

## DETERMINATION OF GROUND WATER LEVEL IN CHITTAGONG CITY

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### ABSTRACT

Southern part of Bangladesh is now facing water scarcity problems in both agriculture and secured livelihood. Ground water forms the major portion of earth's fresh water source and it is almost safe to drink. Depletion of ground water table due to continuous pumping causing scarcity of water in the city area of Bangladesh. So information about ground water table is required for future recommendation of ground water supply to general people. For the investigation purpose, depth of water table has been determined in one seasons with respect to mean sea level. 41 wards of Chittagong City Corporation have been selected for this purpose where depth of water table is measured from the shallow and Deep tube well. The present investigation includes field investigation for locating of tube well in Chittagong City Corporation area with the aim of measuring water level from ground surface. From the investigation, it has been established that, water table with respect to mean sea level is different at different wards. During field investigation, 88 shallow tubes well and 89 deep tube well in 41 wards were found. The overall view shows that, in almost every ward, to find fresh water deep tube well is must as shallow tube well can't frequently pump water. From the investigation, it is clear that ground water table is lowering day by day. At the beginning of rainy season when it started to rain the water table comes up. Ground water through shallow tube well is not sufficient to fulfill the required demand for the general people as it is becoming out of reach through shallow well day by day. Depth of water table with respect to mean sea level is quite lower in ward 5 & depth of water table with respect to mean sea level is quite higher in ward 14. Average Depth of water table with respect to mean sea level is quite lower in ward no 5 & quite higher in ward no 15. The study was also carried out to assess groundwater table of Chittagong city. From this analysis, it is found that the GW level is lowering in almost all the region of the study. The present study can be concluded with the following decisions: The study shows the groundwater level in the study area is lowering day by day. This scarcity of GW is caused due to excessive extraction and dependence on GW for irrigation and other purposes. The ground water level is decreasing day by day due to intensive use of ground water. So, alternative water source should be ensured to mitigate the problem. Steps must be taken for using rain water, after preserving in tanks in the rainy season as alternate source of groundwater.

**Keywords:** Ground water, scarcity, depletion, Sea Level, investigation, measure, variation

### 1. INTRODUCTION

Ground water forms the major portion of earth's fresh water supply. About 97% of the earth's fresh water supply is stored in the underground. Ground water can be used as a reliable earth's fresh water supply is stored in the underground formation with the increase in population, the design for water system is essential to meet the increasing demand for water is also increasing throughout the world. Effective management of ground water system in essential source of water supply irrespective of the climate. In the monsoon areas of south-east Asia, ground water way becomes an important source of supply especially for irrigation purposes in the dry months. 94% of all the water-works use ground water and they supply 77% for the ground water (Aziz, 1975). The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water is called the water table. Groundwater is recharged from and eventually flows to the surface

naturally, natural discharge often occurs at springs and seeps, a can form oases or wetlands. Ground water is also often withdrawn for drinking, agricultural, municipal & industrial use by constructing & operating extraction wells. The study of the distribution and movement of ground water is hydrogeology, also called ground water hydrology.

Southern part of Bangladesh is now facing water scarcity problems in both agriculture and secured livelihood. Ground water is a vital source of water supply for Bangladesh. Bangladesh is almost entirely underlain by water-bearing formations at depths varying from zero to 20 m below ground surface (Md. A. H. Mirdad et. al, 2010).

Ground water in Bangladesh, except in some places, is available at a shallow depth. Ground water levels are at or near ground level during the period January-may. Ground water rises as a result of recharge during January-may. There are several areas of Bangladesh where ground water withdrawals are causing a large decrease in ground water level during dry seasons. The ground water withdrawal and recharge characteristics suggest that the actual recharge can be increased approaching the potential limits by creating additional storage through increased abstraction during the dry season. According to MPO (1991) estimates, out of 42543 mm<sup>3</sup> total useable recharge, 40% is available through shallow tube wells (Md. A. H. Mirdad et. al, 2010).. In this study, therefore the main focus will be found out the variation of the groundwater table of Chittagong city corporation area (Ahmed et. al, 2000)

## **2. METHODOLOGY**

Chittagong city is the second largest city of Bangladesh, considered the heart of all commercial and business activity. Chittagong water supply and sewerage authority (cwsa) which is the authority for water supply and sewerage only supply water to one-third of city dwellers. Rest of people depends on the shallow tube well and deep tube well. Location of ground water table in Chittagong city corporation area has been shown in study area map of figure- 1. For the investigation purpose specific problem has been identified and through which important information can be found .

