

## **A COMPARATIVE STUDY FOR RETURN PER UNIT OF WATER IN THE NEW AND DESERT LANDS AND OTHER LANDS FOR THE MAIN CROPS IN EGYPT**

**Fayyad, S. M. S.**

**Desert Research Center - Agricultural Economy Department**

### **ABSTRACT**

Egypt suffers from lower water resource in the coming few years and water consider to be one of the most important economic resources in agricultural sector. One of the important challenges Egypt facing in the coming years is the highly demand on agricultural products with fixed land supply, thus new and desert lands are one of the solutions that can meet the higher agricultural products demand. But water supply scarcity will be one of the most difficulties in the extending in the new and desert lands in Egypt. This study aimed to measure the water productivity and water loss and return per unite of water in the new and desert lands comparing to the other lands in Egypt (Delta, middle and Upper Egypt) for different types of crops represent the main food, fodder and fibers groups during the period from 1996 till 2010 divided to three periods of time.

The results shows that the higher water productivity for the crops cultivated in the new and desert lands was for the fodder crops sugar beet, tomato, potato garlic and onion in the three periods of times. While the lowest water productivity in the new and desert lands was cotton legumes and oil groups in the three periods of times. For the return in L.E. per unit of water in the new and desert lands for the crops under study reach about 26.12 L.E./M<sup>3</sup> in the first average period (1996-2000) and it increase to reach about 49.02 L.E./M<sup>3</sup> in the third average period (2006-2010) with growth rate reach about 87.3%. This was the highest growth rate comparing to the growth rate that happen for the return in L.E. per unit of water in other regions like delta, middle and upper Egypt. Thus, the study recommends in the end that vegetables and fruits and exports products like potato, onion and garlic and sugar beet, are recommended to be cultivated in the new and desert lands in respect to water revenue. While other crops like grains, oil and legumes and fiber and sugar cane are recommended to be cultivated mainly in other areas like delta, middle and upper Egypt. This cannot be applying without the return to the crop rotation policy and the pricing policy incentives so as to encourage farmers to cultivate crops with high return with respect to the unit of water.

### **INTRODUCTION**

Water is one of the most Important economic resources in the in the agricultural sector. Since water is an economic rescore that is scarcity, which means the supply is not fitting the demand.

Egypt depends on surface water resource from river Nile, in addition to a little amount from underground water and rains. River Nile contributes about 81.9%<sup>(4)</sup> of the clean water from the total cleaned water in Egypt. Thus, the water policy target is to increase the efficiency for the water use, in addition the efficiency use for the underground and the reuse of the water. Agricultural sector use about 82.9%<sup>(4)</sup> for the total available water in Egypt. To carry on in the mega projects and the programs in the new lands we have to increase the availability and water use efficiency in this sector.

#### **The Study Objective:**

Object of this study is to measure the efficiency of the water used in agriculture sector in the new and desert lands, and compare it with the

efficiency of the water used in the delta area, Middle and Upper Egypt. Also, to compare the revenue in L.E. per unit of water in  $M^3$ , water productivity and water loss for the different crops in the areas under study.

**Data Resource and Methodology:**

The study used the primary data, from different resources; the field requirement was taken from the Center Agency for Public Mobilization and Statistics (CAPMS). Also, the data for the areas and productivity was taken from the agricultural economic bulletins, from Ministry of Agricultural and Land Reclamation (MALR). There is a debate about the main items that dominate the economic activity in the new and desert lands. Some related this activity to the revenue per unit of water and per unit of power. So the paper will study the revenue per unit of water, the study depend on the Economic analysis descriptive for the derivative of the productivity per unit of water, water loss, revenue in L.E. per unit of water, in the desert and new lands and comparing it with this productivity in other lands. So as to achieve this the study period extends from 1996 till 2010. This period was divided to three periods (1996-2000, 2001-2005, and 2006-2010). Crops used in this study represent most cultivated crops from different groups in desert and new lands delta middle and Upper Egypt. In calculating the values for these crops the study used fixed price for the average period (2000-2005).

