

السلطة الوطنية الفلسطينية
الجهاز المركزي للإحصاء الفلسطيني

مشروع النشر والتحليل لبيانات التعداد الزراعي، 2010

أثر خصائص الحائزين الزراعيين على استيعاب التكنولوجيا الحديثة
في الأراضي الفلسطينية

إعداد

معهد أبحاث السياسات الاقتصادية (ماس)

آب/أغسطس، 2013

تم إعداد هذا التقرير حسب الإجراءات المعيارية المحددة في ميثاق الممارسات
للإحصاءات الرسمية الفلسطينية 2006

© رمضان، 1434هـ - آب، 2013.
جميع الحقوق محفوظة.

في حالة الاقتباس، يرجى الإشارة إلى هذه المطبوعة كالتالي:

الجهاز المركزي للإحصاء الفلسطيني، 2013. مشروع النشر والتحليل لبيانات التعداد الزراعي 2010، أثر خصائص
الحائزين الزراعيين على استيعاب التكنولوجيا الحديثة في الأراضي الفلسطينية. رام الله - فلسطين.

جميع المراسلات توجه إلى:

الجهاز المركزي للإحصاء الفلسطيني
ص.ب. 1647، رام الله - فلسطين

هاتف: 2 298 7200 (970/972)

فاكس: 2 298 7210 (970/972)

الرقم المجاني: 1800300300

بريد إلكتروني: diwan@pcbs.gov.ps

صفحة إلكترونية: <http://www.pcbs.gov.ps>



شكر وتقدير

تم تمويل هذه الدراسة من البنك الدولي (WB)، يتقدم الجهاز المركزي للإحصاء الفلسطيني بجزيل الشكر والتقدير إلى البنك الدولي (WB)، على مساهمته القيمة بإعداد وطباعة هذه الدراسة.

فريق العمل

- إعداد التقرير
د. فتحي السروجي

- سكرتاريا
ايمان فرهود

- تصميم جرافيك
احمد سوالمه

- تدقيق معايير النشر
حنان جناجره

- المراجعة الأولية
د. رائد الكوني
أحمد مرداوي
محمود عبد الرحمن

- المراجعة النهائية
محمود جرادات

- الإشراف العام
علا عوض

رئيس الجهاز

تنويه للمستخدمين

- الآراء والأفكار الواردة في هذه الدراسة تعبر عن رأي معدها، ولا تعبر بالضرورة عن رأي الجهاز المركزي للإحصاء الفلسطيني أو موقفه الرسمي.
- اعتمد معد هذه الدراسة على بيانات الجهاز المركزي للإحصاء الفلسطيني والمصادر الأخرى ولا يتحمل الجهاز مسؤولية أي خطأ في البيانات.

تقديم

تعتبر التعدادات من أهم مصادر البيانات حيث قام الجهاز المركزي للإحصاء الفلسطيني بتنفيذ التعداد الزراعي الأول عام 2010، وقد تم الحصول من خلاله على مجموعة متكاملة من البيانات المتعلقة بخصائص الحائزين الزراعيين والحيازات الزراعية والتكنولوجيا الزراعية المستخدمة في الحيازات، كما قام الجهاز بتنفيذ المسوح الزراعية وهي المسح الزراعي الهيكلي ومسح البستنة الشجرية وقد اعتمدت هذه الدراسة على نتائج تلك المصادر حيثما أمكن.

وحرصاً منه على الاستفادة القصوى من هذه البيانات قام الجهاز بإصدار سلسلة من التقارير الإحصائية من بيانات التعداد الزراعي والمسوح المختلفة ومنها التقارير التفصيلية للنتائج النهائية للتعداد الزراعي.

واستكمالاً لعمليات نشر وتعميم بيانات التعداد ولتحقيق الاستخدام الأمثل لهذه البيانات يقوم الجهاز المركزي للإحصاء الفلسطيني بتنفيذ مشروع النشر والتحليل لبيانات التعداد الزراعي، ويشمل هذا المشروع إعداد سلسلة من التقارير التحليلية لنتائج التعداد، لإتاحة المجال لأفراد المجتمع لفهم وإدراك أفضل لبيانات التعداد الزراعي.

يسرنا أن نقدم هذه الدراسة التحليلية كأحد مخرجات المشروع كي تكون مرجعاً للمخططين ومتخذي القرارات في القطاعين العام والخاص وجميع فئات المستخدمين من أجل بناء الدولة الفلسطينية على أسس علمية سليمة.

علا عوض

رئيس الجهاز

آب، 2013

قائمة المحتويات

الصفحة	الموضوع
15	المقدمة
15	الفصل الأول:
15	1.1 مشكلة الدراسة
15	2.1 أهداف الدراسة
16	3.1 أهمية الدراسة
16	4.1 منهجية الدراسة
16	5.1 حدود الدراسة
17	6.1 محتوى الدراسة
19	الفصل الثاني:
19	خافية نظرية واستطلاع دراسات سابقة
19	1.2 خلفية نظرية
21	2.2 استطلاع سابقة
23	الفصل الثالث:
23	خصائص الحائزين الزراعيين واستخدام التكنولوجيا الحديثة
23	1.3 خصائص الحائزين الزراعيين
29	2.3 استخدام اساليب الزراعة الحديثة
35	الفصل الرابع:
35	اثر خصائص الحائزين الزراعيين واستخدام التكنولوجيا الحيوية
35	1.4 الكيان القانوني للحائز واستخدام البذور والأبصال والدرنات والأشتال المحسنة
37	2.4 عمر الحائز واستخدام البذور والأبصال والدرنات والأشتال المحسنة
38	3.4 جنس الحائز واستخدام البذور والأبصال والدرنات والأشتال المحسنة
39	4.4 المهنة الرئيسية للحائز واستخدام البذور والأبصال والدرنات والأشتال المحسنة
40	5.4 عدد أفراد أسرة الحائز واستخدام البذور والأبصال والدرنات والأشتال المحسنة
42	6.4 المؤهل العلمي للحائز واستخدام البذور والأبصال والدرنات والأشتال المحسنة
44	7.4 التخصص العلمي للحائز واستخدام البذور والأبصال والدرنات والأشتال المحسنة
45	8.4 أسلوب إدارة الحيازة واستخدام البذور والأبصال والدرنات والأشتال المحسنة
46	9.4 الغرض الأساسي من الإنتاج واستخدام البذور والأبصال والدرنات والأشتال المحسنة
49	الفصل الخامس:
49	أثر خصائص الحائزين على استخدام التكنولوجيا الكيماوية
49	1.5 خصائص الحائزين واستخدام الأسمدة الكيماوية
62	2.5 خصائص الحائزين واستخدام المبيدات الكيماوية

75	خصائص الحائزين واستخدام التكنولوجيا الميكانيكية	الفصل السادس:
75	1.6 الكيان القانوني للحائز واستخدام الآلات والمعدات الزراعية	
77	2.6 عمر الحائز واستخدام الآلات والمعدات الزراعية	
87	3.6 جنس الحائز واستخدام الآلات والمعدات الزراعية	
79	4.6 المهنة الرئيسية للحائز واستخدام الآلات والمعدات الزراعية	
80	5.6 عدد أفراد أسرة الحائز واستخدام الآلات والمعدات الزراعية	
82	6.6 المؤهل العلمي للحائز واستخدام الآلات والمعدات الزراعية	
84	7.6 التخصص العلمي للحائز واستخدام الآلات والمعدات الزراعية	
85	8.6 أسلوب إدارة الحيازة واستخدام الآلات والمعدات الزراعية	
86	9.6 الغرض الأساسي من الإنتاج للحائز واستخدام الآلات والمعدات الزراعية	
89	خصائص الحائزين واستخدام المكافحة المتكاملة	الفصل السابع:
89	1.7 الكيان القانوني للحائز واستخدام المكافحة المتكاملة	
91	2.7 عمر الحائز واستخدام المكافحة المتكاملة	
92	3.7 جنس الحائز واستخدام المكافحة المتكاملة	
93	4.7 المهنة الرئيسية للحائز واستخدام المكافحة المتكاملة	
94	5.7 عدد أفراد أسرة الحائز واستخدام المكافحة المتكاملة	
96	6.7 المؤهل العلمي للحائز واستخدام المكافحة المتكاملة	
98	7.7 التخصص العلمي للحائز واستخدام المكافحة المتكاملة	
99	8.7 أسلوب إدارة الحيازة واستخدام المكافحة المتكاملة	
100	9.7 الغرض الأساسي من الإنتاج للحائز واستخدام المكافحة المتكاملة	
103	الاستنتاجات والتوصيات	الفصل الثامن
103	1.8 الاستنتاجات	
110	2.8 التوصيات	
113	المراجع	

-
-
-
-

3.1

2010

4.1

2010

.()

χ^2

(One-way ANOVA)

5.1

(2011)

%71

.()

1.2

%50
()

.(2011)

.(2003)

.(Ruttan, 1980)

.(Ruttan, 1980)

.(Integrated Pest Management: IPM)

.(2007)

.(Wozniak, 1987; Lo and Sutthiphisal, 2010)

.(Davies, 1979; Frambach and Schillewairt, 2002)

(Flaig and Stadler, 1994)

.(Bertschek, 1995; Aghion et al., 2009)

.()

:

:

.()

:

:

:

.(

(Rogers and Stanfield, 1968)

.(Weir and Knight, 2003)

2.2

1.2.2

(Wozniak, 1987)

(Lo and Sutthiphisal, 2010)

(Ihli et al., 2012)

2.2.2

(Petros, 2010)

130

(Binary Logit¹)

.(

:1)

1

.....
.....
.....
.....
.....
.....
.....
.....
.....

1.3

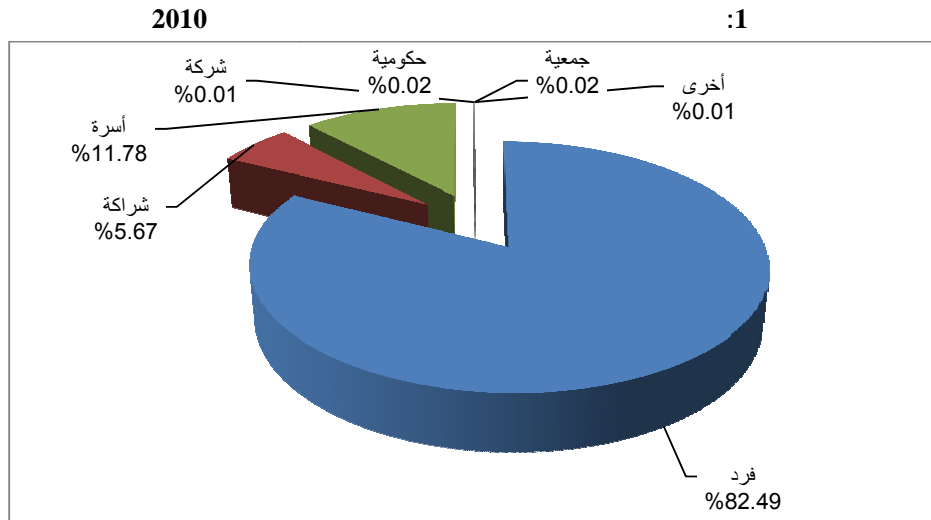
1.1.3

.....
..... :
..... (2011)

(1)

(%82)
 (%81)
 (%89)
 (%12)
 (%6)
 (%7)
 (%13)
 (%5 %6)
 (%1)
 58

3



2.1.3

98 15

51.5

50.5

51.6

53.8

30

48.8

47.2

(2)

60

60-46

45-31

-46

%39

37,751

60

45-30

%71

%32

31,129

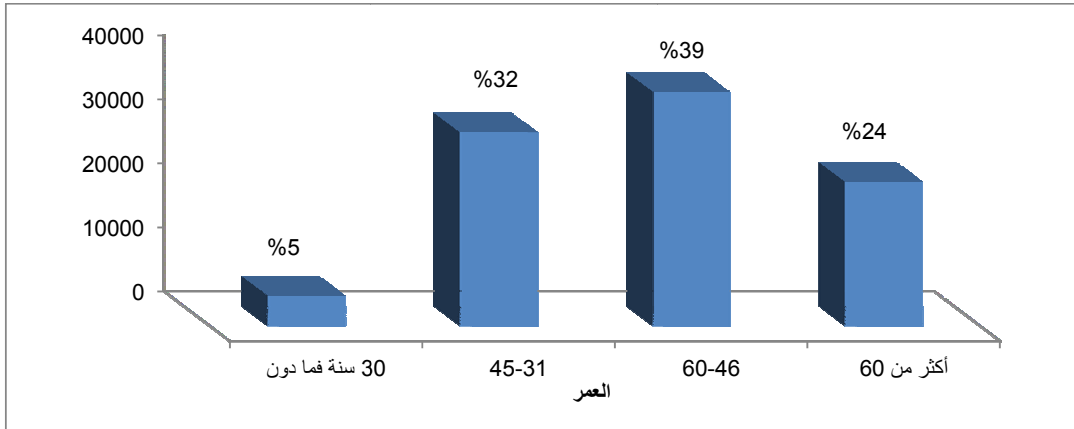
%24

60-31

%5 (30)

2010

:2



3.1.3

(3)

%88

%87

%90

%7

%4

%6

%7

%0.1

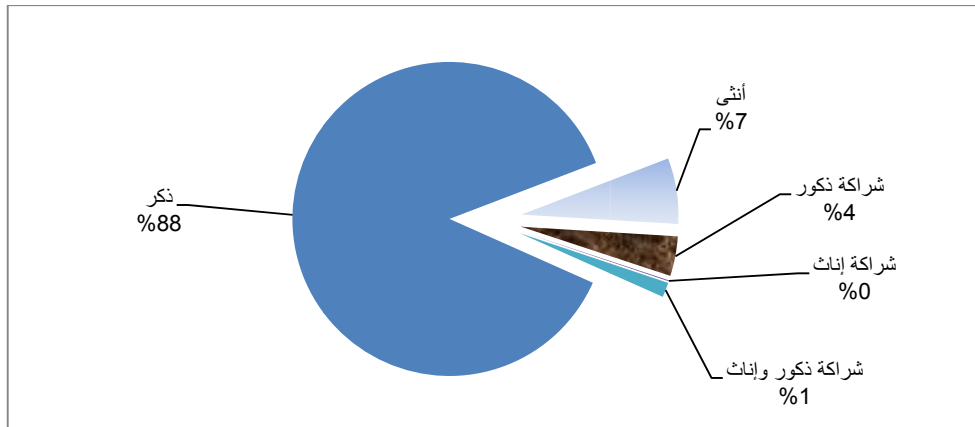
%1.5

%1

%2

2010

:3



4.1.3

%25

%75

%60

%.22

%40

%78

5.1.3

(9-6)

(5-4)

(3-2) ()

(4)

10

48,143

(9-6)

(5-4)

.(%50)

%21

19,945

(3-2)

%16

15,081

11,827

%12

%2

2,010 ()

(3-2)

(5-4)

(9-6)

%16

%21

%50

()

