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RESEARCH ARTICLE

MULTIPLE USE OF DESICCATED LIK RIVER OF THE THAR DESERT IN WESTERN RAJASTHAN

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ABSTRACT

It is well established through studies of diverse parameters that there are a number of palaeochannels exist in the Thar Desert of western Rajasthan. These palaeochannels are good sites for plantation. Plants through their transpiration process increases in content of water vapour in the atmosphere leading to precipitation in form of rain. The rain will reduce frequency and intensity of draught and will convert dry land into greenery which will check further extension of the desert. Other then wood we will get a number of products from plants too. The primary aim of the present study is to find out the possible cause of the contribution of palaeochannels for well being of local residents of the area.

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INTRODUCTION

The Thar Desert exists mainly in western part of the state and occupies an area about 57% of the total area of the state. The region is arid and having low rainfall. The average annual rainfall varies between 150 and 400 mm. The maximum temperature goes up to 50°C (average 40 – 45°C) in summers and minimum air temperature range between 1- 2°C (average 10 – 12°C) in winters. It has been inferred that sometime in the past the desert was a green land recharged by a very mighty Himalayan river "Sarswati' flowing through western Rajasthan and meeting Arabian Sea. Sarswati is described as a mighty and holy river of India in the Vedic period literature like Rigveda, Yajurveda, Ramayana, and Mahabharata etc. (Kochhar, 1997). The river become extinct about 1500-2000 B.C. Numerous workers (Kar, 1988, 1999; Roy and Jakhar, 2002; Bhardwaj, 1987; Bhadra *et al.,* 2009; Thussu, 1999; Valdiya, 2002; Kar, and Ghosh, 1984; Yashpal *et al.,* 1980; Bakliwal, and Grover, 1988; Sahai, 1999; Gupta *et al.,* 2004; Rajawat, 1999) have worked on palaeochannels of the Sarswati and its tributaries in western Rajasthan. They have been recognised by scientist of different disciplines on basis of data gathered by them including remote sensing imageries, geomorphic features, occurrence of fluvial deposits and ground checks. These palaeochannel are oriented in NE-SW to N-S direction.

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However some of palaeochannels cum desiccated rivers were flowing almost parallel to NW-SE direction i.e. almost right angle to the path of present Arabian monsoon which is trending in NE-SW direction in Rajasthan. The palaeodrainage map prepared by Regional Remote Sensing Centre, Jodhpur is shown in figure 1. The Lik River (Fig. 2A and B) is desiccated one and lies in Jaisalmer and Barmer districts of Rajasthan. The orientation of the river is almost NNW-SSE (Jakhar, 2010)

Lik River and Plantation

To start within a palaeochannel for plantation, the Lik River may be chosen for experimental work. The Lik river is a western tributary of the ephemeral river Luni. The river originates from rhyolitic mounds (Roy and Jakhar, 2002) exposed west of village Bhaniyana (Fig. 2A and B). It traverses more than hundred kilometres distance to join the Luni River near Balotra in Barmer district (Fig. 2A and B). The river has not witnessed continuous water flow in the living memory. With lapse of time the meandering river lost its identity as its course is obstructed by the moving sand dunes. In its entire course it passes through hard and weathering resistant volcanic rock rhyolite. The river is more or less wider than half-kilometre throughout its course. The human habitation have encroached the sight of the old and abandoned channel of the river. It is a good site for plantation because state Government have already started laying pipeline to bring drinking water from Indira Gandhi Canal to Pokaran and then to Bhaniyana, Phalsund and Balotra area (Fig. 2A and B, Photo 1).