## **RESULTS**

**Water productivity:**

Table (1) shows that water productivity in the New and desert lands vary from one crop to other in the in the Average period (2006-2010) comparing to the average period (1996-2000). Since it increase for some crops like wheat, chickpeas, fenugreek, lupines, soya beans and berseem Hegazy since it was 0.97, 0.34, 0.38, 0.30, 0.25 and 8.59 ton/000  $M^3$  respectively in the average period (1996-2000) to 1.08, 0.53, 0.48, 0.36, 0.45 and 11.33 ton/000  $M^3$  respectively in the average period (2006-2010). While for some other crops table (1) shows the reduction for the water productivity in the new and desert lands like summer maize fava beans lintel Cotton, long berseem, sugar cane and sugar beet since it was 0.87, 0.91, 0.29, 0.20, 9.48, 5.26 and 7.07 ton/000  $M^3$  respectively in the average period (1996-2000) to 0.81, 0.83, 0.25, 0.18, 8.70, 4.96 and 6.45 ton/000  $M^3$  respectively in the average period (2006-2010).

Also we can notes from table (1) that water productivity in the new and desert lands in general are less than water productivity in delta and middle Egypt areas for all crops in the three periods that is understudy and this is due to either the soil fertility in delta areas or to the water requirements for the varieties especially in the new and desert lands variants in these area and heat stress . Comparing this productivity in the new and desert lands with the productivity in upper Egypt we can notes that water productivity in new and desert lands are more than water productivity for some crops in the upper Egypt especially in the last period (2006-2010) like nili maize fava beans Soybeans, clover and alfa alfa .

For horticultural crops like vegetables and fruits and other crops, table (1) shows that water productivity for these crops in new and desert

lands increase in the average period (2006-2010) comparing to the average period (1996-2006) for all vegetables and fruits crops especially for the winter vegetables, summer vegetables and fruits group since it increased from 3.65, 2.79 and 0.74 Ton/1,000 M<sup>3</sup> in the average period (1996-2000) to 4.59, 3.89 and 1.24 Ton/1,000 M<sup>3</sup> in the average period (2006-2010). The increase in the water productivity in new and desert lands is higher than the increase in the water productivity in other lands in the periods under study. While same table presents that water productivity in other crops like potato, onion and garlic increase in the new and desert land for winter and summer onion in the average period (2006-2010) comparing to the water productivity for this crop in the average period (1996-2000). While water productivity reduced for potato and garlic in the third average period comparing to the first one.

#### **Sacrificed Productivity**

Table (2) shows that scarified productivity reaches its maximum for winter vegetables, short barseem, winter and Nili tomato and winter potato since 1000 fed. cultivated from these crops in the new and desert lands scarify about 5363, 3209, 2332, 1421 and 1275 ton/1000 fed from these crops in upper Egypt in the average period (1996-2000). This scarified productivity for these crops reduce in the average period (2006-2010) to reach 3096, 1393, 1088 and 1170 tons/1000 fed for winter vegetables, winter and Nili tomato and winter potato respectively. Since lowest crops productivity sacrificing was for summer green beans, sunflower, Sesame, chickpeas and Sugar cane, since 1000 fed. cultivated from these crops in the new and desert lands scarify about 0.7, 3.7, 3.8, 22.1 and 51.7 ton from these crops in upper Egypt in the average period (1996-2000). This sacrificing productivity does not exist in the mentioned crops during the average period (2006-2010) for new and desert lands comparing to Upper Egypt where scarified productivity was higher. From the same table we can notes that there are some crops the scarified productivity increase in the new and desert lands than the lands in upper Egypt like nili maize, clover, summer vegetables, summer potato, Lemon and Guava. From the same table we can notes that there is some crops reach higher productivity in the new and desert lands than in upper Egypt, in the third average period than the first one these crops like wheat, short berseem, Oranges.

Looking for the scarified productivity in the new and desert lands comparing to the scarified productivity in middle Egypt we can notes that this productivity reach its maximum for sugar beet, alfa alfa, garlic, summer onion and linen since 1000 fed cultivated from these crops sacrificed about 6089, 3205, 2442, 2327 and 1984 ton respectively in the average period (1996-2000). These crops sacrificed productivity increased in the average period (2006-2010) to reach about 8183.1, 16713, 56232, 4528 and 3137 ton respectively. Since lowest crops productivity sacrificing was for winter green peas, Soybeans, sesame and nili vegetables cotton since 1000 fed cultivated from these crops sacrificed about 25.3, 27.2, 44.5, 52.2 and 57.4 ton respectively in the average period (1996-2000). These crops sacrificed productivity increased in the average period (2006-2010) to reach about 1085, 376.7, 183.4, 4250.4 and 226.7 ton respectively.





From the same table we can noted that the productivity for the crops under study in middle Egypt are higher than the productivity for the crops in desert and new lands. This productivity increased in the average period (2006-2010) comparing to the average period (1996-2000). This means that technology for the varieties that is cultivated in the middle Egypt, was given more attention that the technology that was given to the varieties for these crops that is cultivated in new and desert lands.

