

(/ / 0.483)

.(/ 1000 / 6.955)

.(/ / 320.739)

(/ 1000 / 1.299)

%12.5 %22.2

() %9.7 %19.3

3 1480-640
3 156-107

800

.1

.(2001)

1999)

.(2002

15

)

.(1995

2001

2007/11/25

.(2.3)
.2008/8/20

(1)

*

) %17 2000
(.2001) (

Eutrophication

National Center for Small Communities, 2006)
(1991

)

(2006 2002

(2004 1995)

2003

Sazakli *et. al.* 2007; Roy *et. al.* 2006; Gasana *et. al.*
(2002)

.2

(2004)

2003

)

(2002 1991

(Gouze *et*

al., 2008; Lou *et al.*, 2007; Yang *et al.*, 2007)

(desalinated water)

.(Ministry of Health (MoH), 2004)

0.483

320.739

1.729

(Gerard *et al.*, 2003; American Public Health Association (APHA), 1992; World Health Organization, (WHO), 1993; Palestinian Standards Institution (PSI), 2004)

. / / 270.823

(WHO, 1984

and 1996)

/ 11.327 22.227 32.854

/ 1000

.(SPSS version 11.0)

. / 1000/ 0.915

/ 1.299)

6.955) (/ 1000

.(/ 1000/

.3

(1)

(1)

2003

(1000/)		(/)	()	*2003	
6.955	16,414	0.483	1,139	2,360,183	
1.170	457	0.369	144.0	390,660	
32.854	9,613	1.729	506.0	292,600	
6.593	1,077	0.258	42.2	163,352	
11.327	1,033	0.493	80.5	91,194	
22.227	1,340	1.327	80.0	60,286	
2.572	820	0.052	164.0	318,143	
1.533	416	0.046	12.5	271,371	
1.079	183	0.113	19.2	169,623	
2.926	120	0.0	0.0	41,014	
2.668	1,355	0.179	90.9	507,940	
1.299	1,752	320.739	432,500	1,348,450	
0.915	233	346.225	92,700	254,513	
1.619	763	347.458	168,500	471,384	
1.572	220	466.532	65,300	139,969	
0.431	116	233.397	62,800	269,070	
2.633	420	270.823	43,200	159,514	
4.898	18,166	0.117	433,639	3,708,633	

* Palestinian Central Bureau of Statistics (PCBS) (1999).

409

%22.2

%12.5

.%17

E.coli

.(Abo-Shehada et al. 2004)

(3)

(2)

%11

.(Virkyute and Sillanpaa, 2006)

.(Schets, et. al. 2005)

()

:

%100.0 % 47.0

%14.0 %21.2

(TDS)

%46.0 %49.0 %15.7

%66.7 %42.2 %17.1 %52.0 %64.2

%5.3 %11.3

%8.3

%7.8 %6.7 %15.2

%19.3 ()

%80

%9.7

(3)

%86.5

%15.4 %21.4

%43.6

(2003

)

(TDS)

%60.4% %76.3 %56.0 %58.6

%56.4 %48.9 %48.9 %35.7 %22.3

(1994, Bellisar 1995)

.(Ergil, 2000)

(Palestinian Water Authority, 2002)

(N, P)

(Metcalf and Eddy, 1991)

.(FC)

.(De Roos, *et al.*, 2003)

20

.(Dowidar *et al.*, 1990; Zacheus 2001)

()

(De Roos *et al.*, 2003; Chun-

.Yuh *et al.*, 2007; Gulis *et al.*, 2002)

(Abu-

.Rulcah and Al-Kofahi, 2001)

250) 1500

45 (

35 (2006)

%85

.(2006)

%27

/ 250

(AL-Khatib *et al.*, 2003)

(Nashashibi and

.vanDuijl, 1995)

%50

%27

(Bellisari, 1994 1995) (2002

(2)

()		()				
(%)		(%)		(%)		
-	*	21.2	3,290	22.2	409	Total Coliform
-	-	14.0	3,290	12.5	409	Faecal Coliform
-	-	-	-	-	-	Faecal strepto.
-	-	-	-	-	-	Pseudomonas
-	-	-	-	-	-	Cholera
19.3	507	15.2	3,087	11.3	1,463	Total coliform
9.7	507	6.7	3,093	5.3	1,502	Faecal Coliform
2.1	483	7.8	1,587	8.3	964	Faecal strepto.
3.8	474	2.4	211	-	-	Pseudomonas
-	-	0.0	48	-	-	Cholera

*

(3)

						()				
(%)				(%)		(%)		(%)		
21.4	14	WHO1996	5 NTU	15.7	51	-	-	-	-	
-	-	WHO1984	8.5-6.5	10.6	47	47.0	83	1.8	277	
0.0	17	WHO1984	1500 µS/cm	49.0	49	1.2	84	58.6	280	
0.0	17	WHO1996	1000 mg/l	46.0	50	1.2	84	56.0	280	
0.0	17	PSI 2004	0.3 mg/l	0.0	33	0.0	43	1.4	222	
5.9	17	WHO1996	50 mg/l	64.2	53	8.3	84	76.3	279	
-	-	WHO1996	250 mg/l	52.0	50	1.2	84	60.4	280	
15.4	13	WHO1996	250 mg/l	17.1	35	0.0	73	22.3	273	
0.0	15			0.0	39	0.0	75	0.0	274	
-	-	WHO1984	500	42.2	45	0.0	97	35.7	277	
-	-	PSI 2004	100 mg/l	0.0	39	0.0	75	0.0	274	
-	-	PSI 2004	100 mg/l	0.0	39	0.0	75	48.9	182	
0.0	15	WHO1996	1.5	66.7	3	100.0	12	48.9	182	
-	-	PSI 2004	10	0.0	39	0.0	75	0.0	273	
-	-	WHO1996	200	0.0	39	0.0	75	56.4	273	

1991

1995

2004

2001

1999

.2006

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Factors Affecting Water Quality in the West Bank and Gaza Strip of Palestine

*Issam A. Al-Khatib, Aysha A. Eshkair and Ne'meh K. Manasreh**

ABSTRACT

This study aims at knowing water quality and factors affecting it in the West Bank and Gaza Strip in Palestine. The annual rate of chlorine usage in the districts of the West Bank (0.483 gram/capita) was less than that of Gaza Strip (320.739 grams/capita). The annual rate of inspection visits made by inspectors of Ministry of Health for water sources in Gaza Strip (1.299 visits/1000 persons) was much less than that of the West Bank (6.955 visits/1000 persons). There was a clear effect of the deteriorated environmental situation, unstable political situation, and the declining economical situation on the lowered microbiological, physical and chemical water quality in Palestine. For example, 22.2% and 12.5% of the tested water samples from wells in the West Bank, and 19.3% and 9.7 of the tested treated water (desalinated) samples in Gaza Strip for total Coliforms and Faecal Coliforms respectively were exceeding the Palestinian and WHO guidelines limits.

Regarding the chemical and physical quality, it was found that the percentage of tested water samples exceeding the Palestinian and WHO guidelines limits in Gaza Strip was higher than that in the West Bank. Based on the current situation, necessary remediation measures should be implemented in order to reduce the size of the problem if not to solve it completely, such as the development a suitable inspection program on water sources and samples collection and testing, in addition to the distribution of chlorine to all districts, and conducting wide public awareness campaigns for water disinfection. Rehabilitation of existing water networks mainly in the main cities and having new ones in communities that do not have water networks will highly improve the water quality.

Keywords: Water Quality, Causes of Pollution, Pollutants, Palestine.

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