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**The possibility of social acceptance to reuse recycled sewage
water in agriculture in Ramallah and Al- Biereh Governate
"A case study: Deir Debwan"**

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2008

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**The possibility of social acceptance to reuse recycled sewage water in agriculture in Ramallah and Al- Biereh Governate
"A case study: Deir Debwan"**

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“This Thesis was submitted in partial fulfillment of the requirements for the Master Degree in Modern Arab Studies/ Geography from the Faculty of Arts/Graduate Studies at Birzeit University, Palestine”

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Abstract

The possibility of social acceptance to reuse recycled sewage water in agriculture in Ramallah and Al- Biereh Governate "A case study: Deir Debwan"

. Treated waste water has been considered a potential source for domestic and agricultural use, especially in the scared–water resources countries as in Palestine. The major obstacles against using treated waste water almost similar in different countries, including Palestine, which are related to people awareness, understanding and acceptability to use.

In order to investigate the degree of people's awareness and acceptability, the socio-economic and religious related issues as well as the feasibility of using treated waste water, a study has been conducted in Deir Debwan village located in the central Palestinian mountains. The study uses the random sample questionnaire research method as well as interview with key persons interested in sewage water treatment and usage.

The study revealed that acceptability of using treated waste water and the willing to pay for it increased by increasing the education level, the degree of fresh water shortage, the increase in the income, and the level of people's understanding of its environmental hazard. In addition, the study showed that acceptability increased by decreasing the people's contact to treated waste water; being the highest acceptability for industry rather than for house hold due to different degrees of direct contact.

As moving from collected rain water, grey water and black water, people's preferences to use in agriculture decreased, with more preference toward

irrigating agricultural products that need to be well-cooked as well as olives and forage crops. The willingness to use crops irrigated with treated sewage water also increased by decreasing its price.

The study also showed that none of the population related factors (i.e. sex, age and the number of family members) has significant relation with the acceptability to use treated sewage water.

Based on these results, it is recommended to increase the people's degree of awareness using different methods of publicity and media, so as to increase their acceptability and cooperation. In addition, it is recommended to strengthen the legal aspects related to the waste water treatment, usage and its environmental monitoring and consequences.

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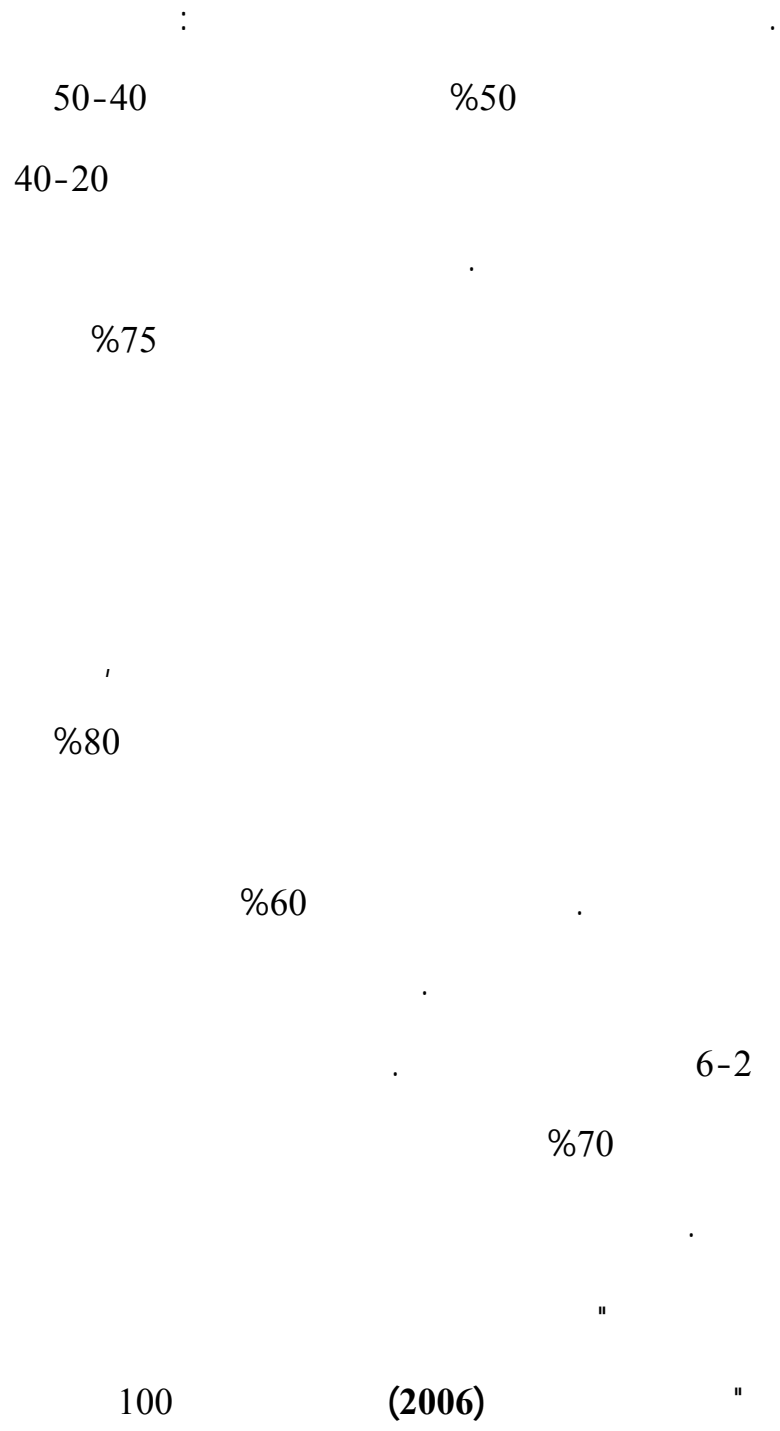
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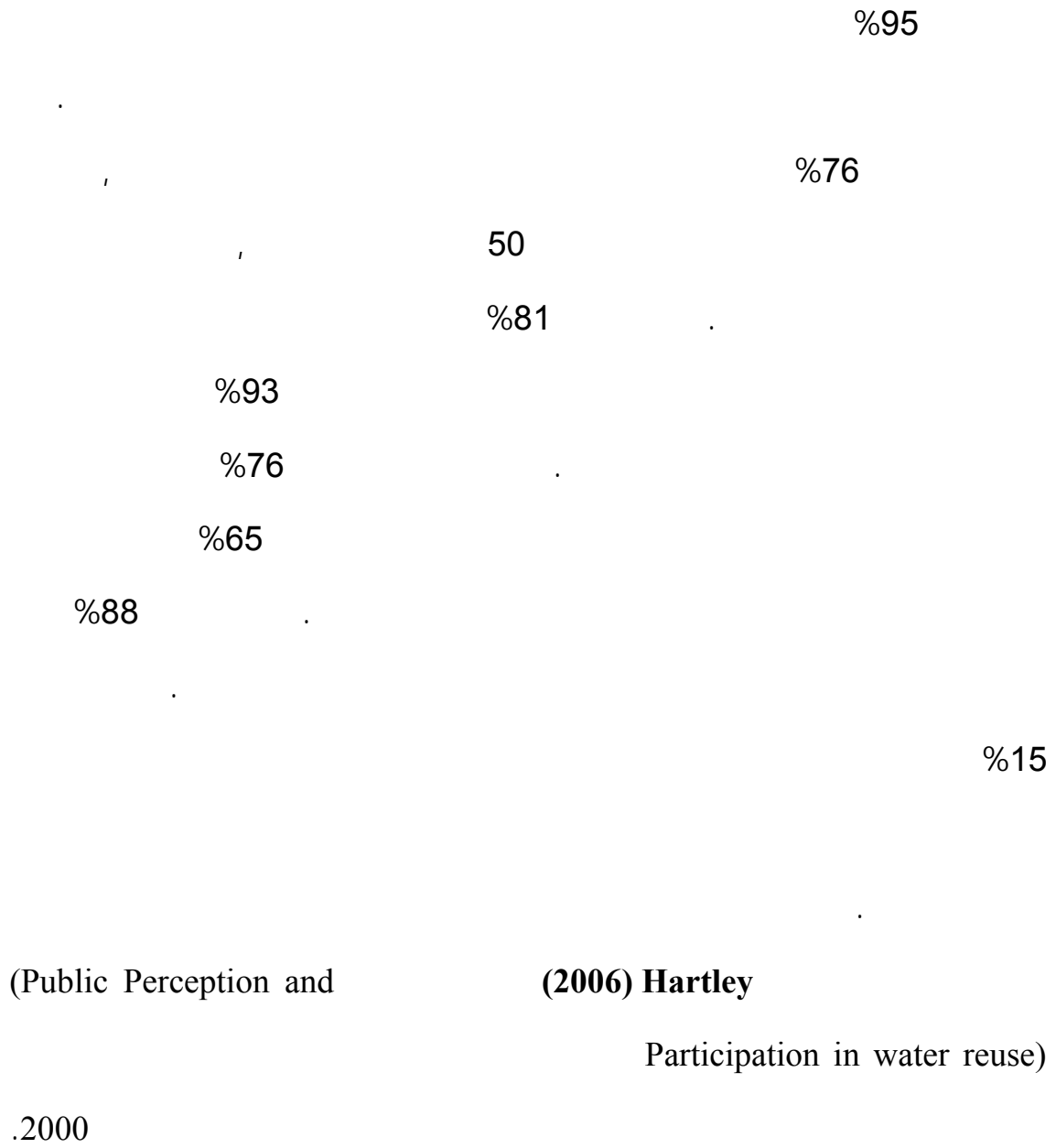
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(Social acceptability and evaluation of recycled water in Crete : study
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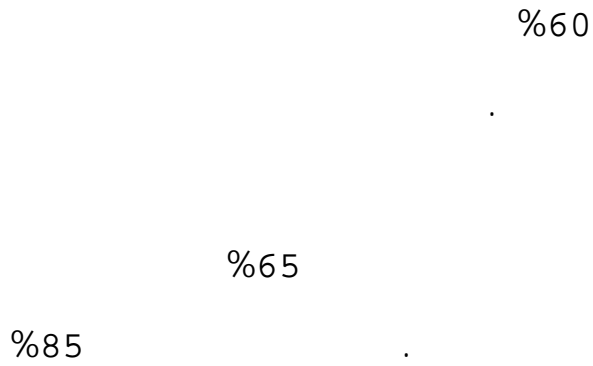