While the scarified productivity in delta areas comparing to the scarified productivity in new and desert lands, table (2) shows that this productivity reach its maximum for short Berseem, clovers, summer tomato, summer and winter potato, since 1000 fed cultivated from these crops sacrificed about 4085, 2676, 2237, 2117 and 1825 ton respectively in the average period (1996-2000). These crops sacrificed productivity increased in the average period (2006-2010) to reach about 11715, 9856, 4906, 4132 and 3841 ton respectively. Since

Lowest crops sacrificed productivity was for chickpeas, Cotton, ground beans, lintel and soybeans since 1000 fed cultivated from these crops sacrificed about 25, 62.7, 89.7, 97 and 104.8 ton respectively in the average period (1996-2000). These crops sacrificed productivity increased in the average period (2006-2010) to reach about 529, 292, 315, 525.7 and 392 ton respectively. From the same table we can see that the productivity for the crops under study in delta areas higher than the productivity for the crops in desert and new lands. This productivity increased in the average period (2006-2010) comparing to the average period (1996-2000). This means that technology for the varieties that is cultivated in the delta is given more attention that the technology that was given to the varieties for these crops that is cultivated in new and desert lands.

**Water loss:**

Loss in water means the increasing in the water use as a result for the decision to cultivate in the new and desert land than in Upper middle or Delta areas. The study calculated the loss of water for the field required water for the crops understudy in the average period (2005-2010). Thus, we can notes form table (3) that the water loss in Upper Egypt comparing to the desert and new lands reach its maximum for sugar cane, summer onion, fruits products and Rice since this loss reach about 1660, 1271, 1258 and 1004 thousand M<sup>3</sup> in case of cultivated 1000 fed respectively. Also from the same table we can notes that water loss excites in all crops that are cultivated in Upper Egypt comparing to the cultivation in desert and new lands.

While for the water loss due to the cultivation in middle Egypt comparing to the desert and new lands, we can notes from the same table water loss reach its maximum for vegetables and potato and summer onion.

In the same time some other crops the water loss was positive and this is due to the lower quantity of water in middle Egypt comparing to the water quantity for these crops in new and desert lands. This water saving reach its maximum for sugar cane, clover, legumes crops and winter onion.

**Table (3) Water loss and saving in New and desert lands comparing to Upper, Middle and Delta Areas in the average period (2005-2010)  
(,000 M<sup>3</sup> / 1000Fed.)**

	Average (2005-2010)		
	1	2	3
<b>Grains Group</b>			
Wheat	(385)	95	290
Summer Maize	(514)	16	497
Nili Maize	(537)	106	431
Rice	(1004)	(165)	545
Sorghum	(310)	182	525
<b>Legumes</b>			
Fava Beans	(350)	126	224
Lintel	(454)	155	299
Chickpeas	(383)	134	249
Fenugreek	(352)	124	228
Lupines	(401)	129	272
<b>Oil Group</b>			
Sunflow er	(394)	(12)	406
Soybeans	(498)	17	482
Sesame	(471)	22	449
Ground beans	(577)	(127)	704
<b>Fiber group</b>			
Cotton	(560)	54	506
Linen	(382)	136	246
<b>Fodder Group</b>			
Clover	(702)	172	530
Short Berseem	(303)	83	221
Alfa Alfa	(709)	75	634
<b>Sugar Group</b>			
Sugar Cane	(1660)	276	1384
Sugar Beet	(526)	121	405
<b>Vegetables</b>			
Winter Tomato	(496)	(496)	991
Sum Tomato	(790)	(790)	1579
Nili Tomato	(870)	(870)	1739
Sum Squash	(790)	(790)	1579
Su Green Beans	(790)	(790)	1579
Win Green Peas	(496)	(496)	991
<b>Fruits</b>			
Orange	(1258)	112	1146
Lemon	(1258)	112	1146
Grapes	(1258)	112	1146
Guava	(1258)	112	1146
<b>Other</b>			
Winter Potato	(495)	(495)	991
Summer potato	(789)	(789)	1579
Nili Potato	(870)	(870)	1739
Winter Onion	(501)	130	371
Summer Onion	(1271)	(648)	648
Garlic	(443)	63	380

**1= Water quantity used to cultivate 1000 fed, in new and desert lands - water quantity used to cultivate 1000 fed, in Upper Egypt**

**2= Water quantity used to cultivate 1000 fed, in new and desert lands - water quantity used to cultivate 1000 fed, in Middle Egypt**

**3= Water quantity used to cultivate 1000 fed, in new and desert lands - water quantity used to cultivate 1000 fed, in Delta**

**Number between brackets are negative which means water loss, positive number means water saving**

**Source: Calculated from table (1) in Annex**

While comparing the water use in the new and desert lands with the water use in delta for the crops under study we can note from the table the water saving, since most figures were positive which means that water used in delta for the crops under study was lower than water use for these crops in new and desert land as an average period (2005-2010). This water saving reaches its maximum for potato, vegetables, fruits and sugar cane. While it reaches its minimum for legumes, grains and oil crops.