### **2.1 Investigation Of Shallow and Deep Tube well In Chittagong City Corporation Area**

At the beginning of the work first task is to find out the shallow and Deep tube well in the 41 ward's City Corporation. Shallow tube well is not available in Chittagong city corporation area. Are Deep tube well has been found available in Chittagong city corporation. Tube well has found in-41 wards that was shown by the figure-1.

### **2.2 Determination Of Ground Water Level**

At the beginning of the work first task is to find out the shallow and Deep tube well in the 41 ward's City Corporation. Shallow tube well is not available in Chittagong city corporation area. Are Deep tube well has been found available in Chittagong city corporation. Tube well has found in-41 wards that was shown by the figure-2.

#### **2.2.1 Reduced Level of Ground Surface in Well Location by Mobile GPS**

Reduced level of ground surface in well location can be easily found by mobile GPS. Mobile GPS is a space based global navigation satellite system that provides reliable location and time information in all weather & all times anywhere. On the well location, switch on the mobile GPS by using internet. Then wait for five minutes to set its location properly. Then it will give value of longitude latitude & elevation of that specific location with respect to mean sea level. Mobile GPS device gives almost accurate elevation in the location. Mobile GPS device works accurately in the open area.

### 2.2.2 Depth of Water Table in Different Seasons by Thick Wear -

Depth of water table has been measured from the ground level at well location by opening the head of well. After opening the head of the well, wait for 10-15 minutes to drop the water in the well pipe. Then using a thick wear with a small steal at its bottom, entering into the well pipe until the wear is in a state of less weight. Then by using tape, find the depth from the wire. In this process, the depth is measured Dry season. Once at the ending of Dry season (In April) after some rainfall when water table is recharged and comes up.



Figure 1: Location map of shallow and deep tube wells in Chittagong City



Figure-2: Determination of ground water level by thick wear in shallow tube well

### 3. ILLUSTRATIONS

#### 3.1. Figures and Graphs

From Figure-3 it shows the depth of water table with respect to mean sea level is quite lower in ward no 5 (hazi razak monjil, gafur road, one kilometer) and depth of water table with respect to mean sea level is quite higher in ward no 14 (kazi orcid, high level road, lalkhan bazar).

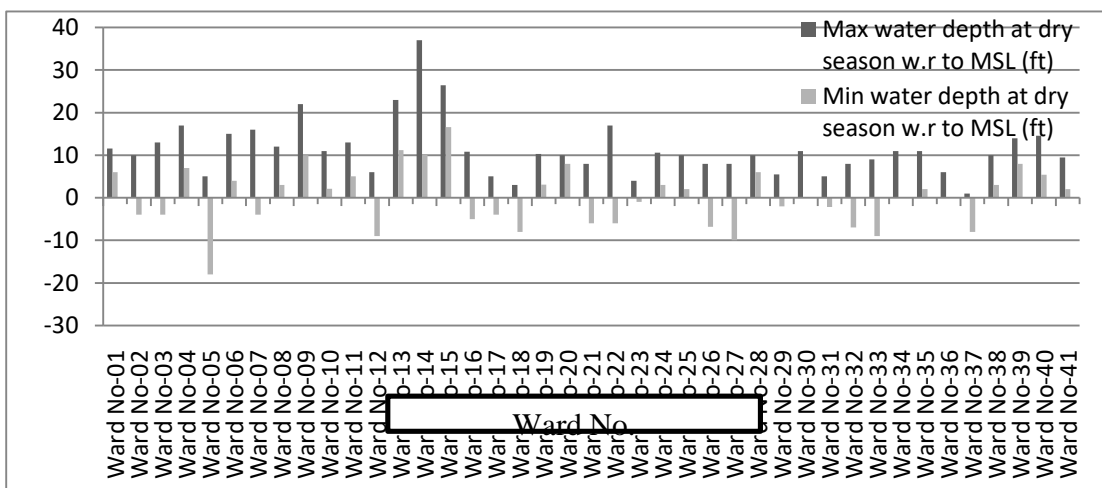


Figure: 3 Graphical representation of water table in dry season. Equations

From figure-4 it shows the average Depth of water table with respect to mean sea level is quite lower in ward no 5 & quite higher in ward no 15.

