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Rain Water Harvesting Zonation of Nagpur City

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ABSTRACT

As per the study done by authors the world population increases, the demand increases for quality drinking water. Surface and groundwater resources are being utilized faster than they can be recharged. Rainwater harvesting is an old practice that is being adopted by many nations as a viable decentralized water source. This paper reviews the methods, design of rainwater harvesting systems, and its impacts adopted in all parts of the world.

Keywords: Construction Management, Risk Analysis, Bridge Construction, Construction Planning, Resource Utilization.

I. INTRODUCTION

Rain water harvesting is one of the most effective methods of water management and water conservation. It is the term used to indicate the collection and storage of rain water used for human, animals and plant needs.

Artificial recharge to ground water is a process by which the ground water reservoir is augmented at a rate exceeding that under natural conditions of replenishment. The collected water is stored and pumped in a separate pipe distribution. This is a very useful method for a developing country like India in reducing the cost and the demand of treated water and also economizing the treatment plants operation, maintenance and distribution costs.

As per the Ministry of Urban Development and Poverty Alleviation, Govt. of India has made modifications to the building bye laws that requires Water Harvesting through storing of water runoff including rain water in all new buildings on plots of 100 sq. meters and above will be mandatory.

II. METHODS AND MATERIAL

The project work is divided into **3 Phase:**

Phase 1:

- The selected site was divided into 1 Sq.km area of grid on the map with the help of AutoCAD software and the Google earth software
- The junctions of the grids were noted and numbered.
- Then the water levels in the well were taken with the help of tape on or near the noted junctions.
- The location of the well of which the water level was taken was noted with the help of Google earth app.
- The exact location or the exact coordinates were marked with the help of GPS.
- The obtained readings were compared and the fluctuations in the water levels of the different areas of the city were found.

Phase 2:

- The points or the location on which the water level was taken in the 1st phase will be taken again.

- The readings of the water levels obtained will be compared with the readings of 1st phase.
- This will give us the water level fluctuation in the specific period of time.

Phase 3:

- The points or the location on which the water level was taken in the 1st phase and 2nd phase will be taken again.
- The readings of the water levels obtained will be compared with the readings of 1st phase and 2nd phase.
- This will give us the water level fluctuation in the specific period of time.
- The overall Fluctuation of Water level in the Nagpur city in the whole year will be obtained.

III. RESULTS AND DISCUSSION [Page Style]

- The water levels of the various areas were taken and the 1st phase and the 2nd phase of the project is done.
- The following are the readings of the water levels obtained in 1st phase and 2nd phase:

Tabel 1

Grid no.	Depth Phase 1.	Depth Phase2.	X latitude	Y longitude	Z altitude
161	0.95	3.2	295081	2335771	327
162	1.6	3.5	296013	2335821	311
160	4.6	11.2	293861	2336288	329
163	1.3	3.8	296971	2335976	324
164	0.9	2.1	297799	2335993	299
165	2.7	5.8	298934	2335963	290
179	1.8	5.9	298835	2335019	311
185	2.16	4.9	304973	2334978	263
150	1.2	5.2	299243	2337251	313
134	1.52	2.36	298336	2337934	282
133	2.8	4.5	298015	2337848	317
166	1.1	5.4	297841	2339043	468
66	1.08	3.5	300965	2342011	298
65	0.7	2.8	300097	2342569	338
61	1.3	5.1	296279	2341870	314
82	0.7	4.6	297445	2340701	325
147	1.35	2.8	296002	2337068	345
148	2.02	4.6	299339	2336907	285
163	1.3	3.2	296971	2335976	324
177	1.3	3.1	297012	2334989	321
178	1.7	3.5	298034	2335043	318
150	1.25	5.2	290672	2337093	319
210	1.02	5.2	305023	2333026	307
199	1.75	5.8	305027	2336907	233
200	1.85	4.9	305974	2333959	288
186	2.1	6.3	305963	2335030	297
182	2	4.3	302192	2335106	315
168	1.15	3.1	302094	2336075	306
184	2.45	4.1	303982	2334989	310
198	1.8	5.2	304013	2334041	311
197	2.6	6.3	303063	2334004	301
177	0.9	4.1	298682	2339113	288
100	1.7	5.5	299159	2339773	294
99	2.4	4.6	298144	2339786	315
116	2.12	6.3	298035	2339094	334
98	0.7	4.5	296835	2339895	328
218	8.3	12.8	305000	2332004	308
26	1.9	4.2	299016	2344019	306
27	2.1	6.5	299908	2344064	285
17	1.2	5.8	299951	2344931	291
179	1.5	4.9	298923	2335081	341
180	4.25	8.2	299765	2335260	310
194	4.4	7.9	299921	2333837	309
166	1.8	5.4	299974	2335892	302
181	1.35	5.1	360843	2335055	283
195	dry	Dry	300680	2331581	280
176	1.2	4.1	295410	2334964	305
175	1.15	10.1	294872	2335132	315
174	1.3	9.7	293985	2334866	318
191	3.05	7.9	297954	2334052	306
207	7.8	12.8	298977	2332900	312
208	1.9	5.3	300185	2332765	290

143	3.7	7.1	297901	2342875	325
25	2.3	5.4	297735	2343592	309

IV. CONCLUSION

RWH is a gradual process, we can not suddenly increase the ground water table after constructing recharge structures, by constructing any type of recharge structure, and we can give our contribution in aquifer recharge. This will help to rejuvenate the depleting ground water resources. Also help to save the little amount of rain water which used to drain away from many years. The methodology used in helped to examine the ground water level of various areas of the city.

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