

APPLICATION OF REMOTE SENSING TECHNIQUE FOR CANAL NAVIGATION IN GREAT INDIAN DESERT ; A CASE STUDY OF JODHPUR AND ITS ENVIRONS

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ABSTRACT

With the help of remote sensing technique two unique types of proposals, that is, a canal navigation and a new site for the Jodhpur have been prepared. On the basis of the present study the canal navigation is possible in the desert town. After the completion of this plan the desert town of Jodhpur will be known as the Venice of India. After the construction of the proposed canal at the proposed new site for the city, the famous historical sun city of Jodhpur will be converted into a beautiful modern city of India. In the light of Bhuj - Kachchh geological movement it is essential to vacate the people living in the area of the surrounding fort of the old city and should be immediately shifted to the newly proposed site near Kankani hill.

STUDY AREA : The present study area is located on 73° east longitude and 28° 20' north latitude (**Figure-1**). After Jaipur it is the second largest city of Rajasthan state and the principal regional centre of the arid west, sprawling over an area of approximately 125 square kilometres. As per 2001 census, the population of Jodhpur city is approximately one million with growth rate in last decade (91-2001) being approximately 30 percent. The high growth rate indicates the fast industrial development, migration of population from adjoining desert rural areas and heavy set up of defence establishments. The city was founded by Late Rao Jodha on 12th May, 1459 A.D. about 9 Kilometers away from former capital of the Marwar "Mandor" in the form of a walled fort town on a hillock. Towards north and north-west, Marwar sand store and Malani rhyolite out-crops upto a height of 397 meters above mean sea level. The hill range of north-northwest are well-known areas of intensively quarried famous "cheettar-patthar" red-stones of Jodhpur which enjoy export-reputation in Gulf countries and other European and African markets, beside being popular building stone for the entire city itself. The Jojari, a tributary of river Luni is the sole seasonal drainage system in its vicinity which is active only ephemerally.

Arid conditions dominate its climatic and weather scenario throughout the year. The mean annual maximum temperature is around 33.6° centigrade and the minimum is often about 19.8° centigrade. Rainfall is dismally low, the mean annual over the last one century being around 370.00 millimetres with high coefficient of variation 55%, potential of evapotranspiration being around 1843 mm with a moisture index of 80.5%. The range of 6.6 to 16.6 kilometres per hour of high speed winds contributes significantly and substantially towards sustaining aridity. The above referred geographical conditions of the city characterise

its over-all water resources to be consistently influenced by a frequency of drought in its vicinity.

MATERIAL AND METHOD : In this study IRS 1D LISS III and Landsat Remote Sensing Satellite data i.e. different dates in colour composites transparency have been used for visual interpretation. Coloured imagery for year 2000 and 2001 was of IRS and scale 1 : 50,000 and other imageries of black and white band No. 3 & 4 with scale 1 : 250,000 were used. The Indian Topographical sheets No. 45B-15 & 16 and 45F-3&4 were also used in this study. Apart from the data inferred from the Indian topographical sheets, satellite imageries and field survey, the relevant data were also collected from the secondary sources appearing in the different reports.

SIGNIFICANCE OF THE STUDY : If the present state Government accepts the proposed navigational canal plan and the proposed new site for establishment of new Jodhpur in the great Indian desert, the historical Jodhpur city will be converted into a beautiful modern city of India. After the construction of this canal Jodhpur will be converted into the Eastern Venice. The proposed navigational canal will generate transport facilities in this desert town. Looking to the new policies of the Union Government of India of restructuring bigger states into smaller ones, it is essential to make a new plan for Jodhpur city. In near future from the state of Rajasthan the Maru Pradesh can also get the status of a separate state. Then Jodhpur will become the capital of the Maru Pradesh. Therefore, this type of plan has been prepared for Jodhpur.

ANALYSIS : Upto nineties Jodhpur city of Rajasthan faced severe water problem. But due to the construction of Rajiv Gandhi lift canal, now Jodhpur city is having one of the best supplies of water and hence Jodhpur city has become a modern one not only in Rajasthan but also in the entire desert area of the world. At present the water supply of Rajiv Gandhi lift canal accumulates in Kaylana lake. Due to the storage of water in Kaylana lake, the underground water-table-level has increased in the old city. Now-a-days the old city is facing the problem of water seepage. The seepage problem in the old city is due to intensification of faults, folds, and lineament. Looking to the availability of excess water in Jodhpur city and old track of meter gauge railway line, a canal navigation plan has been made.