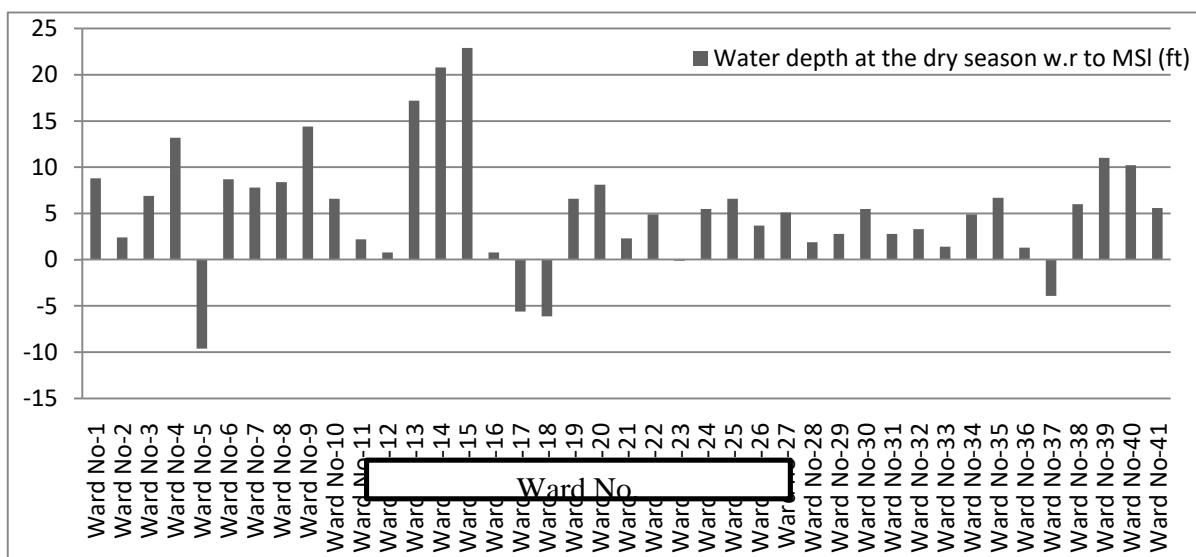


Figure:4 Graphical representation of Avg. water table in dry season.

### 3.2. Results of Ground Water Table of Shallow and Deep Tube Wells –

#### (i) Depth of Water Table in Dry Seasons from MSL -

Depth of water table measured in dry seasons from ground level & adjustment of depth from mean sea level has been shown in Table 1.

Ward No.	Ward Name	Well location	Elevation (RL of ground surface w.r. to MSL)	At the beginning of dry season
01	South Pahartali	1) Mona Meya Shorkar Bari, House No#11, Road No#03, Aman Bazar.	25'	25'-16'=9'
		2) Katar Para, Aman Bazar.	23'	23'-17'=6'
		3) Kathal Bagan, House No#10, Baluchora	23'	23'-16'=7'
		4) Romjan Ailr Bari, House No#06, Khilla Para,	24'	24'-13'=11'
		5) Shanti Colony	28'	28'-11'=11'
02	Jalalabad	1) Etiquette Ali Lodeg, H/N#03,Nasirabad	29'	29'-37'=-8'
		2) Sarja Kanon, House No#09, Sersha, Oxyzen.	31'	31'-35'=-4'
		3) Rohim Member Bari, RohomanNagor,	28'	28'-18'4"=9'8"
		4) Kader Ali House, Lane No# 05, Nasirabad	33'	33'-23'=10'
		5) Burma Colony, Bayazid Bostami	25'	25'-21'=4'
03	Panchlaish	1) Rof Rof Tower, House No# 02, Lane No#01, Katalgong.	25''	25'-29'=-4'
		2) Noor Garden, House No# 19, Lane No# 02, Katalgong.	28'	28'-35'=7'
		3) Mushi Colony, Abdul Hamid Road, Shulakbahar.	29'	29'-16'=13'
		4) Habibullah Road, Noyarhat,	36'	