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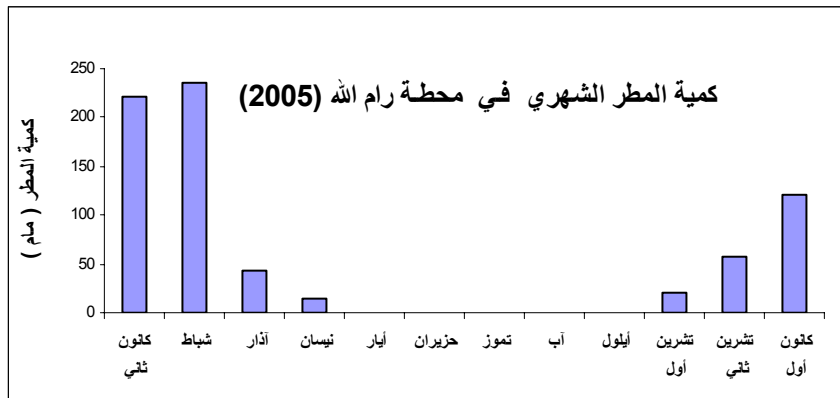
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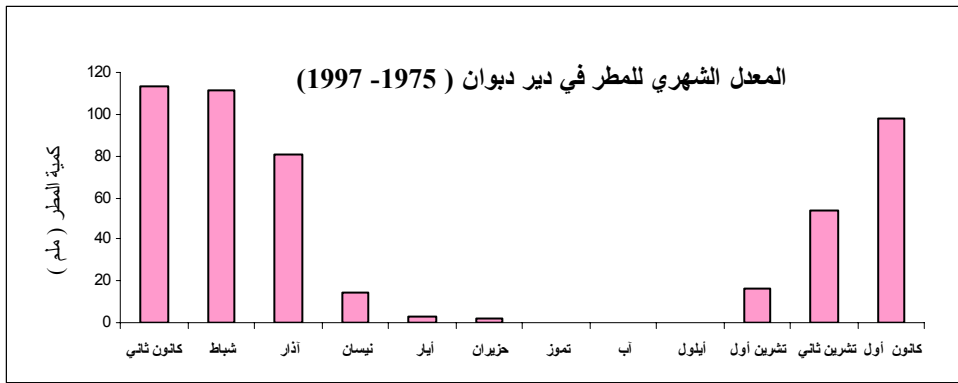
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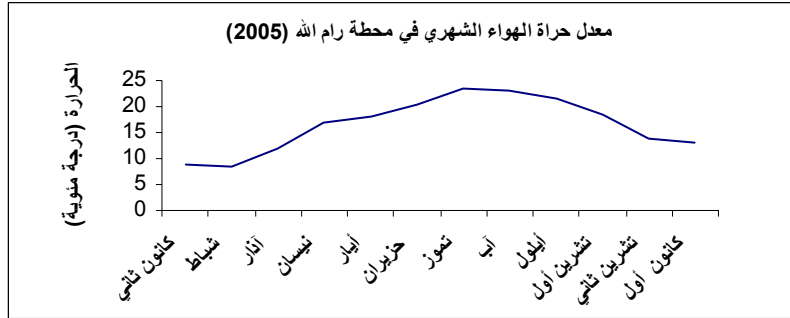
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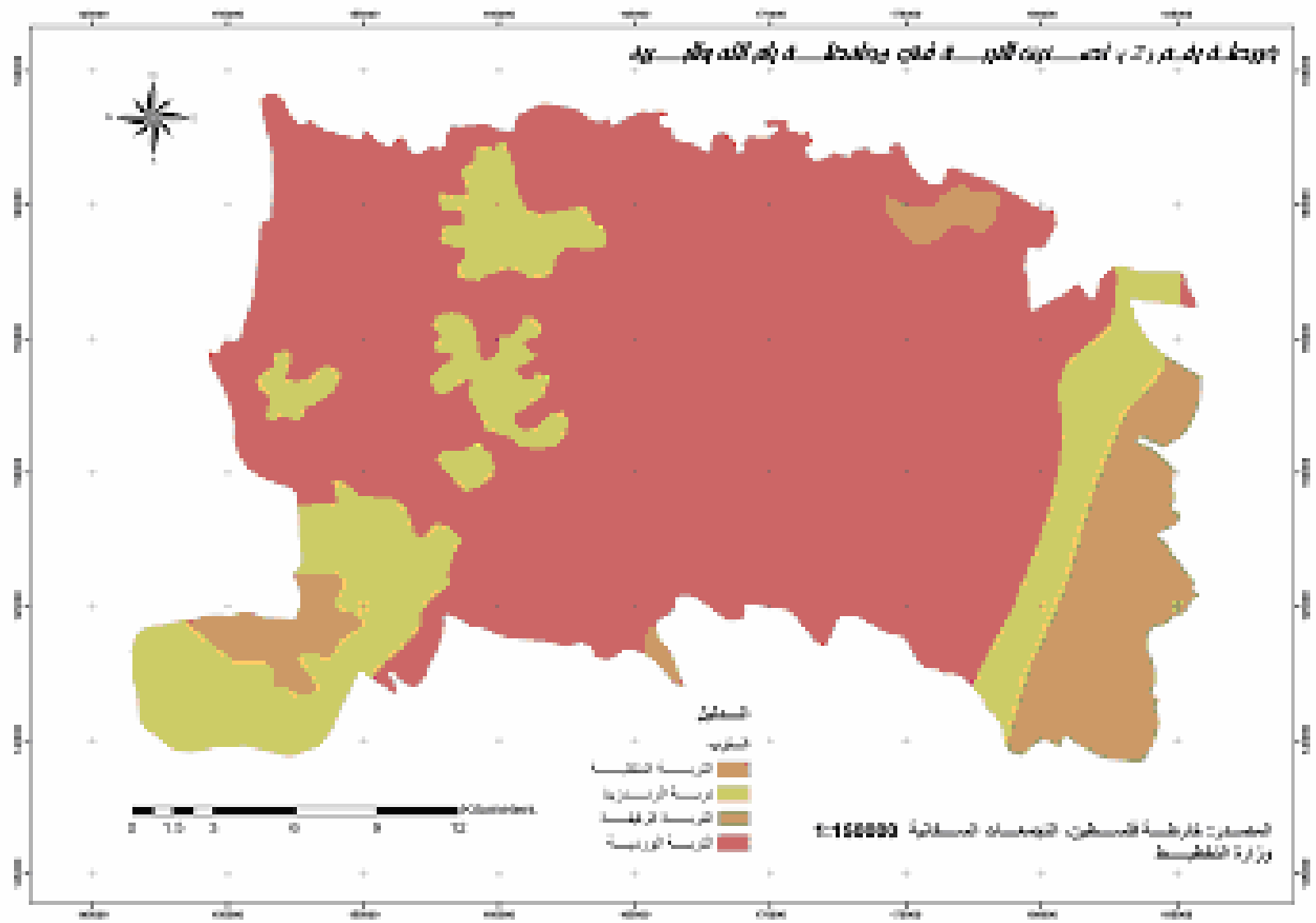
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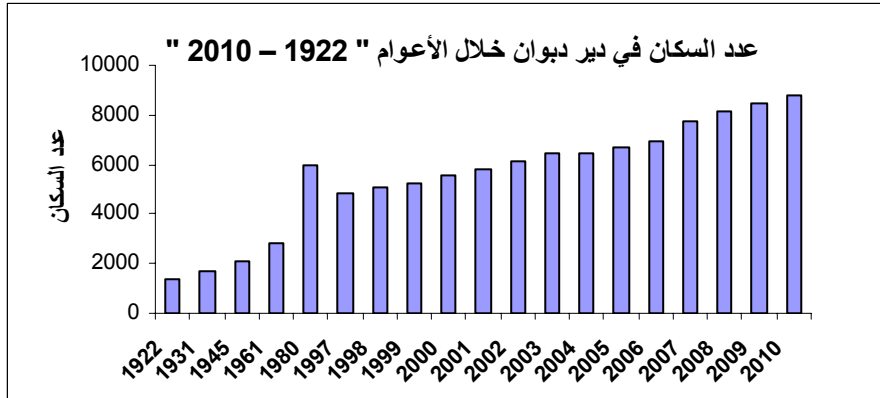
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(Turbidity) (NTU)	598	9.38	98
(pH)	7.43	7.60	-----
(TSS)	574	24.5	95.5
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(TS)	1606	929	42
Fecal Streptococcus	6.293	5.095	17
(Fecal coli form)	7.325	4.453	39
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(Pathogens)	Amoeba, Giardia cysts	ND	

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(Al-saed, & Hithnawi, 2006, p4(