#### **Revenue per Unit of Water**

Table (4) presents the revenue in L.E. per unit of water for the crops under study in the four areas for the three average periods of time. The revenue reaches about 37.70 L.E. per unit of water in the average period (1996-2000) for the crops under study in Upper Egypt. This revenue slightly reduced in the average period (2001-2005) and (2006-2010) to reach 35.22 and 33.80 respectively. Wheat, clover, summer maize, sugar cane and winter tomato are the higher crops that achieve higher return in L.E. per unit of water in Upper Egypt in the three average periods of time. While winter green peas, summer squash, sugar beet, and Alfa alfa are the crops that achieve lower return in L.E. per unit of water in Upper Egypt in the three periods of time.

For Middle Egypt we can note from table (4) the return per unit of water in L.E. reaches about 43.17 L.E. in the average period (1996-2000), it slightly increased to reach about 47.02, 46.93 L.E. per unit of water in the average periods (2001-2005), (2006-2010) respectively. Wheat, clover, summer and nili maize achieve the higher return in the three average periods of time. While revenues per unit of water in L.E. from lentil, chickpeas, lupines, , Summer green beans and summer squash are the crops that reached the lowest revenues in the three average periods of time in middle Egypt.

For delta area we can note from the same table the return per unit of water in L.E. reaches about 175.30 L.E. in the average period (1996-2000), it increases to reach about 204.88, 198.13 L.E. per unit of water in the average periods (2001-2005), (2006-2010) respectively. Wheat, clover, rice, summer maize and cotton achieve the higher return per unit of water in L.E. in the three average periods of time. Alfa alfa, chickpeas, soybeans, lupines and sunflower are the crops that reached the lowest revenues in the three average periods of time in delta.

For New and desert lands we can note from table (4) the return per unit of water in L.E. reaches about 26.17 L.E. in the average period (1996-2000), it increases to reach about 33.28, 49.03 L.E. per unit of water in the average periods (2001-2005), (2006-2010) respectively. Wheat, Clover, summer and winter tomato, grapes and fava beans achieve the higher return in the three average periods of time. While revenues per unit of water in L.E. from legumes group except fava beans, cotton, soya beans, Alfa alfa and nili potato are the crops that reached the lowest revenues in the three average periods of time in new and desert lands. From this table water revenue per unit change rate for the new and desert lands reaches about 87.4% and 47.3% in the average period (2006-2010) comparing to the average periods (1996-2000), (2001-2005) respectively.





While the water revenue per unit change rate for the new and desert land in the second period (2000-2005) reach about 27.2% comparing to the first one (1996-2000). While for delta areas we can notes that water revenue per unit change rate in this area reach about 13.02% and -3.29% in the average period (2006-2010) comparing to the average periods (1996-2000), (2001-2005) respectively. While water revenue per unit change rate for delta cultivated crops in the second period (2000-2005) reach about 16.87% comparing to the first period (1996-2000). For middle Egypt areas we can notes that the water revenue per unit change rate in this area reach about 8.70% and -0.19% in the average period (2006-2010) comparing to the average periods (1996-2000), (2001-2005) respectively. While water revenue per unit change rate for meddle Egypt cultivated crops in the second period (2001-2005) reach about 8.91% comparing to the first period (1996-2000). For Upper Egypt areas we can notes that the water revenue per unit change rate in this area reach about -10.33% and -4.01% in the average period (2006-2010) comparing to the average periods (1996-2000), (2001-2005) respectively. While the water revenue change rate for delta cultivated crops in the second period (2001-2005) reach about -6.58% comparing to the first period (1996-2000).