%2

%1

%13

%18

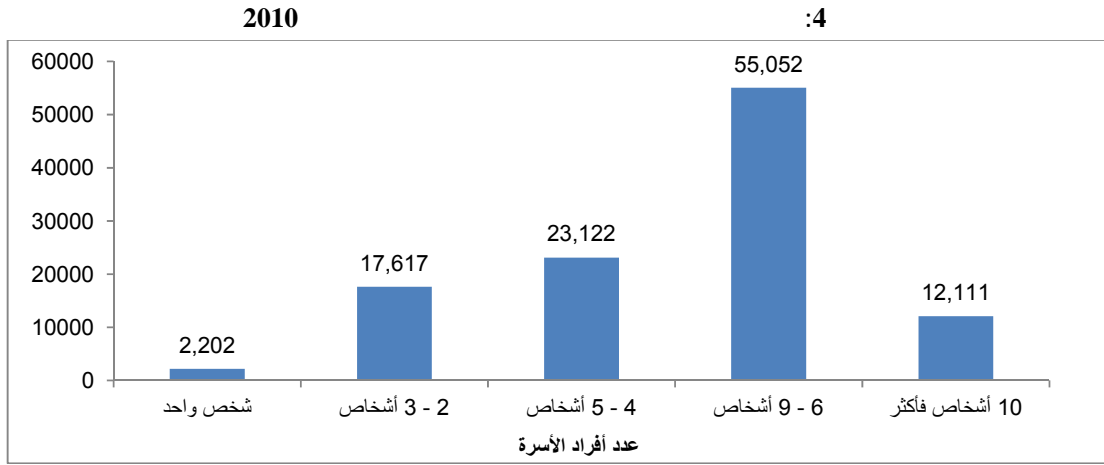
%47

10

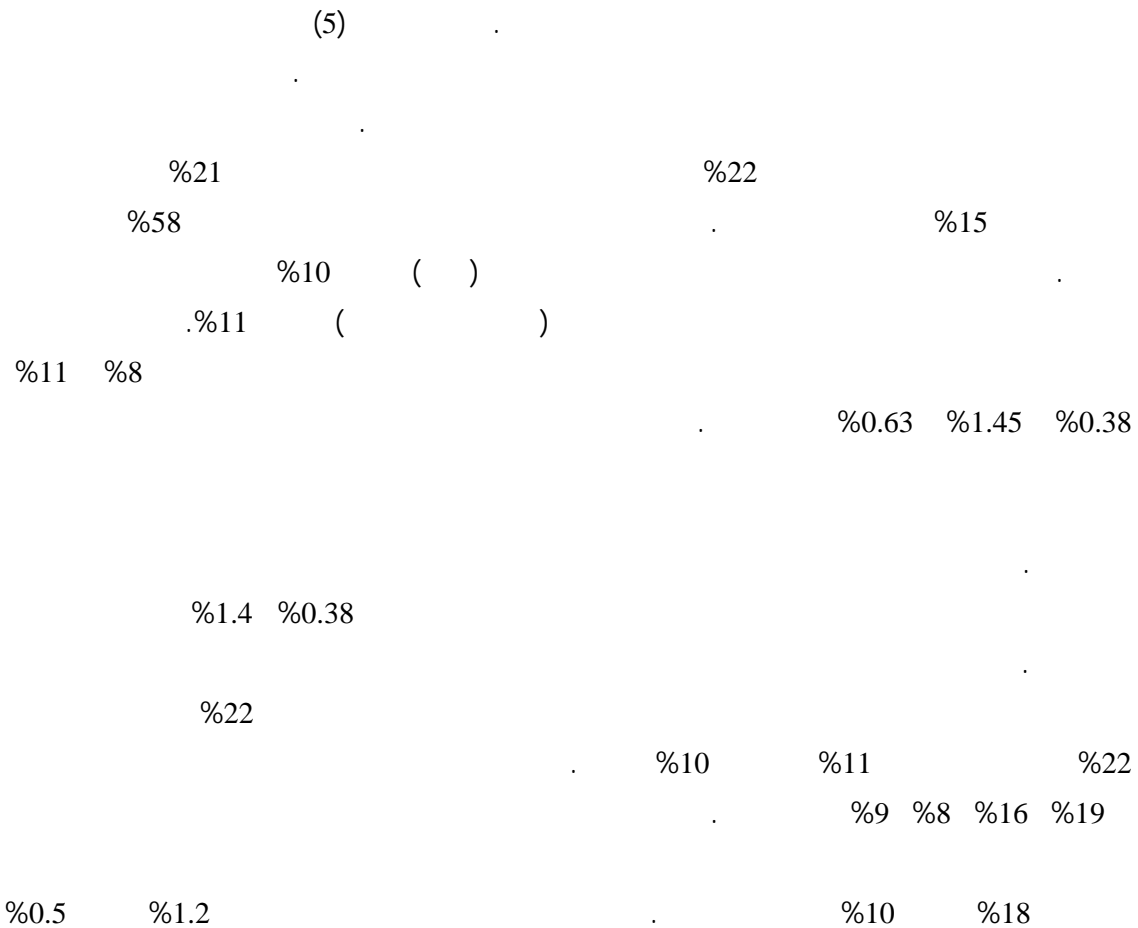
10

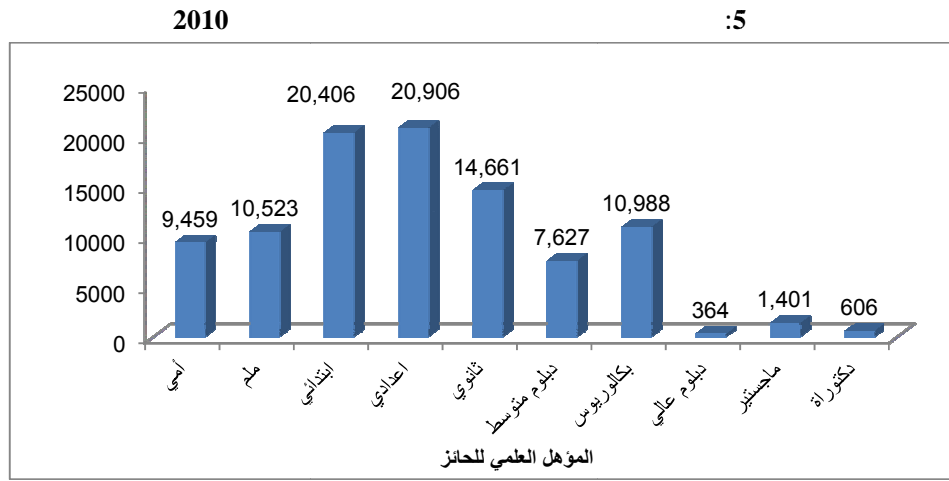
%.10

%20



6.1.3





7.1.3

%5

%95

%4

%8

%96 %92

8.1.3

(6)

.%74

%2

.%24

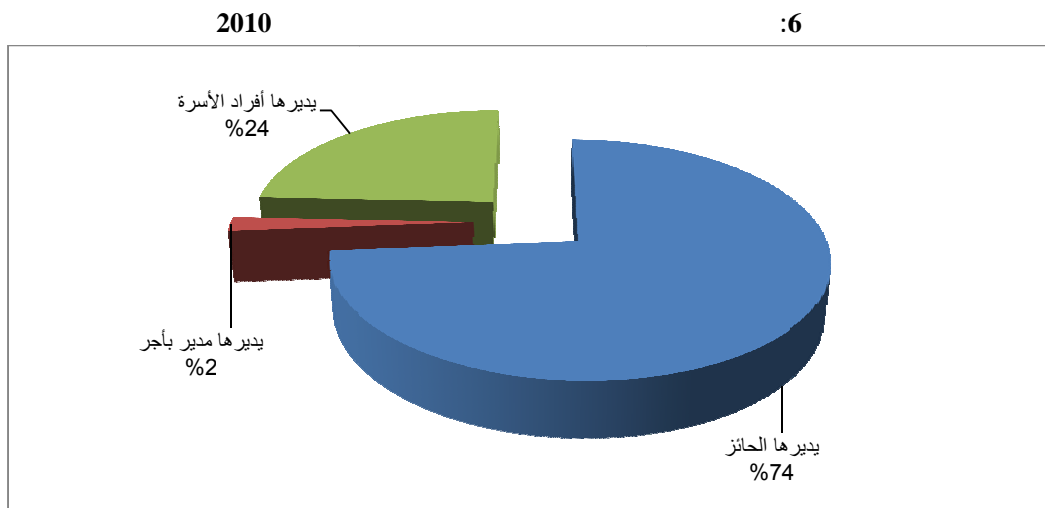
%80

.%73

.%1.8 %2.4

%26

.%18



9.1.3

.%76

.%24

.%55

.%19

2.3

) ()
() ()

1.2.3

(%25)

(%75)

%22

%38

%31

%50

%69

%44

%45

%13

%12

)

(

2.2.3

%35

(%65)

%25

%74

%26

%46

%73

%76

%74

%39

.%18

%12

)

(

(%50)

%74

%44

%62

%87

%72

%75

%67

.%27

%16

)

(

3.2.3

(%40)

%60

)

(%25

)

.(%50

%35

%59

%68

%70

%88

%84

%80

%70

.(%63

%51

)

(

3.2.4

%18

%82

%16

%30

%29
%37
%35
%57
%38
%10
%3
)
(

(1.2.3)

%25

1.4

(7)

(%82)

(1)

19,271

%12

2,871

1,498

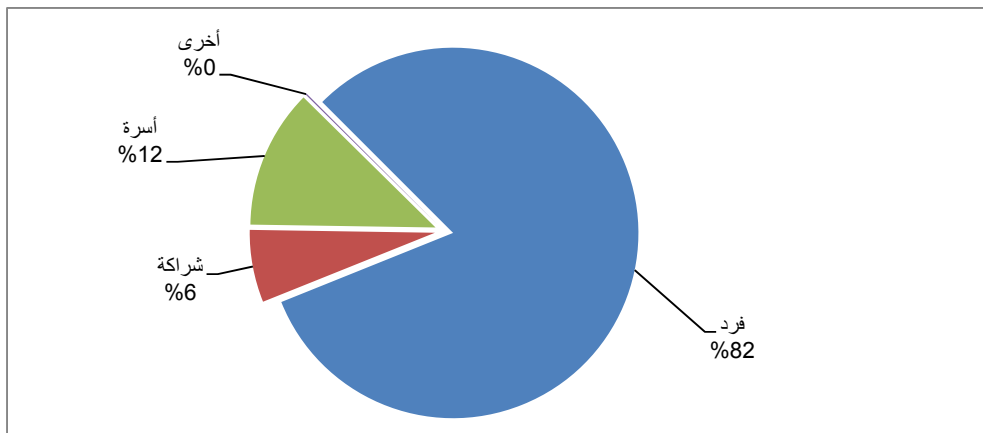
%6

()

25

2010

:7



11

15

22

9

22 (1)
 %59 13
 8 15
 %53
 4 11
 %36
 %25
 %28 %26

2010

:1

%75	57,891	%25	19,271	
%72	3,780	%28	1,498	
%74	8,169	%26	2,871	
%64	7	%36	4	
%47	7	%53	8	
%41	9	%59	13	
%67	6	%33	3	
%75	69,869	%25	23,668	

(χ^2)

0.05

(1)

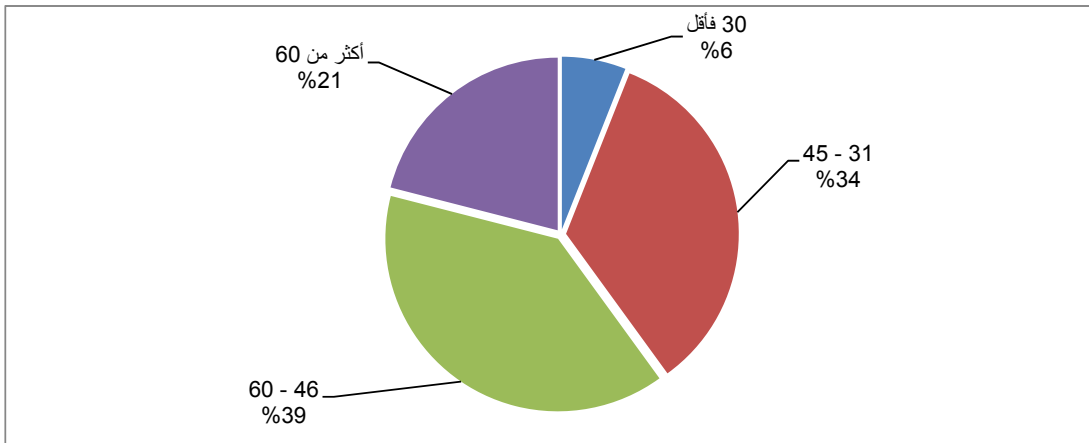
2.4

(8)

%39	(2)	9,181	(60-46)
%34	(45-31)		
%21		7,949	
%6	(30)		5,106
			1,406

2010

:8



(2)

(30)

.%30

%26

(45-31)

(60-46)

%25

.%23

2010

:2

%70	3,279	%30	1,406	30
%74	22,126	%26	7,949	45-31
%75	27,168	%25	9,181	60-46
%77	17,272	%23	5,106	60
%75	69,845	%25	23,642	

0.05

(One-way ANOVA)

(2)

3.4

(9)

%89

21,027

(3)

1,220

%5

271

%1

1,103

%5

15

(3)

%32

%26

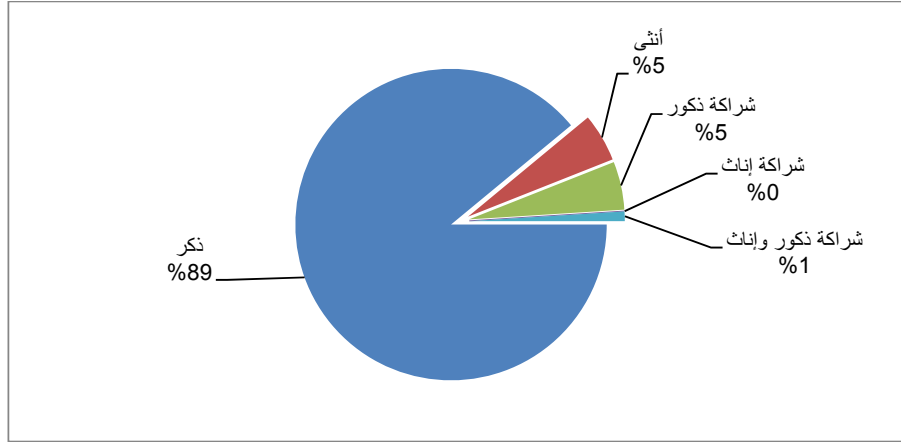
%19

%17

%16

2010

:9



0.05

(3)

2010

:3

%74	60,773	%26	21,027	
%83	5,233	%17	1,103	
%68	2,603	%32	1,220	
%84	79	%16	15	
%81	1,140	%19	271	
%75	69,828	%25	23,636	

4.4

(10)

13,698 (4)

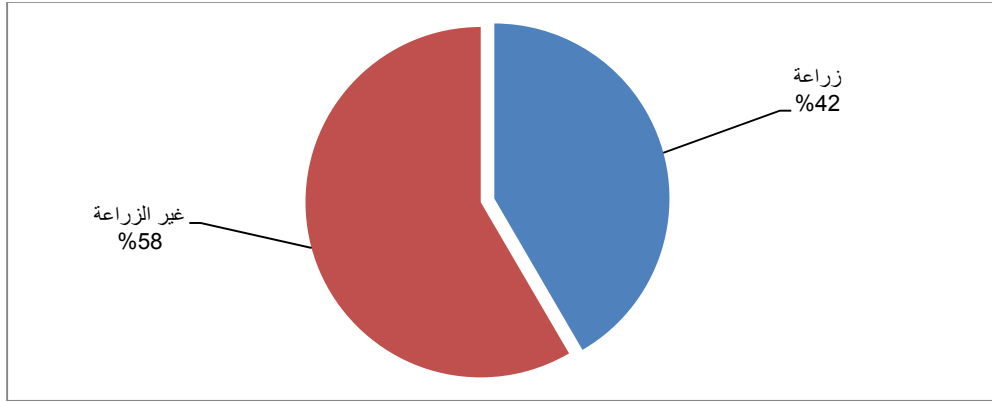
%58

%42

9,755

2010

:10



(4)

()

%20

%42

0.05

(4)

2010

:4

%58	13,198	%42	9,755	
%80	55,632	%20	13,698	
%75	68,830	%25	23,453	

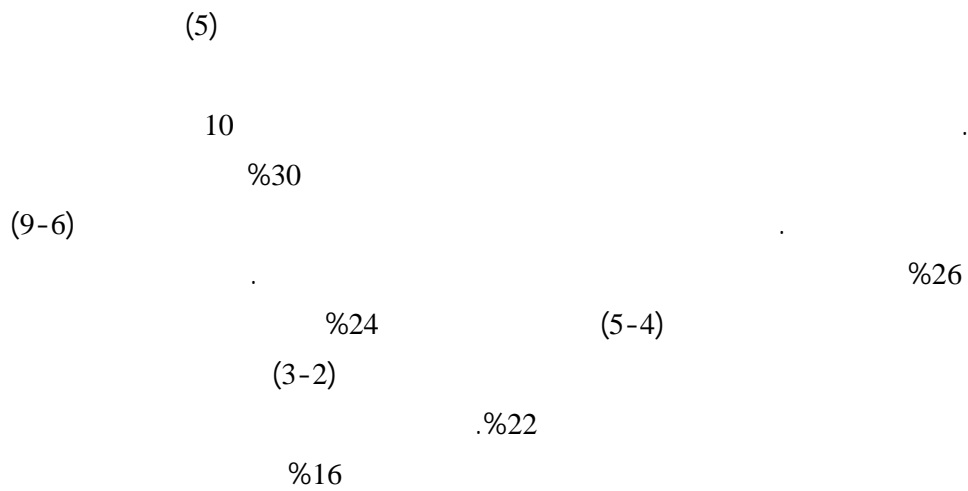
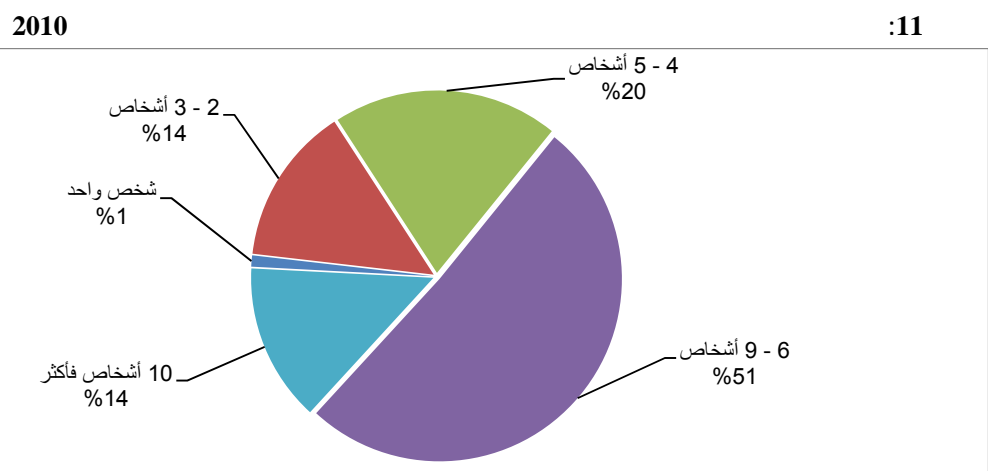
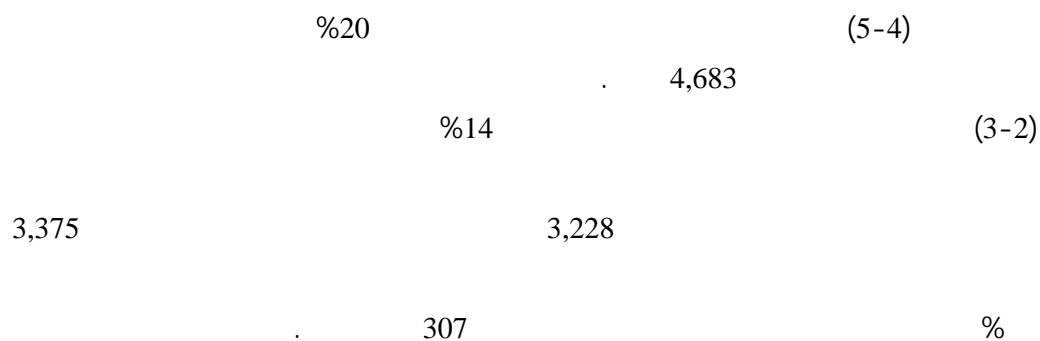
5.4

