



THE ROLE OF NEW AND OLD RIVER BASINS AND CUT OFF OF BAGRI TRACT FOR MAINTAINING THE GROUND WATER STORAGE IN THE DISTRICT OF MURSHIDABAD, WEST BENGAL, INDIA

Mijanur Rahaman¹ and Dr. Harsha Kumar Dasgupta²

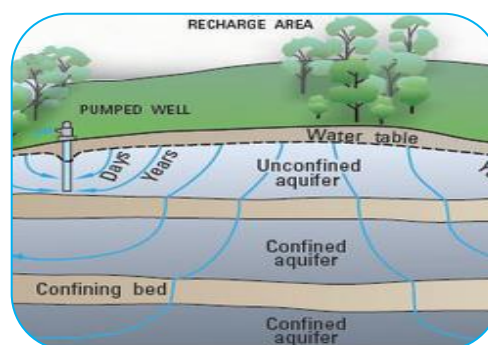
¹Research Scholar of Geography, Seacom Skills University, Birbhum.

²Research Guide, Seacom Skills University, Birbhum.

ABSTRACT:

Murshidabad plain is a part of moribund delta. The location of Bagri tract is within the quadrilateral, bounded by Bhagirathi, Padma and partly of Mahananda. In the study region the river Bhagirathi, flowing from north to south dividing the district into two topographical divisions showing contrasting physical characteristics.

Bagri is our study area, and it is a flat rolling plain in the eastern side. The Blocks Farakka, Samserganj, Suti-I and Suti-II, Raghunathganj-I, Nabagram, Khargram, Bhrdwan, Kandi, Berhampore and Beldanga fell in Western part. While the rest of the Blocks are in the side of the eastern region the major blocks in Bagri tract are Samserganj, Suti-II, Raghunathganj-II, Lalgola, Bhagwangola-I and II, Raninagar-I and II, Murshidabad, Jiaganj, Berhampore, Domkal, Jalangi, Major part of Farrakka, Suti-I, Beldanga-I and a Small part of Raghunathganj-I and Hariharpara. As the eastern part is a flat plain the height varies between 12'5 meters to 24 meters. The average slope is towards east and south east. Shortfall of ground water in Bagri tract of Murshidabad, West Bengal, India. The reasons and mitigation possibilities.



KEY WORDS: Bagri tract, Flat plain, Ground water storage, River basin, Shortfall of ground water.

I. INTRODUCTION:

River Bhagirathi has been bifurcated the triangle shape of the district Murshidabad. The physical reason of peniplanation of Rarh tract. The old flow of Ganga river was the present Bhagirathi channel. In geological ages the old Ganga/Bhagirathi channel many time, changed its courses.

Bagri lies among the Ganga, Bhagirathi and Jalangi river. In geological history, the Bagri tract was constituted by Mahananda river alluvium. Which is how the marked channel ridges. Shifting of Ganga, Bhagirathi, Jalangi occurred many times. The old alluvial carried by Mahananda/Jalangi river build the foundation of Bagri tract of Murshidabad. At present condition; human activity seriously affected the zone from the short fall of ground water. I tried to analyses the problems related to the terrain character. With the help of settlement images.

Rising, and increasingly widespread incidence and levels of pollution, surface and ground water sources in different parts of Murshidabad is a matter of grave public concern. Pollution of the Ganga attracted nation-wide attention. But the problem is for more wide spread. As per report of NEERI

(National Environmental Engineering Research Institute) 70 per cent of available water in India is polluted. The picture of water pollution is uniformly gloomy. Even our large perennial rivers like the Ganga is today heavily polluted.

In Bagri tract of Murshidabad almost all the Bills are polluted the rapid growth of urbanization and increase of population are the main reasons. Ground water pollution, which is more dangerous because it is more difficult to reverse, is also becoming a major problem. Its seriousness is illustrated by the prevalence of arsenic poisoning in Bengal as well as in the Bagri tract of Murshidabad. More over growing salinity problems and the prevalence of high levels of pesticide residues in groundwater in several areas and bills of the district.

The scientists from Jadavpur University estimate that 38 million people in eight district of West Bengal are exposed to health risks from the high arsenic content of ground water.

The National water polices (Ministry of water resource, 1987) declared Economic development and activities including agricultural, industrial and urban development should be planned with due regards to the constraints imposed by configuration of water availability.....but all in papers no effective measure yet implemented. All the department political sector. NGO's are concentrated in papers and meetings.