		Bayejid	36'-25'7"=10'5"	
<b>04</b>	Chandgaon	1) Etiquette IBBL Officer Tower, Khaza Road.	24'	24'-13'=11'
		2) Jafor Company House, House No#08, Khaza Road.	20'	20'-13'=7'
		3) Pathainnagoda, Bohoder Hat, Chandgaon	30'	30'-16'=14'
		4) Khadija Tower, Road No#03, Hous No#04.	27' 31'	27'-10'=17' 31'-14'=17'
		5) Jalal Khan Chowdhury Bari Road		
<b>05</b>	Mohara	1) S.Rose. House, South Mohora, Kalurghat.	20'	20'-35'=-15'
		2) Nikti Bobon, CNB, Kalurghat.	16'	16'-34'=-18'
		3) KhalekVali, Road No#03, House No#15,	20'	20'-30'=-10'
		4) Hazi Razak Monjil, Lane No#02, Gafur Road, One Kilometer.	33'	33'-28'=5'
<b>06</b>	East Sholashahar	1) Railway Colony, Sholashahar	31'	31'-16'=15'
		2) Rahmania High School, Sholashahar	23'	23'-17'=6'
		3) Khaja Hotel, Rohoman Nogor		
		4) Shohel Place, House No#7, Road No#3, Kapashgola	26'	26'-14'=12'
		5) Phanto Neer, Hamidulla Meya Road	23' 27'	23'-19'=4' 27'-21'=6'
<b>07</b>	West Sholashahar	1) Hamzarbag Colony,	36'	36'-22'6"=13'6"
		2) Chowdhury Complex, Mohammadpur	32'	32'-27'=5'
		3) Hossain Ahmed Chowdhury City Corporation School	37' 27'	37'-21'=16'
		4) Khan Bari, House No#14, Road No#1, Mohammadpur		27'-31'=-4'
<b>08</b>	Sulakbahar	1) Shah Habibullah Road, Noyarhat.	29'	29'-17'=12'
		2) Munshi Colony, Vaktapur	26'	26'-15'8"=11'4"
		3) Daraga Bari, Chaillatali Bazaar.		
		4) Kholia Meya Sodhagor Bari, Lane no#2, Sulakbahar	32'	32'-25'=7'
<b>09</b>	North Pahartali	1) Pahartali Rail Way Colony,	30' 39'	30'-27'=3' 39'-29'=10'
		2) Ambagan Rail Way Colony, Pahartali	42'	42'-26'10"=14'2"
		3) Nobi Bobon, Mosque Lane, Bachamia Road	45'	45'-34'=11'
		4) Jalala Menson, Nesariya Housing Society,	65'	65'-43'=22"
<b>10</b>	North Kattali	1) Jiku Shorkar House, Post Office Road, Kattali	39'	39'-28'=11"
		2) Madrasa Road, North Kattali	26'	26'-19'=7'
		3) Reque Menson, House No#07, Road No#7, Proshanti Society.	29'	29'-26'2"=2'10"
		4) Laky Monjil, House No#03, Road No#2, Proshanti Society.	30'	30'-24'9"=5'3"