(11)

12,049 (5)

(9-6)

%51



2010

:5

%84	1,660	%16	307	
%78	11,319	%22	3,228	3-2
%76	14,535	%24	4,683	5-4
%74	34,343	%26	12,049	9-6
%70	7,988	%30	3,375	10
%75	69,845	%25	23,642	

2

0.05

6.4

%58

%21

)

%19

%2.5

(

(12)

14,062 (6)

%60

%19

4,499

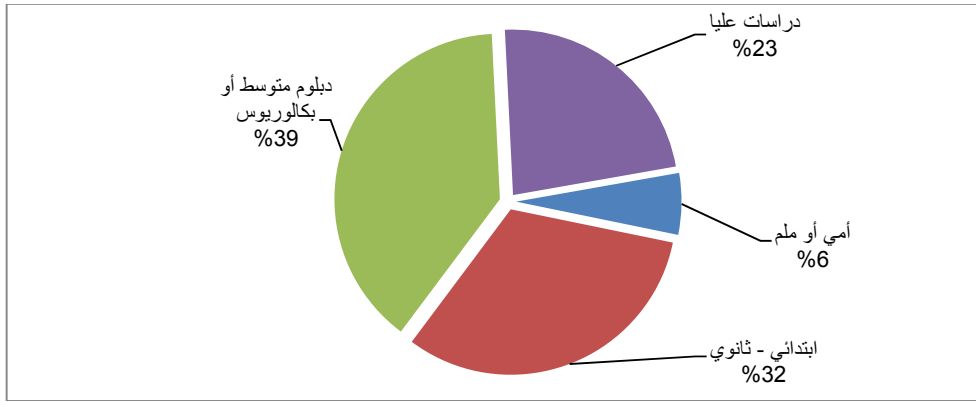
4,552

%2

513

2010

:12



(6)

%25

%26

.%24

%22

2010

:6

%76	14,566	%24	4,552	
%74	39,962	%26	14,062	
%75	13,486	%25	4,499	
%78	1,783	%22	513	
%75	69,797	%25	23,626	

0.05

(6)

7.4

(13)

%92

7,770

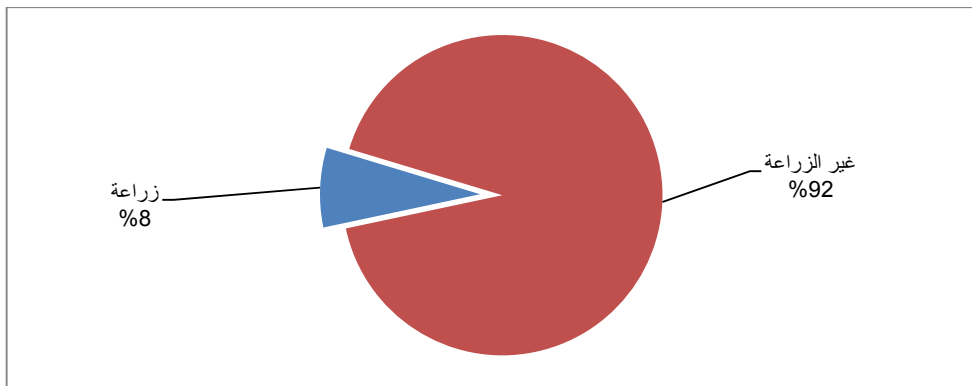
(7)

641

%8

2010

:13



(7)

%41

%25

0.05

2010

:7

%59	939	%41	641
%75	22,853	%25	7,770
%74	23,792	%26	8,411

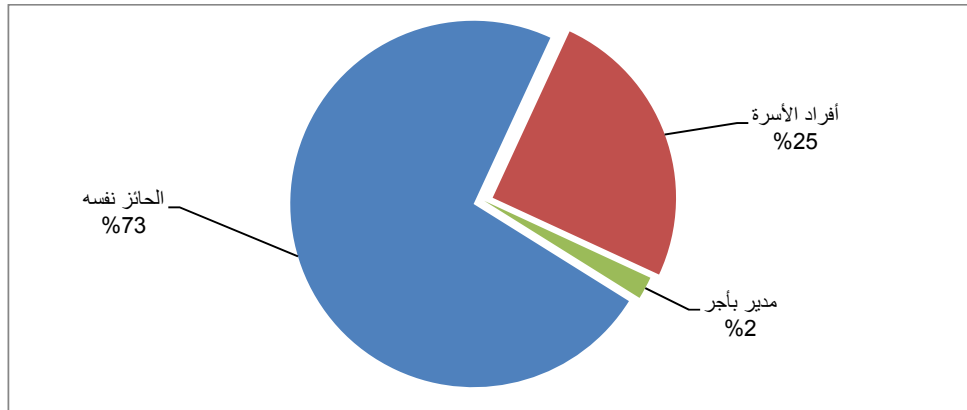
8.4

(14)



2010

:14



(8)

%26

%25

%24

2010 **:8**

%75	51,671	%25	17,277
%76	1,383	%24	444
%74	16,667	%26	5,922
%75	69,721	%25	23,643

9.4

(15)

(9) (15)

%55

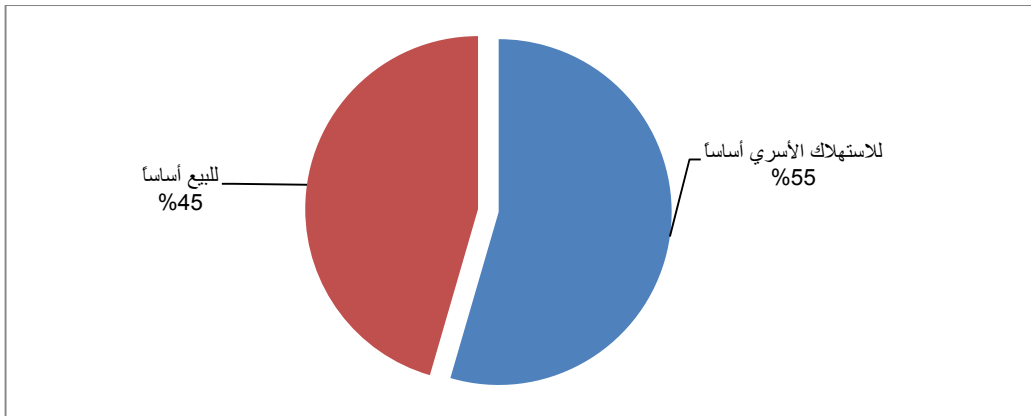
12,849

%45

10,726

2010

:15



(9)

%52

%48

%19

%81

0.05

2010

:9

%81	56,242	%19	12,849	
%52	11,494	%48	10,726	
%74	67,736	%26	23,575	

1.5

(2.2.3)

%35

(10)

1.1.5

(16)

(%83)

(10)

27,139

3,755

%11

1,954

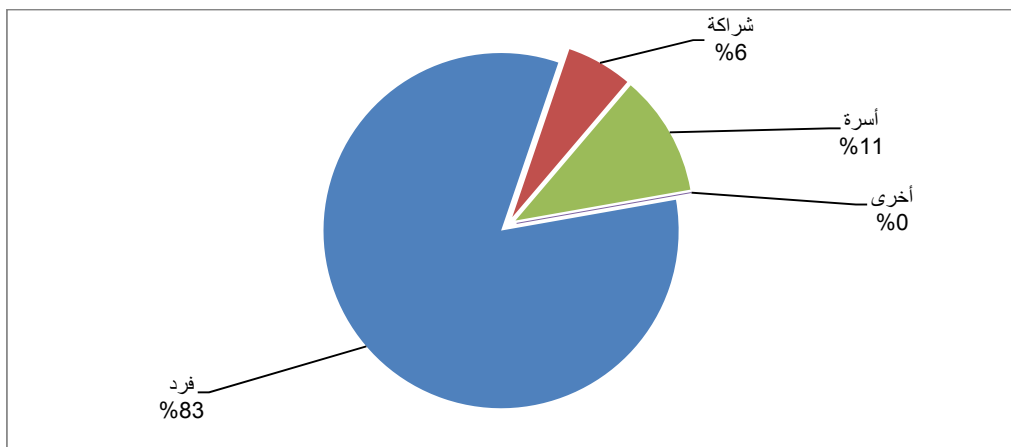
%6

()

30

2010

:16



22

11

15

9

15

(10)

%67

%64

7

11

9

22

%41

%35

%34

%.37

2010 ()

:10

%65	50,125	%35	27,139
%63	3,332	%37	1,954
%66	7,305	%34	3,755
%36	4	%64	7
%33	5	%67	10
%59	13	%41	9
%56	5	%44	4
%65	60,789	%35	32,878

0.05

(10)

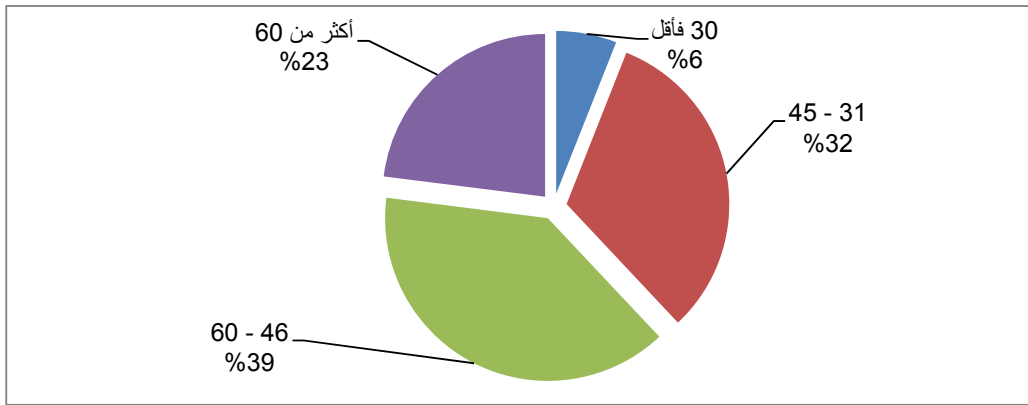
2.1.5

(17)

9,181 (11) (60-46)
 %39
 %34 (45-31)
 %21 7,949
 %6 (30) 5,106
 1,406

2010

:17



(11)
 (30)
 %40
 (45-31)
 %35
 (60-46)
 %34
 [(60-46) (45-31)]
 %35

2010 ()

:11

%60	2,810	%40	1,878	30
%65	19,530	%35	10,578	45-31
%65	23,570	%35	12,832	60-46
%66	14,858	%34	7,561	60
%65	60,768	%35	32,849	

0.05

()

3.1.5

(18)

%89 29,226 (12)

%5

%1

1,651 %5

1,643

29

392

(12)

%40

.%36

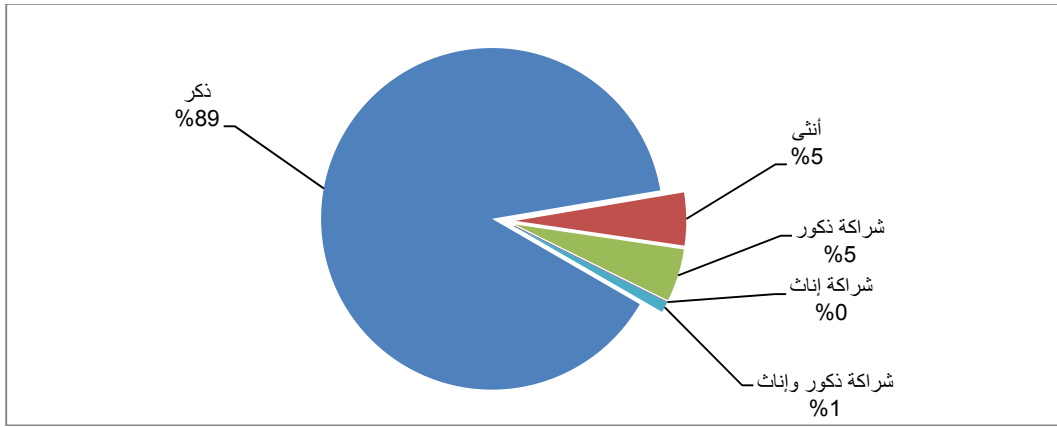
%31

%28

%26

2010

:18



0.05

(12)

2010 ()

:12

%64	52,686	%36	29,226	
%74	4,694	%26	1,651	
%60	2,287	%40	1,543	
%69	65	%31	29	
%72	1,021	%28	392	
%65	60,753	%35	32,841	

4.1.5

()

(19)

(13)

(19)

%61

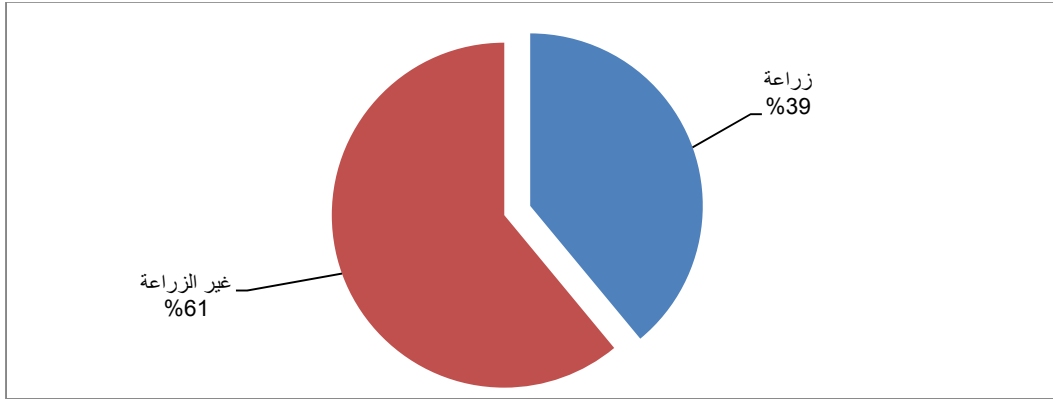
%39

20,027

12,550

2010

:19



(13)

()

%55

%20

0.05

2010 ()

:13

%45	10,433	%55	12,550	
%71	49,396	%29	20,027	
%65	59,829	%35	32,577	

5.1.5

(20)

(9-6)

%50

16,408 (14)

%20

(5-4)

(3-2)

6,618

%15

%14

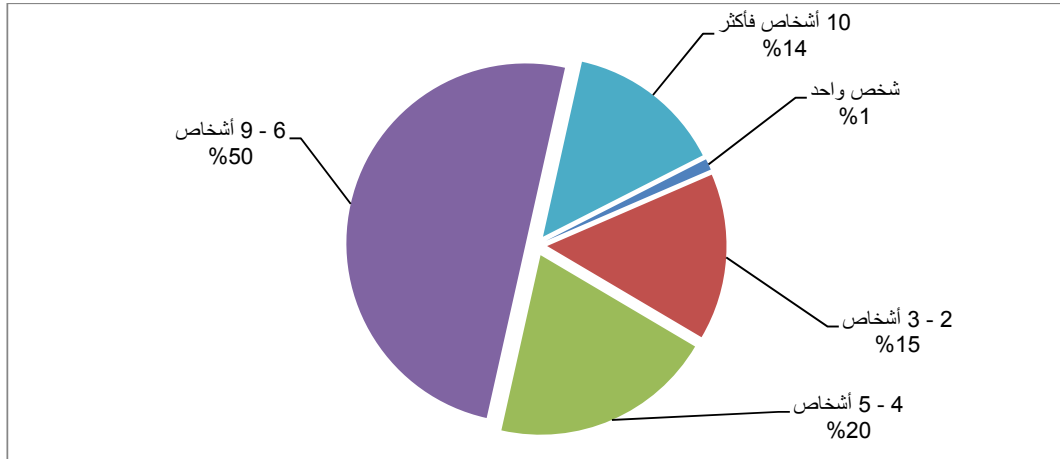
4,549

484

%

2010

:20



(14)

10

%40

(9-6)

%35

%34

(5-4)

(3-2)

.%33

%25

2010 ()

:14

%75	1,487	%25	484	
%67	9,784	%33	4,790	3-2
%66	12,625	%34	6,618	5-4
%65	30,051	%35	16,408	9-6
%60	6,821	%40	4,549	10
%65	60,768	%35	32,849	

0.05

6.1.5

(21)

%58 19,119 (15)