II .LOCATION OF THE STUDY AREA

In the district of Murshidabad, Bagri is our study area, and it is a flat rolling plain in the easternside. The major blocks in Bagri tract are Samserganj, Suti-II, Raghunathganj-II, Lalgola, Bhagwangola-I and II, Raninagar-I and II, Murshidabad, Jiaganj, Berhampur, Domkal, Jalangi, Major part of Farakka, Suti-I, Beldanga-I and a Small part of Raghunathganj-I and Hariharpara.

III .MAJOR RIVERS AND THEIR COURSE OF THE STUDY AREA

The major rivers and the course are given below for better understanding the influence of the rivers in the Bagri tract :-

Name of the Rivers	Name of the Blocks
The Ganga and Bhagirathi	Farakka, Suti-I, Raghunathganj-I and II, Murshidabad-Jiaganj, Berhampur, Beldanag-I and II, Sagardighi
Padma	Suti-II, Raghunathganj-II, Lalgola, Bhagwangola-I and II, Raninagar-I and II, Samserganj, Suti-I
Bhairab	Raninagar-I and II, Murshidabad-Jiaganj, Berhampur, Hariharpara, Nowda
Jalangi	Jalangi, Domkal, Nowda

IV. OBJECTIVES

The plan the Bagri tract under a single water shade management

To restore the links of the bills

To clean the bills from urban waste, specially plastic and polyethen

To clean and restore the bill for the improvement of percolation rate to maintain ground water resource.

In the district of Murshidabad mainly in the Bagri tract. The water pollution is very common feature, Administrations are also not active If we consider the government report of Water Investigation and Development Department, Berhampur, the data from 1993 to 2003 of Bagri tract block wise as follows:-

Name of the Block	Per monsoon in meter	Post monsoon in meter
Lalgola	4.37	1.94
Bhagwangola-I	3.65	2.02
Bhagwangola-II	5.86	2.26
Raninagar-I	5.97	2.98
Raninagar-II	4.49	2.18
Murshidabad-Jiaganj	4.45	2.54
Beldanga-I	4.11	1.61
Beldanga-II	5.25	2.48
Noada	5.95	2.90
Hariharpara	5.22	2.32
Berhampore	4.69	1.97
Domkal	4.84	2.29
Jalangi	5.61	2.73

V. PHYSIOGRAPHY OF THE STUDY AREA

Murshidabad district is essentially an alluvial plain. The Bagri tract is formed by Ganga/Padma and Bhagirathi. The basic formation of alluvial plain formed by Mahananda river.

Pleistocene Sediment form the Barh tract of the district. Bagri tract is formed by Quaternary sediments deposits in the wide deltaic flood plain found mainly in Block Samserganj, Suti-II, Raghunathganj-II, Lalgola, Bhagwangola-I and II, Raninagar-I and II, Murshidabad-Jiaganj, Berhampore, Domkal, Jalangi, Major part of Farakka, Suti-I, Burwan, Beldanga-I, and small part of Raghunathganj-I, Sagardighi, Natungram, Kandi, Khargram, Bharatpur-I and II and Hariharpara. It happens the tectonic movements, and shifting of Bhagirathi and/or Ganga.

Recent alluvial deposits consist of clay, silt and sand which are located in the riverine flood plain of Noada, major part of Hariharpara, Beldanga-I and II, Blocks geologically eastern part or the Bagri tract is more favorable for agriculture than the western part or the Barh tract.

All the minor and major bills and old river channels are passing through urban places and big villages and towns are so filled with pollutants that they appear to be no better than gutters. Even major river Bhagirathi flowing past big towns have begun to resemble Waste-drainage system, characterized by heavy loads of organic waste, micro-organisms, and toxic chemicals released by neighboring industrial effluents is that level 73-4mg/l. Toxic elements released by automatic service stations, hospital wastes and what not are present. Thus dissolved oxygen content in river water has gone down much below the critical level. Toxic elements like lead, Zinc, Chromium, Copper, Cadmium etc. have been entered into the framework of clays of riverbed and bill sediments.

These toxic elements, in trace amount, have found very common their way into food chain of animals and human-who consume the polluted water and grasses that grow on the floodplains of polluted rivers and bills in the Bagri tract of Murshidabad.

