havelis*.³⁴

Sisodia Rani ka Bagh (garden) is surrounded by high walls at all levels and it comprised of beautiful octagonal and rectangular *chhatris*, which are covered by

³³ *Princely Terrain- Amber, Jaipur and Shekhawati*, op. cit., p. 26.

³⁴ *Ibid.*, p. 28.

domes. This garden is laid out in four levels, and its lowest level being a huge square, intersected by water channels and pathways, forming the Mughal pattern (*ChaharBagh* pattern) with a central fountain.³⁵

Gardens OF Periphery Areas and Its Expenditure:-

Karkhana Jama Kharch Baghayat document also provides interesting information about garden of periphery areas as well as Jaipur garden.³⁶ We have following details of Jaipur gardens and periphery area gardens for the year 1830 A. D.

Expenditure incurred on Jaipur gardens and gardens of periphery areas in 1829-30 A.D (1886-87 V.S)

NAME OF THE GARDEN	EXPENDITURE (RS.)
Shyam Bagh	171.62
Ram Bagh	104.33
Bagh Chandra	226
Bagh Baswa	42
Beej Bagh	3
Bagh Jasno	35.18
Bagh Maji Shri Ranawat ji ko	380.48
Gardens(Bagayat)Sanganair	167.22
Bagh Jigsala	34.37
Bagh Maji Shri Chandrawat	19.46
Bagh JaiNiwas	22.23
Bagh Sisodni	11.32
Bagh DalaRam	1.32
Bagh Kalano	1

This table shows that highest amount was incurred on the maintenance of *Bagh Maji Shree Ranawat Ji* and low amount was incurred on *Beej Bagh*, *Bagh Dalaram* and *Bagh Kalano*. There may be two reason behind this, either such

³⁵ *Ibid.*, p. 25.

³⁶ *Karkhana Jamakharch Baghayat*, sheet no, 88, pp. 43-49.

gardens where the amount lowest were already well maintained that there was no need to spent more money, or these were not very significant. On the basis of above argument we can say that these gardens may be already well maintained in mentioned year.

Irrigation Facility for Gardens: Canals were especially constructed for the irrigation of gardens (*baghayat*). As we know, that water is important in desert area, like Rajasthan, and primary need for the agro-economic growth. Our documentary evidence shows, that there were many orchard (*bostan*), and *Gulistan* gardens (*baghayat*), for which a proper channel of irrigation was provided by canals.

The text of the map says “*Nahri Bagh Ke Buste*” canal was constructed for garden. We have information of some prominent gardens and places, which were attached with this *Bagh* (garden). This map shows that canal (*Nahri*) was constructed for the gardens. Canal water was carried for the irrigation of gardens and this canal water irrigated some specific areas. These gardens and places are mentioned thus, *Bagh* (garden) of *Purohit Ganganam*, *Garden of Samrat ji*, *Garden of Malji*, *Bagh Malukpuri*, *Naulakha Bagh*, *Chaudha Bagh*, *Prithi Bagh*, *Prahlad das purohit Bagh*, *Narad purohit Bagh*, *Mansaram purohit Bagh*, *Ahsar well (kuwa)*, *Brajbhushan Swami Bagh*, *Bagh sarkar*, *Vyas kund*, *Vijay Bagh*, *Badarami Bagh*, *Sarai Miyan ki*, *Maan Bagh*. This canal water was also carried towards the Amber gardens.³⁷ Map of (*Tarah Nahri Bagh Jai Niwas Mai Abai*). Canal was especially constructed for the *Jai Niwas* garden. This canal water irrigated areas like *Meenawalo-ka-Bas*, *Bhawanishankarpur*, *Bhujpura*, *Jai Niwas* and *Mansarampur*.³⁸

Organization of the Gardens: We have information regarding *tahwildar* and superintendent (*danogha*) of Gardens from *Hamakharah/Baghat* document. The *tahwildar* distributed the wages, among the workers, and kept vigil on workers. Our document provides the name of *tahwildar*, and superintendent, Hiralal was the *tahwildar* and Bakhtawarmal was the superintendent. They supervised the gardens of Jaipur state. Interestingly, *Karkhana Jama Kharch*

³⁷ *Kapad-Dwara*, Map and Note No. 1700—First quarter of 18th century.

³⁸ *Ibid.*, Map and Note No. 1122—second quarter of 18th century.

Baghayat also provides us information about gardeners (*Mali*) and their wages. Following is a table of gardeners (*Mali*) and their wages,³⁹

³⁹ *Karkhana Jama Kharch Baghayat*, List no. (Fard.) 76, pp. 15-19.

Table indicating wages of gardeners (Mali)

Bagh (garden)	Name of the gardener (Mali)	Jan {Magha} Rs	Feb {Phalgun} Rs	March {Chaitra} Rs	April {Baisakh} Rs	May {Jyeshtha} Rs	June {Ashadha} Rs	July {Shravana} Rs	August {Bhadrapada} Rs	September {Ashvina} Rs	October {Kartika} Rs	November {Margashirsha} Rs	December {Pausa} Rs
Garden of Rajawat	Thakarsi	-	11	-	-	-	21	-	-	-	-	-	22 Ru
Mukand Bagh	Anando	-	16	-	-	-	12	-	2	-	-	-	-
Raambagh	Nihalo	-	-	-	-	-	35.48	-	7.32	-	-	-	34.32
Murlidharbagh	Bhabani	-	-	-	23.54	-	-	-	3.10	-	-	-	8
DilaRaam Bagh	Girdhari Lichmano	-	-	-	-	-	-	-	-	-	9paise	13.18	13.32
Bagh Chandra Badaran	-	-	41.50	-	-	-	83.50	-	41.50	-	-	-	83.48
BaghMaji Ranawat ji	-	-	50	-	-	-	281.33	-	43.50	87.61	-	-	99.60
Paal ka Bagh	-	-	118.4	-	-	-	234.7	-	118.2	-	-	-	236.7
Beej Mahal Bagh dasraha ki	-	-	5.46	-	-	-	11.24	-	5.48	-	-	-	11.30
Nand Bagh	Ganga Ram	-	-	25	-	61	-	5	97.36	-	40.28	18.8	53.8

This table shows that highest wage amount was paid to the gardener of Paal Bagh and low wage amount was paid to the gardener of Dilaram Bagh. We have got information about the name of some gardeners viz, Thakarsi, Anando, Nihalo, Bhabani, Girdhari lichmano and Ganga Ram of the gardens Rajawat, Mukand Bagh, Raambagh, Murlidhar Bagh, Dilaram Bagh and Nand Bagh respectively.

Raw material utilized in gardens:- *Arhsatta Imarti* document furnish information about the expenditure, which was incurred on raw material in the repairing of such gardens, like *Mohanbadi*, *Dilaram Bagh*, and *Jai Niwas garden*.⁴⁰ We have prepared a table of raw material and its expenditure which is as follows;

Expenditure incurred on raw material used in the maintenance of gardens in 1730 A.D.

GARDEN	INGREDIENTS	RS	WAGES (UJURA)
MohanBadi	The bark of qalam	7	159
"	Lime	10.16	"
"	Cord of twisted grass	2	"
"	Gadi Mati ki	1.16	"
"	Unslaked lime	42.32	"
"	Lac	1	"
"	Iron	1	"
"	Tiles	1	"
"	Linseed Oil	2	"
Dila Ram Bagh	Lime	10.32	267
"	Unslaked lime	43.48	"
"	Clay	32paise	"
"	Clay	1	"
"	Tiles	1	"
"	Kaanch Albari Ko	10	"
"	Cord of twisted grass	3	"
"	Gul	3.32	"
"	The bark of qalam	6	"
"	Fenugreek	1.32	"

⁴⁰ *Arhsatta Imarti*, Bundle No.33, 1733 A.D. (1783 W.SS), pp. 331-333.

“	Lac	1.20	“
“	Hirmich, Ochre colour	24paise	“
“	Green stone	7	“
“	Yellow stone	1.12	“
“	Gum-resins	32paise	“

This table shows that, expenditure was incurred on raw material and wages paid to the workers, who were employed in the repairing and white washing of gardens, in mentioned year. The raw material was made use for following purpose:-

Munj (The bark of qalam reeds):- It was used for making ropes to fasten the thatching.⁴¹

Lime (*Chuno*):- Lime could be divided into three kinds: (1) Lime procured from lime stone (2) lime obtained from fresh water (3) lime obtained from *Kankar* (gravel).⁴² *Kalai* (unslake lime)⁴³ and *Baan* (A cord of twisted grass)⁴⁴ were used in the repairing of Jaipur garden.⁴⁵

Clay:- (*Gadi Mati Ki*), *Nali Mati Ki* and *Multani Mitti* were used for whitewashing. The simplest cementing material was plain earth or clay mixed with water.⁴⁶ According to George Watt *Multani Mitti* clay is a soft saponaceous earth varying in colour from yellow to red, sometimes greenish, mostly employed as a pigment colour.⁴⁴ Red clay (*Hirmich*) was also used in Jaipur Gardens.⁴⁷

⁴¹ *Ain-i-Akbari*, op. cit., p. 117.