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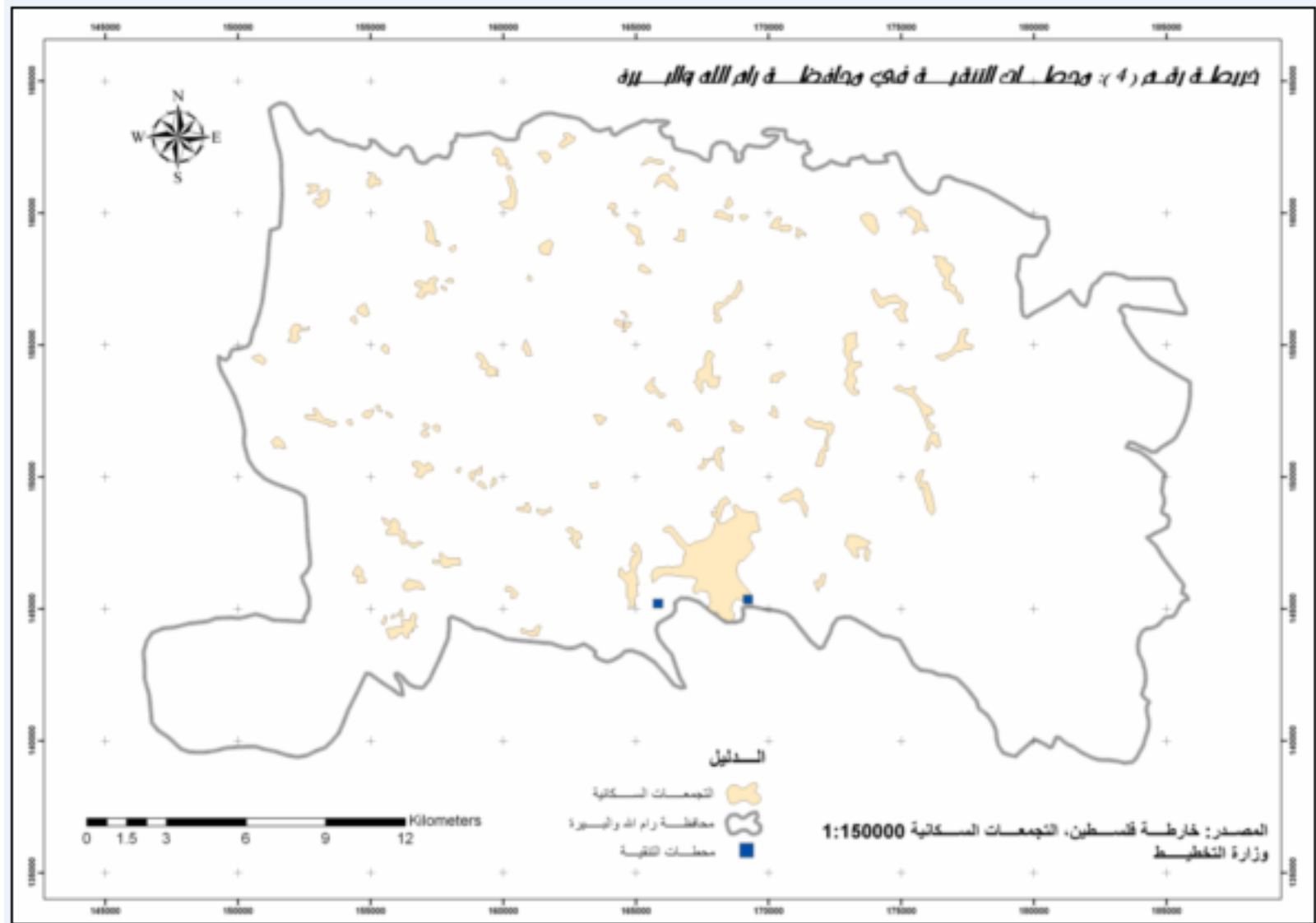
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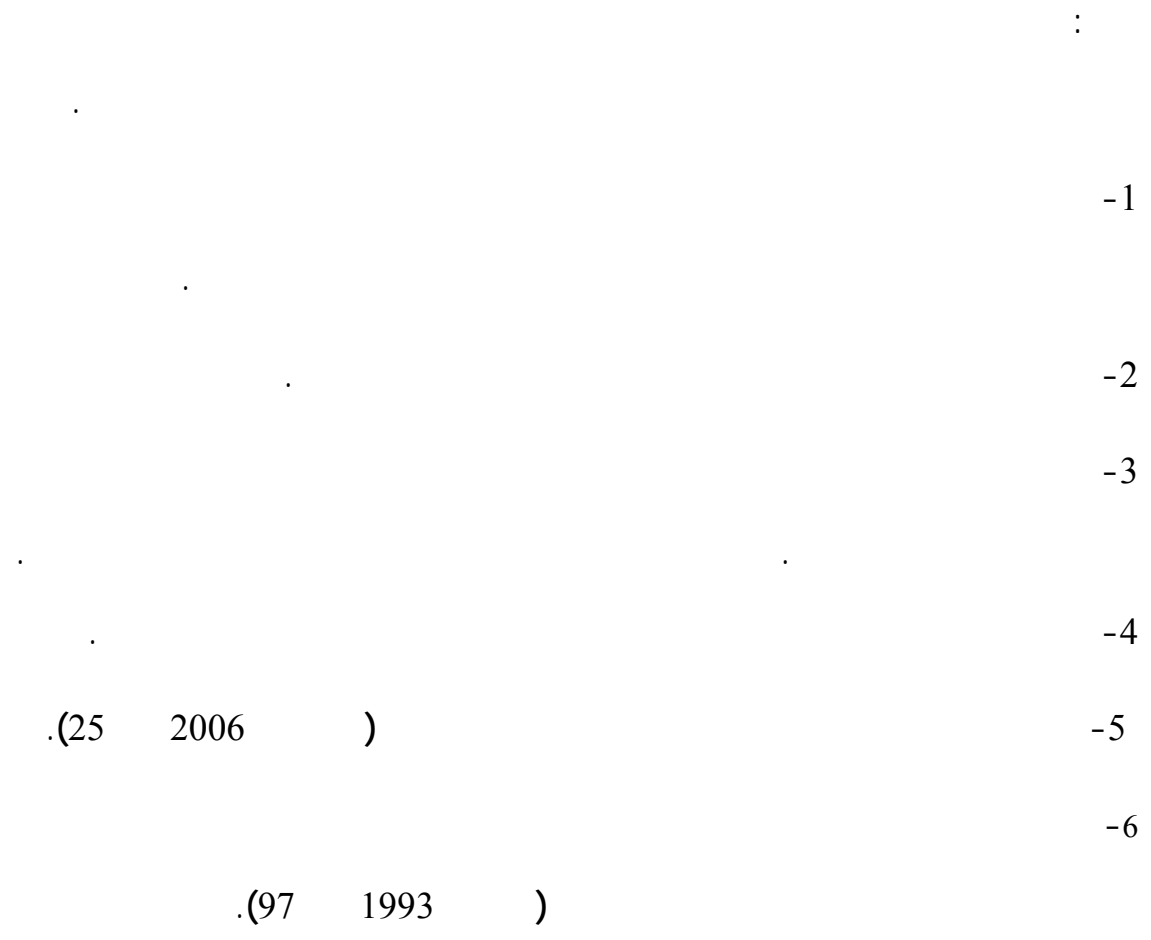
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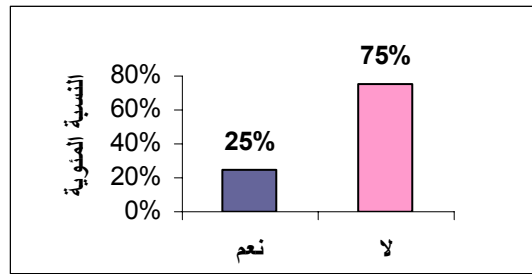
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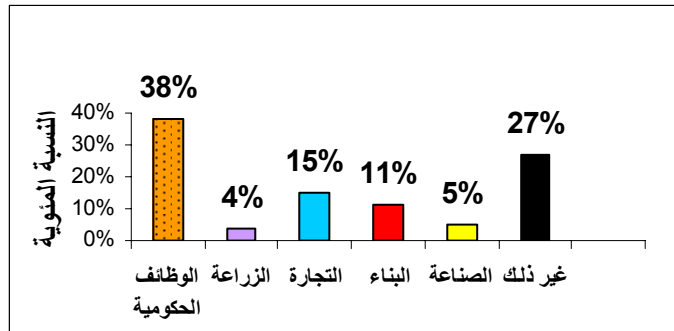
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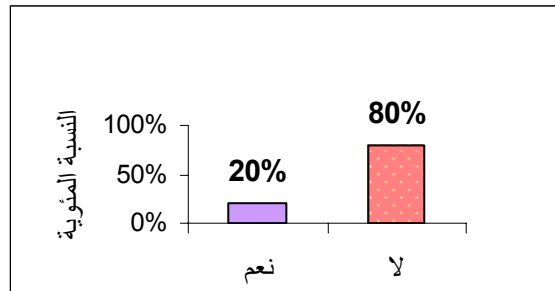
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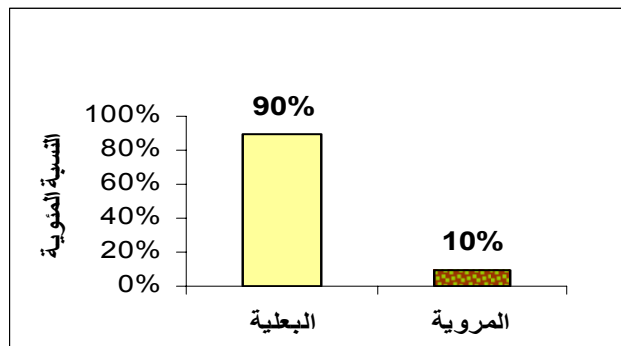
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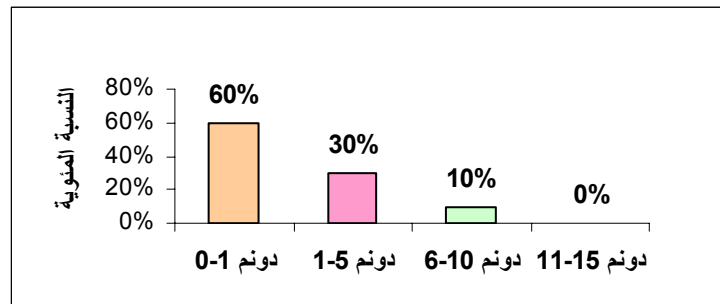
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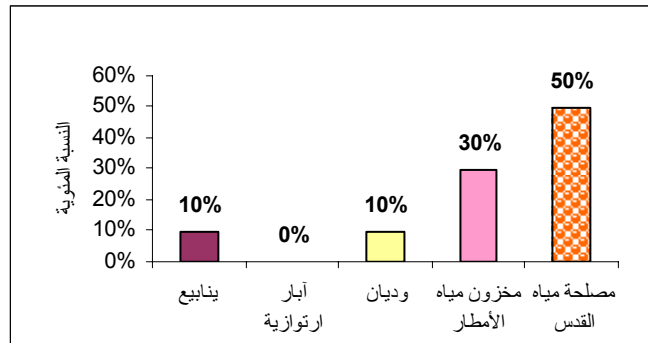
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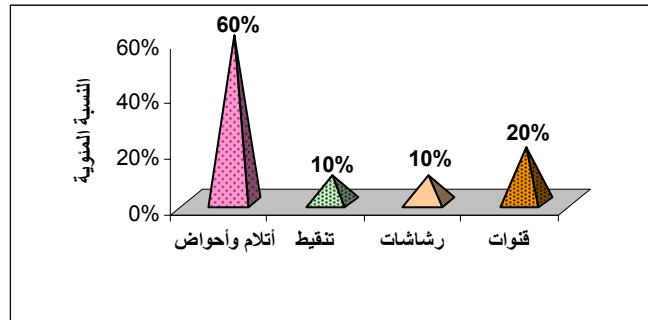
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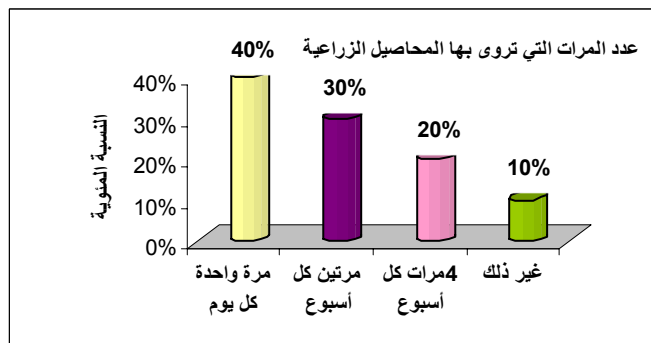
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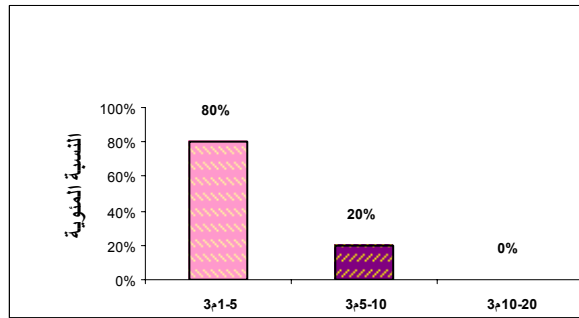
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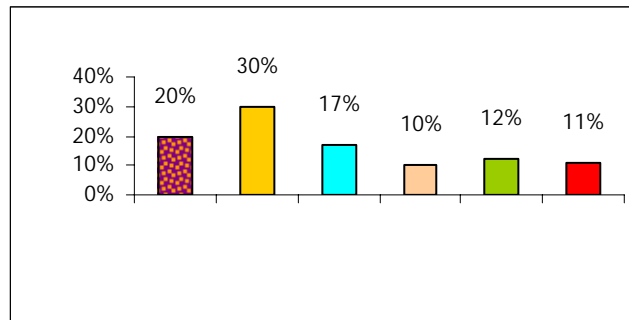