During per rain floodwaters carry days that have absorbed toxic elements from urban areas and industrial effluents, and spread this onto the plains supporting fodder grasses. On the whole, surface water and river water and overflow of bills is becoming less and more less consumable thanks to the phenomenal increase in pollution everywhere in the district and beyond.

All presents attempts to reduce pollution have met with disastrous failure.

In a nutshell of the field study is Bagri tract remarkable pollution threats are evident. Due to the shortfall of awareness many bills are become dry, or lost the water holding capacity due to unplanned agricultural activity. More over lifting of ground water for irrigation made the situation more grave.

Construction of roads, railway lines are the most worst impact. No risk characterization and assessment of risk ever done in the district. As to the pH status of bills in Bagri tract is under threat. Also lost the percolation ability due to the various forms of pollutions and unplanned urban growth. No administration, measures ever taken to solve the problems. The administration and also people not


aware of acid deposition has caused some surface water of the district to acidity. For the reason fish and other aquatic life are effected by the impact. Thus the vegetation also effected in places of Bagri tract.



Map of Murshidabad in MS



Land sat MS image Scale 1:30,000 R-2 G-3 B-4

SL. NO.	Name of Bills	Lat. & Long.	ALT. In mt.	PH	PHOTO
1.1	Chaltiya	24.076 & 88.259	13.39	7.9	
2.2	Vandardaha	24.063 & 88.322	1.35	7.8	
3.3	Bhola Bill(Voyrab river link)	22.091 & 87.254	0.27	8.5	
4.4	Khora Bill	23.822 & 88.469	49.31	8.0	

5.8	Goribag Bill	24.188 & 88.324	7.0	6.8	 Latitude: 24.180344 Longitude: 88.324482 Elevation: 20.2m Altitude: 7.0m Perim: 04-06-2019 11:15 Photo: 04-06-2019 11:15
6.10	Nohar Bill	24.314 & 88.323	27.21	8.8	 Latitude: 24.314327 Longitude: 88.323589 Elevation: 27.21m Altitude: 8.8m Perim: 04-06-2019 11:13 Photo: 04-06-2019 11:13
7.13	Balir ghat Bill	24.132 & 88.351	30.31	7.9	 Latitude: 24.132777 Longitude: 88.351118 Elevation: 20.75m Altitude: 7.9m Perim: 04-06-2019 11:16 Photo: 04-06-2019 11:16
8.14	Dalutabad Bill	24.151 & 88.379	30.29	7.9	 Latitude: 24.151889 Longitude: 88.379267 Elevation: 20.75m Altitude: 7.9m Perim: 04-06-2019 11:16 Photo: 04-06-2019 11:16
9.15	Gumani Bill	24.176 & 88.471	11.24	7.9	 Latitude: 24.176227 Longitude: 88.471484 Elevation: 11.24m Altitude: 7.9m Perim: 04-06-2019 11:16 Photo: 04-06-2019 11:16
10.16	Bor Bill	24.200 & 88.451	13.00	7.6	 Latitude: 24.200000 Longitude: 88.451000 Elevation: 13.00m Altitude: 7.6m Perim: 04-06-2019 11:17 Photo: 04-06-2019 11:17
11.17	Nishit pur Bill	24.209 & 88.433	14.24	8.5	 Latitude: 24.209000 Longitude: 88.433000 Elevation: 14.24m Altitude: 8.5m Perim: 04-06-2019 11:17 Photo: 04-06-2019 11:17

12.18	Shilmari Bill	24.121 & 88.555	-7.85	8.1	
13.21	Dumni daha Bill (Napukur)	23.960 & 88.314	12.0	5.0	

VI .LOCATIONAL OBSERVATION OF THE STUDY AREA

1.1. Chaltia related problem- The location of Chaltia bill bow within the Berhampore town. It is the old course of Bhagirathi river. At present its link with Bhagirathi in per rainy season blocked due to the unauthorized settlements. In most of the cases local political interest for vote is related. Due to the stagnation of flow per rainy season 80% of the bill now covered by water-hyacinth. More over disposal of domestic waste around the bill both solid and liquid made the situation grave the water pH 7.9 in a temperature of 26.67C.