⁴² Qaisar, Ahsan Jan, *Building Construction of Mughal India*, (Delhi, 1988), p. 19; See also Watt, George, *A Dictionary of Economic Product of India*, Vol. II, (reprint) Delhi 1973, p. 144. For detail information see Habib, Irfan, *An Atlas of the Mughal Empire*, (Delhi, 1982), sheet 4B, p. 12.

⁴³ *Technology in Medieval India*, op. cit., p. 57, In the 17th century, Palsaert (1626) spoke enthusiastically of the Indian “white plaster of the walls”, made of unslaked lime, which is mixed gum and sugar into a thin paste with milk.

⁴⁴ McGregor, R. S., *The Oxford Hindi-English Dictionary*, Delhi, 1993. p. 724.

⁴⁵ Amir Khusrau, *Khaza'in al- Futuh*, edition Wahid Mirza, Calcutta, 1953, p. 46, 158. Cf; *Building Construction in Mughal India*, op. cit., p. 18.

⁴⁶ Watt, George, *Dictionary of Economic Product*, Vol. VI, part I, p. 283.

⁴⁷ *Arhsatta Imarti*, p. 32.

Lac (*Chapri*):- Chapri was used for *Chighs* (Sliced Bamboo) sticks, placed horizontally, and joined by strings, with narrow interstices between the sticks. They were painted and used as screens.⁴⁸

Iron (*Loha*):- Iron oxides were used as Dye and pigment, the ochres, both yellow and red are largely employed in many localities for the adornment of the walls of huts and houses. Iron oxides sticks smoothly on wood or iron, and has been successfully used against bricks and plaster.⁴⁹

Tiles (*Thokra*):- Abul Fazl also mentions it for the surface of construction of roof (*Khaprail*).⁵⁰

Linseed oil (*Alsi -ka-tail*):- The Linseed oil is expensively used in the manufacture of paint, printing ink, floor and cloth.⁵¹ The addition to the oil renders the colour more brilliant and lasting.

Methi (Fenugreek):- The seed yields a yellow dye and the yellow decoction produces a fine permanent green with sulphate of copper. It is used for brilliant colour and shining.⁵²

Kanch Albari Ko:- It was also used in the Dilaram Garden during the year 1733.⁵³

Stone:- Stones were extensively used in the Dilaram Garden like *Sawaz patthar* (Green Stone) and *Pila Patthar* (Yellow Stone).⁵⁴ Stone was used for purposes, other than building for example in making stone door.⁵⁵

Gouli (Gogul, gum-resins)⁵⁶:- It was used in the repairing and white washing of Dilaram Garden.⁵⁷

⁴⁸ *Ain-i- Akbari*, op. cit., p. 118.

⁴⁹ *Dictionary of Economic Product*, Vol IV, p. 52. See also, Habib, Irfan, *An Atlas of the Mughal Empire*, sheet no, 6B, Delhi, 1982, p. 20.

⁵⁰ *Ain -i- Akbari*, op. cit., p. 116.

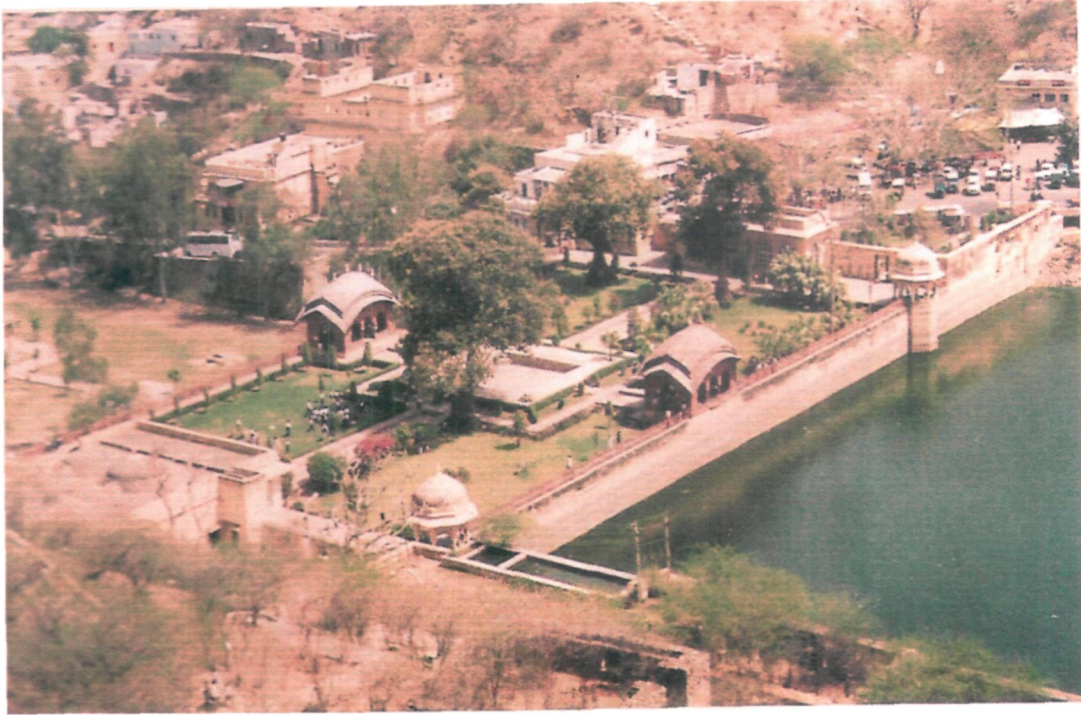
⁵¹ *Dictionary of Economic Product*, Vol. V, p. 7.

⁵² *Ibid.*, Vol. VI, part IV, p. 86.

⁵³ *Arhsatta Imarti*, p. 31.

⁵⁴ *Ibid.*

⁵⁵ Abdul Hamid Lahori, *Badshahnama*, Bib. Indica, II, Calcutta, 1866, 1872, p.325. Cf; *Building Construction of Mughal India*, op. cit., p. 16.



(XXXIII) DILARAM GARDEN OF AMBER

⁵⁶ Hobson Jobson, (*A Glossary of Colloquial Anglo-Indian Words and Phrases, and of Kindred Terms, Etymological, Historical, Geographical and Discursive*) by Henry Yule and A.C. Burnell, ed; William Crooke, New Delhi, 1995, P. 386.

⁵⁷ *Arhsatta Imarti*, p.31



(XXXIII) DILARAM GARDEN OF AMBER

⁵⁶ Hobson Jobson, (*A Glossary of Colloquial Anglo-Indian Words and Phrases, and of Kindred Terms, Etymological, Historical, Geographical and Discursive*) by Henry Yule and A.C. Burnell, ed; William Crooke, New Delhi, 1995, P. 386.

⁵⁷ *Arhsatta Imarti*, p.31

CHAPTER-4

Building Material and its Expenditure

Buildings of India have been the focus of attention of Mughal Emperors. Babur in his memoirs criticized the building structures of India, because of its lacking in regularity and symmetry. Though Humayun laid the foundation of Delhi, but he had no time for pursuing building activities. Full fledged building activities started from the time of Akbar. Since the empire came to be completely consolidated in the time of Akbar, he therefore started his building enterprise by laying out massive forts of Agra and Delhi. Abul Fazl describes the large scale construction of Akbar's period comprising of forts, towers, palaces and sarais etc.¹

Studies on buildings and town planning of Jaipur have always aroused great interest of scholars therefore considerable researches have been conducted on these aspects.² However an important aspect, the building material has been overlooked by scholars. In this chapter we shall discuss about raw material and wage structure of artisans characterized as *Karigars*, *Majur*, *Beldars* and *Ustagars*. Fortunately, rich archival material preserved in Rajasthan state Archives, provides exhaustive details on the raw material used in Jaipur construction, repairing, whitewashing and renovations. These data of expenditure are statistical in nature.

Many buildings were constructed and repaired during the time of Sawai Jai Singh and subsequently also. Noteworthy are *Govind Deva* temple, *Chandni chowk*, *Ram chowk*, *Jai Niwas*, *Feelkhana*, *topkhana* etc. Our document deals with the construction, repairing and renovations of *havelis* and white washing of some temples.

Our document 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 (*chob lakdi*) were the essential ingredients, and hence will be taken up initially.

¹ Verma, Tripta, *Karkhanas under the Mughals from Akbar to Aurangzeb*, A study in Economic Development, Pragati Publications, Delhi, First Pub., 1994, p. 89.