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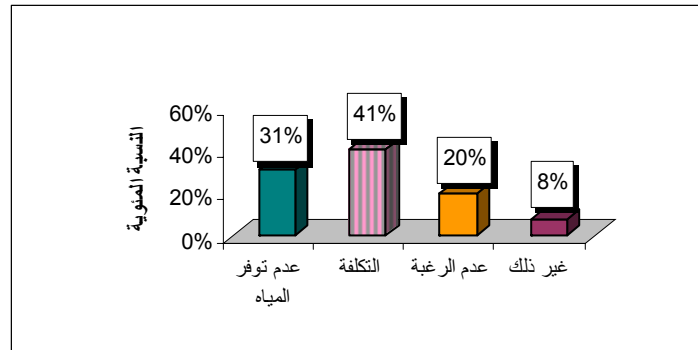


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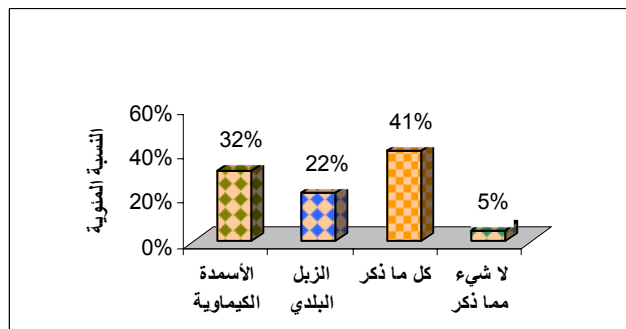
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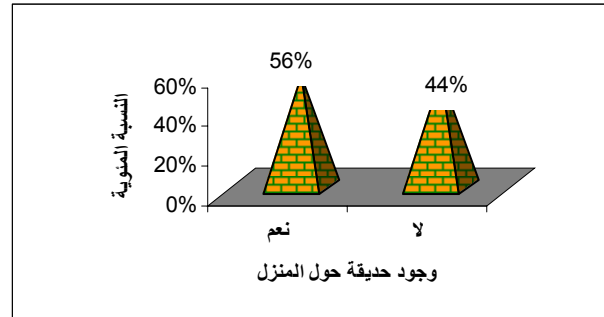
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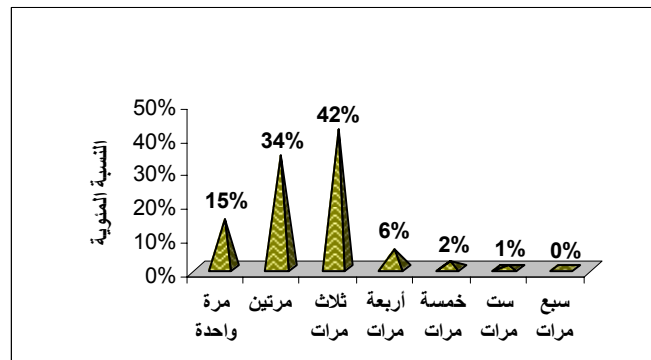
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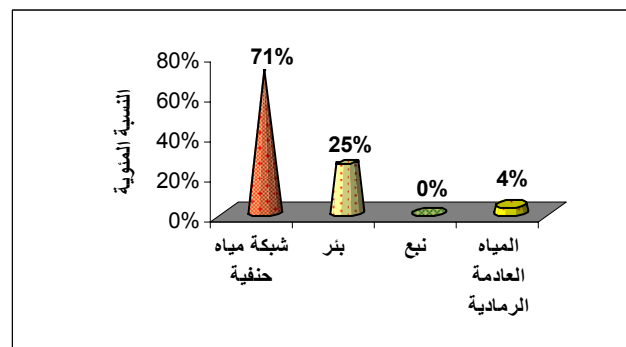
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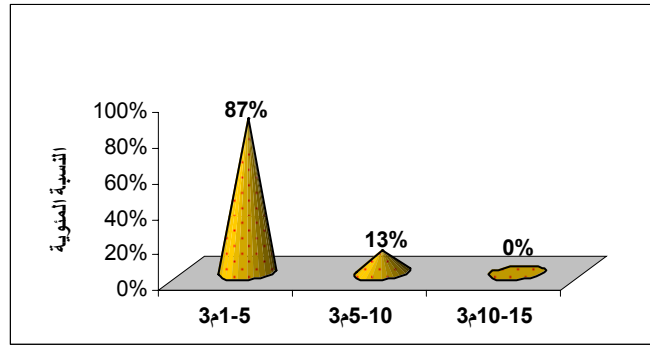
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Quzeh

.(Quzeh, 2001, p17)

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2006) (11 2006) ,(22)
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.(WHO, 2006, p103)

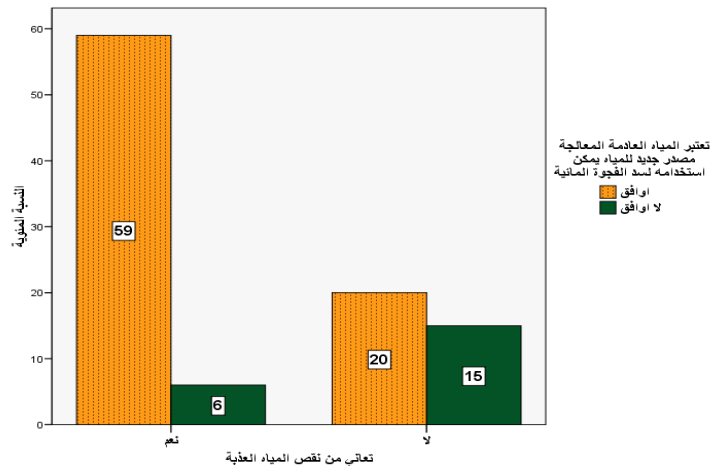
Abu Shaban .(74 ,2002 ,)

.(Abu Shaban, et.al, 2006, p1)

() (Bristow, et.al, 2002, p2)

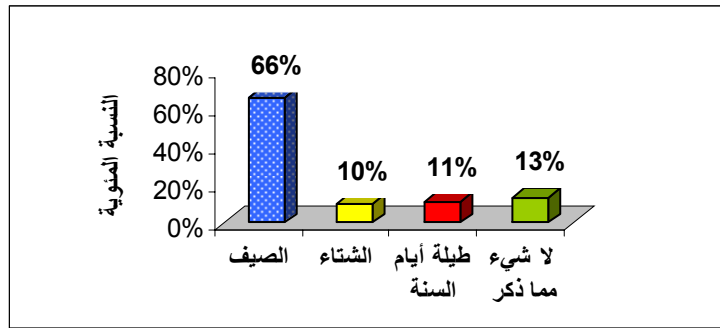
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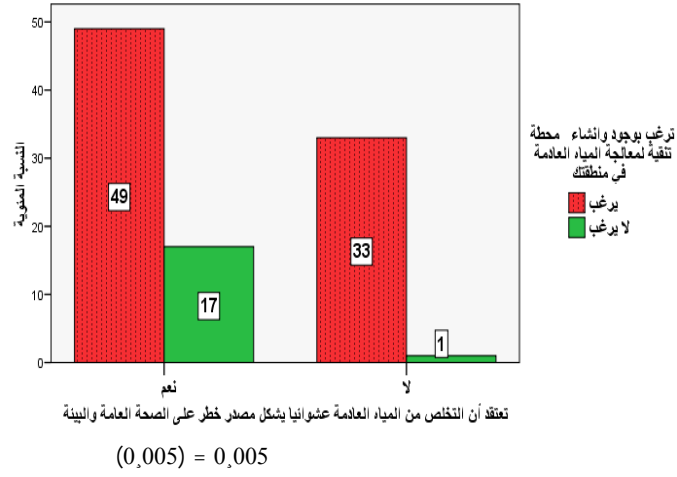
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.(26 2001)