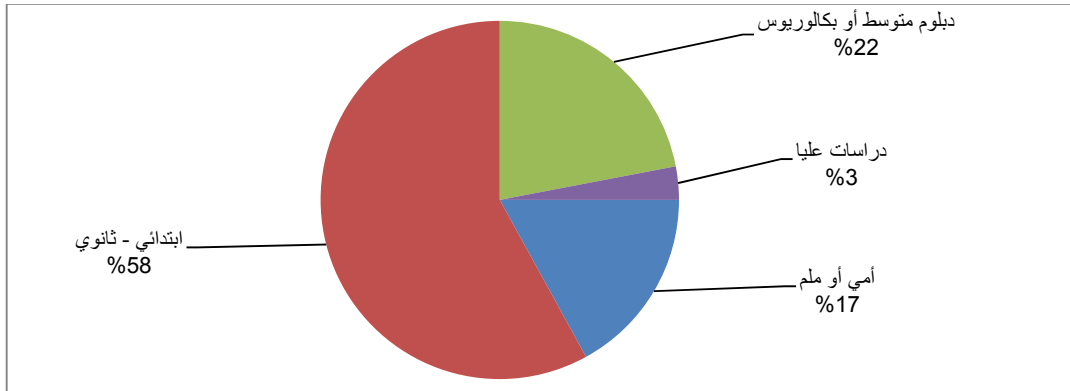
%22 7,097

5,730

%3 888

2010

:21



(15)

%39

%35

.%30

2010 ()

:15

%70	13,411	%30	5,730	
%65	34,983	%35	19,119	
%61	10,915	%39	7,097	
%61	1,410	%39	888	
%65	60,719	%35	32,834	

0.05

7.1.5

(22)

%93

12,165

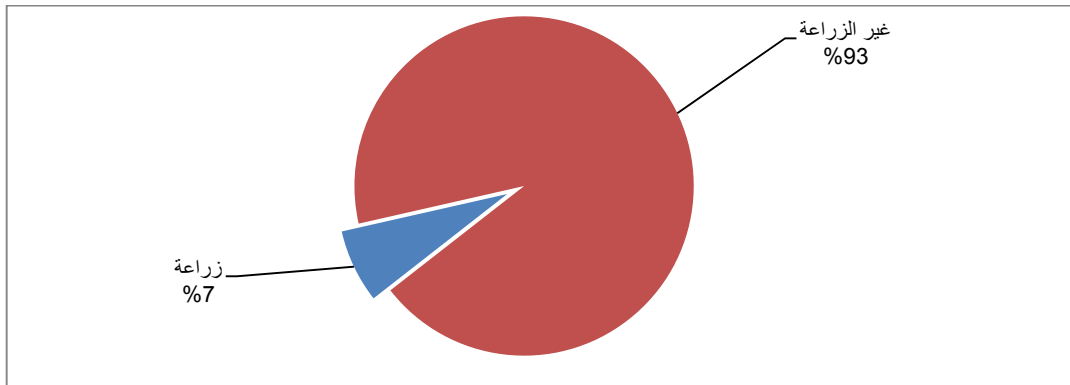
(16)

938

%7

2010

:22



(16)

%59

%40

0.05

2010 ()

:16

%41	643	%59	938	
%60	18,502	%40	12,165	
%59	19,145	%41	13,103	

8.1.5

(23)

(17)

%76

24,931

%22

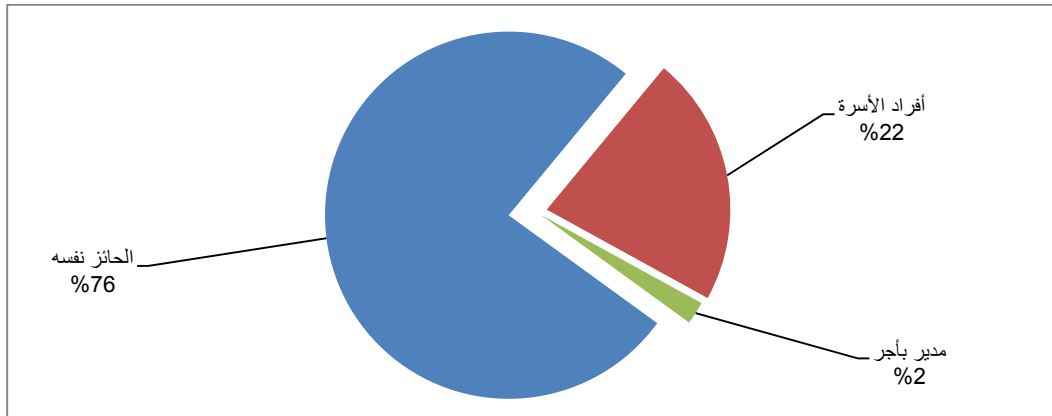
7,128

%2

777

2010

:23



(17)

%42

%36

%32

0.05

2010 () :17

%64	44,118	%36	24,931	
%58	1,052	%42	777	
%68	15,486	%32	7,128	
%65	60,656	%35	32,836	

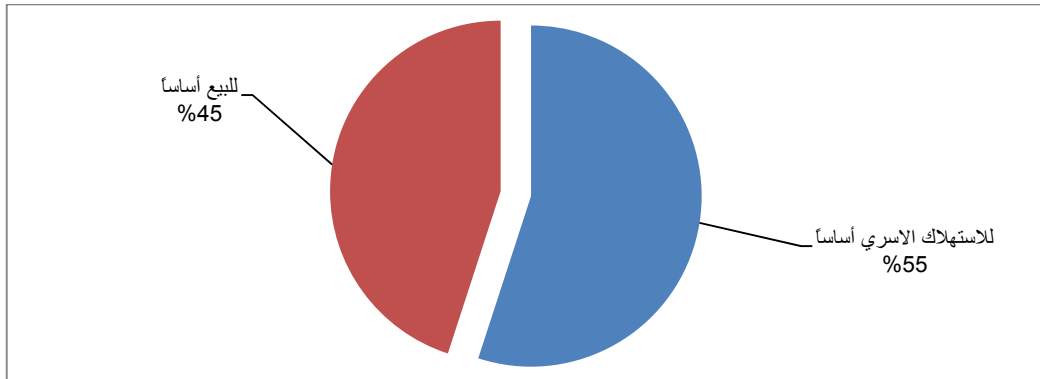
9.1.5

(24)

(18) (24)

%55 17,860
%45
14,864

2010 :24



(18)

%33

%67

%26

%74

0.05

2010 ()

:18

%74	51,341	%26	17,860	
%33	7,374	%67	14,864	
%64	58,715	%36	32,724	

2.5

(2.2.3)

%50

1.2.5

(25)

(%83)

38,843 (19)

5,260

%11

2,735

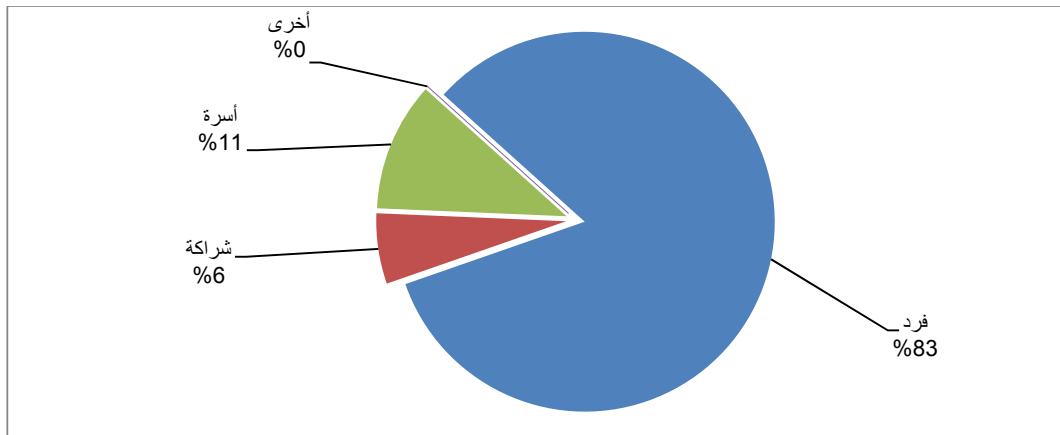
%6

()

33

2010

:25



22

15

11

9

.(19)

11

%82

15

%67

10

10

22

%45

%50

%48

%.52

(χ^2)

0.05

(19)

2010 ()

:19

%50	38,412	%50	38,843	
%48	2,549	%52	2,735	
%52	5,800	%48	5,260	
%18	2	%82	9	
%33	5	%67	10	
%55	12	%45	10	
%56	5	%44	4	
%50	46,785	%50	46,871	

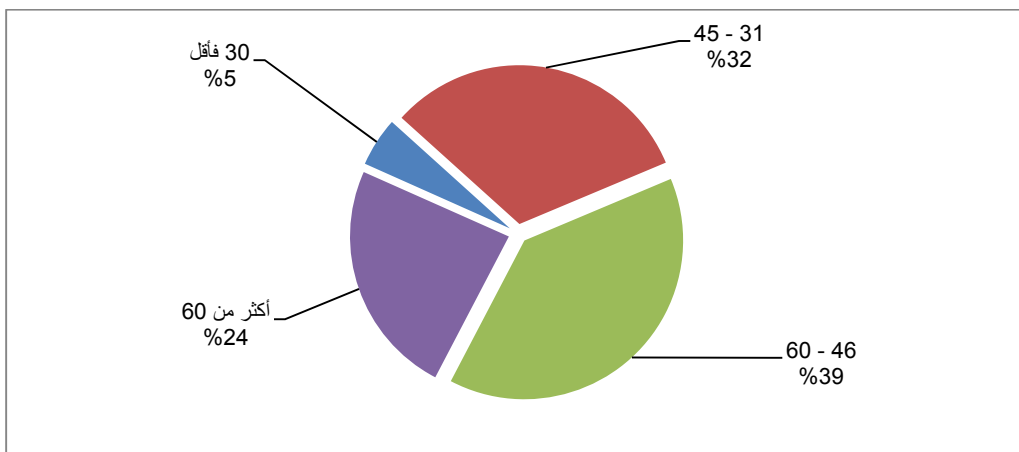
2.2.5

(26)

%39	18,359	20	(60-46)
%32	(45-31)		
%24		14,964	
%5	(30)	11,147	
		2,368	

2010

:26



(20)

(30)

%51

%50

0.05

()

)

(

2010 ()

:20

%49	2,319	%51	2,368	30
%50	15,141	%50	14,964	45-31
%50	18,037	%50	18,359	60-46
%50	11,269	%50	11,147	60
%50	46,766	%50	46,838	

3.2.5

(27)

(21)

(27)

%89

41,556

%5

2,113

%5

605

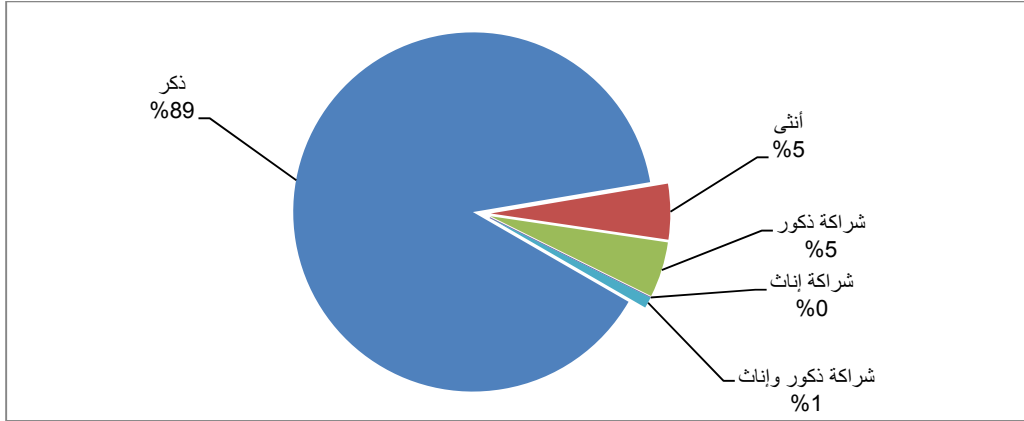
1%

2,520

36

2010

:27



(21)

%55

%51

%43

%40

%38

0.05

2010 () :21

%49	40,349	%51	41,556	
%60	3,823	%40	2,520	
%45	1,715	%55	2,113	
%62	58	%38	36	
%57	808	%43	605	
%50	46,753	%50	46,830	

4.2.5

(28)

%66

%34 30,645 (22)

15,728

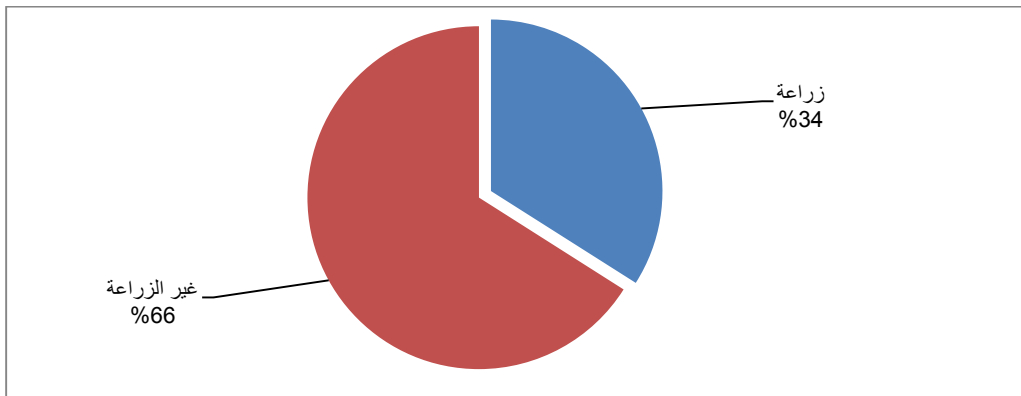
(22)

()

%68

%44

2010 :28

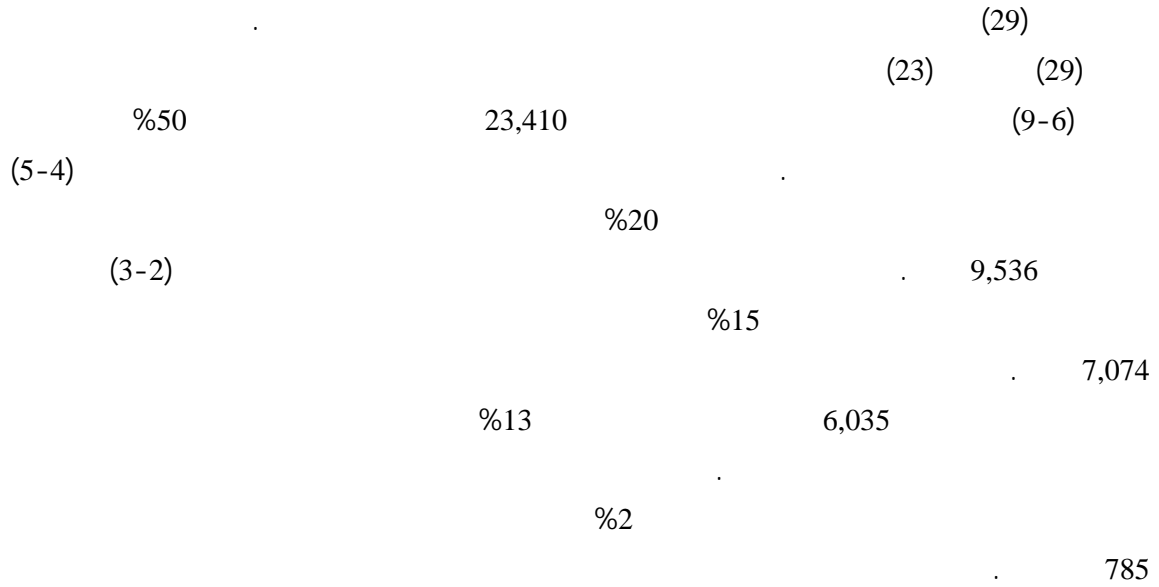


0.05

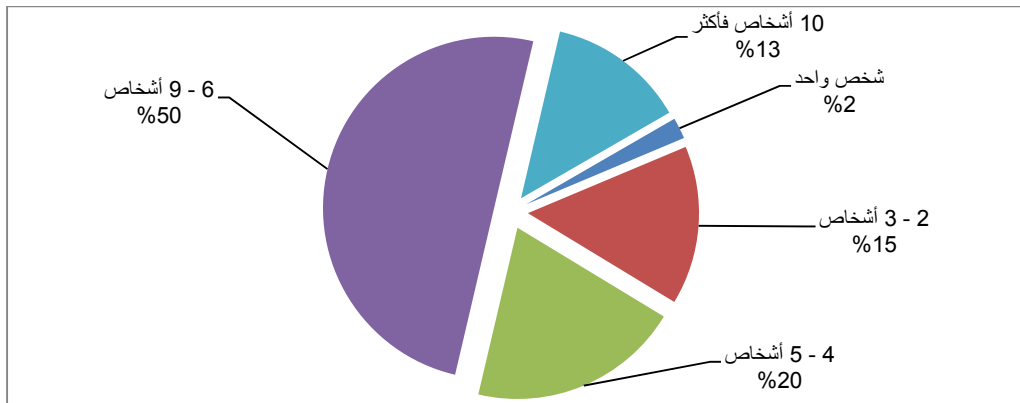
2010 () :22

%32	7,252	%68	15,728	
%56	38,772	%44	30,645	
%50	46,024	%50	46,373	

5.2.5



2010 :29



(23)

10

%53

(9-6)

