REPLENISHMENT STUDIES

Replenishment Rate is the rate at which Bajri is transported into the river channel, which is under examination or subjected to sand extraction. This volume is often considered as sustainable yield of that river. Estimation of Bajri discharge through stream bed and its residence period (temporary deposition) is one of the most difficult task in sediment budgeting as it requires sophisticated instruments and establishment of many gauging stations. It is axiomatic that during high flow period, Bajri which is otherwise moved by siltation (i.e., partially suspension and partially bed load) will completely be in suspension in the overlying waters. The best way for sediment discharge computation is to collect and analyze water samples from a river reach where the entire particles come into suspension. It can be assumed that the Bajri and other coarser sediments in suspension would be deposited mainly in the river segment. The replenishment rate approach has the virtue of scaling extraction to the river load in a general way, but bed load transport can be notoriously variable from year to year. Thus, this approach is probably better if permitted extraction rates are based on new deposition that year rather than on long-term average bed load yields. The mined reach is the "upstream" sediment source for downstream reaches, so mining at the replenishment rate could be expected to produce hungry water conditions downstream. Sediment yield estimation is an important parameter in the evaluation of the sediment effects on the projects and activities occurring due to land use. Estimation of annual sediment yield produced from a single rainfall event requires applying many approaches to get acceptable and valid results. These approaches were classified as a single event approach and an average annual approach, knowing that the most project designs require quantitative estimation of the transported sediment volumes resulting from a single rainfall event.

There are many sediment transport equations which are suitable for use in the prediction of the replenishment rate of rivers/ watershed. Some of the famous sediment transport equations are:-

1. Dandy – Bolton Equation

2. Yang Equations

3. Engelund-Hansen Equation

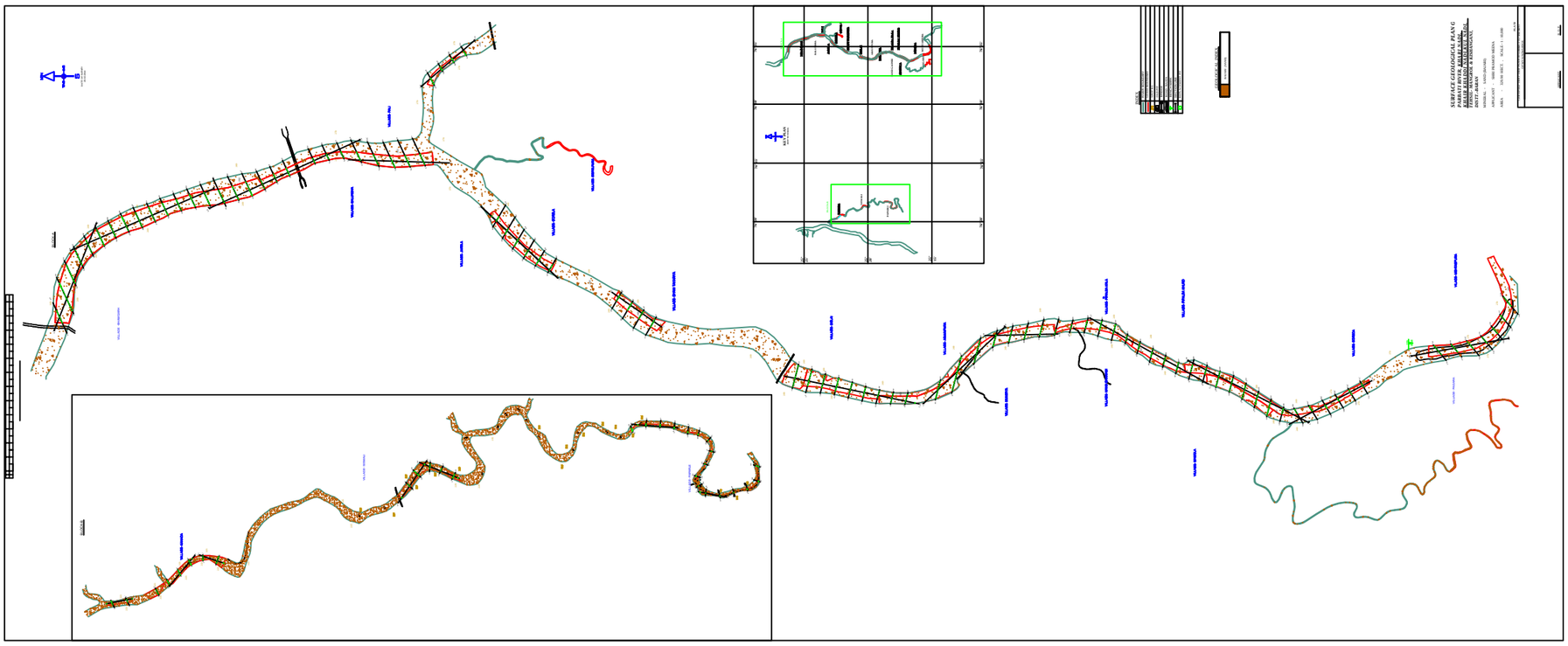
4. Modified Universal Soil Loss Equation (MUSLE) developed by Williams and Berndt (1977) – it includes only one type of sediment yield (sheet and rill Erosion). Dandy - Bolton formula is often used to calculate the sedimentation yield. The