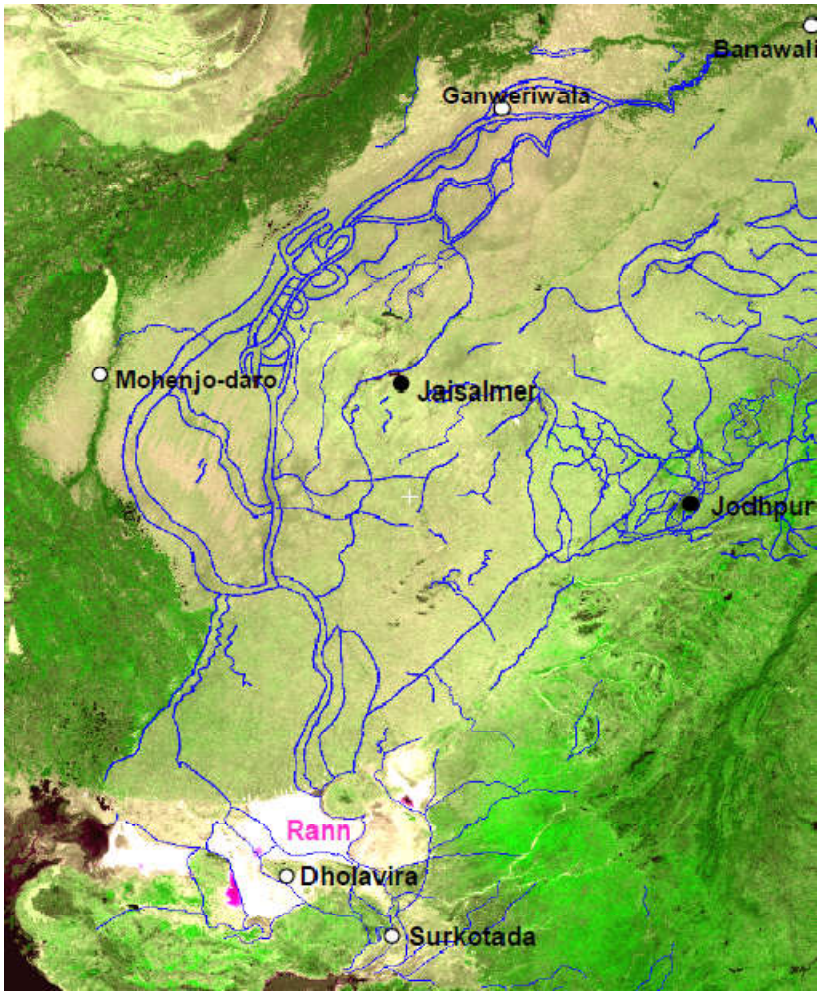

Figure 1. Palaeodrainage Network Map of The Indian Desert Region using IRS P3 WiFS Image (RRSC, Jodhpur, Rajasthan)

It is planned to lay pipeline almost parallel to the Lik River from the village Bhaniyana onwards. If water is released at village Bhaniyana in the river then it will flow upto Balotra via Phalsund without lifting it in between because of natural gradient of the river. However because of settlement, sand dunes and shortage of water it may not be possible to release the water in the river for free flow but at different places water may be released from the pipeline through taped pipes in the river course at intervals of one or half kilometers distance and after every 15 to 20 days interval to grow forest plantation in the river.

The orientation of the course of the Lik river is parallel to NNW-SSE direction i.e. almost right angle to the path of present Arabian monsoon which is trending in NE-SW direction. Long height trees may be selected for plantation in the river to make available an artificial barrier for Arabian monsoon to showers in the desertic terrain. There will be no harm in implementation of this project. If in any case we will not get success for more rain due to plantation in the desert even then we are assured for wood and fodder of animals as well as it will help to check further extension of the desert. We may select trees out of which we can get fruits, seeds, animal fodder, beverage, medical value, timber, firewood, craft wood, fiber for making paper and cloths, resin/gum/latex, honey etc.

It will definitely increase prosperity graphs of villagers residing in the course of the river. Not only the plants will be good for human beings but also they will provide shelter and fodder for wild animals too. In addition to this few ponds may be developed in course of the river for fisheries and aqua culture.

Photo 1. Large diameter pipeline laying work under process from Pokaran to Balotra via Bhaniyana and Phalsund villages