%50

(5-4)

(3-2)

.%49

%40

2010 ()

:23

%60	1,186	%40	785	
%51	7,499	%49	7,074	3-2
%50	9,705	%50	9,536	5-4
%50	23,042	%50	23,410	9-6
%47	5,334	%53	6,035	10
%50	46,766	%50	46,840	

0.05

6.2.5

(30)

(30)

(24)

%58

27,043

9,832

2010 :30

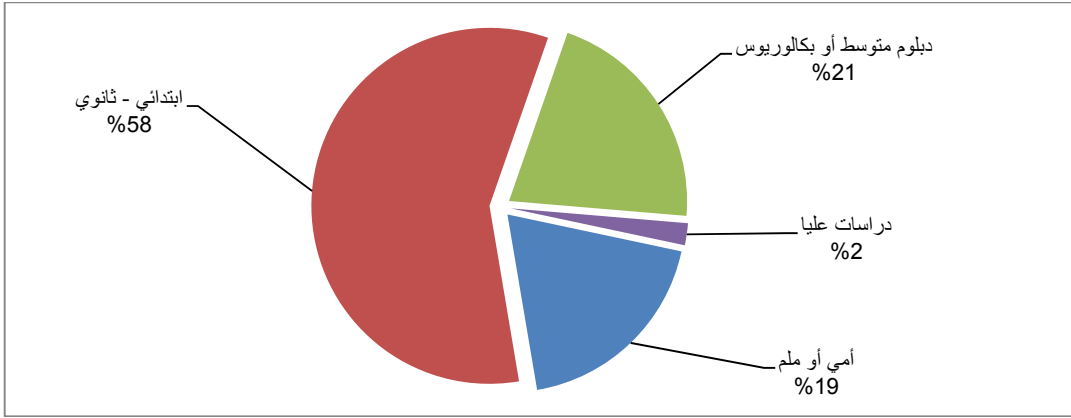
1,185

8,753

%21

%19

%2



(24)

%52

%55

%50

%46

0.05

2010 ()

:24

%54	10,382	%46	8,753
%50	27,052	%50	27,043
%45	8,182	%55	9,832
%48	1,113	%52	1,185
%50	46,729	%50	46,813

7.2.5

(31)

(25)

(31)

%94

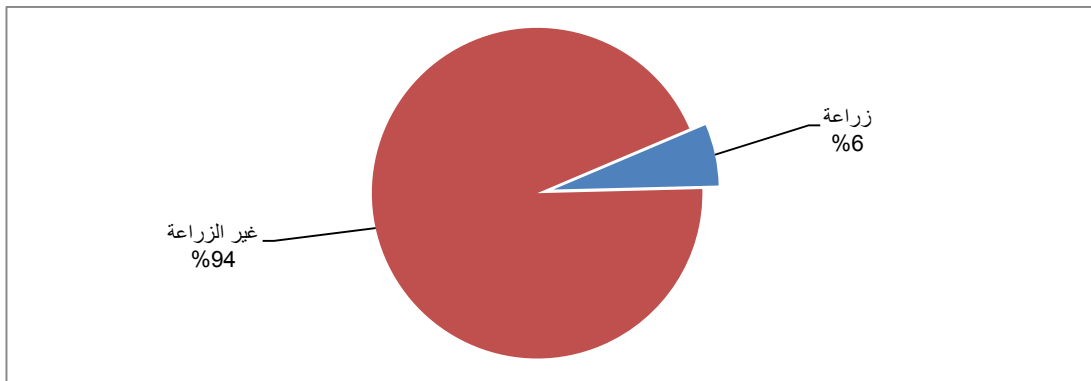
16,517

%6

1,111

2010

:31



(25)

%70

%54

0.05

2010 ()

:25

%30	469	%70	1,111	
%46	14,150	%54	16,517	
%45	14,619	%55	17,628	

8.2.5

(32)

(26)

%75

35,232

10,556

%23

1,021

%2

(26)

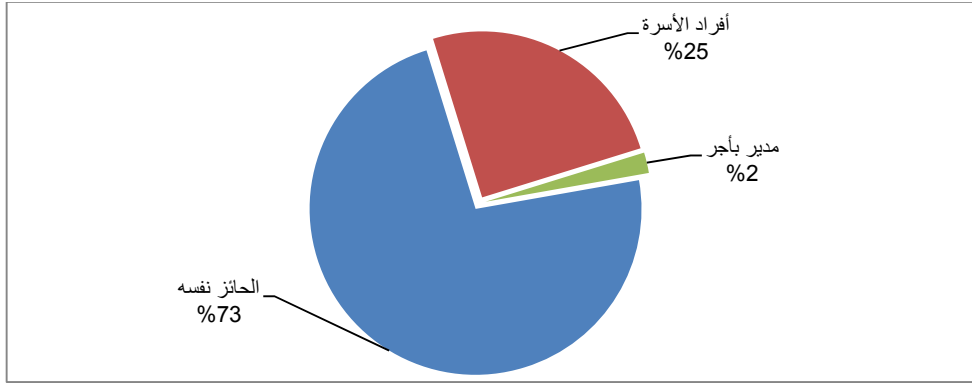
%56

%51

%47

2010

:32



0.05

2010 ()

:26

%49	33,808	%51	35,232	
%44	808	%56	1,021	
%53	12,057	%47	10,556	
%50	46,673	%50	46,809	

9.2.5

(33)

(27)

%63

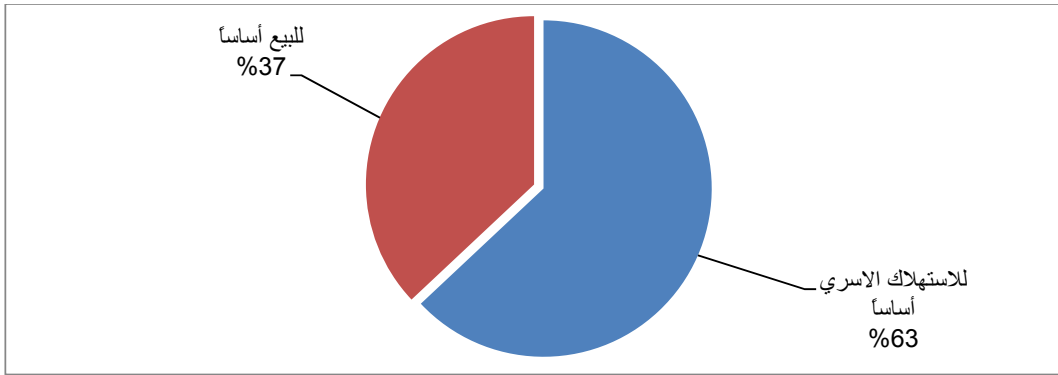
29,217

%37

17,448

2010

:33



(27)

%22

%78

%58

%42

0.05

2010 ()

:27

%58	39,974	%42	29,217	
%22	4,789	%78	17,448	
%49	44,763	%51	46,665	

(3.2.3)

%60

1.6

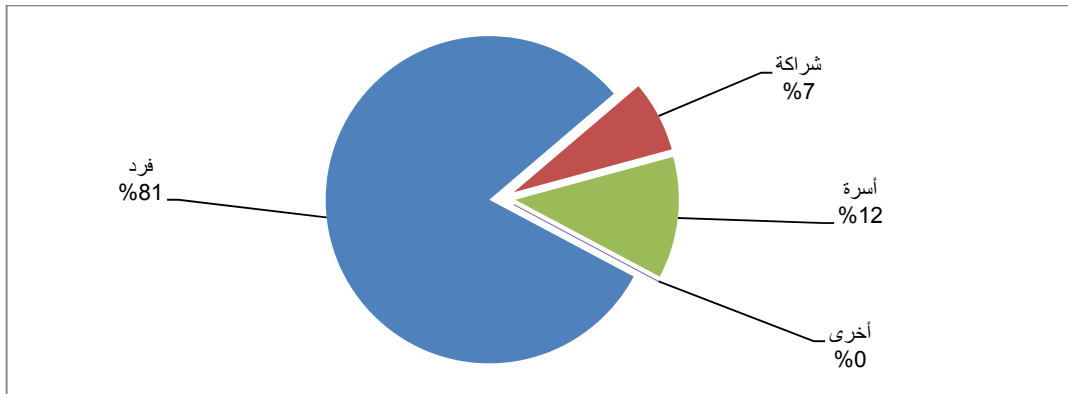
(34)

7,010
3,627
46,046 (28)
%12
%7
()
(%81)

37

2010

:34



22

11

17

9

.(28)

17

%88

15

11

%82

9

13

22

%59

%59

.%68

%63

2010 ()

:28

%41	31,436	%59	46,046	
%32	1,674	%68	3,627	
%37	4,086	%63	7,010	
%18	2	%82	9	
%12	2	%88	15	
%41	9	%59	13	
%44	4	%56	5	
%40	37,213	%60	56,725	

0.05

(19)

2.6

(35)

(29)

21,984 (60-46) %39

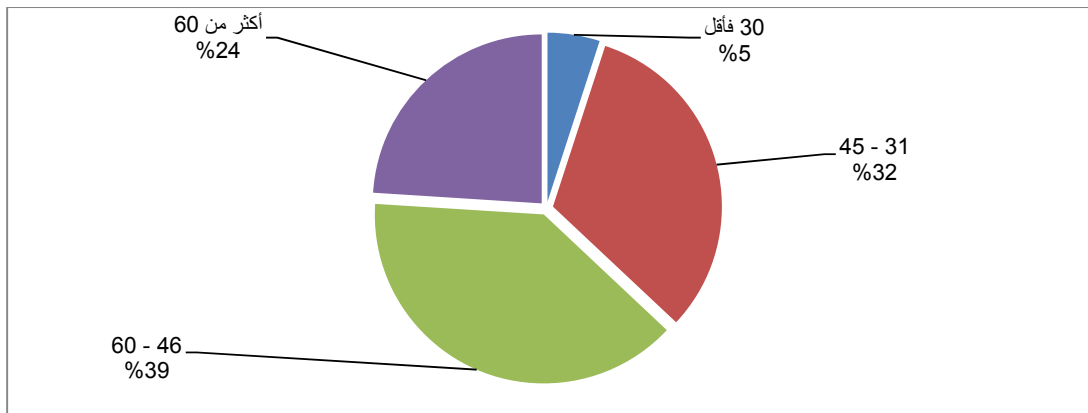
18,153 (45-31) %32

13,591 %24

2,957 () %5 (30)

2010

:35



(29)

النمط

(30)

%63

%60

0.05

()

2010 ()

:29

%37	1,742	%63	2957	30
%40	12,050	%60	18,153	45-31
%40	14,516	%60	21,984	60-46
%40	8,893	%60	13,591	60
%40	37,201	%60	56,685	

3.6

(36)

(30)

%87

49,609

%6

2,718

%5

3,411

54

878

2%

(30)

%71

%62

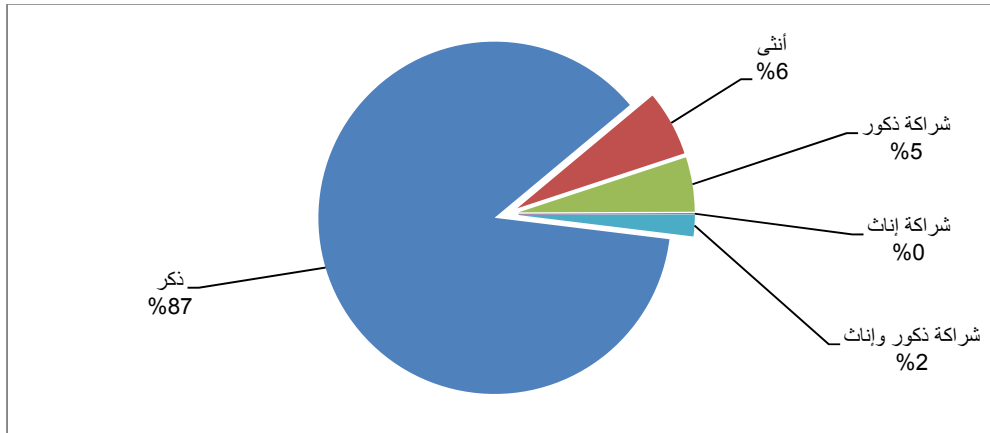
%60

%57

%54

2010

:36



0.05

2010 ()

:30

%40	32,538	%60	49,609	
%46	2,953	%54	3,411	
%29	1,125	%71	2,718	
%43	40	%57	54	
%38	537	%62	878	
%40	37,193	%60	56,670	

4.6

(37)

39,014 (31)

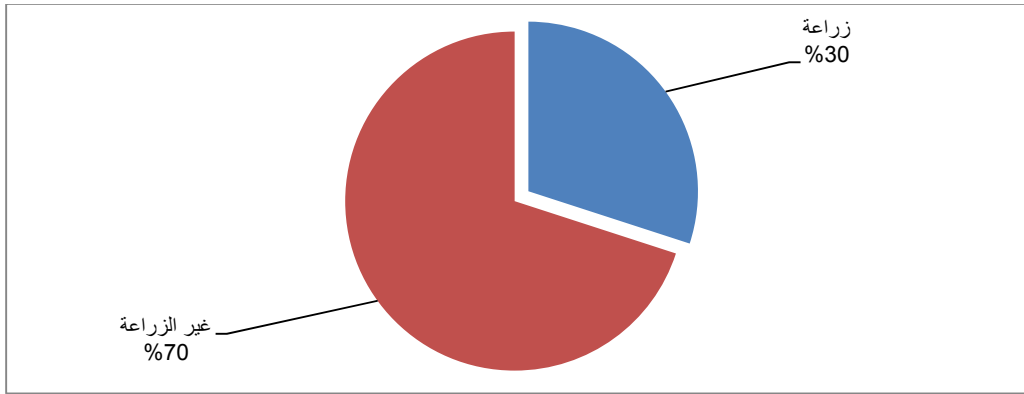
%70

%30

17,060

2010

:37



(31)

()

%74

%56

0.05

2010 ()

:31

%26	5,999	%74	17,060	
%44	30,594	%56	39,014	
%39	36,593	%61	56,074	

5.6

(38)

(32)

%50

28,271

(9-6)

(5-4)

%20

(3-2)

11,497

%15

8,589

%13

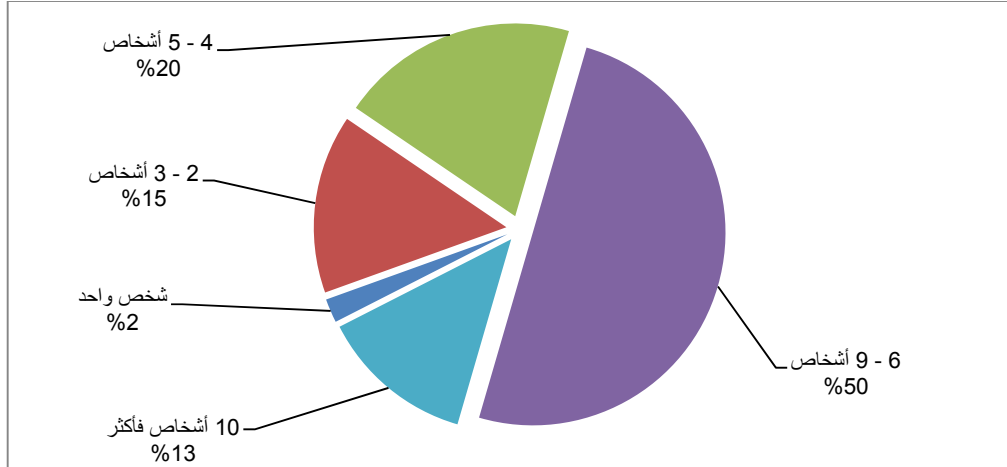
7,297

%2

1,031

2010

:38



(32)

. ()

10

%61

%61

(9-6)

(5-4)

%60

(3-2)

.%59

%52

2010

)

:32

%48	943	%52	1,031	
%41	6,029	%59	8,589	3-2
%40	7,811	%60	11,497	5-4
%39	18,321	%61	28,271	9-6
%36	4,097	%64	7,297	10
%40	37,201	%60	56,685	

0.05

6.6

(39)

(33)

(39)

%58

32,783

%20

11,039

%20

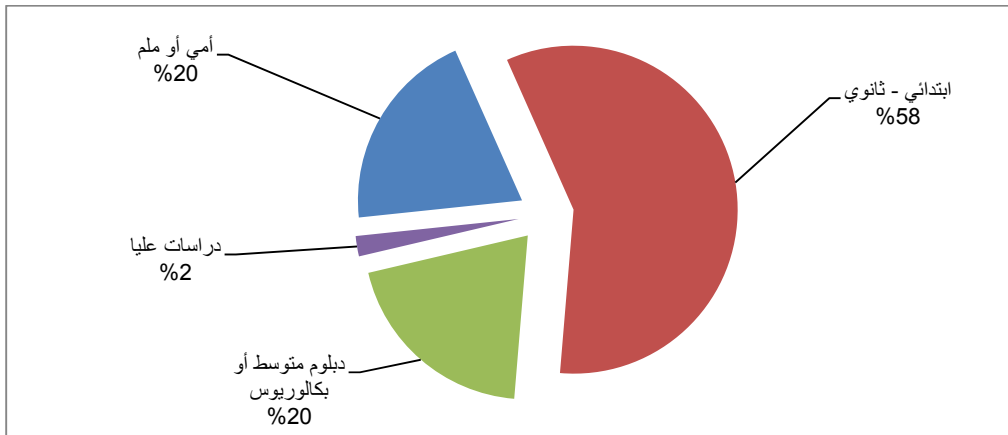
11,496

1,295

%2

2010

:39



(33)