² The Books that have given adequate information about Planning of Jaipur City are *History of the Jaipur City*, *A History of Jaipur*, *Rajdarbar and Raniwas*, *Life and times of Sawai Jai Singh*, *Princely Terrain-Amber*, *Jaipur and Shekhawati*, etc. op. cit.,

Bricks (*itha*) - Bricks are the basic need of buildings. Bricks are called *Khist Ajur* in Persian. *Ain* categorizes them into three kinds of bricks (1) *Pukhta* (burnt), (2) *Neem Pukhta* (half burnt) and (3) *Kham* (unburnt, unbaked).³ Irfan Habib observes that bricks were extensively used after the advent of the Muslims in India and were used to make true arches and domed roofings.⁴ Afif refers to *rori* which were broken bricks.⁵ Farhang refers, to *kirgawwa (itha ka chura)*, which was also mixed with lime for binding purpose.⁶ There were large quantity of bricks and its expenditure mentioned in our document. We have information of unbaked bricks (*Kalib, kachchi itha*), which were used in the construction of Market (*bazaar*) shops (*hatya*).⁷ Shops were constructed on high plinth after leveling the streets (*Rasta hamwaar kiyo*) and the amount was fixed for the construction of these shops.⁸ The amount of Rs. 36178.83 rupees was fixed for 332 shops. 248 shops were built on the main road of *chandni chowk* and *Ram chowk* and 84 were built in the *Katla*.⁹ Road were pulled down for maintaining the uniformity of the city. Unbaked bricks were also used in the construction of *haveli* wall (*haveli kot kachchi itha ki*).¹⁰ We have information of its expenditure for instance Rs 34/ were incurred on *haveli* of Fateh Singh and Rs 6/ rupees on Jai Niwas Garden.¹¹

Stones (*Sang*) - Our document refer to various kinds of stones, used in Jaipur building. Stones were used in making door as well as building purposes. Stone of various types and colours were used in Jaipur for instance, *Lajward-* is a kind of precious stone.¹² Some innovation was done in Jai Niwas structure and

³ *Ain-i-Akbari*, op. cit., p.22.

⁴ Habib, Irfan., *Changes in Technology in Medieval India*, Studies in History, vol. II, No.1, 1980, p. 22.

⁵ Afif, *Tarikh-i-Firoz Shahi*, eds. Wilayat Hussain, Bib. Indica, Calcutta, 1891, p. 376. See also, *Building Construction of Mughal India*, op. cit., p.20.

⁶ Rahman, Zafarur., *Farhang Istalahat-I Peshwaran*, vol.i Delhi, 1939-41, p. 81. (A Glossary of Technical terms used in Indian Arts and Crafts and it is in 8 vols.).

⁷ *Arhsatta Imarti*, B. N. 12, p. 47 (Preserved in *Rajasthan State Archives*).

⁸ *Ibid.*

⁹ *Ibid.*, B.N.8, P.10.

¹⁰ *Ibid.*, B. N.12, p. 29.

¹¹ *Ibid.*, B. N. 6, 7, pp. 3, 83.

¹² *Bhargava's Dictionary Hindi Language*, ed. R. C. Pathak, (reprint) , April 1973, Varansi, p. 957.

lajward was used in this. An amount of Rs 2.75/- was incurred on it.¹³

Tillotson has briefly 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 sand stone and the *Jai Mandir* of white marble. Building an entire city at once using imported stone would have proved impossibly expensive. It was probably for this reason, as much as the desire to build the city quickly, that Jai Singh used rubble and render. It has been noted that the use of a rusty rather than cream paint over the render meant that a passable imitation of the fashionable red sand stone could be created at a fraction of the cost.¹⁴

Sang surkh (red sand stone) - *Ain* also mentions about it.¹⁵ *Sang surkh* was extensively used in the structure of Jaipur. The expenditure incurred on *sang surkh*- Rs 3129 for Jai Niwas Garden.¹⁶ *Kurand*- It is a whet stone or corundum stone.¹⁷ An amount of Rs 6/- was incurred in Jai Niwas.¹⁸

Yellow stone (*Pila paththar*) - Yellow stone was used in the *haveli* of Fateh Singh.¹⁹ It is also called *sang zard*.

Sang safaid (white stone) - It 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.²⁰ Tavernier also mentions about colour stones and places from where they were obtained.²¹

There were other quality of stones, namely *Sang dnau*, *sang bhakri*, *sang chidi*, *sang sawaz* (green stone), *sang gilula* (irregular broken pieces of stone) and *Blue*

¹³ *Arhsatta Imarti*, B.N. 7, p. 79.

¹⁴ *The Rajput Palaces -The Development of an Architectural Style (1450-1750)*, op. cit., p. 168-69.

¹⁵ *Ain-i-Akbari*, op. cit., p. 115.

¹⁶ *Arhsatta Imarti*, B. N. 7, p. 83.

¹⁷ *Dictionary of Hindi Language*, op. cit., p. 225.

¹⁸ *Arhsatta Imarti*, B.N. 6, p.74.

¹⁹ *Ibid*, p. 69.

²⁰ *Arhsatta Imarti*, B.N. 7, 12, pp. 83, 72.

²¹ Tavernier, Jean-Baptiste., *Travels in Mughal India*, 1640-67, eds. Crooke, London, 1972, p. 77

stone (*Nila Paththar*).²² Our documents mention, its quantity also, which is as follows,

Table showing quantity of stone utilized in *Haveli*

Name of Stones	Quantity
Sang Gilula	21965 man
Sang toda slab (<i>patti</i>)	76 pieces (<i>adad</i>)
Sang dnau	10 pieces
Sang surkh slab (<i>patti</i>)	3 pieces
Sang Bhakri slab	30 pieces
Sang chidi	80 pieces

The above quantity of stones were used in the construction of the gents (*mardana*) portion of haveli. Unfortunately this document fails to give the name of *haveli* in which above material were used. We have intricate information of each stone used in the different apartment of buildings for instance Screens (*jali*) and raised seating at entrance (*Gokha*) were built of *sang danau* in the *haveli*.²³

Woods (*chob lakdi*) - *Ain* mentions seventy two kinds of woods, but eight were in general use.²⁴ It was used in the construction of buildings. We have information that woods were brought from neighbouring areas for instance *Ambli* (*tamarindus Indica*) and *Nimb* (*azadirakhta Indica*) were brought from Sangair and Mohanpur in 1727 A.D. for the construction of Santosh Ram *haveli*.²⁵ Our document also mentions other types of woods, like *Babul* (*Acacia wood*) and *Gul* (*bassia latifolia*). These were used for making the door frames (*barsa*) and Doors (*kibad*).²⁶

²² *Arhsatta Imarti*, B.N. 12, pp. 30-32. See also, *Ain-i-Akbari*, op. cit., p. 116. (for Sang-i-gulula).

²³ *Arhsatta Imarti*, B.N. 12, pp. 31-33

²⁴ *Ain-i-Akbari*, op. cit., p. 119.

²⁵ *Arhsatta Imarti*, B.N. 12, p. 18.

²⁶ *Ibid.*, B. N. 4, 5, 6, pp. 32, 66.

The quantity of door frame (*barsa*) and small doors (*kibadi*) are mentioned in the document for instance 30 pieces (*adad*) doors (*kibad*) and 35 door frames (*barsa*) were procured for the purpose of shops (*hatiya*) of market (*katla*).²⁷

The big and small Bamboo stick (*balli badi*, *balli chhoti*) were used for roofing purposes. There are references of different size of beams some are big and some are small (*souti*, *danda bada* and *danda chhota*) and document showing the quantity and expenditure of these raw materials used is as follows²⁸:

Table showing Expenditure on raw material

Item	Unit	Expenditure (Rs)
<i>Balli badi</i>	366 pieces (adad)	Rs. 85.25/-
<i>Balli Chhoti</i>	495 pieces	Rs.145.50/-
<i>Danda bada</i>	384 pieces	Rs. 53.62/-
<i>Danda chhota</i>	2289	Rs. 160/-
<i>Souti</i> (form of wood)	432 pieces	Rs. 432.79 /-

Beddone says about *gul* that it is used for the naves of wheels, for door and window frames.²⁹ Abul Fazl mentions that it is used for building purposes.³⁰

Other Materials and Tools- Apart from basic building materials such as bricks, stones and woods, variety of other ingredients were used in construction of structures of forts, palaces and houses in Jaipur, during the time of Sawai Jai Singh. These include Iron, cement and plaster products, White washing, painting products, strings and ropes for tying purposes, resins for adhesion of whitewash, paints and pigments for colouring.

Iron (*Loha*) - Our document provides information, regarding variety of iron articles procured in large quantity for instance 2.33 *man* were brought from

²⁷ *Ibid.*, B. N. 12, p. 47,

²⁸ *Ibid.*, p. 43.

²⁹ *A Dictionary of Economic product of India*, Vol. I, (reprint) Delhi, 1972, p. 415.

³⁰ *Ain-i-Akbari*, op. Cit., pp.75, 119.

