DISCUSSIONS

FORMATION AND EROSION OF HOLOCENE ALLUVIAL FANS ALONG THE NARMADA-SON FAULT NEAR RAJPIPLA IN LOWER NARMADA BASIN, WESTERN INDIA by Subhas Bhandari, Rachna Raj, D.M. Maurya and L.S. Chamyal. Jour. Geol. Soc. India, v.58, 2001, pp.519-531.

Utpal Chakrabarti and **Abhinaba Roy**, Geological Survey of India, Central Region, Nagpur, comment:

The authors provide a good and thorough description of Early Holocene alluvial fans from the Lower Narmada Basin. Our interest in the paper stems from the fact that we are currently engaged in carrying out active fault mapping in the Narmada Valley Quaternary Basin in the vicinity of Jabalpur, Madhya Pradesh for the purpose of palaeo-seismic studies. In this context we would like to make the following observations on the paper:

(1) Fig.1C of the authors shows a NW-SE trending fault passing along the southern bank of the Narmada River and a NNW-SSE trending fault near the western limit of their study area, both of which actively controlled the formation of the Early Holocene alluvial fans along with the Narmada Son Fault (NSF). While the NSF is known as a fault of great antiquity that was possibly active during the Quaternary period as well, occurrence of active faults with trends at high angles to the NSF and with considerable throws (about 50 m for the NW-SE trending fault; Fig.ID of the authors) during the Early Holocene time has not been reported previously. Since we are also in search of active faults in our study area, any additional evidence supporting the presence of the NW-SE and NNW-SSE trending faults would be helpful. We would also like to know if the topographic contrasts produced by movement along these two faults during Early Holocene led to the formation of their own sets of fans.

(2) Although the authors do not clearly state the temporal relationships among the five alluvial fans they have described, it appears from Figs.1C and 2A of their paper that the fans evolved simultaneously through deposition of sediments by short, low order streams perpendicular to the basin margin forming a bajada facies (Damanti, 1993). However, keeping in view the shingled arrangement of the fan lobes (Fig.2A of the authors) and the known sinistral strike-slip component of movement along the NSF in areas further to the east around Jabalpur (Acharyya and Roy, 2000; Acharyya et al. 1998), is there any reason at all to believe that Fan-5 is the oldest fan and Fan-1 the youngest? In this context, it is interesting to note that the Shamariya Khadi River shows an abrupt easterly deflection of its course right across the NSF (Fig.2B of the authors). Does the apex of Fan-3 show an offset in relation to the position of the outlet of the supplying river?

(3) The authors have described only the architectural features of the fans. However, alluvial fans developed along tectonically active morphological escarpments often show an abundance of deformational structures (Williams, 2001). A study of the type, orientation and succession of deformations would allow the determination of the palaeotectonic regime, sense of fault movement and time relations between tectonic activity and sedimentation (Mastalerz and Wojewoda, 1993). Further, it is possible that these deformational structures could result from sediment liquefaction triggered by seismic shocks. It would be interesting to know if the authors came across any such structures in their area of study.

(4) We would request the authors to provide some data on the thickness of the alluvial fans which would help determine the magnitude of the dip-slip movement along the NSF during the growth of the fans.

(5) A comprehensive palaeocurrent study is needed to support the authors' contention that the palaeotransport direction was towards NW to NNW. It is rather surprising that the authors did not find any facies showing trough crossbedding which would have provided reliable data for sediment dispersal pattern study.

(6) Contrary to the normal practice, the north direction in Fig.2B is shown pointing, downwards. Has it been done intentionally to emphasize the morphology of the fan?

Subhash Bhandari, Rachna Raj, D.M. Maurya and **L.S. Chamyal,** Department of Geology, M S. University of Baroda, Vadodara-390002 reply:

We appreciate the interest shown in our paper by Utpal Chakrabarti and Abhinaba Roy. Pointwise replies to their comments are as follows:

1. As mentioned in the caption, the figure is meant for showing the interrelationship between the various geomorphic surfaces. The two faults at high angles to the NSF are well established in the area. Our study also confirms the existence of these faults. Estimation of throw along these faults is not possible since the thickness of the fan sediments is not known, as the base is not exposed. The vertical scale in Fig.1D is for the topographic profile, the thickness of the sediments is exaggerated for the purpose of clarity.
2. The fans have coalesced to form a fan surface. Inferences on the chronology of these fans will be mere speculation in the absence of absolute dates. We did observe the easterly deflection of Shamariya Khadi, but apart from this no other evidence was found to substantiate the strike-slip movement along the NSF. Detailed study on neotectonics is necessary for this.
3. No deformational structures were observed in the fan sediments.
4. Exact thickness of the fan sediments is not known. However the thickness appears to be less since the Late Pleistocene sediments are exposed along the Narmada river (Merh and Chamyal, 1997; Maurya et al. 2000).
5. Since alluvial fans are formed by multichannel distributary river systems, detailed palaeocurrent analysis may not reveal much. Alluvial fans are established based on their geomorphic and tectonic settings and the well-established lateral, vertical and down fan variation of sedimentary facies.
6. The north direction indicated in Fig.2B is correct.

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KIMBERLITE OCCURRENCE IN RAICHUR AREA, KARNATAKA by S. Shivanna, J.K. Srivastava and A.R. Nambiar, Jour. Geol. Soc. India, v.59, No.3, 2002, pp.269-271.

V. Madhavan, Department of Geology, Kakatiya University, Warangal- 506 009, A.P. comments:

The occurrence of kimberlite near Raichur in Karnataka, as reported in the above mentioned paper and preceded by two earlier reports (Nambiar et al. 2001; Shivanna et al. 2002), gains significance in view of its location between the two large and well established kimberlite fields of Mahbubnagar (Narayanpet kimberlite field - NKF) and Anantapur (Wajrakarur kimberlite field - WKF). The wide gap, hitherto existing between the NKF and WKF is now considerably reduced with the Raichur kimberlites providing the desired link. The authors deserve compliments for their efforts in locating this new body.

The step-wise or sequential manner in which kimberlite, lamproite and lamprophyre are found distributed across the Cuddapah basin was first noticed and broadly interpreted as the multifaceted manifestations of mafic potassic magmatism within and adjoining the intracratonic basin (Madhavan, 1990). The scenario was recently described in terms of zonal arrangement of kimberlite, lamproite and lamprophyre wherein the kimberlite and lamprophyre zones