11	South Kattali	1) Ma Monjil, House No#6, Monsurabad, Colonel Hat.	25'	25'-32'=-7'
		2) Rowson Tower, House No#10, Road No#7, Proshanti R/A.	23'	23'-34'6"=-11'6"
		3) Firoz Shah Colony, Colonel Hat.	24'	24'-19'=5'
		4) Kazir Bari, Lane No#2, Post Office Road, Colonel Hat.	26'	26'-15'=11'
		5) Poros, Lane No#1, Office Road	30'	30'-17'=13'
12	Saraipara	1) Soronika, House No#11, Shanti Bag R/A,	22'	22'-31'=-9'
		2) Noju Meyar Lane, Saraipara	25'	25'-19'=6'
		3) M.Kholil Company Bari, Sobujbag, Saraipara	23'	23'-21'=2'
		4) Raja Baburci House, Saraipara	21'	21'-17'5"=3'7"
13	Pahartali	1) Etiquette Khulshi Complex, South Khulshi, Block-B, Lane No#3, Road No#1.	68'	68'-45'=23'
		2) Mishon South Point, Road No#1, Khulshi	57'	57'-41'=16'
		3) Jawotola Railway Colony, Road No#2,	51'	51'-39'10"=11'2"
		4) New Jawtala Primary School	78'	78'-51'=27'
		5) Nondon, House No#11, Sagun Bagan	60'	60'-39'=21'
14	Lalkhan Bazar	1) Etiquette Aurora, Road No#1. Hill Side R/A, Near Momota Hospital,	102'	102'-67'7"=34'4"
		2) Selicon Kazi Orcid, House No#3 Hilevel Road, Lalkhan Bazar.	98'	98'-61'=37'
		3) Monju House, Buttaia Colony, Lalkhan Bazar.	48'	48'-37'2"=10'10"
		4) Samsi Colony, Lalkhan Bazar.	46'	46'-33'9"= 12'3"
		5) Tigerpass Railway Colony	50'	50'-41'=9'
15	Bagmoniram	1) Sky Lack, Lane No#1, Kazirdewri.	112'	112'-85'8"=26'4"
		2) Hazir Bari, Lane No#3, Kazi Para, Kazirdewri.	87'	87'-64'=23'
		3) Gov. Empoloy Colony Mosque, Golphar Circel, Mehedibag.	66'	66'-41'=25'
		4) Khorshed House, Lane No#1, Dampara.	59'	59'-42'6"=16'6"
16	Chawkbazar	1) Hosen Tower, Near D.T Road, Chawkbazar .	26'	26'-39'=-13'
		2) Chaianeed, House No#3, Parchiaheel, Chawkbazar.	38'	38'-43'=-5'
		3) Kalam Colony, D.T. Road, Chawkbazar.	27'	27'-17'=10'
		4) Rohoman Bari, Lane No#2, Gasheya Para, Chawkbazar .	29'	29'-18'4"=10'8"
17	West Bakalia	1) Aleya House, Lane #02, W.Bakalia	25'	25'-29'=-4'

		2) Shajam Compamyr Bari, Bakalia	28'	28'-23'=5'
		3) Karim Tower, House No#5/D, Lane#4.	22'	22'-36'=-14'
		4) Active Alom Tower, Lane#01	20'	20'-38'=-18'
		5) Hazi Alauddin Road,	24'	24'-21'=3'
<b>18</b>	East Bakalia	1) Cast View, House No#11, Road No#3, E.Bakalia	23'	23'-31'=-8'
		2) Shopno need, House No#08, Road No#01	20'	20'-35'3"=-14'9"
		3) Kheleda Colony, Bakalia	24'	24'-21'=3'
		4) Kazi Kanon, House No#14, Bakalia	20'	20'-28'=-8'
<b>19</b>	South Bakalia	1) Jaitun Cotej, Noya Mosque Area,	28"	28'-24'2"=3'10"
		2) EkraTower, Road No# 4, S.Bakalia	26'	26'-31'=5'
		3) Khadizanebas, H/N#8, Bakalia	30'	30'-23'=7'
		4) Bakalia Khal Para,	29'	29'-18'9"=10'3"
<b>20</b>	Dewan Bazar	1) Shadat Tower, House No#16, Road No#1, Dewan bazar.	30'	30'-21'5"=8'7"
		2) Sale Nur Tower, House No#9, Road No#4,	34'	34'-25'=9'
		3) BogerbilLabour Colony, Dewan Bazar.	27'	27'-19'=8'
		4) Shohid Cont. Bari, Dawan Bazar.	31'	31'-21'=10'
<b>21</b>	Jamal Khan	1) Rokeya Cotez, House No#05,Hamsen Lane	42'	42'-38'=4'
		2) Oli Bobon, House No# 10, Emdad Colony	39'	39'-45'=-6'
		3) Kanu Das House, Dopa Para	45'	45'-37'=8'
		4) Meyar Bari, Gunacor Lane.	40'	40'-37'2"=2'10"
<b>22</b>	Enahet Bazar	1) Harun Sodagorer Bari, H/N#12, Lane No#2, Gowal Para,	52'	52'-46'=6'
		2) Romjan Monjil, House No#08, Lane No#3.	51'	51'-57'=-6'
		3) Hasena Vila, H/N#03, Batali Road, Mosque Lane,	49'	49'-47'=2'
		4) Baki Sodagor Bari,College Road,	56'	56'-39'=17'
<b>23</b>	North Pahartooly	1) Raj Monjil, House No#12, Doniwala Para, Dewan Hat.	29'	29'-37'=-8'
		2) Hoque Tower, House No#01, Road No#5, Oposit Site of Passpot Office. Monsurabad.	35'	35'-34'=-1'
		3) Sultan Colony, Lane No#1, Dewan Hat.	31'	31'-27'=4'
		4) Supariwala Para, House No#4, Dewan Hat.	27'	27'-28'=-1'
		5) Manan Bobon, Chanmeyar Bill,	30'	30'-24'6"=5'6"
<b>24</b>	North Agrabad	1) Etiquette Mowlana Tower, Port Connecting Road, Boro pool,	20'	20'-17'=3'
		2) Newaj Monjil, House No# 08, N.Agrabad.	22'	22'-19'=3'
		3) Raja Mear Bari, Road No#02, Muhuri Para,	20'	20'-14'=6'
		4) Mosque Colony, Moinna Para,	25'	25'-14'6"=10'6"
		5) Jahan Monjil, Askara Bad,	21'	21'-16'=5'
<b>25</b>	Rampur	1) Tara Nebas,Rampur Post	23'	23'-21'=2'