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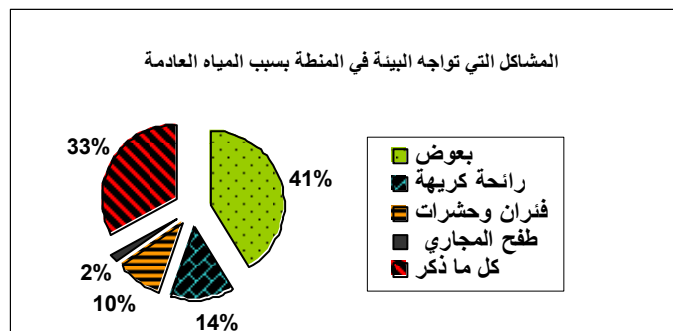


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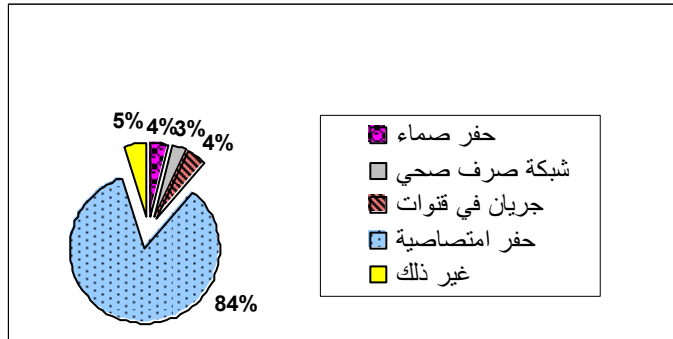
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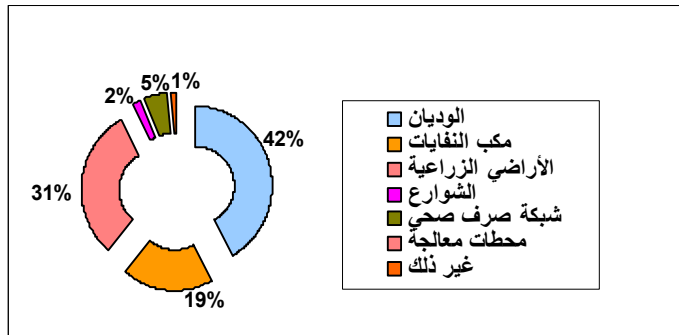
%31

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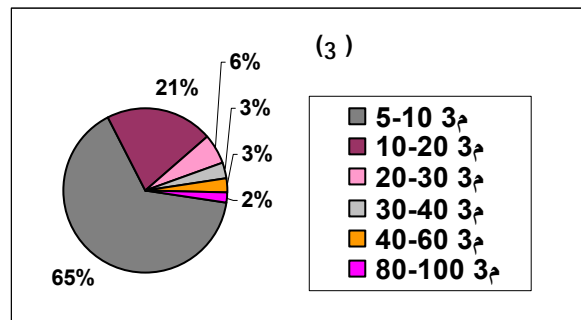
200-100

(29)

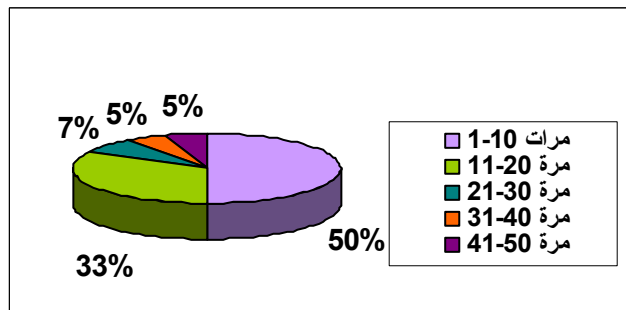
%39

(³)

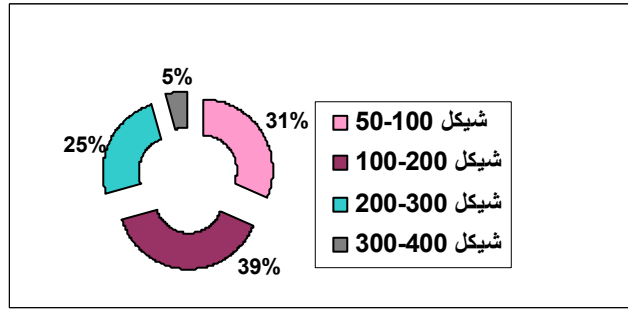
:(27)



:(28)



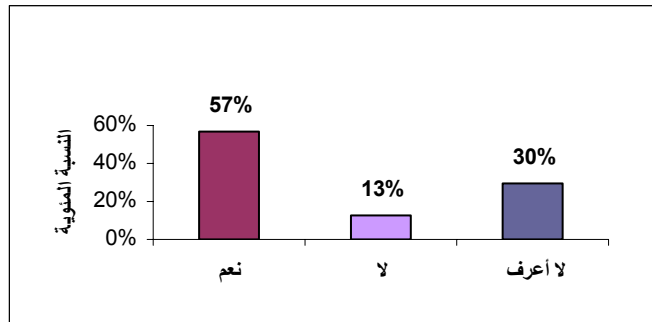
:(29)



%57

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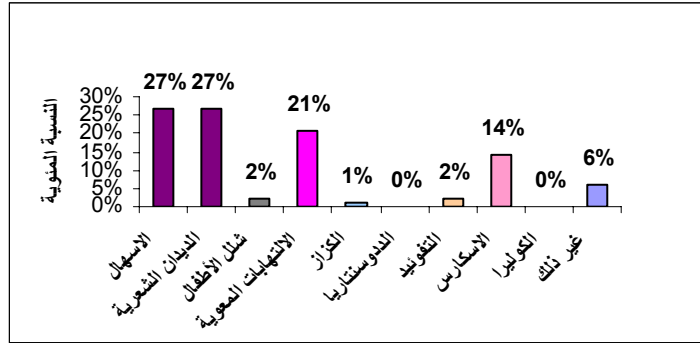
.(31)

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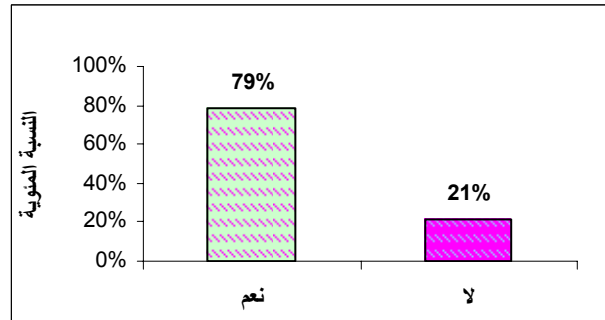
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(Dolnicar, & Schafer 2006, p2)

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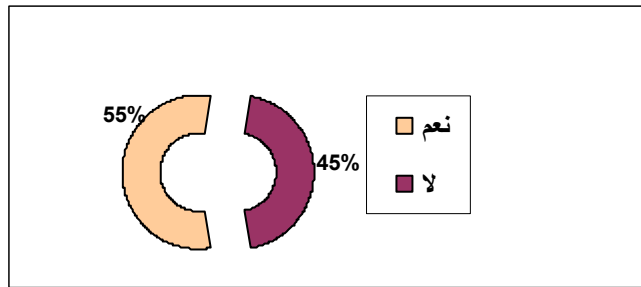
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(WHO, 2006, p102)

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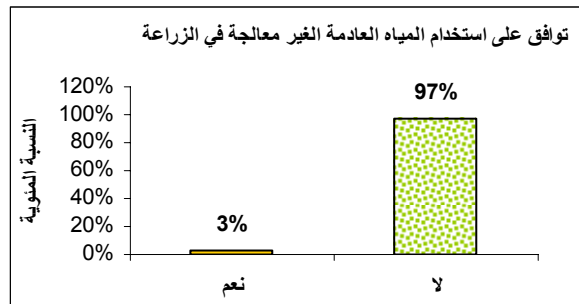
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" () (90 1993)

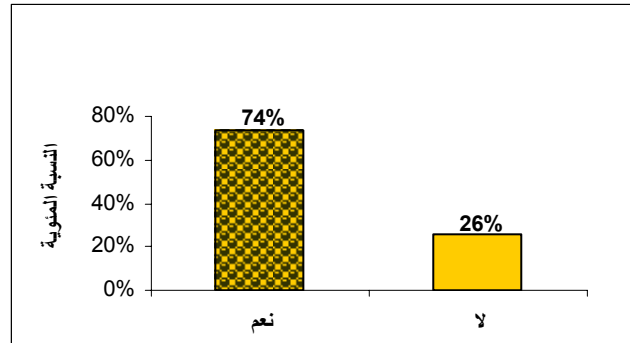
:(34)



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(Menegaki, 2006, p42)

.(Isaed, et. al., 2008, p14)

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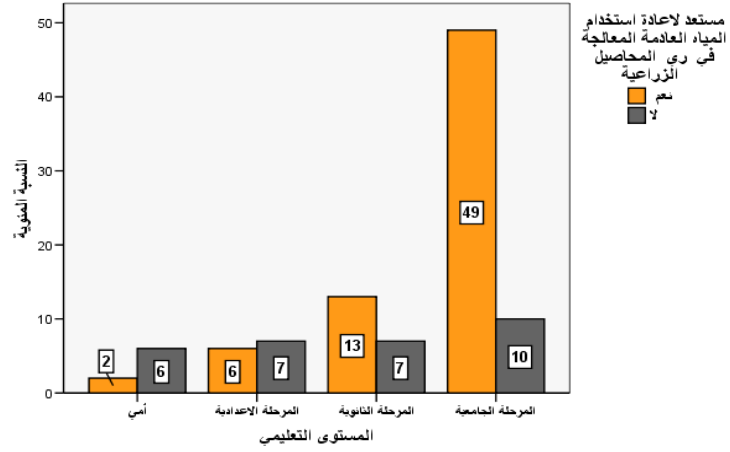
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:(36)