%61

%60

%.56

2010 ()

:33

%40	7,704	%60	11,496	
%40	21,473	%60	32,783	
%39	6,970	%61	11,093	
%44	1,008	%56	1,295	
%40	37,155	%60	56,667	

0.05

7.6

(40)

(34)

(40)

%95

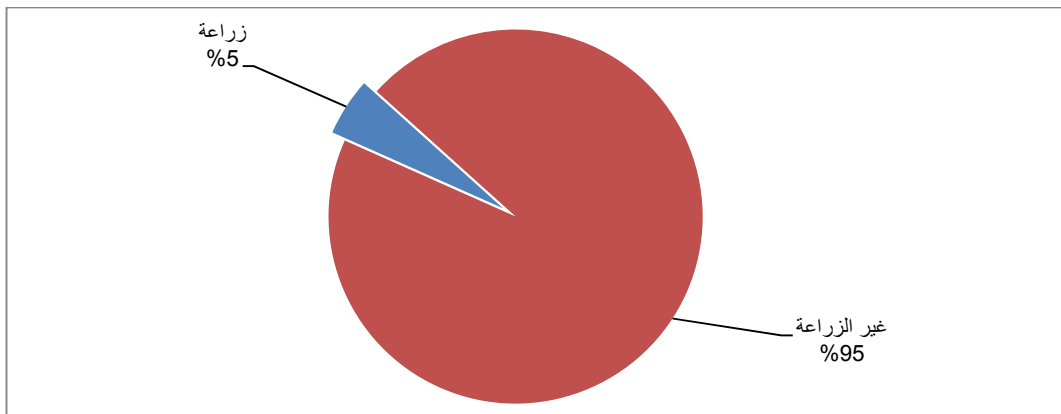
18,728

1,070

%5

2010

:40



(34)

%67

.%61

0.05

2010 () :34

%33	516	%67	1,070
%39	12,015	%61	18,721
%39	12,531	%61	19,791

8.6

(41)

%73

41,379 (35)

%25

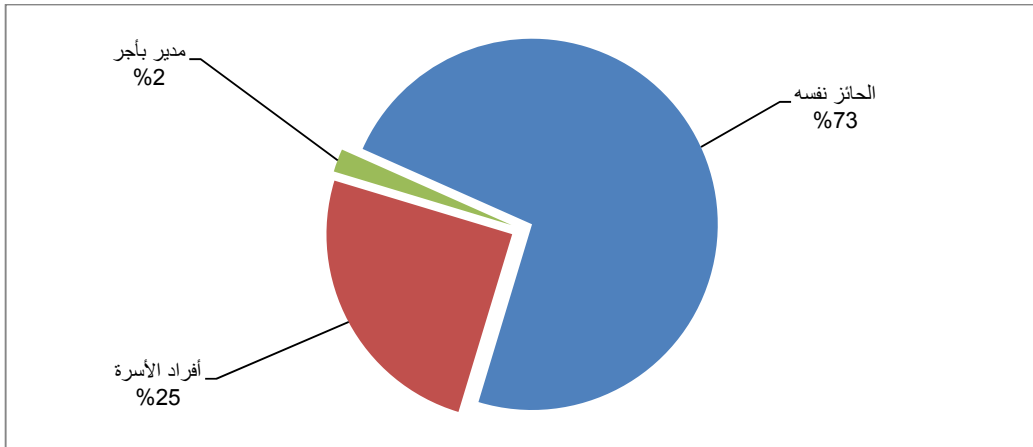
14,153

%2

1,120

2010

:41



(35)

%62

%61

%60

0.05

2010 () :35

%40	27,879	%60	41,379	
%39	712	%61	1,120	
%38	8,516	%62	14,153	
%40	37,107	%60	56,652	

9.6

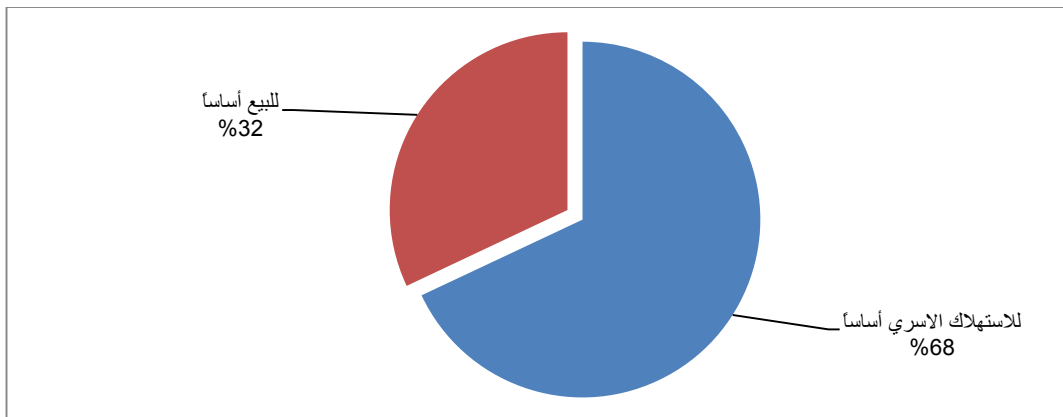
(42)

(36)

%68 38,484
%32
17,973

2010

:42



(36)

%19

%81

%45

%55

0.05

2010 ()

:36

%45	30,905	%55	38,484		
%19	4,339	%81	17,973		
%38	35,244	%62	56,457		

(4.2.3)

%18

1.7

(43)

(%82)

14,156 (37)

1,908

%11

1,146

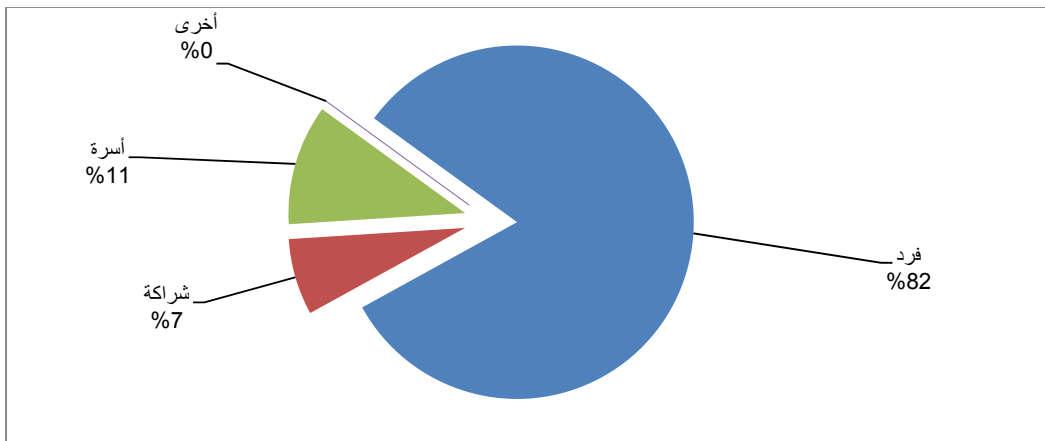
%7

()

15

2010

:43



22

11

15

9

(37)

15

%40

11

%27

3

6

22

%27

%18

%22

%.17

2010

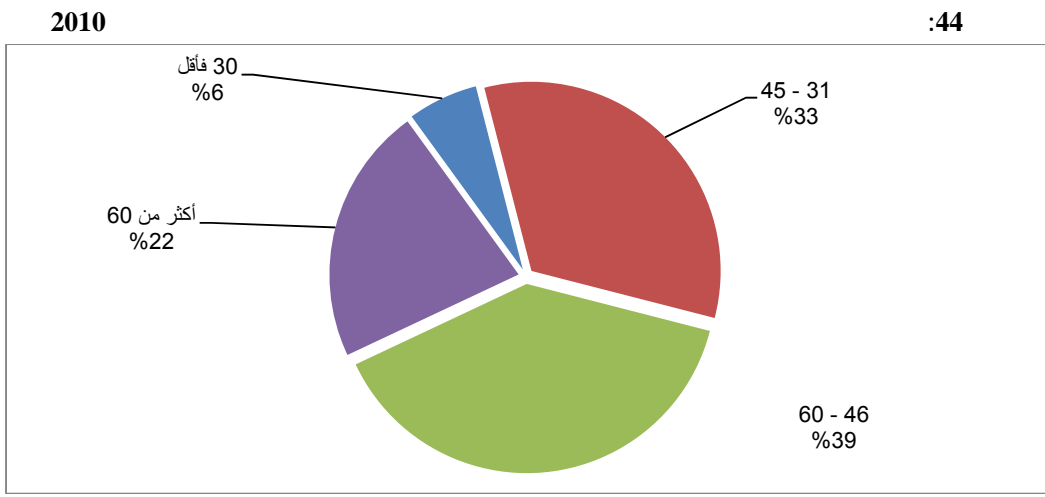
:37

%82	63,060	%18	14,156	
%78	4,136	%22	1,146	
%83	9,147	%17	1,908	
%73	8	%27	3	
%60	9	%40	6	
%73	16	%27	6	
%89	8	%11	1	
%82	76,384	%18	17,226	

0.05

(37)

(60-46) (44)
 (38)
 6,635
 %39
 5,701 (45-31)
 %33
 3,817 %22
 1,056 %6 (30)



(38)
 30) %23 ()
 (45-31)
 %19
 (60-46)
 %18
 .%17

2010

:38

%77	3,630	%23	1,056	30
%81	24,394	%19	5,701	45-31
%82	29,740	%18	6,635	60-46
%83	18,585	%17	3,819	60
%82	76,349	%18	17,211	

3.7

(45)

15,258

(39)

%89

%5

843

%5

281

1%

801

19

(39)

%22

%20

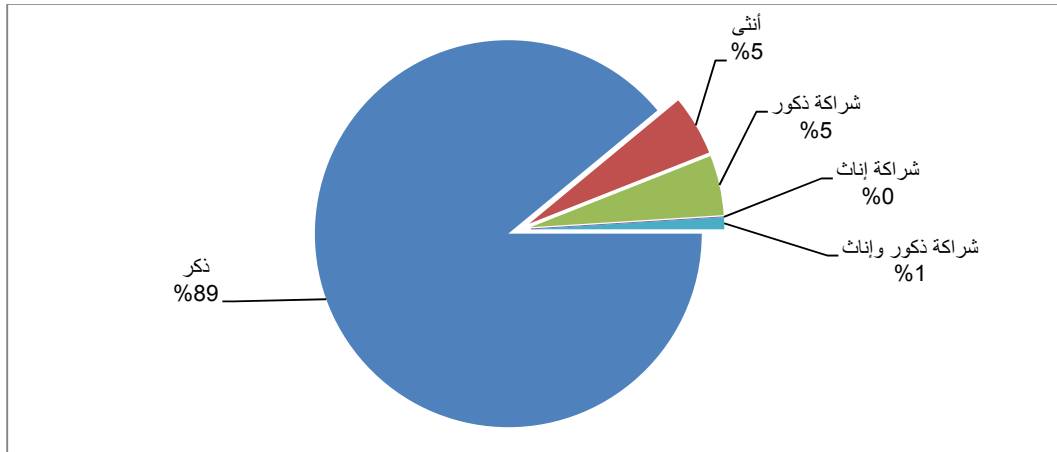
%20

%19

%13

2010

:45



0.05

2010

:39

2010		2010		
%81	66,605	%19	15,258	
%87	5,540	%13	801	
%78	2,985	%22	843	
%80	75	%20	19	
%80	1,130	%20	281	
%82	76,335	%18	17,202	

4.7

(46)

%62

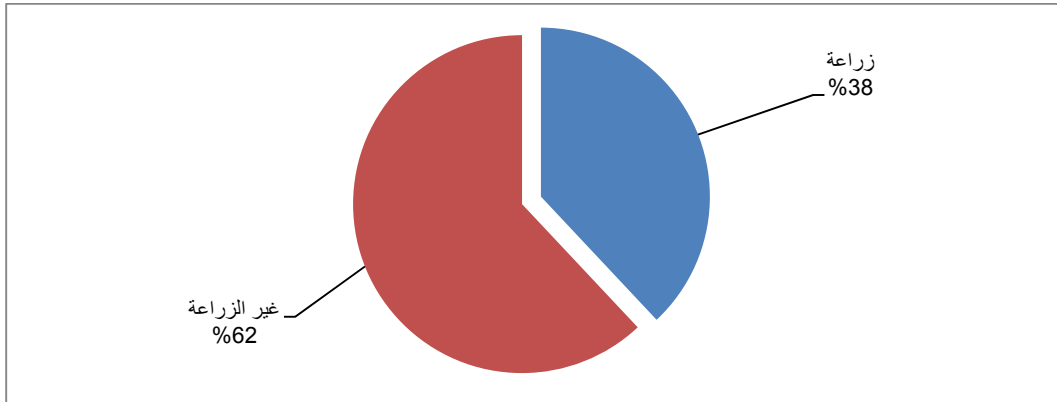
%38

10,482 (40)

6,473

2010

:46



(40)

()

%28

%15

2010

:40

%72	16,488	%28	6,473	
%85	58,909	%15	10,482	
%82	75,397	%18	16,955	

0.05

5.7

(47)

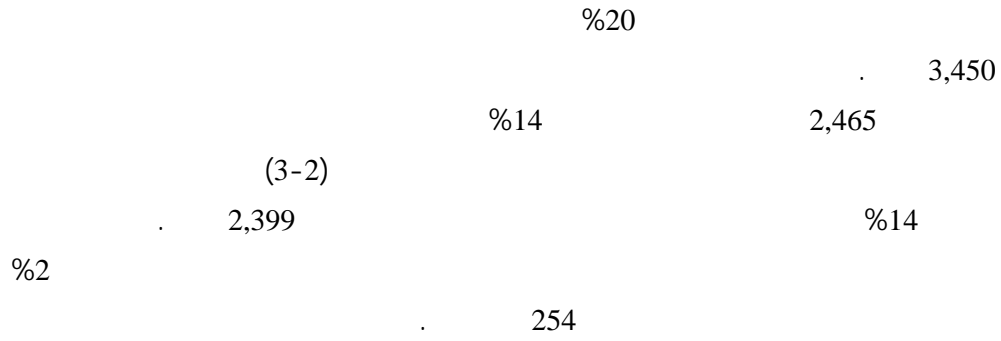
(42)

(9-6)

%50

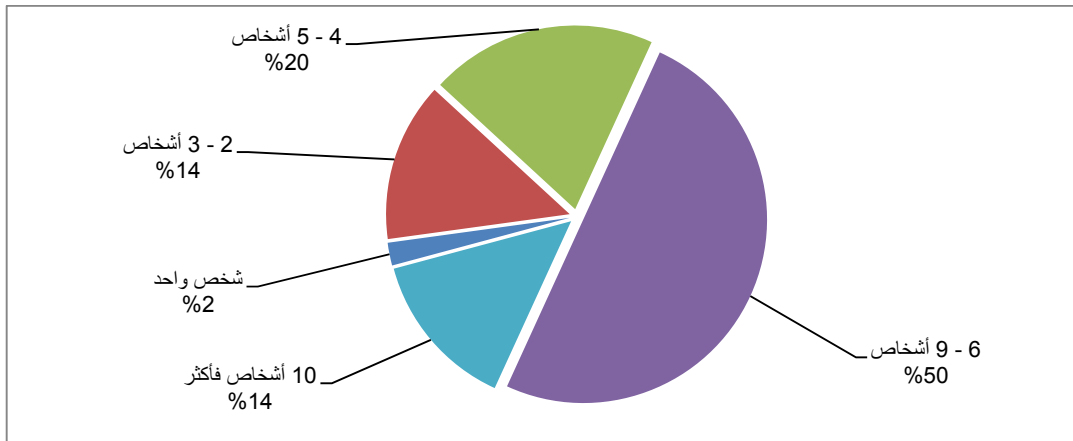
8,643

(5-4)

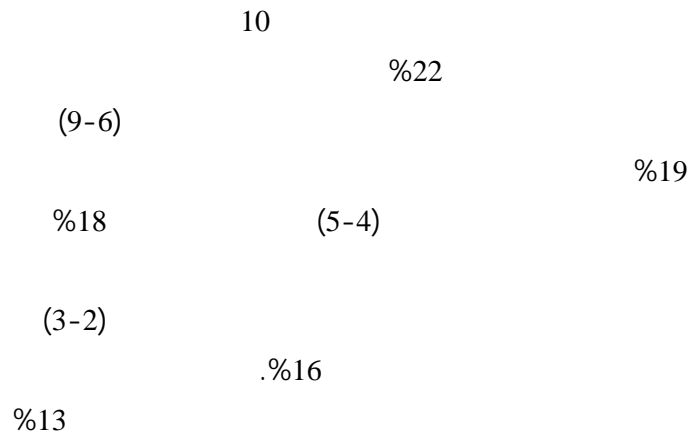


2010

:47



(41)



2010

:41

%87	1,716	%13	254	
%84	12,161	%16	2,399	3-2
%82	15,781	%18	3,450	5-4
%81	37,797	%19	8,643	9-6
%78	8,894	%22	2,465	10
%82	76,349	%18	17,211	

0.05

6.7

(48)