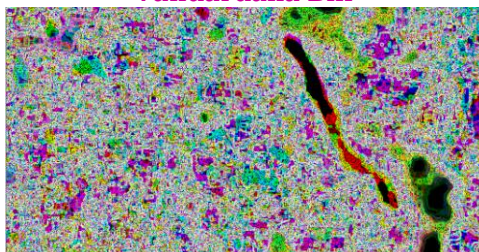
Chaltia



Scale 1;80,000 R1 G3 B4

2.2. Vandardaha Bill- Water being the common pool resource like vandardaha bill. Actually there is the old course of river Mahananda. In many locations its depth is more than 100 meters or even more. This river channels not have many oxbow lakes. From the brithbh era this old changed of Mahananda was considered as a disposal channel of Berhampore town. Gradually the increased urbanization around this bill made the situation critical. Water pH7.8.

Vandardaha Bill



Scale 1;1000,000 R -2 ,G -2 ,B-3 Low pass filter 33/33

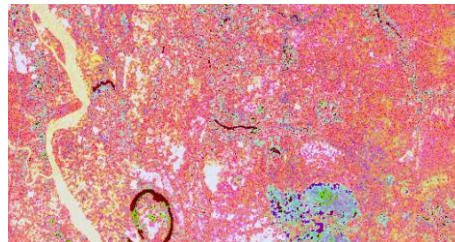
Vandardaha Bill



Sale1: 125,000 Water shade

3.3. Bhola Bill- May be considered as a missing link of Bhairab river. It is a straight. small segment of old channel of Bhairab river . Now it is used by the village people for fermenting of Sweetwater fish.

Bhola



Sale 1:95,330 R-2 G-3 B-4

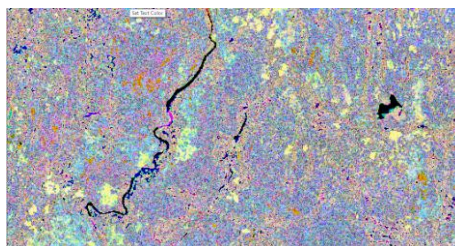
Bhola



Scale 1:125,000 Water shade

4.4. Khora Bill- Lost flow for pollution concentration lost its flow even in per rainy season. The agricultural activity and disposal of urban waste destroyed the ecosystem and biodiversity. The pH rate is 8.0. Full of water hyacinth. The bottom is pocked by thick mud casing the presenting against of percolation. People using tube well water for domestic needs. But the quality of ground water is no so safe as per government report. this bill is a extended part of Vandardaha Bill.

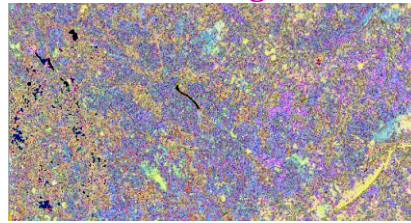
Khora



Scale 1:143,000 R-1 G-2 B-3

5.8. Goribag Bill- This is another extension of Vandardaha Bill water pH- 6.8. As the urbanization not developed, the water is available but it is a stagnant pull. As the local panchayet clean the water hyacinth the situation here is to same extent good.

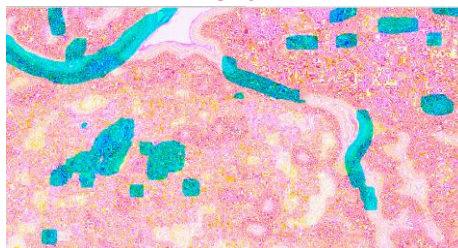
Goribag



Scale 1:35,700 R- G-3 B-4

6.10. Nohar Bill- Almost dry, in imagery the contour intervals shown 3 mts. Slope 33/33 in low parts flipper. The discontinuity of links from Ganga is clearly evident. In rainy season their bill carries water and join the mission links. In British period they build the bridge for axis to Jessor via Akhriganj. The water pH 8.8. It is the most polluted Bill of Bagri tract, More over the growth of urbanization , thick density of population, made the situation more grave.

Nohar



Scale 1:21,4500 R-2 G-3 B-4

7.13. Balirghat Bill- The segment of Vandardaha bill here the water pH is 7.9. The depth of the Balirghat bill is the highest nearly 200 mts. or more. Full of thick alluvium. The foundation river of Bagri region. The settlements along this long Bill in Bagri tract. Here we find the clear indication that this large bill was not used for urban or village water supply as the pollution rate is very high. The main source of pollutants are the agricultural activity through out the year. Organic materials, including plant debris and animal remands made the situation more grave.