(0,001) = 0,005

:(8)

Wald	Degree of freedom (df)	Significant (Sig.)	Exponential (B)	المتغير المستقل
2.862	1	.091	.329	
.482	3	.923	---	30-18
.120	1	.729	1.262	45-30
.112	1	.738	.793	65-45
.043	1	.836	.654	65
5.866	2	.053	---	
4.191	1	.028	3.679	
7.076	3	.070	---	
3.280	1	.070	13.922	
6.840	1	.009	79.631	
5.578	1	.018	36.118	
9.375	3	.025	---	500
1.935	1	.164	.203	1000-500
3.964	1	.046	.077	2000-1000
.008	1	.930	1.122	2000
2.141	1	.143	.201	

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-2 .3 .3

(37)

(%52) 36

6 (%23) 16

(%9)

(Po, et. al., 2003,.p35)

(Bristow, et. al., 2002, p9)

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(Po, et. Al., 2005, p40)

.(Po, et. al., 2005, p11)

%95

.(Menegaki, 2006, p42)

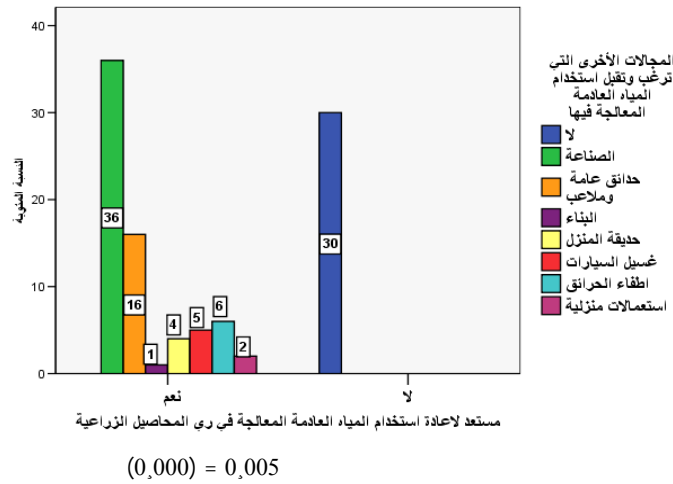
(26 2006)

%42 %38 %35)

.(%51

.(%80 %96 %97 ,%98)

:(37)



-3 .3 .3

(38)

(%53) 37

(%30) 21
(%14) 10
(%3) 2

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(14 1994)

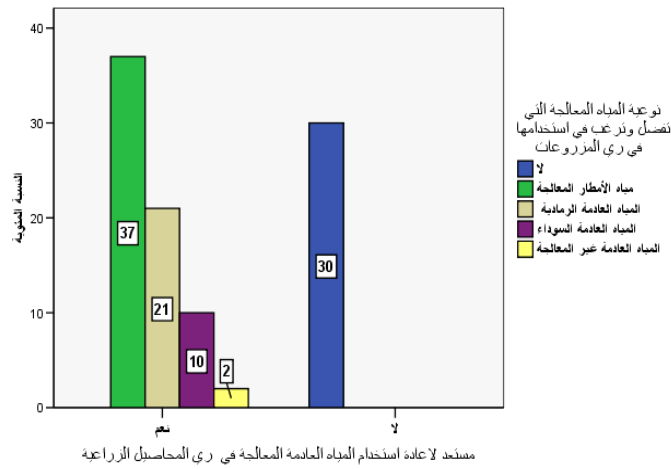
(Po, et. al., 2005, p48)

(Symc, 2002)

Macdonald, Dyack

.(Macdonald, Dyack, 2004, p11)

:(38)



(0,000) = 0,005

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-4 .3 .3

(39)

(%76) 53

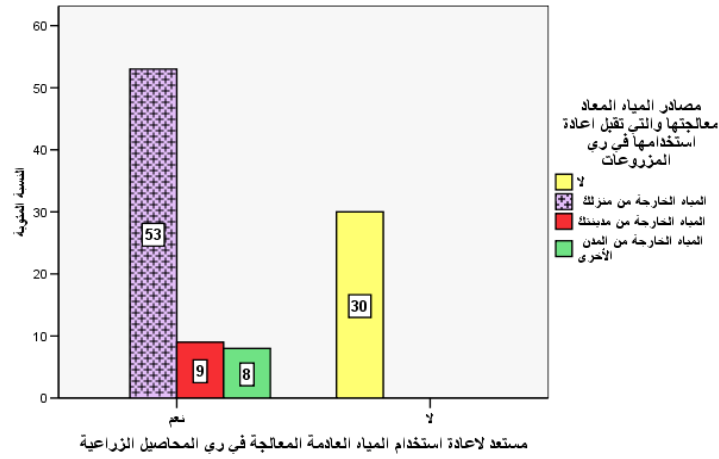
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.(Schaw, 2006, p34)

:(39)



(0,000) = 0,005

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-5 .3 .3

(7) 54 () (%77)

6) () (%10) 7

(%4) 3) (%9

%50 Po, et. al.,

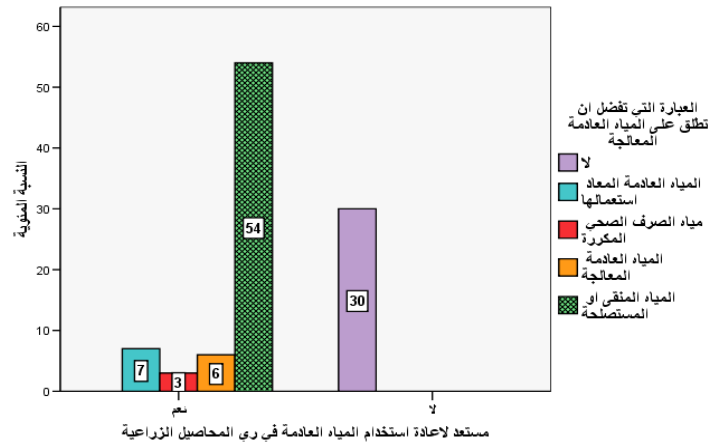
.(Po, et. al., 2005, p9)

(Po, et. al., 2003, p38)

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(Hartley, 2006, p122)

:(40)



(0,000) = 0,005

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41 (41)

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(%17) 12 ,()

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(75 ,2001 ,)

1978

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2004 (4431)

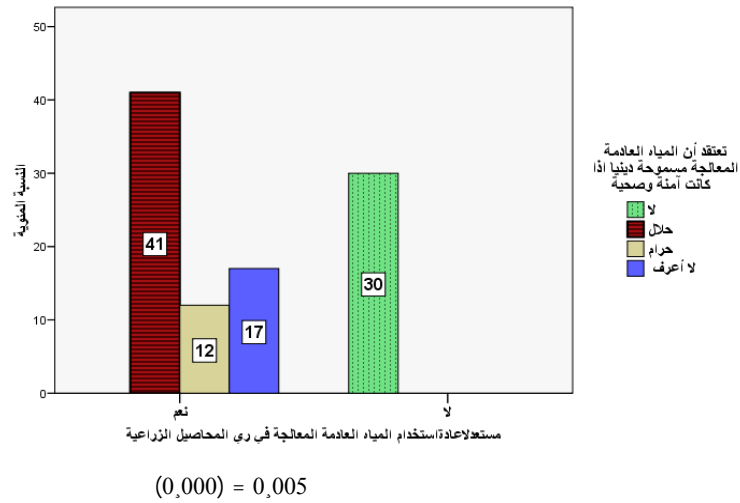
.(15 2006)

(2005)

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" (2005 68) "

:(41)



-7.3.3

(%76) 53 ,(42)

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Al-Zeer

(Isaed, et. al.,

.(Al-Zeer, 2000, p40)

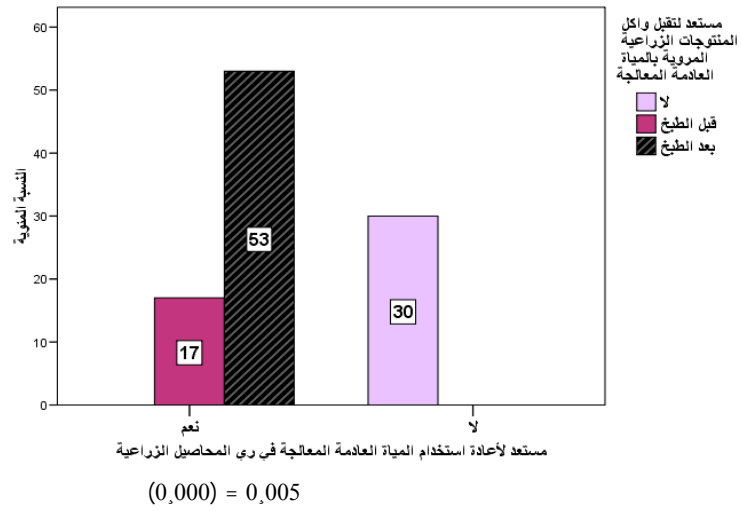
2008, p 11)

(Po, et. al., 2005, p48.)

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.(71 2002

:(42)



(43)

%33

(WHO,)

.2006, p10

(%28.5)

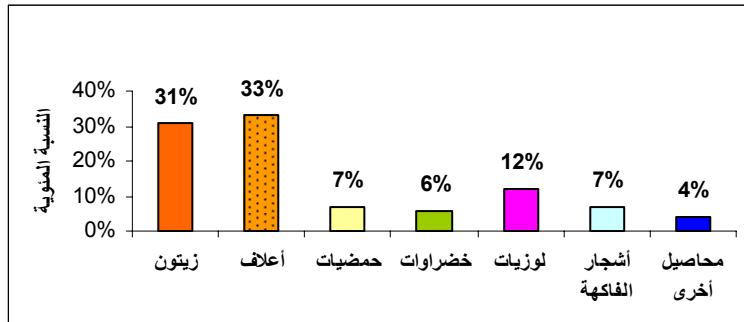
Shetty, 2001,) (%22.4)

(%45.3)

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.(p6

:(43)



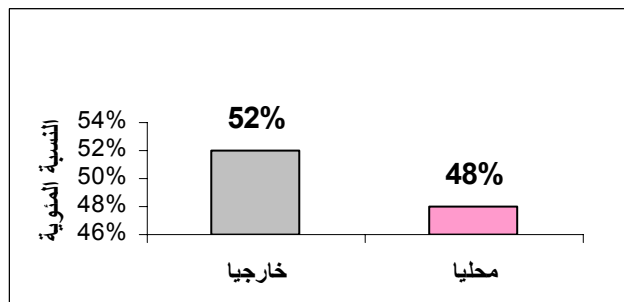
%52

%48

(2002 71) .