(42)

%59

10,157

3,375

%20

%19

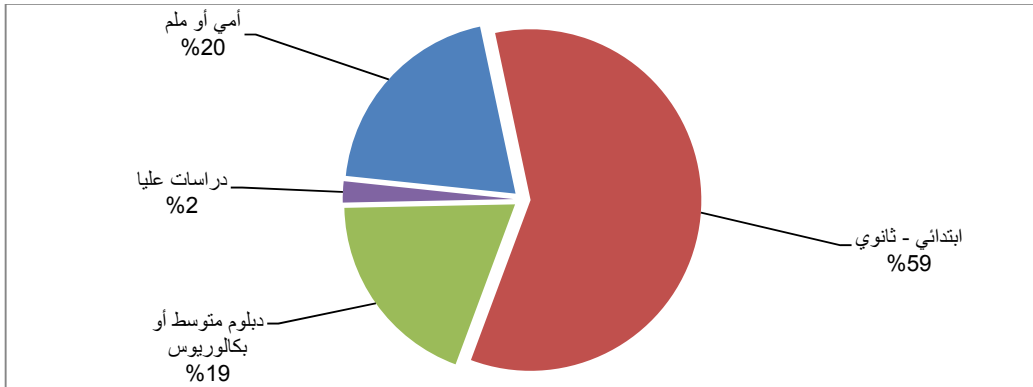
3,318

%2

344

2010

:48



(42)

%19

%18

%15

0.05

2010

:42

%82	15,753	%18	3,375	
%81	43,913	%19	10,157	
%82	14,683	%18	3,318	
%85	1,953	%15	344	
%82	76,302	%18	17,194	

7.7

(49)

(43)

464

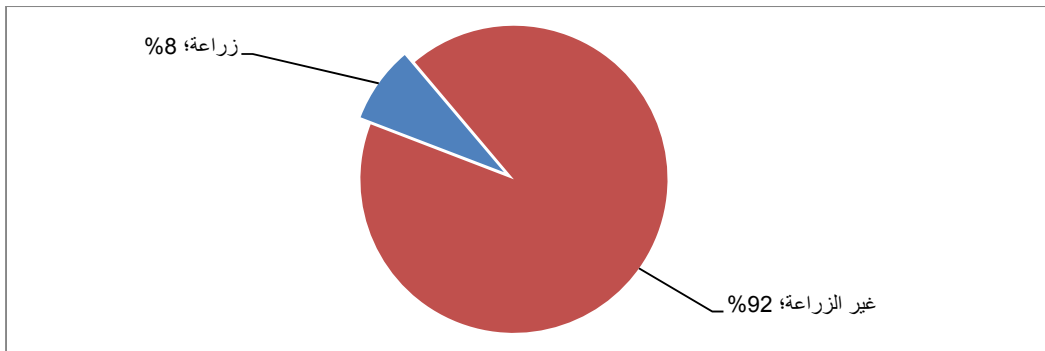
%92

%8

1,111

2010

:49



(43)

%29

%18

0.05

2010

:43

%71	1,116	%29	464	
%82	25,066	%18	5,584	
%81	26,182	%19	6,048	

(50)

%76

13,007 (44)

%22

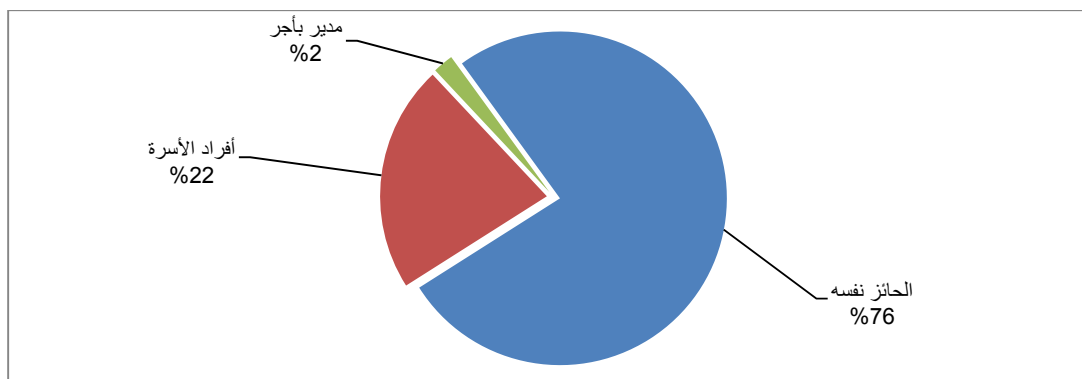
3,832

%2

369

2010

:50



(44)

%20

%19

%17

0.05

2010

:44

%81	55,997	%19	13,007	
%80	1,460	%20	369	
%83	18,771	%17	3,832	
%82	76,228	%18	17,208	

9.7

(51)

9,874

(45)

%42

%58

7,284

(45)

%67

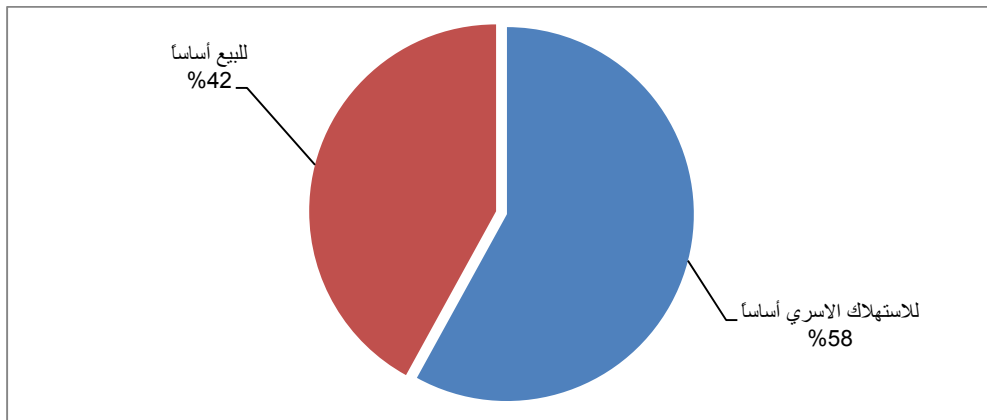
%33

%86

%14

2010

:51



0.05

2010

:45

%86	59,283	%14	9,874	
%67	14,942	%33	7,284	
%81	74,225	%19	17,158	

()

1.8

:

2010

:

(%82)

:

•

(%6)

(%12)

.(%1)

(%71)

(60-31)

:

•

.(%6)

(

30)

(%24)

(

60)

(%7)

(%88)

:

•

(%25)

(%75)

:

•

(%50)

(9-6)

:

•

10

(%16)

(3-2)

(%21)

(5-4)

.(%2)

(%12)

:

•

%.58

:

•

%5

%95

:

•

(%24)

%74

.(%2)

:

•

%26

%74

:

. %25

. %35 ()

. %50 ()

. %60 ()

. %18

:()

)

. (

. %22 %38

()

. ()

. %26 %74

()

. ()

. %45 %74

)

. (

. %59 %68

)

. (

. %16 %30

:

.

(%50) (%69)

(%44) (%45) (%31)

. (%13) (%12)

()

(%73)

(%76) (%74) (%39) (%46)

. (%13) (%12)

()

(%87)

(%72)

(%75)

(%67)

(%62)

.(%27)

(%16)

(%70)

(%88)

(%72)

(%80)

(%70)

.(%63)

(%51)

(%29)

(%57)

(%38)

(%35)

(%37)

.(%3)

(%10)

:

)

(

.

•

.

•

.

.

•

.

•

:

()

•

.

)

(

•

.

•

.

.

•

.

.

•

:
)

()

(

•

•

•

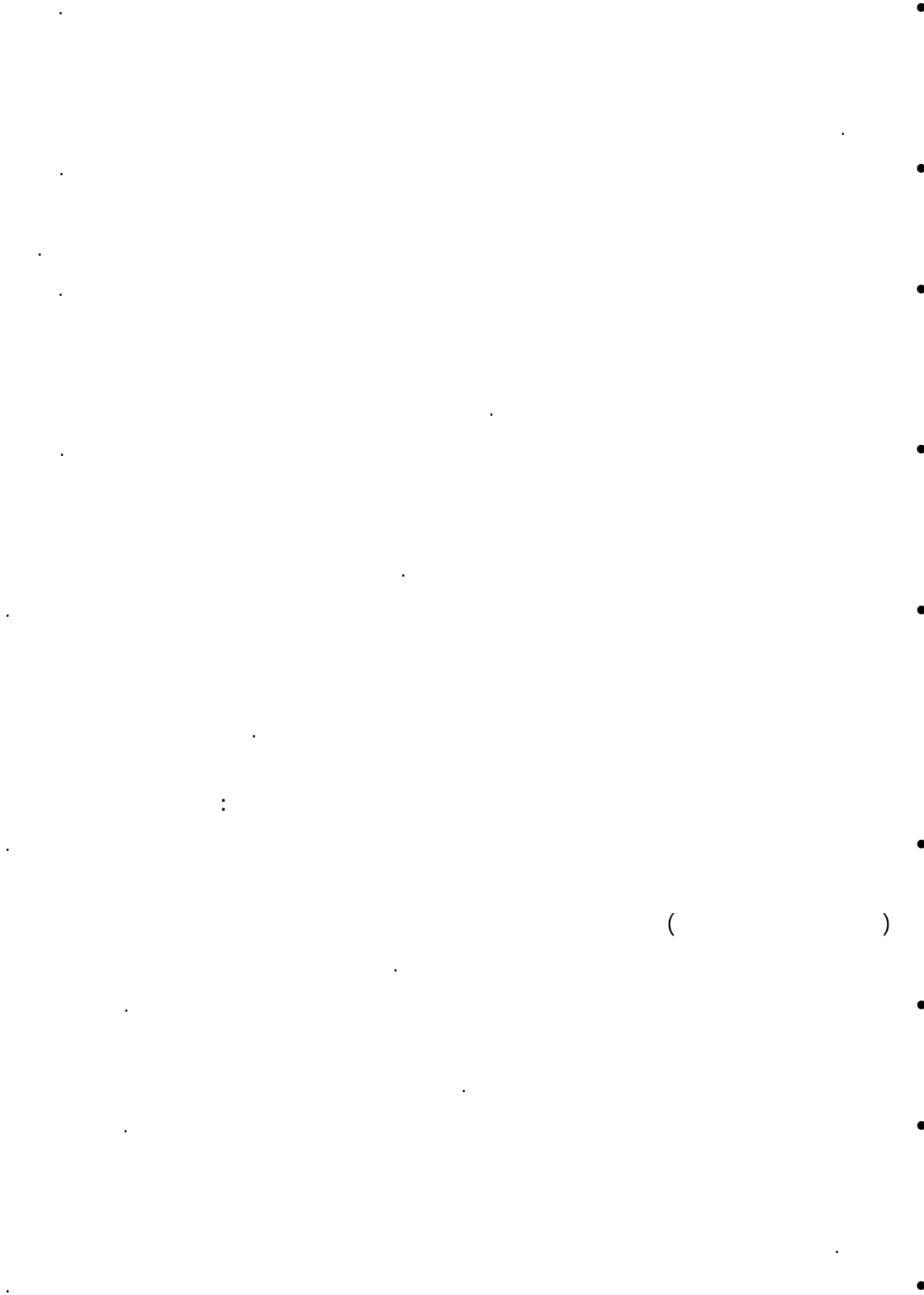
•

•

•

•

•



)

:

(

•

•

•

•

•

•

•

•

•

•

•

•

•

•

2.8

•

•

•

•

•

•

•

•

•

•

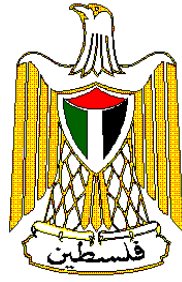
•

•

•

- (2010).
- (2010) ()
- (2007)
- (2011)
- www.un.org.arabic/news/fullstorynews.asp?newsID=14520
- (2003)
- (2011)
- (2011)
- (1980)
- Aghion, P., Blundell, R., Griffith, R., Howitt, P. and Prantl, S. (2009). "The Effects of Entry on Incumbent Innovation and Productivity", *The Review of Economics and Statistics* 91, 20–32
- Bertschek, I. (1995). "Product and Process Innovation as a Response to Increasing Imports and Foreign Direct Investment", *Journal of Industrial Economics* 43(4),341–357
- CIMMYT Economics Program (1993). *The Adoption of Agricultural Technology: A Guide for Survey Design*. Mexico, D.F.: CIMMYT Davies, S., (1979). *The Diffusion of Process Innovations*. Cambridge University Press, Cambridge, MA.
- Engelstätter, B., Sarbu, M.(2011). "The Adoption of Social Enterprise Software", Centre for European Economic Research, Discussion. Paper No. 11-078
- Flaig, G. and M. Stadler (1994). "Success Breeds Success: The Dynamics of the Innovation Process", *Empirical Economics* 19, 55–68
- Frambach, R. and Schillewaert, N. (2002). "Organizational Innovation Adoption, a Multilevel Framework of Determinants and Opportunities for Future Research", *Journal of Business Research* 55, 163–176
- Ihli, H., Maart, S., Musshoff, O., (2012). "Investment Disinvestment in Irrigation Technology: An Experimental Analysis of Farmers' Decision Behavior", Agricultural and Applied Economics Association (AAEA). Seattle, Washington, August 12-14, 2012
- Jack, K. (2011). "Market Inefficiencies and the Adoption of Agricultural Technologies in Developing countries. Agricultural Technology Adoption Initiative J-PAL(MIT), Berkeley.
- Lo, S. and Sutthiphisal, D. (2010). "Crossover Inventions and Knowledge Diffusion of General Purpose Technologies: Evidence from the Electrical Technology". *The Journal of Economic History*. 70(3), 744–764
- Petros, T. (2010). "Adoption of Conservation Tillage Technologies in Metema Woreda, North Gondar Zone, Ethiopia", Unpublished M.sc Thesis, Haramaya University
- Rogers, E., Stanfield, J.(1968). *The Adoption and Diffusion of New Products*. New York John Wiley and sons

- Ruttan, V. (1980). "Agricultural Research and the Future of American Agriculture". Department of Agricultural Economics and Applied Research, University of Minnesota, Staff Paper, July, 1980
- Weir, S., J. Knight and T. Woldehanna (2003). "The Role of Education in Facilitating Risk-taking and Innovation in Agriculture". *Journal of Development Studies* 39(6): 1-22
- Wozniak, G. D. (1987). "Human Capital, Information, and the Early Adoption of New Technology". *The Journal of Human Resources*. 22(1): 101–112.



**Palestinian National Authority
Palestinian Central Bureau of Statistics**

Dissemination and analysis of Agricultural Census – 2010

**Impact Properties of Agricultural Holders to Absorb
and Use of Modern Technology in the Palestinian
Territory**

Prepared by

Palestine Economic Policy Research Institute-MAS

August, 2013

This document is prepared in accordance with the standard procedures stated in the Code of Practice for Palestine Official Statistics 2006

August, 2013.

All rights reserved.

Suggested Citation:

Palestinian Central Bureau of Statistics, 2013, *Impact properties of agricultural holders to absorb and use of modern technology in the Palestinian Territory. Ramallah, Palestine.*

All correspondence should be directed to:
Palestinian Central Bureau of Statistics
P.O.Box 1647 Ramallah, Palestine.

Tel: (972/970) 22 98 2700

Fax: (972/970) 2 298 2710

Toll Free: 1800300300

E-Mail: diwan@pcbs.gov.ps

web-site: <http://www.pcbs.gov.ps>

Acknowledgments

This study was carried out funding from the World Bank (WB), PCBS expresses its gratitude to the World Bank (WB), for their valuable contribution towards the funding of preparation and printing the study.

Executive Summary

The main objective of this study is to analyze the effects of the socio-economic characteristics of the agricultural holders on the adoption of agricultural technology. This was done through analyzing the results of the agricultural census which was completed by the PCBS in cooperation with the Ministry of Agriculture and the Union of Agricultural Work Committees. The specific objectives of the study are to: identify the main characteristics of the agricultural holders; identify to which extent different types of agricultural technology are used including: biotechnology, chemical, mechanical, and integrated pest management; analyze the difference in applying these types of technologies in different geographical areas in the Occupied Palestinian Territory (OPT); and analyze the relation between the different types of technologies and the socio-economic characteristics of the agricultural holders.

The importance of the study is to present policy recommendations that could be used as a basis for policy formulation from which to improve productivity, production and holders' income. The study is also important to importers of these types of technologies, and to the exporters of different agricultural products. Moreover, the results of the study are also important to the agricultural unions and the agricultural firms who by which can identify the groups who are heavy users of such technologies.

In order to achieve its objectives, the study uses both descriptive and inferential statistics. In the descriptive side, the study calculates frequencies and percentages to describe the socio-economic characteristics of the holders and the extent to which the different types of agricultural technologies are used. In the inferential statistics side, the study uses the Chi-square test and the one-way ANOVA test to examine the relation between the use of agricultural technologies and the socio-economic characteristics of the agricultural holders.

There were no geographical limits to the study. In fact, the census included all governorates in the West Bank and in the Gaza Strip (eleven in the West bank and five in the Gaza Strip). Because there are differences between the circumstances and types of technologies used in plant and animal production, and because the initial results of the census show that 71% of the total agricultural holdings are plant holdings, the study analyzed the use of different types of technologies in plant production. And since the mixed holdings include plant production, the study used observations from both plant and mixed holdings in the analysis. The study excluded from the analysis observations that didn't provide a specific answers to the question.

