artificial escarpment but the implementation of this plan is not so simple as they have described for the following reasons:

— in a large number of locations, wind direction changes with the season; in some places almost by 180 degrees.

—the normal spacing requirement to be fulfilled will necessitate very long escarpments which may not be economically feasible.

5. In conclusion, while admitting that wind energy has a definite future in India, it is felt that estimates given by Jagadeesh et al. are gross over-estimates.

It is felt that any wind estimate should specify either the ‘available energy’ in the wind at given locations or the anticipated output from a windmill of given specifications at given locations.

While planning the augmentation of wind speed by providing escarpments, the seasonal change of wind directions should be taken into account; natural escarpments with favourable wind directions in the major part of the year, should be looked for.

The suitability or otherwise, of the different windmills to different areas of the country should be studied and spelt out.

Over generalized estimates of “wind energy potential” over wide regions, based on long term mean winds are likely to mislead the country’s planners and windmill manufacturers besides causing disillusionment to the ultimate user because of the use of a windmill not suited to his locality.

6. The author would like to express his thanks to the Tata Energy Research Institute, Bombay for providing a collection of wind energy references.

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551.579.4(544.6)

UNPRECEDENTED FLOODS IN SOUTH RAJASTHAN IN JULY 1979

Floods in southwest Rajasthan are very rare. The only significant river, there is the Luni (Fig. 1) which is considered to be a blessing to south Rajasthan. In July 1979, however, the river got flooded and caused considerable misery. Slow movement of a low pressure area with associated cyclone circulation extending up to the middle troposphere, its intensification over west Rajasthan as a result of upper air divergence in association with a trough in westerlies, subsequent almost stationary position over southwest Rajasthan and later movement northeastwards have been found to be the synoptic situation responsible for the heavy rain near the source of the Luni river and over the area traversed by it and for the resulting floods.

2. Vceeraraghavan and Ghosh (1974) studied the very unusual formation and movement of a monsoon depression which caused generally widespread rains over west Rajasthan for a period of about six days during August 1973. The system lay over west Rajasthan during 15 to 18 August 1973. In July 1979 the rainfall was almost continuous during 15 to 19 July due to the stationary nature of a low pressure area. Ajmer in north Rajasthan had an all time record rainfall of 29.4 cm on 16 July 1979. It had another 14.0 cm on 19 July. This rain contributed significantly to the flooding of the Luni river which rises in the hills southwest of Ajmer at Lat. 26° 25’ N, Long. 74° 34’ E.

3. A mid-tropospheric cyclonic circulation developed on 12 July 1979 over north Madhya Pradesh and adjoining south Uttar Pradesh. It persisted there the next day and moved slightly westwards to northwest Madhya Pradesh and adjoining east Rajasthan where it lay as a low pressure area on 14th. Moving slowly westwards it intensified into a well marked low pressure area on 16th. Under the influence of a trough in wester-
lies located at 300 mb with its axis along longitude 64° east having a westward displacement required for intensification of the low pressure area (Haltiner and Martin 1957). The trough in westerlies having axis along 64° east had just the optimum westward tilt of about 10 degrees required for intensifying the pre-existing low level system (Veeraraghavan & Gupta 1977). The well marked low pressure area lay over southwest Rajasthan during the next two days. On 19 July it lay over northeast Rajasthan as an upper air cyclonic circulation extending up to middle tropospheric levels and merged with the seasonal trough by the same evening. Under influence of this system southwest monsoon advanced into west Rajasthan on 15 July and widespread rain with vigorous monsoon conditions prevailed in west Rajasthan between 16 and 18 July.

As a result of very heavy rainfall associated with the well marked low pressure area persisting over southwest Rajasthan for 2 to 3 days unprecedented floods occurred in the Luni river. The total loss of property and crops estimated by the State Government was approximately Rupees sixty crores. 237 people died and another 231 were reported missing. The head of livestock lost numbered nearly 2 lakhs.

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632 : 633.1

भारतवर्ष में गेहूं के किसान की खेती का असर शिक्षण

मानकिक प्रविष्टियों पर गेहूं उपयोगकर्ता शेषों (सत्र 1966) में शिक्षन किया गया था: (i) उग्र शेष, (ii) शेषों तथा सांरी के शेष, (iii) सांरी पत्ती के शेष, (iv) हजारों से अधिक शेष। जबकि उग्र शेष की जाति का नाम है, तुरारी शेषों का नाम बागी शेषों का नाम, सांरी पत्ती के शेष का नाम तथा हजारों से अधिक शेष का नाम है।

2. गेहूं के किसान गोद घीयन गर्भ नहीं लाते कर सकते हैं, पर गर्मियों में वे पहले शेषों में उपस्थित हुए। फसलों का अग्रणी शेष के अंपवर्सियों में शिक्षण करते हैं। वेश्य हैं अन्यस्कर, इस कारण गर्भ में शिक्षन करते हैं। गर्भ की जाति का नाम है।

(i) वर्दा प्रविष्टि शेष पुरे पल्ट का 1/4 या कम कर, (ii) वर्दा प्रविष्टि शेष पुरे मुख के 1/4, (iii) वर्दा प्रविष्टि शेष पुरे खार का 1/2 या अधिक कर गर्भ में बागी शेषों के अंपवर्सियों में शिक्षण करते हैं।

मूल ज्ञान शेषों के लिए उत्साह, जीवन के अंदर लाभकारी में 50, त्रिकोण के बने 37 ऐसे पत्तों जहाँ प्रविष्टियों की प्रभावित अवस्था साझेदार देने की निर्देशित है।

वर्दा प्रविष्टि > 10 प्रविष्टि, मध्य प्रविष्टि > 20 प्रविष्टि, मन्त्रप्रविष्टि > 25 प्रविष्टि