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Delineation of low Order Palaeochannels of Lost river Saraswati in the Indian desert

Shrivastava K.L¹

Department of Geology, Jai Narain Vyas University, Jodhpur 342005 klsgeology@yahoo.co.in

A mighty river, Saraswati has flowen in the Indian Desert before wanishing from the surface. It is believed that the present Luni river (earlier, Lunawati, a tributary of Saraswati) has also shifted its course, while assisting the then master stream of Saraswati. Although some of the courses of the mighty vedic river 'Saraswati' have been delineated for the large scale, but it can not apply for the prospecting of Groundwater to this scale. Present attempt is to identify low order palaeochannels in the Thar desert. The regions selected are (i) The Fitkasni-Rashida ($73^{\circ}08':26^{\circ}18'$), Salawas-Nandanvan ($72^{\circ}58':26^{\circ}07'$) and Binawas ($73^{\circ}25':26^{\circ}03'$), located southeast of Jodhpur city. (ii) Agolai (E $72^{\circ}32'$: N $26^{\circ}26'$) and Popawas ($72^{\circ}40'$: N $26^{\circ}15'$) area is located at northwest of Jodhpur. Digital enhancement has been carriedout using high resolution LISS-III data of IRS 1-C satellite. The study performed on both the data sets namely, IRS 1-C, LISS-III data of 23.5 meter resolution and Cartoset data of 2.5 meter resolution as merge product. The processing has helped in identification of a few palaeochannels not visible in other digitally enhanced product of IRS 1-C, LISS-III data. Identification of palaeochannels with the help of Satellite imageries have been made on the basis of (i) Lower topography along the palaeochannel is better enhanced due to oblique illumination in varying hours of a day. (ii) Distinctly high to moderate backscatter is observed on RISAT SAR images due to high moisture content of soil in contrast with the background of sand dunes. (iii) A line of vegetation along the palaeochannel is distinctly seen on Landsat ETM FCC. (iv) Merger of RISAT SAR and Landsat ETM FCC integrate the complementary information content of both sensors and the signature of palaeochannel is distinctly enhanced. Further, in the field check, the following points have confirm the existence of palaeochannels (i) Green vegetation along a line. (ii) Moisture in deeper topography. (iii) High elevation of the water table. (iv) Accumulation of river sands/pebbles. The study has led to the identification of low order palaeochannels with the field validation to of low order palaeochannels. The application of the low order palaeochannels can be further extended to tapping of portable drnking water, water for agriculture purpose, a possible site for artificial recharge, search of archeological sites and explorations of placer minerals and calcrete type uranium deposits for the economic development of the desert.