Biotechnology is defined as the use of hybrid and improved seeds and seedlings in the agricultural production process with the aim to increase agricultural production and to enhance the quality of agricultural products. The World Bank asserts that there was an increase in the agricultural production due to the use of such technology. Chemical technology is defined as the use of chemical fertilizers to maintain soil fertility, and the use of chemical pesticides to control pests that threat plant growth. Mechanical technology is defined is the use of heavy machinery in the agricultural production process. It is a labor-saving king of technology. Studies show that both bio and chemical technologies are land-saving technologies, since their use increase production or produce the same level of output using less land. The use of mechanical technology, studies say, does not increase production but it reduces the use of the labor force in the production process.

The results of the study show that the legal status of most of the holders are individuals 82%, followed by households 12% and partnerships 6%, whereas the institutions (societies, government and companies) only makes about 1% of the total number of holders. Most of the holders fall in the age group of (31-60) years who comprise 71%, followed by those 60 years of age or older who comprise 24%, and those aged 30 years or less making up 6%. Most of the holders are males 88%, while the females constitute 7% of the total number of holders and the remaining proportions go to their partnerships. Holders whose main occupation is not agriculture constitute 75% of all holders, whereas the occupation of 25% of them is agriculture. The percentage of holders who live in households with (6-9) members is 50%, while those who live with (4-5) members is 21%, and the percentage of those who live within a household of (2-3) members is 16%, the percentage of households with more than 10 persons is 12% and finally the households with only one household member make up 2%. Holders who attained elementary, preparatory or secondary level of education constituted 58% of total holders, while the others were distributed among other educational levels. Holders with at least secondary level education who were not specialized in agriculture constituted 95% of holders, while only 5% of them had a major in agricultural sciences. Of the holdings, 74% were managed by the holders themselves, 24% by household members while only 2% managed by a hired manager. Holders' whose main purpose of production was oriented toward household consumption constituted 74%, whereas 24% of them was to direct their production for sale in the markets.

The study shows that there are substantial differences in the extent of which different types of agricultural technologies are used. In fact, 60% of the holders use mechanical technology; 50% of them use chemical pesticides; 35% of them use chemical fertilizers; 25% of them use biotechnology; and only 18% of them use integrated pest management.

In terms of the different usages of technologies among different geographical regions in the OPT, the results show that there are statistically significant differences that favoring the Gaza Strip over the West Bank. More specifically, the results show that 38% of the holders in the Gaza Strip use biotechnology, whereas 22% of the holders in the West Bank use it; the percentage of holders in the Gaza Strip who use chemical fertilizers was 74%, whereas 26% of the holders in the West Bank use such chemicals; the percentage of holders in the Gaza Strip who use chemical pesticides was 74%, whereas 45% of the holders in the West Bank use such chemicals; the percentage of holders in the Gaza Strip who use mechanical technology was 68%, whereas 59% of the holders in the West Bank use such technology; the percentage of holders in the Gaza Strip who use integrated pest management was 30%, whereas 16% of the holders in the West Bank use such technology.

In terms of the differences among governorates of the OPT in using agricultural technologies, the results show a statistically significant difference among them, at the statistical level of significance (0.05). Furthermore, the differences are in favor of governorates that are characterized by irrigated agriculture over governorates that depend on rain-fed agriculture. Specifically, the results show that holders located in irrigated governorates use biotechnology more intensively than holders who are located in the rain-fed governorates. As examples, in the irrigated governorates, the percentage of holders who use biotechnology in Jericho and Al- Agwar made up 69%, 50% in Tubas, 31% in Qalqilya, 45% in Rafah, and 44% in Khan Yunis. However, only as examples of the rain-fed governorates, it is noticed that only 12% of the holders in Ramallah and Al-Bireh, and 13% in Salfit use such technology. Holders located in irrigated governorates use chemical fertilizer more intensively than holders who are located in the rain-fed governorates. As examples of the irrigated governorates, the study found that

73% of the holders in Jericho and Al- Agwar, 46% in Tubas, 39% in Qalqilya, 74% in Rafah, and 76% in Khan Yunis use chemical fertilizers. As examples of the rain-fed governorates, however, the study found that only 12% of the holders in Ramallah and Al-Bireh, and 13% in Salfit use such chemicals. Holders located in irrigated governorates use chemical pesticides more intensively than holders who are located in the rain-fed governorates. As examples of the irrigated governorates, the study found that 87% of the holders in Jericho and Al- Agwar, 62% in Tubas and Tulkarm, 67% in Qalqilya, 75% in Rafah, and 72% in Khan Yunis use chemical pesticides. As examples of the rain-fed governorates, however, it found that only 16% of the holders in Ramallah and Al-Bireh, and 27% in Jerusalem use such chemicals. Holders located in irrigated governorates use mechanical technology more intensively than holders who are located in the rain-fed governorates. As examples of the irrigated governorates, the study found that 88% of the holders in Jericho and Al- Agwar, 70% in Tubas, 70% in Qalqilya, 80% in Rafah, and 72% in Khan Yunis use mechanical technology. As examples of the rain-fed governorates, however, it found that only 51% of the holders in Ramallah and Al-Bireh, and 63% in Salfit use such technology. Holders located in irrigated governorates use integrated pest management more intensively than holders who are located in the rain-fed governorates. As examples of the irrigated governorates, the study found that 57% of the holders in Jericho and Al- Agwar, 29% in Tubas, 37% in North Gaza, 35% in Rafah, and 38% in Deir Al-Balah use integrated pest management. As examples of the rain-fed governorates, however, it found that only 10% of the holders in Ramallah and Al-Bireh, and 3% in Jerusalem and Salfit use such technology.

The use of biotechnology differs according to the socio-economic characteristics of the holders at the (0.05) statistical significance level. First, there is a statistically significant relationship between the use of biotechnology and the legal status of the holder, and it is in the favor of institutional holdings (cooperatives, companies and government), where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the other groups. Second, there is a statistically significant relationship between the use of biotechnology and the holder's age, and it is in the favor of relatively younger groups, where the percentage of holders that use such technology within the younger groups are larger than the percentage of holders that use it within the other groups. Third, there is a statistically significant relationship between the use of biotechnology and the gender of the holder, and it is in the favor of the males, where the percentage of male holders that use such technology within the male group is larger than the percentage of the female holders that use it within the female group. Fourth, there is a statistically significant relationship between the use of biotechnology and the holder's main occupation, and it is in the favor of holders whose main occupation is agriculture, where the percentage of holders that use such technology within this group is larger the percentage of holders that use it within the holders whose main occupation is not agriculture. Fifth, there is a statistically significant relationship between the use of biotechnology and the holder's household size, and it is in the favor of holders who belong to large size households, where the percentage of holders that use such technology within these groups are higher than the percentage of holders that use it within the holders who belong to small size households. Sixth, there is a statistically significant relationship between the use of biotechnology and the holder's educational level, and it is in the favor of holders who attained higher level of education, where the percentage of holders that use such technology within these groups is larger than the percentage of holders that use it within the holders who attained lower educational levels. Seventh, there is a statistically significant relationship between the use of biotechnology and the holder's academic field, and it is in the favor of holders whose field of specialization is agricultural sciences, where the percentage of holders that use such technology within this group is larger

than the percentage of holders that use it within the group of holders whose field of specialization is not agriculture. Eighth, there is a statistically significant relationship between the use of biotechnology and the holding management method, and it is in the favor of holders whose holding is managed by the holder himself, where the percentage of holdings that are managed by the holder himself and use such technology is higher than the percentage of holdings that are managed by the other methods. Ninth, there is a statistically significant relationship between the use of biotechnology and the main purpose of production, and it is in the favor of holders whose main purpose of production is to sell their products in the market, where the percentage of holders that use such technology within this group is larger than the percentage of holders whose main purpose of production is for household consumption.

The use of chemical technology (chemical fertilizers) varies according to socio-economic characteristics of the holders with statistical significance at the (0.05) level. First, there is a statistically significant relationship between the use of chemical fertilizers and the legal status of the holder, and it is in the favor of institutional holdings (cooperatives, companies and government), where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the other groups. Second, there is a statistically significant relationship between the use of chemical fertilizers and the holder's age, and it is in the favor of relatively younger groups, where the percentage of holders that use such technology within the younger groups is larger than the percentage of holders that use it within the other groups. Third, there is a statistically significant relationship between the use of chemical fertilizers and the gender of the holder, and it is in the favor of males, where the percentage of male holders who use such technology within the male group is larger than the percentage of the female holders who use it within the female group. Fourth, there is a statistically significant relationship between the use of chemical fertilizers and the holder's main occupation, and it is in the favor of holders whose main occupation is agriculture, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the holders whose main occupation is not agriculture. Fifth, there is a statistically significant relationship between the use of chemical fertilizers and the holder's household size, and it is in the favor of holders who belong to large size households, where the percentage of holders that use such technology within these groups is higher than the percentage of holders that use it within the holders who belong to small size households. Sixth, there is a statistically significant relationship between the use of chemical fertilizers and the holder's educational level, and it is in the favor of holders who attained higher level of education, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it but fall within lower educational level groups. Seventh, there is a statistically significant relationship between the use of chemical fertilizers and the holder's academic field, and it is in the favor of holders whose field of specialization is agricultural sciences, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within and whose field of specialization is not agriculture. Eighth, there is a statistically significant relationship between the use of chemical fertilizers and the holding management method, and it is in the favor of those managed by the holder himself, where the percentage of holdings that is managed by the holder himself and use such technology is higher than the percentage of holdings that is managed by the other methods. Ninth, there is a statistically significant relationship between the use of chemical fertilizers and the main purpose of production, and it is in the favor of holders whose main purpose of production is to sell their products in the market, where the percentage of holders that use such technology to sell their products is larger the percentage of holders that use it and whose main purpose of production is for household consumption.

The use of chemical technology (chemical pesticides) varies according to socio-economic characteristics of the holders with statistical significance at the (0.05) level. First, there is a statistically significant relationship between the use of chemical pesticides and the legal status of the holder, and it is in the favor of institutional holdings (cooperatives, companies and government), where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within other groups. Second, there is a statistically significant relationship between the use of chemical pesticides and the holder's age, and it is in the favor of relatively younger groups, where the percentage of holders that use such technology within the younger groups is larger than the percentage of holders that use it within the other groups. Third, there is a statistically significant relationship between the use of chemical pesticides and the gender of the holder, and it is in the favor of males, where the percentage of the male holders that use such technology within the male group is larger than the percentage of the female holders that use it within the female group. Fourth, there is a statistically significant relationship between the use of chemical pesticides and the holder's main occupation, and it is in the favor of holders whose main occupation is agriculture, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the holders whose main occupation is not agriculture. Fifth, there is a statistically significant relationship between the use of chemical pesticides and the holder's household size, and it is in the favor of holders who belong to large size households, where the percentage of holders that use such technology within these groups are higher than the percentage of holders that use it within the holders who belong to small size households. Sixth, there is a statistically significant relationship between the use of chemical pesticides and the holder's educational level, and it is in the favor of holders who attained higher level of education, where the percentage of holders that use such technology within these groups are larger than the percentage of holders that use it but fall within the holders who attained lower educational levels. Seventh, there is a statistically significant relationship between the use of chemical pesticides and the holder's academic field, and it is in the favor of holders whose field of specialization is agricultural sciences, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the holders whose field of specialization is not agriculture. Eighth, there is a statistically significant relationship between the use of chemical pesticides and the holding management method, and it is in the favor of those managed by the holder himself, where the percentage of holdings that is managed by the holder himself and use such technology is higher than the percentage of holdings that is managed by the other methods. Ninth, there is a statistically significant relationship between the use of chemical pesticides and the main purpose of production, and it is in the favor of holders whose main purpose of production is to sell their products in the market, where the percentage of holders that use such technology to sell their products is larger than the percentage of holders that use it within the holders whose main purpose of production is for household consumption.

The use of mechanical technology (heavy machinery) varies according to the socio-economic characteristics of the holders with a statistical significance level of (0.05). First, there is a statistically significant relationship between the use of mechanical technology and the legal status of the holder, and it is in the favor of institutional holdings (cooperatives, companies and government), where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within other groups. Second, there is a statistically significant relationship between the use of mechanical technology and the

holder's age, and it is in the favor of relatively younger groups, where the percentage of holders that use such technology within the younger groups is larger than the percentage of holders that use it within the other groups. Third, there is a statistically significant relationship between the use of mechanical technology and the gender of the holder, and it is in the favor of males, where the percentage of the male holders that use such technology within the male group is larger than the percentage of the female holders that use it within the female group. Fourth, there is a statistically significant relationship between the use of mechanical technology and the holder's main occupation, and it is in the favor of holders whose main occupation is agriculture, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the holders whose main occupation is not agriculture. Fifth, there is a statistically significant relationship between the use of mechanical technology and the holder's household size, and it is in the favor of holders who belong to large size households, where the percentage of holders that use such technology within these groups are higher than the percentage of holders that use it within the holders who belong to small size households. Sixth, there is a statistically significant relationship between the use of mechanical technology and the holder's educational level, and it is in the favor of holders who attained higher level of education, where the percentage of holders that use such technology within these groups are larger than the percentage of holders that use it but fall within the holders who attained lower educational levels. Seventh, there is a statistically significant relationship between the use of mechanical technology and the holder's academic field, and it is in the favor of holders whose field of specialization is agricultural sciences, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the holders whose field of specialization is not agriculture. Eighth, there is a statistically significant relationship between the use of mechanical technology and the holding management method, and it is in the favor of those managed by the holder himself, where the percentage of holdings that is managed by the holder himself and use such technology is higher than the percentage of holdings that is managed by the other methods. Ninth, there is a statistically significant relationship between the use of mechanical technology and the main purpose of production, and it is in the favor of holders whose main purpose of production is to sell their products in the market, where the percentage of holders that use such technology to sell their products is larger than the percentage of holders that use it within the holders whose main purpose of production is for household consumption.

The use of integrated pest management varies according to the socio-economic characteristics of the holders at statistical significance level of (0.05). First, there is a statistically significant relationship between the use of integrated pest management and the legal status of the holder, and it is in the favor of institutional holdings (cooperatives, companies and government), where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the other groups. Second, there is a statistically significant relationship between the use of integrated pest management and the holder's age, and it is in the favor of relatively younger groups, where the percentage of holders that use such technology within the younger groups are larger than the percentage of holders that use it within the other groups. Third, there is a statistically significant relationship between the use of integrated pest management and the gender of the holder, and it is in the favor of males, where the percentage of the male holders that use such technology within the male group is larger than the percentage of the female holders that use it within the female group. Fourth, there is a statistically significant relationship between the use of integrated pest management and the holder's main occupation, and it is in the favor of holders whose main occupation is agriculture, where the percentage of holders that use such technology within this

group is larger than the percentage of holders that use it within the holders whose main occupation is not agriculture. Fifth, there is a statistically significant relationship between the use of integrated pest management and the holder's household size, and it is in the favor of holders who belong to large size household, where the percentage of holders that use such technology within these groups is higher than the percentage of holders that use it within the holders who belong to small size households. Sixth, there is a statistically significant relationship between the use of integrated pest management and the holder's educational level, and it is in the favor of holders who attained higher level of education, where the percentage of holders that use such technology within these groups are larger than the percentage of holders that use it but fall within the holders who attained lower educational levels. Seventh, there is a statistically significant relationship between the use of integrated pest management and the holder's academic field, and it is in the favor of holders whose field of specialization is agricultural sciences, where the percentage of holders that use such technology within this group is larger than the percentage of holders that use it within the holders whose field of specialization is not agriculture. Eighth, there is a statistically significant relationship between the use of integrated pest management and the holding management method, and it is in the favor of those managed by the holder himself, where the percentage of holdings that is managed by the holder himself and use such technology is higher than the percentage of holdings that is managed by the other methods. Ninth, there is a statistically significant relationship between the use of integrated pest management and the main purpose of production, and it is in the favor of holders whose main purpose of production is to sell their products in the market, where the percentage of holders that use such technology to sell their products is larger than the percentage of holders that use it within the holders whose main purpose of production is for household consumption.

In the light of the results outlined above, the study produces policy recommendations that can be of use for different types of stakeholders. First, intensify the use of both biotechnology and chemical technology, since they lead to an increase in yields and total production. Second, reduce reliance on heavy machinery in agriculture, since that leads to more unemployment in the OPT. Third, in the light of the current demand for these machineries, importers may continue importing them. Fourth, enhance the level of education, since holders with higher levels of education intensify their use of all types of agricultural technology. Fifth, encourage students, especially in rural areas, to specialize in agriculture, since holders who specialize in agricultural science in their academic study use all types of technology more than who do not. Sixth, intensify the extension services on the use of the integrated pest management, since the use of such technology is the least used among the types of technologies under consideration. Seventh, encourage farmers to engage in large scale farming and institutional farming (cooperatives and companies), since such forms of holdings use all types of technology more than the individual holdings. Eighth, encourage females to engage in partnership farming with males, since males use all types of agriculture more than female. Ninth, encourage farmers to make agriculture their main occupation, sine this group of holders use all types of agricultural technology more than those whose main occupation is not agriculture. Finally, encourage farmers to direct their production for sale in the market, since this group of holders use agricultural technologies more than those whose purpose of production is for household consumption.