Proposed Navigation Canal Plan : Under this plan, from Bhagat Ki Kothi to Sursagar a permanent stone canal can be built for navigational purpose. The 20-meter wide canal from Kaylana to Pratapnagar can be constructed and it can be divided into two parts. One part of the canal will go from Kabir Nagar to Soorsagar and another part will be diverted from Pratapnagar to Akhalia Chauraya, Masuria, Shashtrinagar and Bhagat Ki Kothi.

This part of the canal is to be further constructed from Bhagat Ki Kothi to Jai Narayan Vyas University, Ratanada, Ummad Bhawan, Military area, Brigadier Zabar Singh nagar, Magara, Punjla and Surpura to Mandor. From the proposed canal near Masuria hill one diversion can be made to this canal for the new site of Jodhpur. The canal will go towards Kheme Ka Kuwa, Pal, Salawas, Purohiton Ki Dhani, Tantiyan Ki Dhani, Kankani, Magra, Rajputon Ki Dhani, Kuri and Jhalamand. This canal will re-join the flow which comes from Bhagat Ki Kothi near Jai Narayan Vyas University. In this canal the required water supply can be arranged from Kayalana lake, in which the stored water from the Rajiv Gandhi Lift canal

will be there. Recently the underground water table has increased and seepage of water problem has occurred in some particular areas in the old city of Jodhpur. This seepage water can also be utilised for the proposed canal. The rain water deposits in Soorsagar, Kali Beri, Roopawaton Ka Was, Barli and Keru mining areas can also be utilised for the proposed canal. The proposed canal can also be utilised from the diverted flood waters of the Punjab rivers and the Yamuna river.

Table - 1

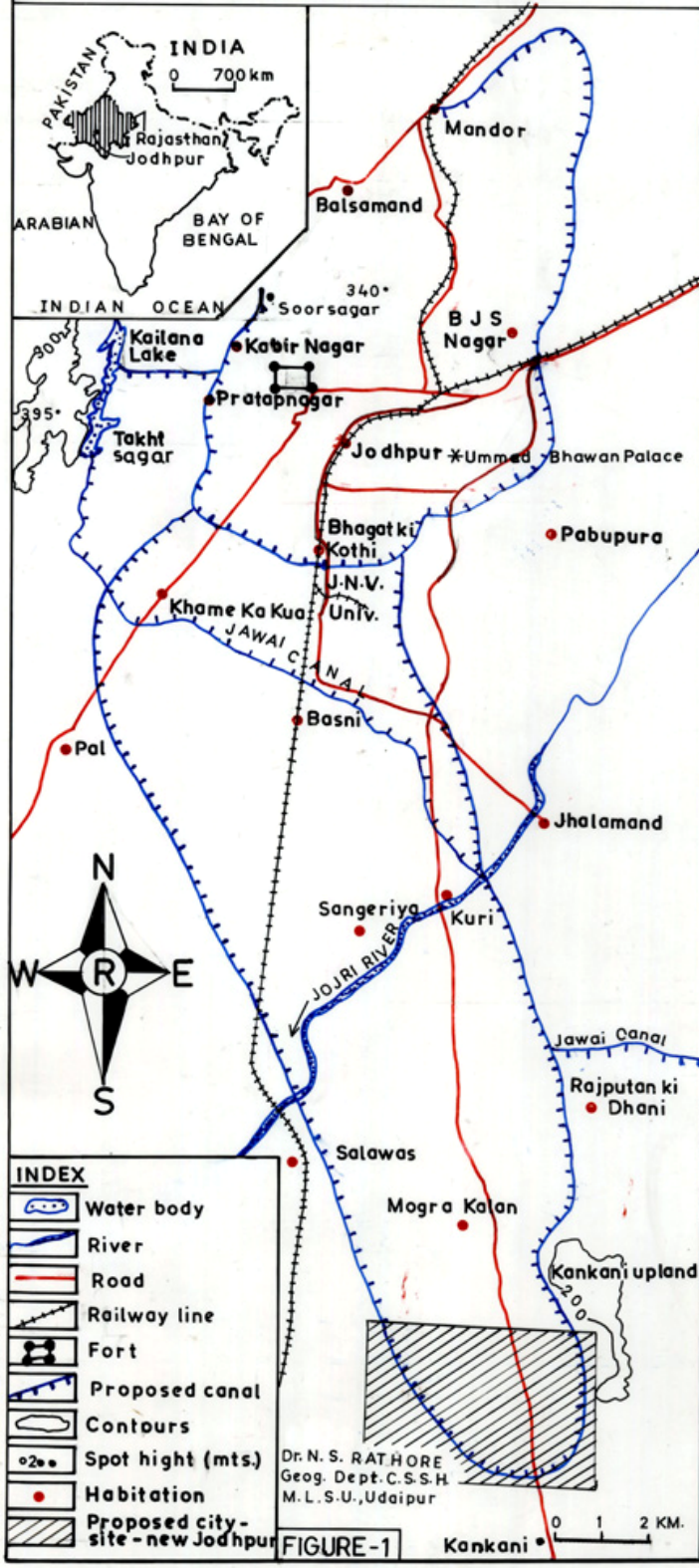
Salient Features of The Proposed Navigational Canal In Jodhpur City