.(44)

:(44)



-8 .3 .3

(30) (%49)

%32

. (24 2006)

.45

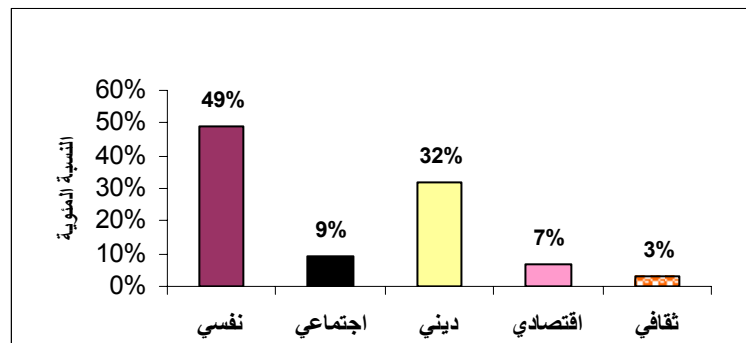
.(:

.(Po, et. al., 2003, p15)

:

.(Abu-Madi, et. al., 2003, P19)

:(45)



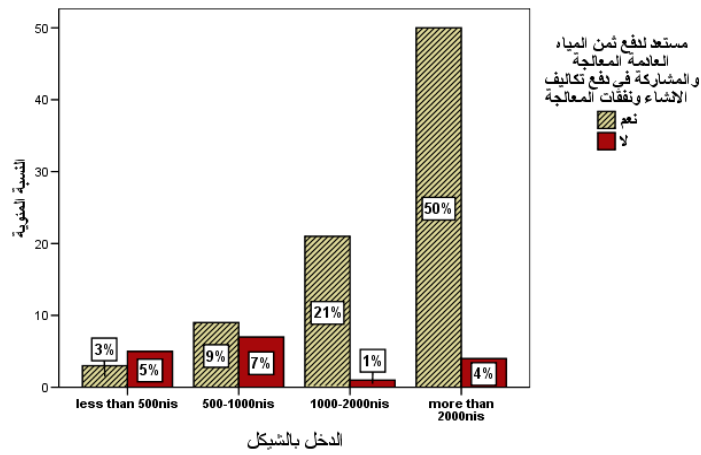
-9.3.3

2000-1000 (95%) 21 (46)
 2000 (92%) 50

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(6 2002) (15 2005)
 (Tubail, et.al., 2002, p14) (Menegaki, 2006, p45) (75 2002
 .(Abu-Madi, et. al, 2003, P19)

:(46)



(0,000) = 0,005

%53

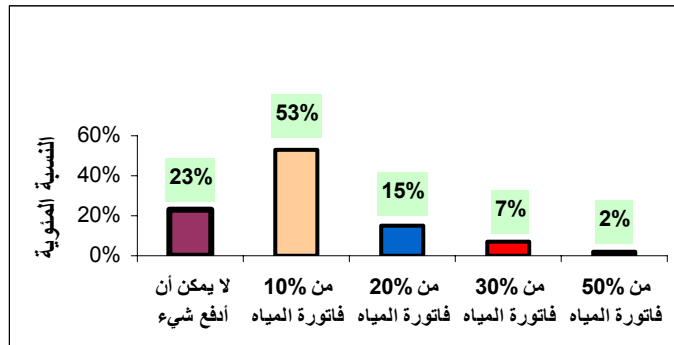
.(47)

%10

(Abu-Madi

et. al, 2003, P116)

:(47)



%63

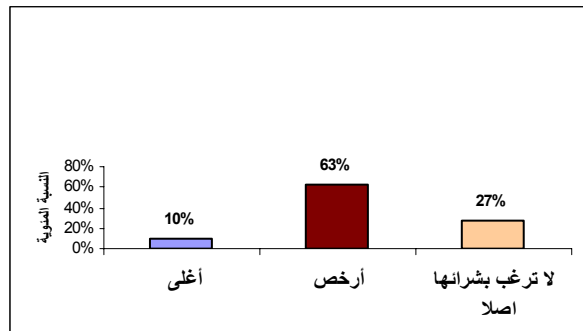
%27

(Po, et. al., 2005)

.(48)

(Isaed, et.al., 2008, p21)

:(48)



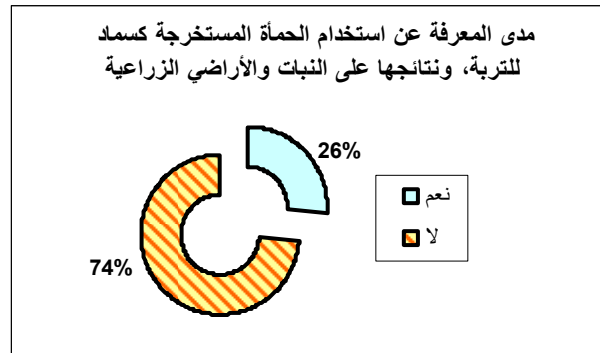
-4 .3

-1 .4 .3

74%

(49)

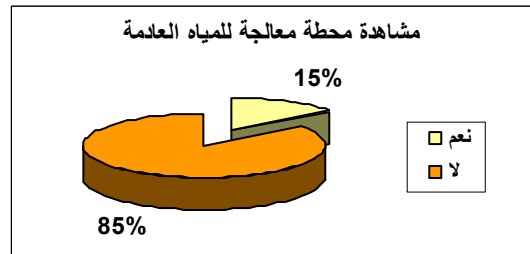
:(49)



(50)

85%

:(50)

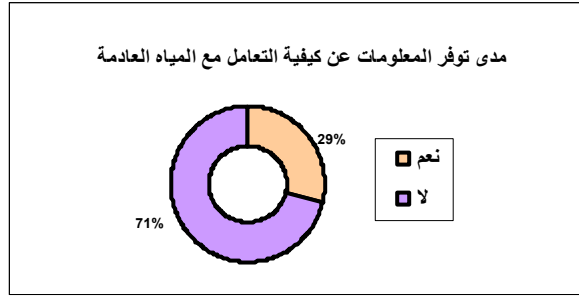


71%

(51)

(75 2001)

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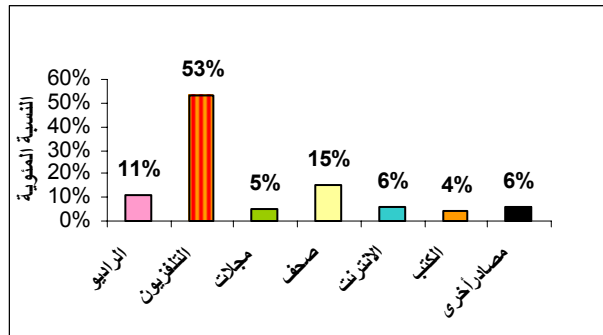
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(1999 325) .

%82

(2006 2) .

(52) :



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(53)

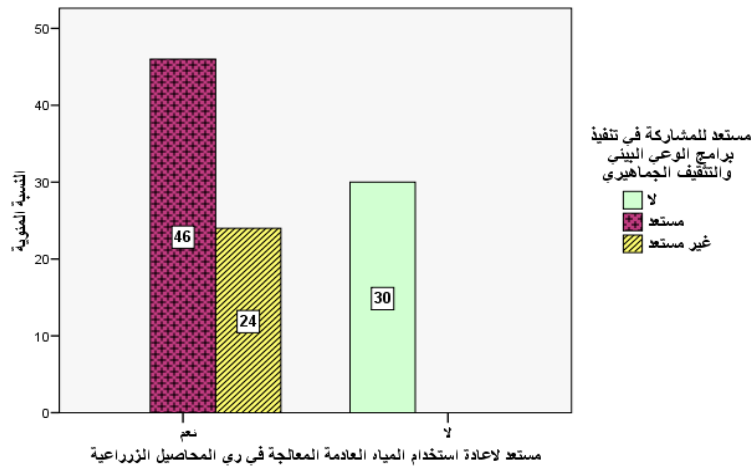
46

(66%)

(53) .

(Cherylk, 2005, p22)

:(53)



(0,000) = 0,005

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-3 .4 .3

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.(Bazza, 2003, p37)

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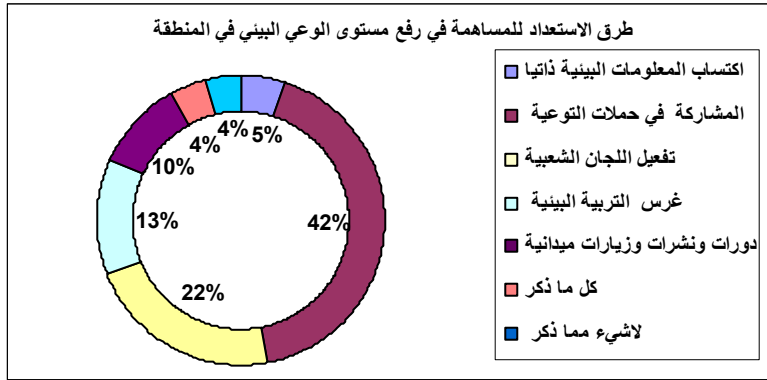
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(SPSS, EXCEL)