formula uses catchment area and mean annual runoff as key determinants to give a yield value. It does not differentiate in basin wide smaller streams and their characteristics. Dandy and Bolton equation calculates all types of sediment yield i.e. sheet and rill Erosion, gully Erosion, channel Bed and bank erosion and mass movement etc.

The hypothetical derivation of replenishment data is not supported by any ground evidence as the same can be derived only after annual study due to inconsistent rains in Rajasthan.

Scheme of filed study: - For the study of replenishment the river lease area. A replenishment pit (3 mx3mx3m) shall be dug at a interval of 200mX30m grid along the length of river. Initial levels shall be taken before rainy season. After river again levels shall be taken. The difference shall give the depth replenishment of sand. The depth multiplying with influence area will give the total replenishment volume of sand in the lease area of river.

The lessee shall make study for continuous two - three year and will submit the actual replenishment to the MOEF.


SURFACE GEOLOGICAL PLAN G
PARBATI RIVER, KHALIFA MINI
KHALIFA KHALIFA NAGAR MINI
FERRO MANGANESE & RESOURCES
DISTT. AMRAN
MINERAL - SAND (MINOR)
AREA - 1.5 KM
SCALE - 1:5000
DATE - 12/04/2021
PLAN
SECTION
NORTH
SCALE

MTS. 20 10 0 100 200 300 400 500 MTS.

SCALE - 1 CM = 20 M. , R.F. = 1 : 2000

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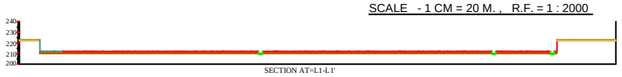

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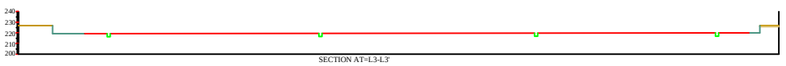

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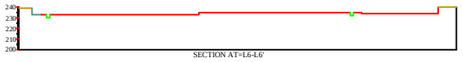

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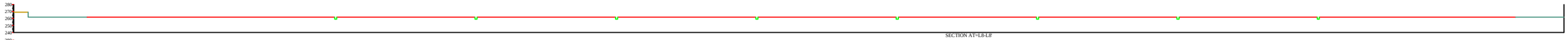

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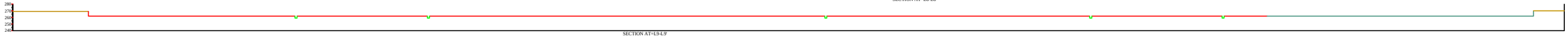

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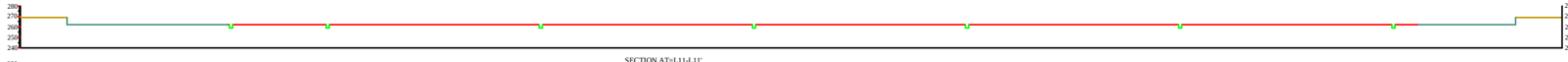