Length	60 kilometre
Width	20 metre
Depth	06 metre
Water carrying capacity of the proposed Navigational canal	7.2 million cubic. metres
Direct Benefit of house	6,000
Employment Generation	10,000 person per day
Tourism	Increase of foreign and inland tourist to the desert area through Jodhpur
Status of Aridity	Aridity will be reduced up to 25%
Status of Humidity	Humidity will be increased up to 15%
Status of Pollution	More than half of city will be pollution free
Construction cost	Rs. 200 million.

One branch of the proposed canal can be diverted to the proposed new site for Jodhpur city and can also be utilized in this canal for navigational purpose between the old city and proposed new city. Through the construction of this canal, in the Maru-Pradesh (Western Rajasthan) tourist industry will be promoted and will also get the benefit of stone industries. Right from Kaylana, Soorsagar, Bhagat Ki Kothi, Salawas, Kankani, Mogra, Kuri, Ummed Bhawan Palace, Magra, Pungla, Surpura and upto Mandor the length of this canal will be about 60 km. After the construction of this canal Jodhpur will be converted into the Eastern Venice. The proposed navigational canal will generate transport facilities and the historical old city will be famous throughout the world as a beautiful modern city.

New Site For New Jodhpur City : In the year 2000, three new states were formed from the Uttar Pradesh, Madhya Pradesh and Bihar which are known as Uttaranchal, Chattishgarh, and Jharkhand. On the same lines in near future from the state of Rajasthan the Maru region (Desert area) can also get the status of a separate state as a Maru Pradesh. If Maru Pradesh is declared as a separate state, Jodhpur will be the capital of the Maru Pradesh. It is only then that a plan should be made to develop the Jodhpur city. For this purpose the proposed site for the settlement of new Jodhpur is more suitable where the Assembly, Governor's and Chief Minister's houses and the residences for speaker, ministers and other government offices will be established at Kankani upland which is 20 km. away from present old city of Jodhpur. Figure-1 shows the proposed site. The total area of proposed site will be about 80 sq.km.

PROPOSED CANAL NAVIGATION ROUTE IN JODHPUR & ITS ENVIRONS



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	Proposed city-site - new Jodhpur

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FIGURE-1

0 1 2 KM.
Kankani

The previous government and the present government of Rajasthan have been successful in providing basic facilities like medical & health, trade, occupation, transport, industries and education to the people of Jodhpur city. As a result, the people of the surrounding desert areas have migrated towards Jodhpur. Now the city is over populated and over crowded. Hence, the new site for new Jodhpur city needs to be developed.

The present old city is facing the problem caused by the increase in water table level, and water seepage from Ranisar, Padamsar, Ummed Sagar and Kaylana reservoirs. Over population and the people of highly densed residential areas like Brahmpuri, Naiyan Ka Bad, Chand Bavadi, Singhpole, Phoolav Ki Pole, Chuna Chauki, Nav-Chaukiya, Fatehpole, Khanda-Phalsa etc. should be shifted to the proposed site of New Jodhpur. The residents of new Jodhpur will also be able to see the world fame Mayurdhwaj Fort of Jodhpur and Ummed Bhawan Palace from the propose site.

In the light of Bhuj - Kachchh geological movement it is essential to vacate the people living in the surrounding areas of the fort of the old city and should be immediately shifted to the newly proposed site.

CONCLUSIONS : After completion and implementation of this plan the famous historical sun city of Jodhpur will be converted into a beautiful modern city and it will be called as the Eastern Venice in India. To complete the proposed plan it will be possible only with the help of special financial assistance from the Central Government in collaboration with state Government in three stages. In the first stage the construction of the navigational canal from Kaylana, Soorsagar to Bhagat Ki Kothi should be done, in the second stage it should be from Bhagat Ki Kothi, Jai Narayan Vyas University, Military area, Magra-Punjala and Surpura to Mandor and finally in the third stage from Masuria, Pal, Salawas, Kankani, Mogra, Kuri to Jhalamand. After the completion of this navigational canal plan and proposed new site for Jodhpur city, Jodhpur will emerge as a new tourist and recreational centre throughout India. The detailed salient features of the proposed navigational canal of Jodhpur are shown in Table-1. Due to ist being over population and over crowded, it is essential to established a new site for new Jodhpur. Hence the new site for new Jodhpur city is to be developed.

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