Mansaram *Lohar* (black smith) in 1738 A.D.³¹ Farhang mentions, tools like *Jhumra* and *Kasi*.³² Iron tools were used for digging purpose like hammer (*Jhumra*), *fouda*, *kasi*, and *kudal* etc. The quantity mentioned in our records is tabulated below.³³

Table Showing Variety and Quantity of Iron tools

<i>Jhumra</i> (Big hammer)	4 pieces (<i>Adad</i>)
<i>Tala</i> (lock)	2 pieces
<i>Kusi</i>	8 pieces
<i>Sakli Kudal</i>	4 pieces
<i>Taki</i>	2 pieces
<i>Khardi</i>	1 pieces
<i>Cheeni</i>	2 pieces

Cement- Cement is an important ingredient for the construction of buildings. During Mughal period mortar was used as a cementing substance to hold buildings. In 18th century Jaipur good quality of cementing material was used by Sawai Jai Singh, in order to strengthen the construction of the buildings and to develop very delicate architecture of that time. Sawai Jai Singh and his successors were very successful in carving out the beautiful buildings, by using the good quality of material, which is as follows,

Mithigach (mortar, cement, plaster, a plastered floor, plastering, brick Laying) – *Arhsatta Imarti* furnishes information that it was brought for the use of building construction. *Ain* refers to the term *gaz-i-shirin* or sweet lime stone. It is

³¹ Ibid., B.N.12, p.54.

³² *Farhang Istalahat-I peshwaran*, vol. I, p. 87.

³³ *Arhsatta Imarti*, B.N. 12, p. 18.

mostly boiled out of *kangur*, a kind of solid earth resembling stone in hardness.³⁴ Amir Khusrau mentions the use of *gach*, perhaps in the sense of whitewashing.³⁵ Afif speaks of plastered walls (*chahha bakawandwaan gach kunanand*) that were used as whitewashing as well as for storing granaries.³⁶ *Mithi gach* was used in the repairing of Jai Mandir and Jai Niwas Garden in 1733 A.D.³⁷

Khad, Chalk (Gypsum) - It was used for white wash and as plaster.³⁸ Gypsum was used in the repairing of Jai Mandir.³⁹ Gypsum hardens rapidly and holds stone or brick together and lends its own solidity.⁴⁰

Chuna (Lime) - Farhang mentions that *chuna* is prepared after boiling the *kankar* in furnace (*puzwaha*). It was used as binding, plastering and white washing agent.⁴¹ It was extensively used for whitewashing of temples and *Havelis*. Our document indicate that lime was brought in large quantity for the construction of Jaipur buildings for instance, 22540 *man* lime was brought. Likewise, 7292.50 *man* was carried by labourers, and 15147.50 were brought from Tulcho *Mali*. An amount of Rs. 55.12/- was paid to him in 1736 A.D.⁴²

Ain gives information about patthar-ka-chuna (*qala-i-sangin*).⁴³ It was obtained from lime stones, and hydrate calcium sulphate, and it is considered first category of lime. Watt mentions, that the principle source of lime is *kankar* in the plains of upper India, and it is second category of lime.⁴⁴ *Ain* also refers to lime, being obtained from gravel (*kankar*).⁴⁵ The third category is sea-shells. Abul Fazl mentions *sadafi* which means lime obtained from sea-shells.⁴⁶

³⁴ *Ibid*, p. 116.

³⁵ Amir Khusrau, *Khazaimul- Futuh*, eds. Wahid Mirza, Calcutta, 1953, p. 24. Cf; *Building Construction in Mughal India* op. cit., p.19.

³⁶ Afif, p. 439. See also *Building Construction in Mughal India*, op. cit., p. 19.

³⁷ *Arhsatta Imarti*, B.N. 7, pp. 12, 79.

³⁸ *A Dictionary of Economic Product*, vol. II, p. 195.

³⁹ *Arhsatta Imarti*, B.N. 3, P. 15.

⁴⁰ *Technology in Medieval India*, op. cit., (c.650-1750), pp. 55-56.

⁴¹ *Farhang Istalahat-I Peshwaran*, Vol. I, p. 80.

⁴² *Arhsatta Imarti*, B.N. 12, p. 54.

⁴³ *Ain-i-Akbari*, op. cit; p. 116.

⁴⁴ *Dictionary of Economic Product*, Vol. II, p. 147.

⁴⁵ *Ain-i-Akbari*, op. cit., p. 116.

⁴⁶ *Ibid*, p. 116.

Paint and Whitewash- it is also an important raw material used in the buildings. Painting makes the surfaces of the buildings smooth and it becomes easy to make a design on such surfaces. White washing is an important painting substance for buildings. White washing added charm to the buildings. The raw material which were used for painting and white washing were as follows,

Sufaidi (white washing) - *Ain* mentions *safidkari*, *sapidkari* and *qala-i* and water were mixed with each other for *supaidi* (white wash).⁴⁷ For an improved effect *simgil* (white and greasy clay) was used for whitewashing.⁴⁸

Multani Mitti (clay) - It is called *gil* in Persian.⁴⁹ Watt mentions that *multani* clay is a soft saponaceous earth varying in colour from yellow to red, sometimes greenish, is employed as a pigment colour.⁵⁰ Clay was also used for adhesive purpose like making the simplest cementing material and it was only mixed with water for making simple cement.⁵¹ Farhang mentions, that clay was mixed with lime for making mortar (*gara*).⁵² Our document also mentions, that cement was prepared from lime (*chuno-ko-gara-karo*). If straw was mixed with clay and water, it was used as plaster too and its term in persian *Kah-i-gil*.⁵³ *Gadi matti* and *Nali matti* (clay) mentioned in our document reveal that it was used in many buildings for instance *Haveli* of Budh Singh Kumani.⁵⁴

Nili, Neelbadi (Indigo)⁵⁵- This was used not only as a dye but also as a pigment, alone it is employed blue tints, mixed with yellow it forms green, with red it produce purple and with salt of iron black.⁵⁶ It was used in Jainiwas and *havelis* such as *Haveli* of Gourai Baal Kishan and Gokul Nath.⁵⁷

⁴⁷ *Ibid.*, p. 118.

⁴⁸ *Ibid.*, p. 116.

⁴⁹ *Ibid.*

⁵⁰ *Dictionary of Economic Product*, Vol. VI, part I, p.283.

⁵¹ *Ain-i-Akbari*, op. cit., p. 117.

⁵² *Farhang Istalahat-I peshwaran*, Vol. I, p.81.

⁵³ *Ibid.*, p. 89.

⁵⁴ *Arhsatta Imarti*, B.N. 6, p. 30.

⁵⁵ Platts, John T.A., *Dictionary of Urdu Classical Hindi and English*, first Indian edition, 1971, p. 913.

⁵⁶ *Economic Product of India*, Vol. VI, part 1, pp. 232-33 also see, Vol. IV, pp. 389, 469.

⁵⁷ *Arhsatta Imarti*, B.N. 5, pp. 54, 62.

Rang (colour) - It is used for white washing the buildings.⁵⁸ Oil (*tel*) was mixed with *safaidi* or other types of colour.⁵⁹ *Arhsatta* refers to *varnish polished* (Roghan) for white washing of buildings.⁶⁰

Mahabad- It is a red colour which is prepared from lac.⁶¹ This is mentioned in our document.⁶²

Lac (Gumlac, Coccuslacca) - In India, lac is dissolved in native spirits and colouring agent. In this form, it is used as a varnish carpentry and furniture. Lac mixed with sulphur and some colouring agent. It can also be used into cement. The native of India from remote times have used lac dye not only for textile purposes but as a pigment.⁶³ Gumlac was used in the whitewashing of temples and other buildings.⁶⁴

Hirmich (*geru or red ochre coloured earth*) - It is also mixed with an improved effect of white washing. Ain mentions *gil-i-surkh* about *hirmich* or *geru*.⁶⁵ *Arhsatta Imarti* document reveals that *hirmich* was used in white washing of Jaipur buildings.

Nausadar (*Ammonium, Salammonia*)⁶⁶- Nausadar was mostly used in the whitewashing of Jaipur buildings such as Dilaram's *Bagh* and Jai Niwas Garden.⁶⁷

Ajwan (Azwain) – This is also mentioned in our document. It was used with colour or whitewashing for resinous purpose.⁶⁸

Methi (Trigonella, Fenugreek) - The seed yields a yellow dye and enters into the composition of an imitation of carmine. The yellow decoction produces a fine

⁵⁸ *Ibid.*, B.N. 6,7.

⁵⁹ *Farhang Istalahat-I Peshwaran*, Vol. I, p. 109.

⁶⁰ *Ibid.*, p. 109.

⁶¹ *Dictionary of Hindi Language*, op. cit., p. 864.

⁶² *Arhsatta Imarti*, B.N. 3, p. 68.

⁶³ *Dictionary of Economic Product*, Vol. II, p.12.

⁶⁴ *Arhsatta Imarti*, B.N. 5,6, and 7.

⁶⁵ *Ain-i-Akbari*, op. cit., p. 116.

⁶⁶ *An Atlas of the Mughal Empire*, op. cit., Sheet no. 4B, p. 12.

⁶⁷ *Arhsatta Imarti*, B.N. 6, p. 48.

⁶⁸ *Ibid.*

permanent green with sulphate of copper.⁶⁹ It is used for brilliant colour and shining.