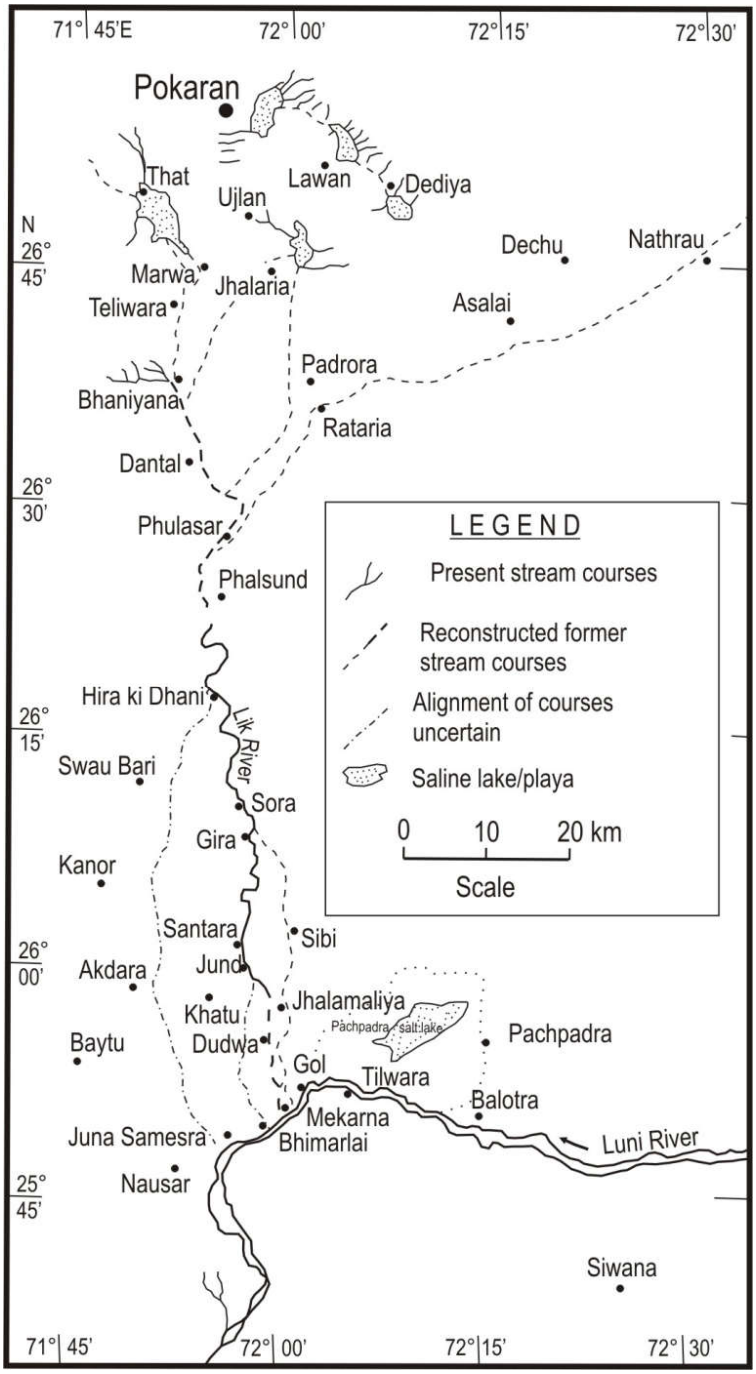

Figure 2A. **Figure 2B.**

Figure 2A. The map showing course of the Lik River (modified after Kar, 1988)
Figure 2B. The course of the desiccated Lik River, marked as dotted line in satellite imagery (Source: Google earth and Jakhar, 2010)

We can plan for remaining other palaeochannels of the desert to link them either with Indira Gandhi Canal or with proposed National River Linking Project of Government of India to recharge groundwater. Water recharging sights of palaeochannels will also be good for tree plantation.

Trees and Rain

Trees humidify air through evapotranspiration for the great majority of inland rain. Trees got a process called transpiration through which it sends out the excess water in the form of water vapour through small pores present on the leaf surface and this increases content of water vapour in the atmosphere leading to precipitation in form of rain. This phenomena is exhibited by most of the land plants and among plants, trees are by far the most effective evapotranspirers. The planting of trees can surely increase local precipitation.

It is also observed by Spracklen *et al.* (2012) that '*for more than 60 percent of the tropical land surface, air that has passed over extensive vegetation in the preceding few days produces at least twice as much rain as air that has passed over little vegetation'*.

Conclusion

If palaeochannels are utilized for plantation, groundwater recharge, establishment of artificial ponds for aqua-culture development than it is surely that these will bring prosperity in life of local residents. Even if there is no increase in rain at least plants wills be there to check the further extension of the desert and wood will be available for multiple uses.

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