		Office Road		
		2) Bow Bazar Mosque Lane	21'	21'-32'=10'
		3) Pukur Par Masjid	28'	28'-21'=7'
		4) Rose Bally, Panir Kol, Lane No#2,	26'	26'-19'=7'
<b>26</b>	North Haliashahar	1) Kazi Orcid, House No#19, K-Block, Karnofuli R/A, Haliashahar.	27'	27'-17'=10'
		2) Alom Tower, House No#09, No 08 Gate. Haliashahar	25'	25'-31'4"=-6'8"
		3) Askara bad Colony, N.Haliashahar	23'	23'-27'=4"
		4) Rahat Ara Lane, Nowa Bazar	26'	26'-19'=7'
<b>27</b>	South Agrabad	1) CGS Colony, South Agrabad	25'	25'-18'=7'
		2) Al Nahian Primary School,	27'	27'-19'=8'
		3) Woab Tower, House No#5, Road No#03, CDA R/A.	23'	23'-17'9"=5'3"
		4) CDA R/A, Mosque Lane.	21'	21'-21'=0'
<b>28</b>	Patantooly	1) Patantooly City Corporation Girl's High School.	27'	27'-37"=-10'
		2) Baitul Hamad Mosque, Patantooly	23'	23'-20'=3'
		3) Sultan Colony, Patantooly	32'	32'-24'=8'
		4) Gaibi Mosque Lane	25'	25'-19'=6'
<b>29</b>	West Madarbari	1) Nikthi Bobon, Majir Gat, Madarbari	26'	26'-21'=5'
		2) Rabeya Workshop, Madarbari	29'	29'-23'6"=5'5"
		3) Ma Monjil, House No#5/D, West Madarbari	27'	27'-29"=-2'
		4) Dalower House, House No#7, W. Madarbari	24'	24'-26'=2'
<b>30</b>	East Maderbari	1) Monu Meya Mosque Lane,	25'	25'-14'=11'
		2) Archaid, House No#4/B, Lane No#2	26'	26'-26'=0'
		3) Kabir Monjil, Nala Para, East Maderbari	22' 20'	22'-18'=4'
		4) Primary Techer's Institute, Ice Factori Road.		20'-13'6"=6'6"
<b>31</b>	Alonkar	1) Sagorika Colony, Sagorika.	23'	23'-18'=5'
		2) Alonkar Kacha Bazar, Alonkar,	27'	27'-25'9"=1'3"
		3) Baitul Jannat Mosque, Alonkar	24'	24'-26'10"=-2'2"
		4) Naj Tower, Sagorika	29'	29'-27'=2'
<b>32</b>	Anderkill	1) Kholipa Potti, Anderkill	28'	28'-21'6"=6'6"
		2) Jemjson Hall, Anderkill	36'	36'-28'=8
		3) MAK Sajid Tower, House No# 18/A, Anderkill	29'	29'-36"=-7'
		4) Sultan Monjil, House No#7, Lane No#01,	28'	28'-25'4"=2'8"
		5) Arc, House No#5, Chairman Goli	33'	33'-27'=6'
<b>33</b>	Firingi Bazar	1) Behari Colony, Firingi Bazar	20'	20'-17'=3'
		2) Al-Alam Tower, Monosha Gate.	19'	19'-19'=0'
		3) Meya Sodhagor House, House No#9, Sultan Meya Lane	20'	20'-29"=-9'
		4) Behari Colony, 3 No Lane, Firingi Bazar		
		5) Shadarghat Port Colony,	23'	23'-19'=4'