Alsi ka tail (Linseed oil) – Oil was used in building white washing.⁷⁰ The oil linseed is extensively used in the manufacture of paint, printing ink, floor - cloth, artificial Indian rubber oil varnish.⁷¹ The addition to the oil renders the colour more brilliant and lasting. Linseed was used in Jai Niwas Garden. the expenditure incurred on it according to the *Arhsatta Imarti* was Rs 62.50/-.⁷²

Hinglu (Mahogany tree, *Swietenia Mahogany*) - The mahogany tree yields a gum which at first liquid, soon dries up into brittle, while shining fragments; these become yellow on keeping.⁷³ This ingredient was extensively used in Jaipur buildings.⁷⁴

San (the plant of *crotalaria juncea*, *flax*, *hemp*)⁷⁵ - Abul Fazl mentions that it is a plant, which is mixed with lime.⁷⁶ *Arhsatta Imarti* mentions that *san* was brought in large quantity for building purposes.⁷⁷ We have information about *astarkari* of Jaipur buildings. *Ain* explains that *chuna qal-i*, *surkhi* and *san* are required for *astarkari*.⁷⁸

Mineral Paints- Iron oxides is used for dye and pigment, the ochres, both yellow and red are largely used in many localities for the adornment of walls and houses. It has been observed that this mineral paint proved to be the cheapest in the Indian market. It smoothly lies on wood or iron and has been successfully used against

⁶⁹ For details see *Economic Product of India*, op. cit., Vol. V, p. 7.

⁷⁰ *Arhsatta Imarti*, B.N. 4,5,6 and 7.

⁷¹ For details see *Economic Product of India*, op.cit., Vol. V, p.7.

⁷² *Arhsatta Imarti*, B.N. 3, p. 67.

⁷³ For details see *Economic product of India*, op. cit., Vol. VI, part III, p. 395.

⁷⁴ *Arhsatta Imarti*, B.N. 5, 6.

⁷⁵ *Dictionary of Urdu Classical Hindi and English*, op. cit., p. 678.

⁷⁶ *Ain-i-Akbari* op. cit., p. 117.

⁷⁷ *Arhsatta Imarti*, B.N. 3, p. 29.

⁷⁸ *Ain-i-Akbari*, op. cit., p. 118.

damp or porous files, bricks and plaster.⁷⁹ The expenditure incurred on it was Rs30/- for Jai Niwas.⁸⁰

Jasat (zinc pewter)⁸¹- *Suhaga* (Borax), *Tamba* (copper), *Jangar* (oxide of copper and copper sulphate) and *Maida* (Fine flour) were used in Jaipur buildings repairing and whitewashing.⁸²

Resins- It is an important source of raw material. It is a natural compound procured from plants and soluble in alcohol but not in water. There are a number of different classes of resins which are follows:

Sirish (Reed glue) - Abul Fazl mentions *sirish-i-kahi*. It was mixed with quicklime.⁸³ Farhang mentions that it was used for resin purpose and it was mixed with *rogan*.⁸⁴

Kali (unslaked lime) - *Pathar ka chuna* (lime stone) is used for *kalai* or *putai* (whitewashing).⁸⁵ Pelsaert mentions that people used unslaked lime, which is mixed with milk, gum and sugar into a thin paste. After plastering the walls, they apply this past.⁸⁶

Gum (gond) - Gum of inferior quality mixed with lime and *Ain* mentions about it *Zamgazabun*.⁸⁷

Katilo (also a kind of gond or gum)⁸⁸ - The document mentions that it was brought for the repairing and whitewashing of Jaipur buildings.⁸⁹

⁷⁹ *Economic Product of India*, op. cit., Vol. IV, p. 52.

⁸⁰ *Arhsatta Imarti*, B.N. 5, p. 52. For detail information; see also B.N. 6, 7.

⁸¹ *An Atlas of the Mughal Empire*, op. cit., sheet 6B, p. 20; See also, *Technology in Medieval India*, (c.650-1750), p. 53. *Ain-i-Akbari*, op. cit., p. 24.

⁸² *Arhsatta Imarti*, B.N. 3 P. 67, 68.

⁸³ *Ain-i-Akbari*, op. cit., p. 117.

⁸⁴ *Farhang Istalahat-I peshwaran*, Vol. I, p. 109.

⁸⁵ *Ibid.*

⁸⁶ Pelsaert, F., *Jahangir's India*, ed. & tr. W.H.Morrland and P. Geyl (reprint) Delhi, 1972, P. 66.

⁸⁷ *Ain-i- Akbari*, op. cit., p. 117.

⁸⁸ Sacariya Badri Prasad and Sacariya Bhupati Ram, *Rajasthani Shabd Kosh*, Vol. I, Jaipur, 1977, p.196.

⁸⁹ *Arhsatta Imarti*, B. N. 6, 7.

Gogul- It is aromatic gum resin of the *Balsamodendron Mukul*.⁹⁰ This was used in specific buildings.⁹¹

Chapri (lac or varnish)⁹² – It is used for chighs (sliced bamboo) sticks placed horizontally and joined by strings with narrow interstices between the sticks. They are painted and used as screens.⁹³

Fasteners-

Munj (the bark of *qalam* reeds) – it was used for making ropes to fasten the thatching.⁹⁴ *Munj* was used in the repairing of Jaipur buildings such as, Jai Mandir, Temple of Shri Narayan, Temple of Narayanji and Mohanbadi.⁹⁵

Sirki (A kind of reed) – *Sirki* is made of very fine *qalam* reed looks well and is very smooth. Ceilings and walls of houses are adorned with it.⁹⁶ The expenditure incurred on it according to *Arhsatta Imarti* was Rs. 30/-.⁹⁷

Sarkanda term was also mentioned in document and it is also a kind of reed.⁹⁸

Nlipa (A hallow reed)⁹⁹- It was used in Jaipur buildings such as *haveli* of Keshavran ji and Sujoghap Mahi Jodhpuri. An amount Rs. 20.8/- was incurred on it for the above *haveli*.¹⁰⁰

Sawan (a kind of lattice work)¹⁰¹- This work was done in the Jai Niwas Garden.

⁹⁰ Hobson Jobson, *A Glossary of Colloquial Anglo-Indian Words and Phrases, and of Kindred Terms, Etymological, Historical Geographical and Discursive*, op. cit., p. 386.

⁹¹ *Arhsatta Imarti*, B.N. 3, p. 68.

⁹² *Dictionary of Urdu Classical Hindi and English*, p. 422.

⁹³ *Ain-i-Akbari*, op. cit., p. 118.

⁹⁴ *Ibid*, p. 117.

⁹⁵ *Arhsatta Imarti*, B.N. 6, 7; See also table no-1

⁹⁶ *Ain-i-Akbari*, op. cit., p. 117.

⁹⁷ *Arhsatta Imarti*, B.N. 6, p. 30.

⁹⁸ *Ibid*.

⁹⁹ *The Oxford Hindi-English Dictionary*, eds. R.S. McGregor, Oxford University Press, 1993, p. 545.

¹⁰⁰ *Arhsatta Imarti*, B.N. 3, p. 48.

¹⁰¹ *Dictionary of Urdu classical Hindi and English*, op. cit., p. 630.

The expenditure incurred on it was Rs. 3/-.¹⁰²

Our document gives information of *Sulli* (A small trumpet twine, thin rope), *Baan* (cord of twisted grass) and also our document mentions the name of person from whom these raw material were bought (*muwai*) for instance 14.8 *man baan* was bought from Siya Ram Mahajan and Rs. 19.12 was paid to him for above quantity of *baan*.¹⁰³

Bans (bamboo) - It is used for spears.¹⁰⁴ *Arhsatta Imarti* document furnish information about bamboo for instance it was used in the *haveli* of Muraridas Ayamal and Rs 17.19/- was incurred on it.¹⁰⁵

We have information of *hukdi* (door-knockers), *kaanch Albari ko* or *kaanch Albari Pachrang* and *Sone (gold) ka qalash*.¹⁰⁶ *Ain* mentions *halqa Zanjir darwaza to hukdi*.¹⁰⁷

Brass (pital) – Brass was also brought for buildings. *Ain* refers to Brinj.¹⁰⁸

Kolu- Farhang refers that it is made of tile material and its structure is like a semi-circle. This was fixed with Khaprail or tiles.¹⁰⁹

Tiles (Thokra) - *Arhsatta Imarti* refers that tiles were used in the construction of roofs and it was brought in large quantity from neighboring areas like *Pohkar* in 1738 A.D.¹¹⁰ *Ain* mentions that tiles were used for the roof construction from the protection against heat and cold. *Khaprel* term was mention in *Ain* for *Thokra*.¹¹¹

Seen and *Seeni*- These were brought for buildings of Jaipur.¹¹² *Seen* is a ringlet

¹⁰² *Arhsatta Imarti*, B. N. 7, p. 78.

¹⁰³ *Ibid.*, B. N. 9, 12 p. 36, 54.

¹⁰⁴ *Ain-i-Akbari*, op. cit., p. 116.

¹⁰⁵ *Arhsatta Imarti*, B. N. 4, p. 47.

¹⁰⁶ *Ibid.*, B.N.3, p. 67.

¹⁰⁷ *Ain-i-Akbari*, op. cit., p. 116.