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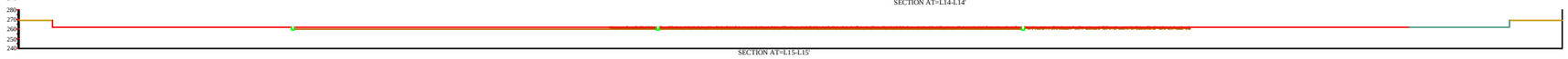

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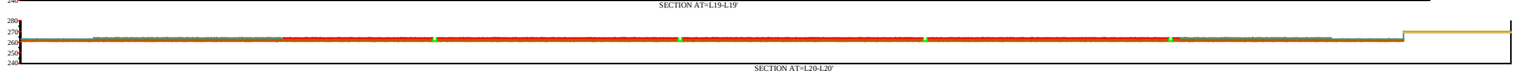

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	RIVER BOUNDARY
	LEASE BOUNDARY
	REPLACEMENT PIT

LONGITUDINAL SECTION OF PARBATI RIVER,KHARI NADI, KHAIR KHADDI NADI,KUL NAI

TEHSIL- MANGROL & KISHANGANJ, DISTT.-BARAN

MINERAL - SAND (BAJARI)

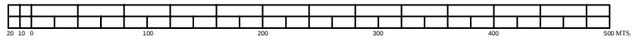
APPLICANT - SHRI PRAMOD MEENA

AREA - 329.90 HECT. , SCALE - 1 : 2000

PLATE NO.-

CERTIFIED THAT THIS SECTION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

APPLICANT	R. Q. P.



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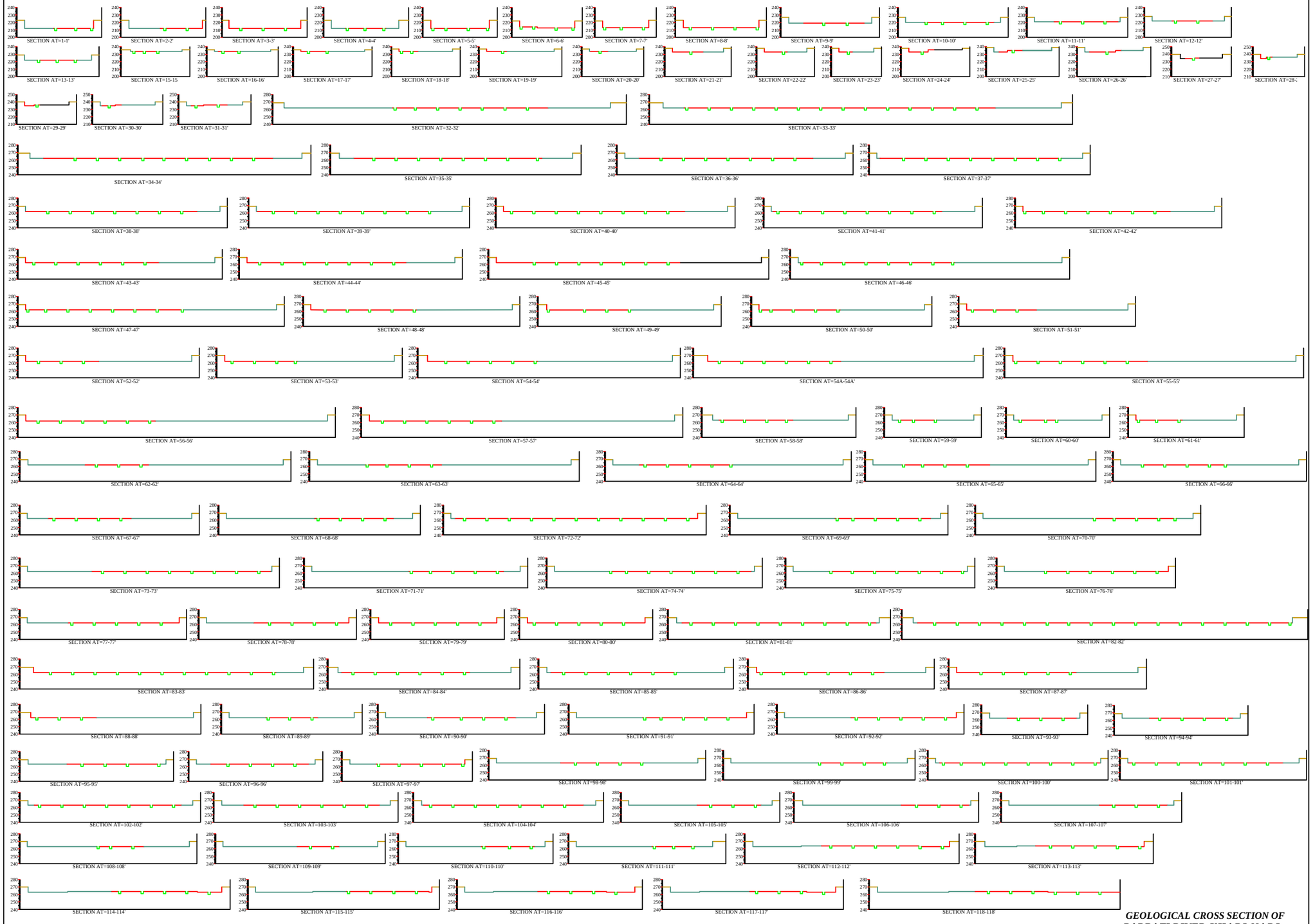