			25'	25'-16'=9"
<b>34</b>	Patharghata	1) ShakMonjil, Lane No#2, Iqbal Road	33'	33'-29'=4'
		2) Bank Colony Road	42'	42'-31'=11'
		3) NazuSodhagorBari,Lane No#1,Brick Field Road	32'	32'-28'=4'
		4) Amir Ail Road	29'	29'-29'=0'
<b>35</b>	Boxir Hat	1) Meyaji Colony, LaneNo#03, Boxir Hat,	39'	39'-28'=11'
		2) Manik Sodagor House, Boxir Hat	30'	30'-35'=-5'
		3) Hendhu Para, Boxir Hat	33'	33'-24'9"=8'3"
		4) Komol Kanon,House No#7,Lane No#5	29'	29'-31'=2'
<b>36</b>	Goshaildanga	1) K.K. Tower, Hanif Sowdagor Lane	32'	32'-27'=5'
		2) Goshaildanga Kali Bari Lane No#1	24'	24'-24'=0'
		3) Becha Shah Masjid Colony	27'	27'-21'=6'
		4) Multi Sitred Colony	25'	25'-27'=-2'
		5) Billa Pada	25'	25'-28'=-3'
<b>37</b>	North Middle Halishahar	1) Moshjid Quarter, 13#No. Road, Bandar Port Colony.	20'	20'-28'=-8'
		2) Road No#7, House No#10, Bandar Port Colony	18'	18'-26'=-8'
		3) SerajMenson, Road No#5/D, Uttara R/A.	25'	25'-24'=1'
		4) Aleya Tower, Road No#2/A, Uttara R/A.	25'	25'-25'=0'
<b>38</b>	South Middle Halishahar	1) Sarja Bobon, House No#3/A, Road No#4,	33'	33'-28'=5'
		2) Baitul Asa Moshjid Quarter, Boro Pool,	27'	27'-24'=3'
		3) Kalam Colony, Pukur Par, Boro Pool.	29'	29'-19'=10'
		4) Iseabally Tower, House No#12, Lane No#2	35'	35'-29'=6'
<b>39</b>	South Halishahar	1) Rokaya Nebas, House No#08, Akmal Ali Road.	30'	30'-21'=9'
		2) Lane No#2, Halishahar A Block. Foliatali Bazar	29'	29'-15'=14'
		3) Behari Colony, Halishahar	24'	24'-11'=13'
		4) Gass Tower, House No#04, Halishahar B Block	27'	27'-19'=8'
<b>40</b>	North Potenga	1) Omol Kanon, Hindhu Para, Lane No#01, Kathgar	33'	33'-21'3"=11'9"
		2) Potenga City Corporation Girl's High School.	39'	39'-24'6"=14'6"
		3) Jala Manson, Lane No#05,Kathgar	32'	32'-26'8"=5'4"
		4) Mohima House, Road No#02,	34'	34'-25'=9'
<b>41</b>	South Potenga	1) South Para, Road No#2, BondhorTila,	28'	28'-19'7"=8'5"
		2) Golden Beach Road, Patenga	26'	26'-16'7"=9'5"
		3) R&R Tower, Road No#01, South Potenga.	23'	23'-21'=2'
		4) See Place, South Potenga.	25'	25'-23'=2'

## CONCLUSIONS

Ground water table in Chittagong City Corporation area is in a position where day by day the water table is lowering. In this research, the result derived from the investigation has been presented below:

- i. Water tables are different in different wards.
- ii. During field investigation, 88 shallow tubes well and 89 deep tube well in 41 wards were found.
- iii. Ground water through shallow tube well is not sufficient to fulfill the required demand for the general people as it is becoming out of reach through shallow well day by day.
- iv. Depth of water table with respect to mean sea level is quite lower in ward no 5 (Hazi Razak Monjil, Gafur Road, One Kilometer).
- v. Depth of water table with respect to mean sea level is quite higher in ward no 14 (Kazi Orcid, High Level Road, Lalkhan Bazar).
- vi. Average Depth of water table with respect to mean sea level is quite lower in ward no 5 & quite higher in ward no 15.

The study shows the groundwater level in the study area is lowering day by day. This scarcity of GW is caused due to excessive extraction and dependence on GW for irrigation and other purposes.

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