¹⁰⁸ *Arhsatta Imarti*, B.N. 3. p. 68; See also, *Ain-i-Akbari*, op cit., p. 24.

¹⁰⁹ *Ibid.*, B. N. 4, p. 4. 3; see also, *Farhang Istalahat-I Peshwaran*, Vol. I, p. 81.

¹¹⁰ *Ibid.*, B. N. 12, p. 54.

¹¹¹ *Ain-i-Akbari*, op. cit., p. 116.

¹¹² *Arhsatta Imarti*, B. N. 4, p. 13,

lock and seeni is painted tiles on walls or brass.¹¹³

We have found terms in our document like *raizya*, *wajto*, *sadras*, *sarmani*, *haripal* and *aghotra*.¹¹⁴ But these are unidentified and we have no information of its uses in buildings.

The following table which shows raw material and its expenditure:

¹¹³ Steingass, F., *Persian English Dictionary*, London, 1963, First Edition, 1892, pp. 718-719.

¹¹⁴ *Arhsatta Imarti*, B. N. 4, p. 43. B.N. 6, p. 26.

Table showing the expenditure on particular ingredients in the *havelis*

Name Of the haveli	Tiles (<i>thokara</i>) Rs	Lime (<i>churo</i>) Rs	Unslaked lime (<i>kalti</i>) Rs	Sarmani (unidentified) Rs	Clay (<i>matthi</i>) Rs	The bark of qalam reed (Murti) Rs	Twisted grass (<i>baan</i>) Rs	Stone (<i>sang</i>) Rs	Twine (<i>sutaiti</i>) Rs	<i>Kolu</i> Rs	Brick (ttha) Rs	Wood (lakdi) Rs	Sriki Rs	Dagra soui Rs	Danda thum Rs	Lac (<i>Chapri</i>) Rs	Tail (oil) Rs	Wages (<i>Ujura</i>)
Haveli of Bhagwandas Rajawat	1	3	6 48 Paise	-	-	-	-	-	-	-	-	-	-	-	-	-	-	101
Haveli of Govardhan Swami	-	-	-	5	1	8 paise	25 paise	-	-	-	-	-	-	-	-	-	-	4 58 paise
Haveli of Chahbehadr	-	-	-	-	-	-	32 paise	-	3	-	-	-	8	13	-	-	-	5 58 paise
Haveli of Fateh Singh and Vijay Singh	14	1400	-	-	-	-	12	Sang Chidi (20) and Kurand (2 Rs)	-	30	16	32 (Neem wood)	-	-	-	2	2	1950
Haveli of Murlidhar	-	3	6 48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
Haveli of Budh Singh Kumari	-	-	-	-	-	1 32 paise	8 paise	4 25 (Sang Gilola)	-	-	-	-	-	-	-	-	-	29 32
Haveli of Gopaldas Rajawat	1	27 32	-	-	-	-	32 paise	-	-	-	-	-	-	-	-	-	-	106
Haveli Gosai Baal Kishan	-	2 32 paise	6 32 paise	-	-	-	1	-	-	-	-	-	7	-	2	-	-	40
Haveli Vijay Ram Chabda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Haveli of Jhujhar Singh	32 paise	7 32	16 40	-	-	-	16 paise	-	-	-	-	-	-	-	-	-	-	43

The table shows various *havelis* of Jaipur city and various items used for construction, repairing and renovations of the buildings during that time. In this table an attempt has been made to show the expenditure incurred on various items and wages. The table also indicates the name of owner and their clan to which they belonged, for example *haveli* of Baghwan Das Rajawat. Baghwan Das belonged to Rajawat clan. Tiles, lime, unslaked lime was used in the repairing of his *haveli* and expenditure incurred on these items was Rs. 1, 3, 6.48. An amount of Rs.101 was paid to the workers who were engaged in the repairing of this *haveli*

Table Showing the Whitewash and Repairing of the Temples

Name of the temple	Unslaked lime (<i>Kali</i>)	Twisted grass (<i>Baan</i>)	The bark of <i>qalam</i> (reeds) (<i>Munj</i>)	Wages (<i>Ujura</i>)
Dehro Shri Jagat Saromani Rai Ji	3. 8 paisa	2.4 paisa	4 paisa	14.12 paisa
Dehro Shri Lakshmi Narayan ji	2.62 paisa	54 paisa	„	11
Dehro of Mohan Rai ji	83 paisa	4 paisa	50 paisa	-
Dehro of Mahamai ji	2. 8 paisa	29 paisa	4 paisa	8.75 paisa
Dehro of Mahadev ji	1.50 paisa	12 paisa	50 paisa	6.33 paisa
Purohit Bihad Mahadev	25 paisa	4 paisa	„	2.33 paisa

The table indicates that the items were used for white washing of temples. The information of above table shows that unslaked lime, twisted grass and bark of *qalam* reeds used for whitewash. The brush for white washing was prepared by the use of twisted grass and which was fastened by the rope of the bark of *qalam*.

Wage Structure of the workers- *Arhsatta Imarti* refers to the wage structure of the various types of artisans (*Karigar*), carpenters (*Khati*), labourers (*majur*), brick layers (*beldar*) and architect (*ustagar*) were engaged in the construction, repairing, renovations and whitewashing of Jaipur buildings.

The document contains rich information of expenditure which was incurred on wages for particular buildings. The amount was fixed (*mukarrar*) as we have an example about *Haveli* of Keshav Ramji and Sujoghap Mahi Jodhpuri which was repaired and some

renovation was done in this *haveli*. An amount of Rs.112/- was fixed for the wages of workers.¹¹⁵

Ain only mentions the category of workers and their wages.¹¹⁶ However *Arhsatta Imarti* refers to the name of workers and their wages (*ujura*) and their domicile also.

Table of Wages of Workers

S.N.	Name	domicile	Duration (per mensum)	No. of days employed	No. of days absented (<i>naga</i>)	Wages	
						Rs	<i>Taka</i>
1	Kanhiram	Khema	March to April (Chaitra to Baisakha)	27	-	6,75 paise	-
			June to July (Ashadha to Sravana)	16	-	4	-
			August (Bhadrapada)	15	-	3	11
			September (Asvina)	10	-	2	-
2	Hamid Habib	-	March to April	27	-	6	10.25
	„	-	June to July	15	-	3	11
	„	-	August	15	-	3	11
3	Jagram	Dala	March	24	-	5	-
	„	„	April	3	-	-	10.25
4	Tulcho	Dolta	March to April	27	-	6	10.25

¹¹⁵ *Arhsatta Imarti*, B.N. 3, p. 48.

¹¹⁶ *Ain-i-Akbari*, op. cit., p. 117.

	..	..	June	25	-	5	10.25
5	Devmani	Magho	March to April	27	-	6	3.25
6	Magolo	..	..	27	1	6	-
7	Jasom	-	..	24	4	6	-
		-	August to October	34	-	8.50	-
8	Maniram	-	March to April	27	1	6	10.25
9	Kishan	Kashipur	..	27	-	..	..
10	Megho	-	..	27	-	..	10.25
11	Gegho	-	..	-	-	4	29
12	Valo Dayaram	-	..	23	-	5	1.25
..	..	..	August (Bhadrapada)	-	-	7	7.25
13	Imam Hussain	-	March to April	-	-	1	11
14	Ramkishan	Tulcha	..	27	3	6	-
15	Hasan Rahim	-	..	27	-	6	10.25
16	Rahim lal	-	..	27	-	5	12.25
17	Chitar Nath	-	..	..	-	6	10.25
18	Lachi Guja	-	..	..	4	5	3.25
19	Ratnomparam	-	..	..	-	6	10.25
20	Ramji	Sambhal	..	27	1	6	7
..	..	..	June	9	-	2	-
21	Nathu Vopath	-	March to April	27	-	6	10.25

..	..	-	June	16	-	4	..
..	..	..	August	12	-	3	-
22	Dayaram Gha	-	..	..	-	6	10.25
23	Bhagirath Sukhram	-	..	27	2	6	-
24	Sukhram	-	..	..	..	6	10.25
25	Pohkar	Udehi	..	6	-	1	7
26	Isharman Singh	-	..	-	-	3	22
27	Harjeen Raheen	-	March to April	2	-	-	7
28	Khemo Hira	-	..	9	-	1	4
..	..	..	April	2	-	-	2
29	Nenho Chitar	-	March to April	7	-	7	7
30	Manpema	-	..	27	-	9	-
..	..	..	May	14	-	4	9.25
31	Hari Singh	Udehi	July to August	14	-	3	7.25
..	..	..	-	-	-	4	-
..	..	..	September	22	-	5.50	-
32	Tulobadan	-	March to April	19	-	4	3.25
33	Vijaytula	-	..	17	-	2	3
34	Udai Khema	-	April	17	-	4	3.25
..	..	-	July	21	-	5	-
35	Peerthiram Singh	-	March to April	17	-	3	5.25
36	Gangaram	Toda	..	5	-	1	9
37	Balkishan	-	..	27	-	9	-