Balirghat

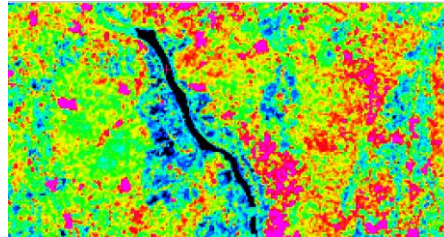


Scale 1;150,000 R-2 G-2 B-4

8.14. Daulatabad Bill- Water pH 8.1. This is a bifurcation of Vandardaha Bill. Due to the agricultural, Brick fields and villages waste. The bill is almost ended to the north more over fishery also polluted the water. The rapid use of water in agriculture. The pupset owners also lifting water for irrigation. Thus it has reached at alarming level. More over involve most of political power using the fair share of fresh rural water supply. The water is almost absent at north channel. Villages developed

depending the water of the river gradually population increased and agricultural activity developed around the Bhola Bill. In years of agricultural activity and development of fishery destroyed the ecology of the locality. The water pH is 8.5. Still people using the water from the Bill.

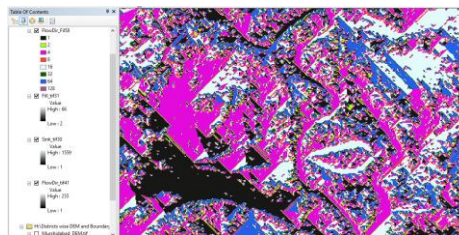
Daulatabad



Scale 1:40,000 R-2 G-2 B-4 Pseudo Colour

9.15. Gumani Bill- Water pH 7.9 almost dry in summer. Due to the construction of road. The flow direction is blocked. In rainy season having a little flow from Bhairab river. The occurrence of flood happens when the rain water blocked by road and urban construction. The area is a place of intensive agricultural activity. The reason the soil erosion rapidly increase during rain. Pumping g out of ground water for domestic and agriculture creating cone of depression around wall. The reasons people not having water from tube wells during summer.

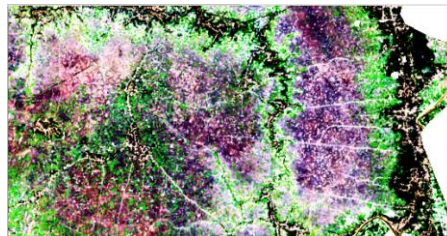
Gumani



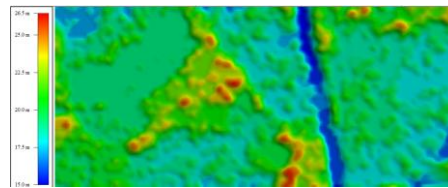
Scale 1:62,500 Flow Direction

10.16. Bor Bill- The old channel of Bhairab river. During dry season people use the big bill for agriculture. But in rainy season it turns to a big bill. The shifting of Bhairab and also construction of metallic roads without adequate culverts restriction the natural runoff in this location. Water pH 7.6 due to application of toxic chemicals for the increase of yield rate. The water table rises above mean sea level from 15 to 30 mts.

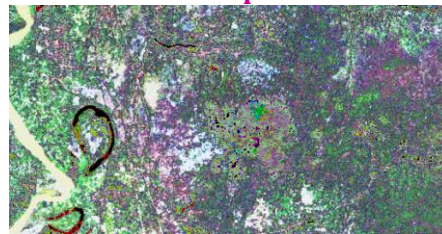
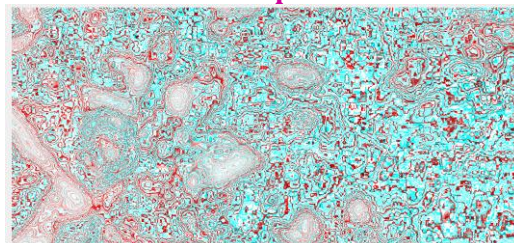
Bar Bill



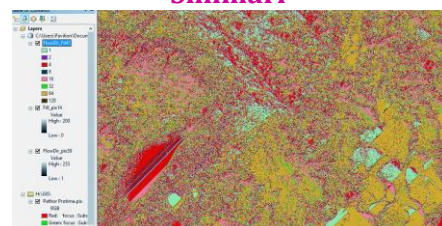
Scale 1:14,25000 R-2 G- B-4

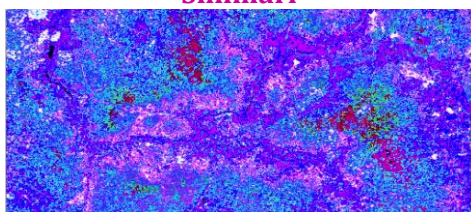
Bor Bill**Scale 1:28,250 Simulated Image of five inch rain flow**