RIVER BOUNDARY
LEASE BOUNDARY
REPLACEMENT PIT

GEOLOGICAL CROSS SECTION OF PARBATI RIVER,KHARI NADI, KHAIR KHADDI NADI,KUL NAL

TEHSIL- MANGROL & KISHANGANJ, DISTT.-BARAN

MINERAL - SAND (BAJARI)

APPLICANT - SHRI PRAMOD MEENA

AREA - 329.90 HECT. , SCALE - 1 : 2000

PLATE NO.-

CERTIFIED THAT THIS SECTION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

APPLICANT	R. Q. P.

PHOTOGRAP SHOWING REPLENISHMENT

PHOTOGRAPH BEFORE RAINY SEASON

PHOTOGRAPH AFTER RAINY SEASON

PHOTOGRAP SHOWING REPLENISHMENT

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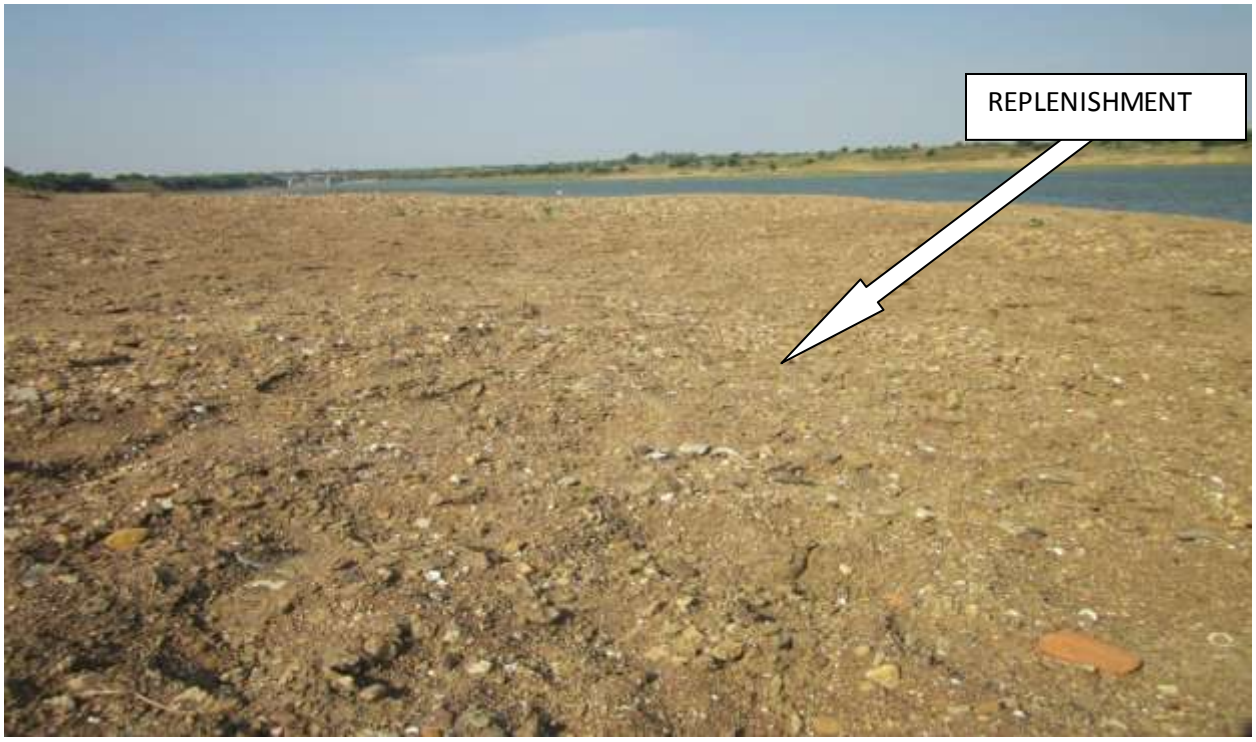
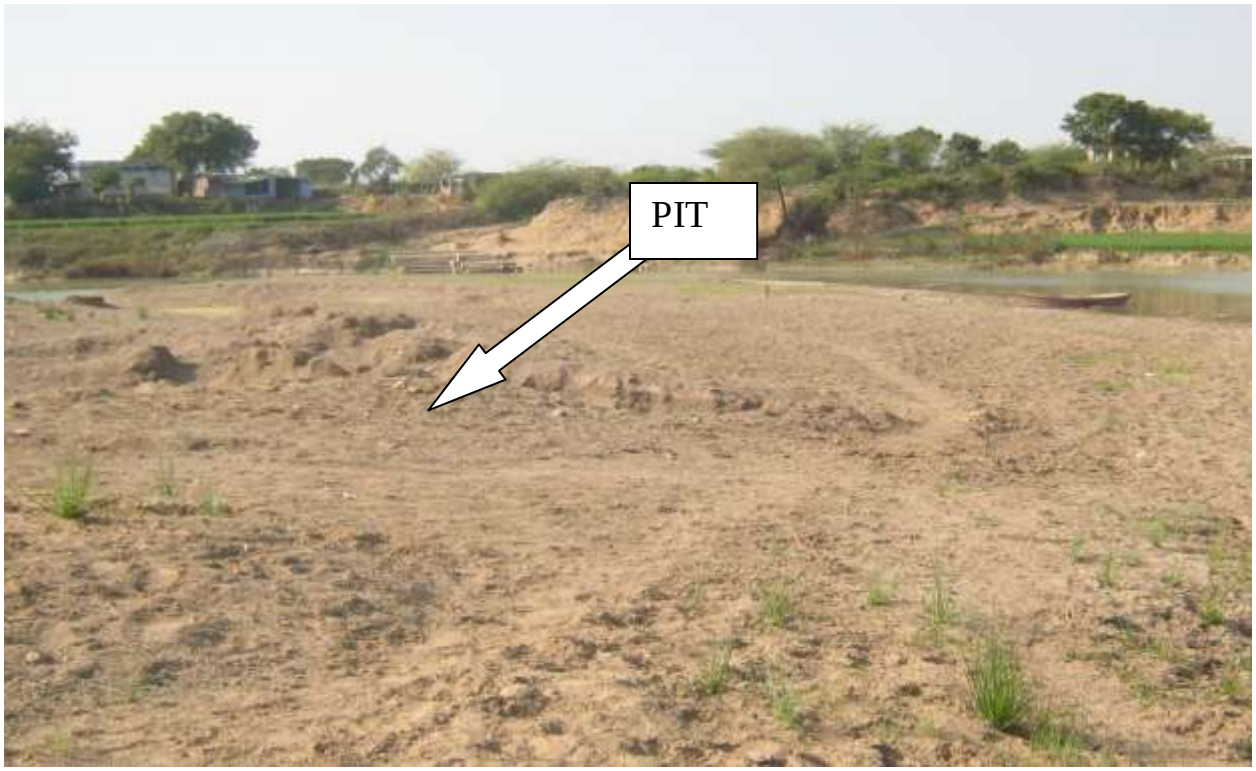


PHOTOGRAP SHOWING REPLENISHMENT

PHOTOGRAPH BEFORE RAINY SEASON



PHOTOGRAPH AFTER RAINY SEASON