”	”	-	May	14	-	4	9.25
38	Ram kishan Maan	-	March to April	27	-	9	-
”	”	”	May	14	-	4	9.25
39	Maan Singh Deepu	-	March to April	28	-	6.50	7
”	”	”	May	29	-	6	18
40	Lalu	Pohkar	June to July	5	-	1	-
41	Jasotara	-	March to April	28	-	7	-
”	”	”	May	14	-	3	7.25
42	Ram Maan Singh	-	March to April	28	-	7	-
”	”	”	27April to May	33	-	7	8.25
43	Ghasi Todar Singh	-	June to July	5	-	75 paise	12.25
44	Khemu Dayaram	-	August to September	-	-	5.50	-
45	Gangaram	Kather	August	22	-	5	-
”	”	”	September to October	33	-	8.25	-
46	Murli	”	August	22	-	5	-
”	”	”	October	8	-	2	-
47	Akhairam	Bathaira	July	-	-	6	-
”	”	”	August	-	-	2	6.25
”	”	”	September	-	-	5	-
”	”	”	October	-	-	4	-

..	Ramkishan	..	July	-	-	6	-
..	..	..	August	29	-	8.75	-
..	..	..	September	-	-	2	6.25
48	Mojiram	Malarna	June	-	-	13	3
..	..	..	July	-	-	7	9
49	Than Singh Saha	-	June	-	-	6	-
..	..	..	July	48	-	12	-
..	..	..	September	-	-	9	9
..	..	..	Pausha (December)	-	-	7.50	-
..	..	..	Feb (Phalguna)	-	-	6	9
50	Lalchand Saha	-	June	66	-	16.50	-
..	..	..	July	48	-	12	
..	..	..	September	-	-	19	-
..	..	..	December	-	-	17.50	-
..	..	..	Feb	-	-	15	-
..	..	..	March	-	-	9.50	-
51	Khubram Saha	..	March to April	66	-	16	7.25
52	Mojiram Viyas	-	-	66	-	13	3
53	Parasram	-	March	30	-	6	-
54	Bhuro (Muslm)	-	June to July	-	-	23	12
55	Mayaram Bhatt	-	September	-	-	22.79 paisa	-
56	Khursal baman	-	September	48	-	9	9

The table shows the name of the various workers, their domicile and the duration of their work. The number of days in which they were absent (*Naga*) and their wages in terms of *taka* and rupees is also indicated in the table. We have information from this table that workers came from other areas for the construction of Jaipur buildings. The amount was fixed (*mukarrar*) for wages for example Rs. 6.75 was paid to Kanhiram, who came from Khema, and this amount was paid for 27 days. Interestingly, the available document shows the absent days of *Karigars* for example Ramji had absented for 1 day out of 27 days so the amount Rs.6 and 7 *taka* was paid to him for 26 days. The month in which wages paid was also mentioned in the document. The workers who were employed for 23-27 days were paid 5 rupees to 6 rupees and the workers who were below these numbers of days were paid 2-4 rupees and the workers who worked above these days were paid 8 rupees.¹¹⁷

The wages were paid in cash to the workers according to the nature of their work. They were paid in the form of rupees and *takka*.

Table indicating the wages of Carpenter (Khati)

Carpenter (<i>khati</i>)	Feb (<i>Phalguna</i>), Year V.S 1795	Fixed days	Wages (<i>Ujura</i>)
Talabda ka <i>Khati</i>	„	7	1.25
Veerpur ka <i>khati</i>	„	„	„
Peeperhetha ka <i>khati</i>	„	„	„
Khurai Hari ko <i>Khati</i>	„	6	1 rupees and 1 <i>taka</i>
Kosaryama ko <i>Khati</i>	„	„	„
Raheravad ko <i>Khati</i>	„	43	10
Devipur ko <i>Khati</i>	„	7	1
Bhopur ko <i>Khati</i>	„	7	1.25

¹¹⁷ *Arhsatta Imarti*, B.N. 13.

This table shows that the carpenters (*Khati*) wages were fixed as we have an example, Rs.1.25 were paid to the carpenter of Veerpur for 7 days. An amount of Rs.10 was paid to the carpenter of Raheravad for 43 days, but there should be Rs.8.75 paid according to the above days. It appears that the carpenter of Raheravad belonged to the superior category. *Ain* mentions the amount of carpenters and their category, 7 dams were paid to the first class, 6 dams for second class and 5 dams were paid to the third category.¹¹⁸

There are information of labourers and their work were divided for instance, some were engaged for making the lime mortar (*chuno- ko-gara-karo*), some were engaged in the work of *Kot ki Chunai*, some were engaged for digging the clay and the construction of *burj* (raised platform).¹¹⁹

Abul Fazl mentions the *beldars* (brick-layers) and their wages. Our document mentions the name of *beldars* as well as their wages. The following table indicates the wages of *beldars*.

Table Showing the Wages of *beldars*

Name of the beldars	Amount paid (Rs.)
Kuslo Kharwal Gubadi	4.12
Sadwo Viarjwasi	50.28
Maharam Virajwasi	1.16
Batwo Virajwasi	5.40
Megha Virajwasi	10
Sheoram Mahajan	20

¹¹⁸ *Ibid.*, B.N. 13, p. 18.

¹¹⁹ *Ibid.*, B. N. 13 p. 71

Kesri Singh	6
Julpo Gubadi	2.16

There were number of *ustager* (architect) whose name were mentioned in the document like Dayaram, Kushpal Kumar, Udairam, Sumram and Sitaram Kumar etc.¹²⁰

Ujura (wages) and *dadni* (advance of money for works or goods) was also specified. The following table indicates the name of workers to whom wages were paid in advance.¹²¹

Table Showing the *Dadni* (1737 A.D.)

Name of the worker	<i>Ujura dadni</i> (wages in advance)	Fixed days
Sudardas	Rs.7 and 10 <i>taka</i>	46
Lakshmiram	Rs.6 and 7.25 <i>taka</i>	39
Ramji Meeno	Rs.7 and 21.25 <i>taka</i>	52
Niryamu Wakhan	Rs.2 and 2 <i>taka</i>	8
Nathuram	Rs.1 and 5 <i>taka</i>	8
Harkishan	Rs.18.12	91
Jamal	Rs.7 and 76.25 <i>taka</i>	74
Somaram	Rs.18.12 and 6.25 <i>taka</i>	141
Kanha Ji	Rs.11 and 15 <i>taka</i>	72
Devidas	Rs.11 and 20 <i>taka</i>	74
Hiramani	Rs.5 and 12.25 <i>taka</i>	35

¹²⁰ *Arhsatta Imarti*, B.N. 6, p. 80, 81, 88.

¹²¹ *Ibid.*, B.N. 8, 12.

The wages were distributed under the supervision of *Tahvildar* and Superintendent (*daroga*) as we have an example, Mohanram *tahvildar* who was responsible for wages distribution in 1738 A.D and Santoshram was in 1739 A.D.¹²²

It is amply clear from the above investigation that exhaustive information on raw material and wages are exhaustively dealt with in the rich content of document preserved in *Rajasthan State Archives*.

¹²² *Arhsatta Imarti*, B.N. 13.

Conclusion

A close study of present work entitled, "Urban Morphology of 18th century Jaipur city" indicates, that the city was based on *Prastara* plan. 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.

As we know that Sawai Jai Singh was very remarkable person of his age. He was not only a good statesman but also a town planner. Before founding the city he had collected large number of maps of literature and plans from other cities. Firstly he repaired the Amber city and prepared the large maps for the city. A number of plans were made on paper for Jaipur.

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. After studying the maps of the *Kapad dwara* document, it appears that he had the vision of the colossal task of tapping the different water resources. Related map shows the pillars were built at different distances for estimating the depth of water. A number of water reservoirs like canals, dams, tanks, lakes, wells and step-wells were constructed for the supply of water for the city. The water supply system was not only rich in the city but it connected also the neighboring areas of the city. On seeing the water supply in the forts we find that Jaigarh fort is self sufficient, with respect to its water requirements and number of plastered water channels were constructed for carrying the water from the Aravalli range.

The city was built, according to the plan made under the chief Architect Vidhyadhar. 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 are number of views regarding the planned city, some researches indicate that it was fully planned, based on *Prastara*. However other scholars do not agree that it resembles to the *Prastara* in any manner. We cannot deny that Sawai Jai Singh made the plan on paper, before the construction of every area. If there was irregularity

in the north-west part of the city it was because of uneven terrain of hills, but other blocks of the city are square or rectangular in shape.

Our document reveals that Sawai Jai Singh ordered to maintain the width of the streets for instance "*chhota rasta sun bada rasta hamwar kiyo*". This clearly indicates that streets were planned in the city, but there were some irregularities in the small lanes. The main streets of the city were regular. Gates of the city were connected to these streets. Some writers mentions that there were seven gates constructed in the city. We have a concentric map supplied by Susan Gole which indicates the eight gates of the city. According to the Rajvallabha, there should be eight gates in the town. So we can say that eight gates were constructed according to the Hindu plan.