11.17. Nishitpur Bill- Water pH 8.5. It is also a vast flood plain of the area. This is also the part of Bhairab river old flow channel. Water pH 8.5. Contour intervals 3 mts. analyzed by low pass 33/33. The indication of dry flood plain. The agricultural activity, increase of population, related urbanization and also the construction of roads blocked the natural flow of Nishitpur bill. The capacity of aquifer for holding water depends on its porosity. The structural discontinuities like fissures, fractures, joints and faults in the rock may be the reason as the Bagri tract is located at south east Excess bring zone. Moreover ability of the soil to allow the passage of water. The area is a clay-rich soil the movement of ground water will be less. Moreover change of slope create many critical probates.

Nishitpur**Scale 1:10,8500 R-2 G-3 B-4****Nishitpur****Scale 1:10,8500 R-3 G-4 B-4 Filter high pass mode 7**

12.18. Shilmari Bill- Also an almost dry bill. Due to the urbanization, construction of road, unauthorized constructions for settlement disposal of urban wastes. The bill turns almost dry. As its location close to national highway, Railway line. The normal runoff restricted by various human activity. Only scattered depressions are available. The natural flow directed has been interrupted due to various reasons.

Shilmari**Scale 1:80,000 R-2 G-3 B-3 Flow direction**

Shilmari**Scale 1:54,240 R-1 G-3 B-4**

13.21. Dumnidaha Bill- This portion is the southern extension of Vandardaha bill. Water pH is 5.00. As action by the panchayet cleared the location from all types of injuring hydrophytes. The bill is surrounded by a thick population but the people are aware of the environmental issues. For the management of waste water from urban places they are partly successful. The problems are related with the topography and water shade. Most of the seasonal links polluting the Vandardaha bill all through the main channel. But the short fall of ground water is common around the bill. As the soil is composed by thick clay the percolation rate is poor through out the year.

Dumnidaha**Scale 1:80,000 R-3 G-3 B-4****Hypothesis-**

As the Bagri tract of Murshidabad basically a flood plain of Ganga, Bhagirathi, Bhairab, Jalangi and Mahananda river. The simulated satellite images in MS form and DEM form demarking the characteristics of river actions by their dynamic equilibrium. the features are as follows

- 1) Contour
- 2) Slope
- 3) Water Shade
- 4) Flow direction
- 5) Simulated Water logging designs
- 6) Vector data analysis
- 7) Rustier data analysis.
- 8) Edge detection
- 9) Ridge making etc
- 10) Location
- 11) Mapping scale with protection
- 12) Agricultural activity
- 13) Correct location etc

All are possible by the major four RS-GIS software's- 1) Geomatica, 2) ERDAS, 3) Arc Gis, 4) Global mapper.

With the help of secondary data and with the help of current imaginaries like LISS II, III, and Land sat Images in 1:30,000 scale used for analysis; various types of filters are used for critical analysis of land forms, terrain, and water bodies. Also stream order, sink, fill images are methodically processed by various software to give a final shape. Latitude & Longitude, buffer, drainage density, flow directions, Identification of plants and water bodies by metamerisem. RGB bands are used for the identification

raster data's. In case of vector data analysis by 3D image processor use from DEM data analysis, where basic images and SRTM-30. Which is the common international standard used for critical applications.

The total frame work of cartography done by WGS 84 and UTM projection and file format are Tiff and pcidx. used for image processing.

CONCLUSION:-

In 3rd world countries the outcome of the human activities in cities and villages are same as to solid waste disposal. Moreover the agricultural actives increased to feed the people, thus the lifting of ground water in Bagri tract is a very common feature. Without any proper analysis they choose to change land slope for vested interest. Construction of roads, railway link block the natural runoff in the terrain. Organic and inorganic waste create the nuisance in rainy seasons . The administration do nothing to this end. For the settlement landfill and blocking the natural flow of runoff is very common in India, More over to protect bank erosion, collection of soil from river beds is a very common method in India, What the hell engineers are doing to protect.

More over no plan yet taken in Bagri tract to removal of heavy metal ions form diluted in waste water from stream. Use of various chemical fertilizer. Pesticides etc. made the ground water polluted. The villages are now expanded due to the increase of population. Modern life style is common in village people. But they are not at all aware and educated for the interest of future generation.

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