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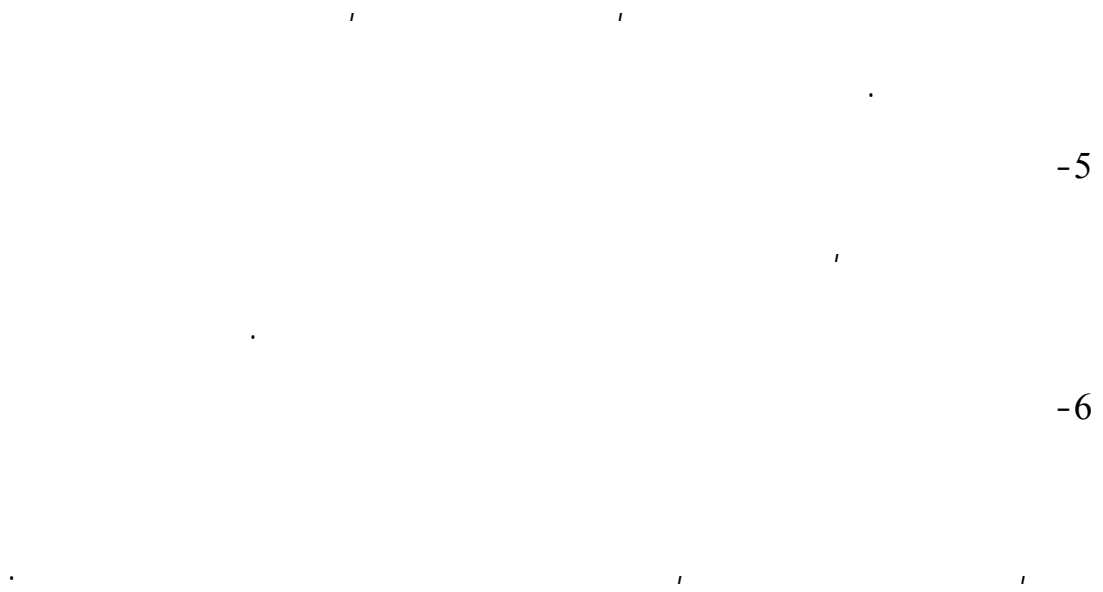
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*www.pcbs.gov.ps (2007)

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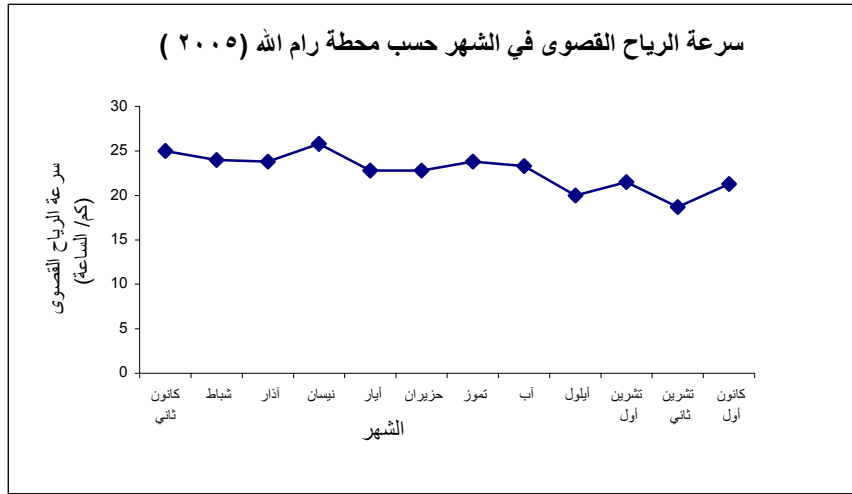
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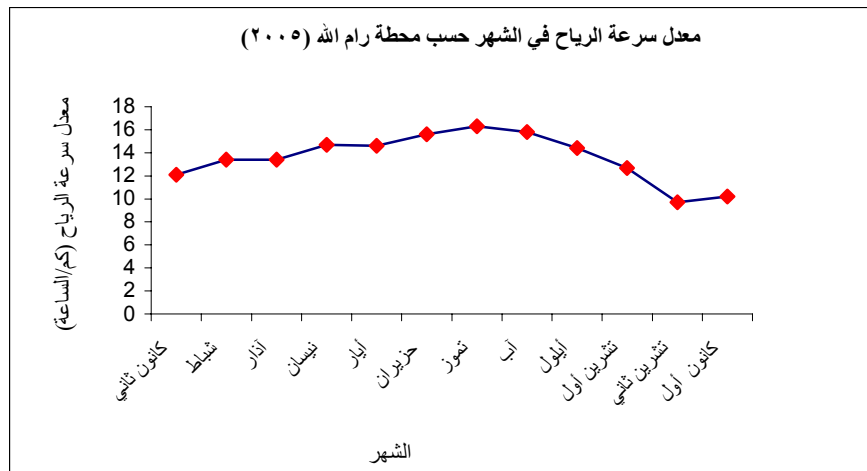
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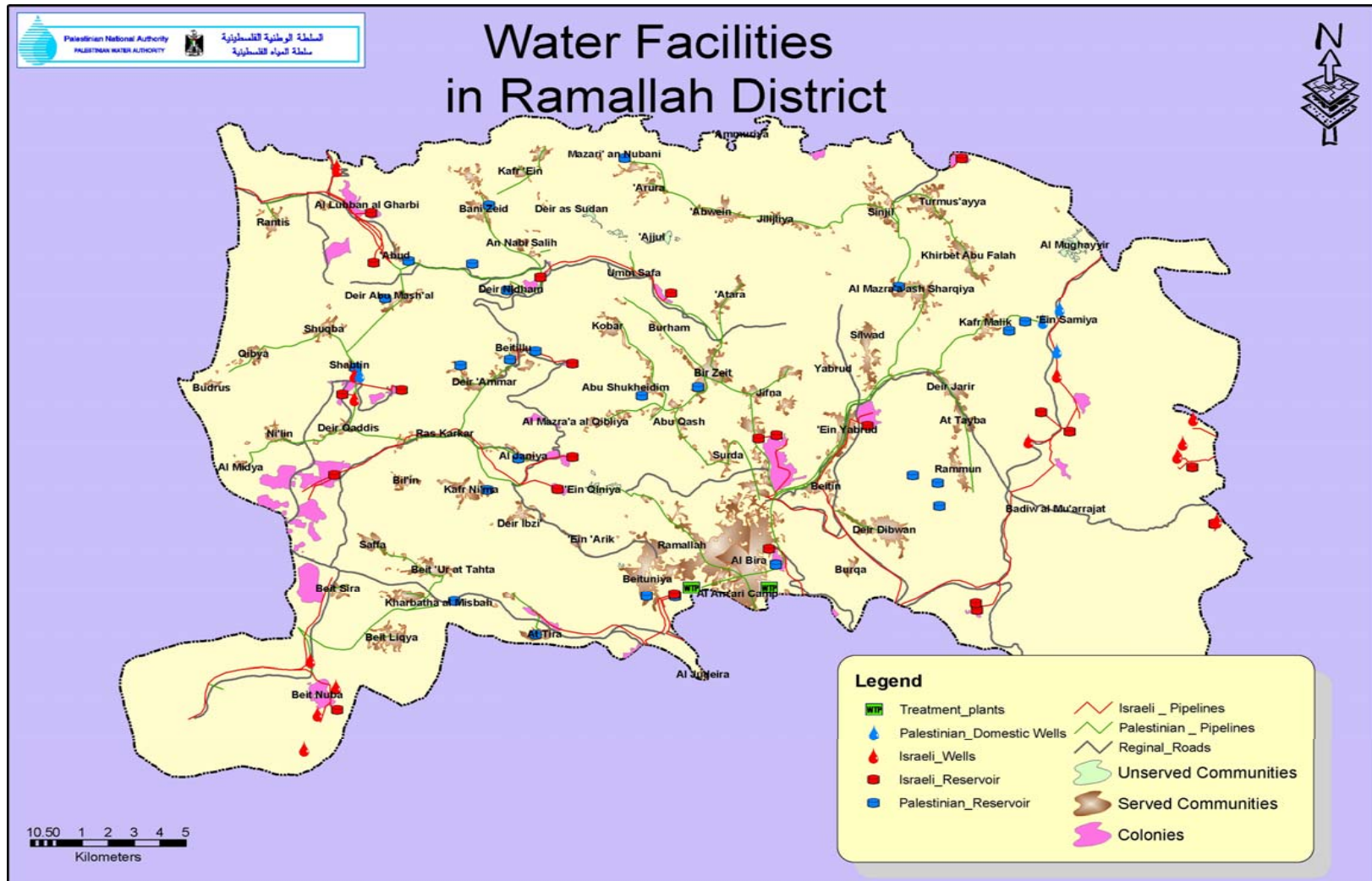
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(1) (3):



:(4) (1)

/ 3	()	()	()		()	()		
-90 130	52	48-15	37-12		60	446	1964	1
165	225	179	170		252	417	1994	a2
180	357	354	216		526	440	1980	3
62	471	469	360		616	432	1990	4
200	350	300	237		590	413	1999	6

.(25 2000) :

:(4) (2)

				(mg/L)
282	286	522	525	(BOD ₅)
560	630	1044	1390	(COD)
360	17	73	79	(Kj-N)
370	10	27	51	(NH ₄) ()
-	1	-	0.6	(NO ₃) ()
36	53	-	132	(SO ₄ (
34	16	44	13.1	(PO ₄)
-	200	1099	350	(Cl -)
-	-	554	1290	(TSS)

(Al-saed, 2003, p 3) :

:(4) (3)

	(TSS) /	(BOD ₅) /			
100/200	30	20			(A)
100/1000	30	20			(B)
100/1000	20	50			(C)
100/1000	20	90			(D)

(3 2003) :

:(4) (4)

	(/)	
	5	Al ألمنيوم
0.5 / 6.0 / 1.0 /	15-0,5	B
5 / 0.5 /	0,1	Be بيريلىوم
/ 1.0-0.1	0,01	Cd
/ 0.01	0,05	Co كوبلت
	0,1	Cr كروم
/ 0.1	0,2	Cu
	1	F
	5	Fe حديد
/ 5 (/ 0.075)	2,5	Li
	0,2	Mn
5.0-0.5 /	0,2	Ni نيكال
	5	Pb
(/ 0.025)	0,02	Se
	0,1	V
6	2	Zn

(54-53 2001

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<http://www.waj.gov.jo/Top/waj/wastewater/wastewater/ reuse/relegious.htm>