Some locality names were derived from Shahjahanabad like *Chandni chowk* and *Tripolia* etc. If we see the bazaars of the city there were walkways constructed in front of shops. There were good arrangements of shopping both in rainy as well as in hot season, because Sawai Jai Singh had constructed some walkways with roofs that protected the people both from heat and rain in the markets. Our document reveals that there were some specialized markets for goods.

Residential areas were also constructed with these shops. The regularity and uniformity of the buildings were maintained. The document shows that all records regarding the construction of buildings were sent to the Vidayadhar. Many artisans were invited by Sawai Jai Singh to settle down in newly built town and even concessions were also provided to them for the construction of houses. The land was allotted to the people according to their occupation, caste and creed. This feature also resembles to the *Prastara* plan.

Sawai Jai Singh was a scholar, scientist and a patron of literature and art. He was well aware of contemporary developments in Europe in the field of Mathematics. He was equipped with various Greek and Arabic work as well as European texts which were related to the Astronomy, some such works were translated it into Sanskrit. He built five observatories. Jaipur observatory is well preserved among

them. He constructed number of instruments of stone and masonry for the observatory.

He was also a follower of vaisnavism. Temples were the regular features of the city. The Suraj temple in the east must have led to the east-west street as the first factor in making the planning decision. He was not disrespectful towards non-vaishnavism, testimony to which are the number of temples, still survive.

Gardens were the tool for the planning of city. Sawai Jai Singh laid the foundation of Jai Niwas in 1726 which exists even today. It is clear from *Baghayat Kharach* document that Jaipur had developed gardens (*Baghayat*) which were categorized into *Bostan*, *Gulistan*, and noble gardens. Jaipur gardens were built on *Chaharbagh* pattern with central water channels which derived from the Mughals. There was good water supply to maintain the gardens of the city.

We have rich information of building material which was used in the construction of the Jaipur structures. *Arhsatta Imarti* provides the information of raw material and its expenditure. *Ain* also provides the information of raw material but does not mention the name of buildings in which raw materials were used. Our documents provide the name of the buildings and even parts of the building in which different kinds of raw material were used. This a singular good fortune of *Rajasthan state Archives* that such intricate details survive.

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- 2) *Baghayat Kharach Document-* It contains the information about bostan, Gulistan and orchard garden of Jaipur city and also gives the detail of its expenditure.
- 3) *Chitthis-* These are the Miscellaneous Papers, preserved Rajasthan State Archives, Bikaner.
- 4) *Dastur Komwar-* *Dastur Komwar* are the records of *Dastur* or protocol observed in respect of persons of different castes, communities and social status. The Government of Jaipur had got these records prepared from the *Touji* records and had preserved them in 32 volumes. The document covers the period from 1718 to 1918. These volumes are preserved in R. S. A. Bikaner.
- 5) *Kapad Dwara-* It is the collection of large mass of maps, plans and notes on the planning of Jaipur city. These documents belong to 1589-1803 and are presently preserved in the City Palace Museum, Jaipur. These are in Rajasthani and Persian language. These maps can be classified into many categories like map of residents, map of water resources, map of markets,

maps of main buildings, which were constructed during 18th century. Interestingly these are in map form and notes attached to it. It reveals the information on town planning and the information related to step by step development and construction of the buildings of Jaipur.

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Appendices

Appendix- 1

Information about the Foundation of Jaipur City in *Buddhi Vilas*

नगर उतपति^१ वरनन^२
नगर वसायौ यक नयौ, जयस्यंघ सवाई,
जाकी सोभा जगत में, दसहौं दिसि छाई।
ताकौ वरनन करनकौ, हुलसी मति मेरी,
इंद्रपुरी हू जानियौ, ताकी है चेरी ॥६७॥

कूरम सवाई जयस्यंघ भूप तिरोमनि,
सुजस प्रताप जाकौ^१ जगत में छायौ^२ है।
करन-सौ दानी पांडवन-सौ कृपांनी महा,
मांनी मरजाद मेर राम-सौ मुहायौ है ॥
सोहै अंवावति की दक्षिण^३ दिसि सांगानेरि,
दोऊ वीचि सहर अनौपम^४ वसायो है।
नाम ताकौ धरघौ है स्वाई^५ जयपुर,
मांनों सुरनि हीं^६ मिलि सुरपुर-सौ रचायो है ॥६८॥

च्यारघौ^१ दिसि रच्यौ उतंग कोट;
तापरि कगुरनि^२ की वनी जोट।
तिह तलि चौड़ी षाई वनाय^३,
औड़ी मनु सरिता चली जाय ॥६९॥
दरवाजे ऊचे^४ वने^५ गोष,
पौरिया बैठि तिह^६ करत जौष।
चौपरि^७ के कीन्हे हैं वजार,
विचि वीचि वनाए^८ चौक चार ॥१००॥
ल्याए^९ नहैरि^{१०} वाजार मांहि,
विचि में ववे गहरे रषांहि।
चौकनि में कुंड रचे गंभीर,
जग पीवत तिनकों मिष्ट नीर ॥१०१॥
हाटिन के विचि रस्ता^१ रषाय,
दीन्हें^२, ते सूधे चले जाय।
बहु वने हवैली कूप वाग,
सुंदर तिनु लषि मन लगत लाग ॥१०२॥
धनवान जु व्यौपारी कितेक,
बहु देस सुदेसनि तैं आये अनेक^३।
ते करत विगज अति निसक^४ होय,
परदेस सुदेसहि जात कोय ॥१०३॥

Appendix 2

Information about Diwan Vidhyahdar in *Ishwar Vilas*

वङ्गालयप्रवरवैदिकगौडविप्रः

न्निप्रप्रसादसुलभः सुमुखः कलावान् ।

विद्याधरो जयति मन्त्रिवरो नृपस्य

राजाधिराजपरिपूजितशुद्धबुद्धिः ॥३८॥

यद्बुद्धिवैभवबलेन नृपः सवाई-

राजाधिराजजयसिंह इति प्रसिद्धः ।

चक्रे पुरं जयपुरं रमणीयमेत-

च्चेतः प्रसादजननं त्रिजगज्जनानाम् ॥३९॥

राजा स मन्त्रिवरमीश्वरसिंहनाम्ने

पुत्राय राजपदवैभवभाजनाय ।

श्रीराजमल्लमुखमन्त्रिषु मुख्यमेनं

विद्याधरं किल समर्पितवान् स्वरुच्या ॥४०॥

अस्त्वेकतः सकलभूतलराज्यलक्ष्मी-

रस्त्वेकतो जनपदः पुरदुर्गसंपत् ।

सन्त्येकतोऽखिलजनाः परमेकतोऽसौ

विद्याधरो गुरुगभीरगुणैकसिन्धुः ॥४१॥

धीरो निजान्तसमयं निकषा सवाई-

राजाधिराजजयसिंहनृपोऽखिलज्ञः ।

श्रीराजमल्लमुखमन्त्रिसमन्वितार्य-

विद्याधराङ्गतलगं कृतवान्कुमारम् ॥४२॥

Appendix-4

Arhsatta Imarti pertaining to Building Material and Its Expenditure

७६		७७	
संकेत	विवरण	संकेत	विवरण
१५	सिंघली	१६	सिंघली
१६	मिठावीक	१७	मिठावीक
१७	प्रसाहवीक	१८	प्रसाहवीक
१८	वागजैनीवास	१९	वागजैनीवास
१९	मरमा	२०	मरमा
२०	गडगोरी	२१	गडगोरी
२१	जंगल	२२	जंगल
२२	श्री	२३	श्री
२३	श्री	२४	श्री
२४	श्री	२५	श्री
२५	श्री	२६	श्री
२६	श्री	२७	श्री
२७	श्री	२८	श्री
२८	श्री	२९	श्री
२९	श्री	३०	श्री

Rare information on Diwan Vidhyadhar in Arhsatta Imarti

इति महाहृदयसेवतुं
लाञ्छितसुखिसंवल
मजकुलमउज्जुमा
तेहवि

उज्जुसवाह्येप्रथेग्रापोतिसं
तोषरंमतेदारपावाकरी
गरवेमनीरंमवकीपावामे
प्रासामिउत्सुस्नेउपाव
नेदीमाप्रवारामा.यागइदिशि
नविद्याधरमोम्मायमुज्जु
मितीचितवदिउनेउमपु

Arhsatta Imarti Indicates Wages Structure of Karigars

११
 श्री-व्येतसुदी १२ सोमवार
 सं-११ रविवार-व्येतसुदी
 नरसुदरसु- ११ रविवार
 यमसाछोन्नाजरोदाद
 वे-हृदिरामधेमांशो वे-इमीरुवीवकांमांस
 वेसाधसुदी ४ मंगलवार
 श्री-व्येतसुदी ५ मंगलवार
 वेसाधसुदी ६ सोमवार
 मंगलवार ६ सुहरवार ६
 व्येतसुदी ५ मंगलवार ६ साठवरी
 छान्नेसाधसु ६ संख्यान्ना
 श्रीवरीवार साठवरी १२
 रोज ३१ रो सुहरवार रोज
 १११ १११
 १११ १११
 १११ १११
 १११ १११