As and all over view we can notes that the highest change rate for the water revenue per unite reach for the new and desert lands especially in the third period comparing from the first two periods. While the lowest change rate for the water revenue per unit was for the crops cultivated in upper Egypt since it reach negative change rates in comparing the three periods. This high growth rate for the water revenue per unit for the crops cultivated in the new and desert lands are related to the horticultural crops especially tomato, potato and grapes, clover, wheat and ground beans especially in the third period. This means that the optimum use for the new and desert lands in agricultural sector is to cultivate these crops especially horticultural crops. In the same time these crops are exported crops and Egypt have a high competitive advantage in these crops , and have higher penetration access to the European and gulf markets in these crops.

So we can recommend that the best crops that can be cultivated in new and desert lands are with respect to water are horticultural crops, wheat, potato and onion especially in the winter season, sugar beet. This cannot happen without the return of the crop rotation policy and the pricing policy incentives so as to encourage farmers to cultivate crops with high return with respect to the unit of water.

## **REFERENCES**

- Alaa E. Abdin , Shaban Salem “ Strategic Plans for Sugar cane Cultivation in Upper Egypt Towards the Implementation of Rational water use” Egyptian Journal of Agricultural Economics – Volume 19 – No 1 March 2009
- Douglas J. Krieger and others “Growth and the productivity of inputs in agriculture on Egypt’s old land: 100—1997” Agricultural Policy Reform Project (APRP) July 1999
- Hazel Wood A. Livingstone. Irrigation Economics in Poor Countries, Oxford 1981  
Ministry of Agricultural and Land Reclamation – Agricultural Economics Affairs

Center Agency for Public Mobilization and Statistics

احمد احمد الجويلي، وآخرون (دكتور) "تقدير المياه الافتراضية ومدى كفاءة الموارد المائية للأمن الغذائي العربي" المجلة المصرية للإقتصاد الزراعي - المجلد التاسع عشر - العدد الأول - مارس ٢٠٠٩  
 جلال الملاح (دكتور) "إدخال مورد المياه في الحسابات القومية عند المفاضلة بين مناطق الإستزراع الجديدة" قضايا معاصرة في الزراعة المصرية - المؤتمر الثالث عشر للإقتصاديين الزراعيين ٢٨،٢٩ سبتمبر ٢٠٠٥

**ANNEXES**

**Annex (1) Water Required on Field level in the average period (2005-2010) (M<sup>3</sup>/Fed.)**

	Upper Egypt	Middle Egypt	Delta	New and desert lands*
<b>Grains Group</b>				
Wheat	2510	2030	1835	2125
Summer Maize	4276	3746	3265	3762
Nili Maize	3644	3001	2676	3107
Rice	8667	7829	7118	7663
Sorghum	3790	3297	2955	3480
<b>Legumes</b>				
Fava Beans	2013	1537	1440	1663
Lintel	2359	1750	1607	1905
Chickpeas	2173	1656	1542	1790
Fenugreek	2013	1537	1433	1661
Lupines	2279	1750	1607	1879
<b>Oil Group</b>				
Sunflower	3236	2855	2437	2843
Soybeans	4069	3555	3089	3571
Sesame	3728	3235	2808	3257
Ground beans	5648	5198	4367	5071
<b>Fiber group</b>				
Cotton	4764	4151	3699	4205
Linen	2093	1575	1465	1711
<b>Fodder Group</b>				
Clover	4296	3421	3063	3593
Short Berseem	14641	1255	1117	1338
Alfa Alfa	5159	4374	3815	4449
<b>Sugar Group</b>				
Sugar Cane	11137	9201	8093	9477
Sugar Beet	3297	2649	2366	2770
<b>Vegetables</b>				
Winter (Tot.)	2637	2297	2347	2427
Summer (Tot.)	4684	3916	3335	3978
Nili (Tot.)	4077	3205	2869	3384
Winter Tomato	4190	4190	2703	3694
Sum Tomato	5331	5331	2962	4541
Nili Tomato	5870	5870	3261	5000
Sum Squash	5331	5331	2962	4541
Su Green Beans	5331	5331	2962	4541
Win Green Peas	4190	4190	2703	3694
<b>Fruits</b>				
Fruits (Tot.)	8751	7381	6347	7493
Orange	8751	7381	6347	7493
Lemon	8751	7381	6347	7493
Grapes	8751	7381	6347	7493
Guava	8751	7381	6347	7493
<b>Other</b>				
Winter Potato	4189	4189	2703	3694
Summer potato	5330	5330	2962	4541
Nili Potato	5870	5870	3261	5000
Winter Onion	2870	2239	1998	2369
Summer Onion	5522	4899	3603	4251
Garlic	2284	1778	1461	1841

\*Water required for the new and the desert lands are the average for the water required in the Upper, Middle and delta areas since the water required for the crops in new and desert lands are not excite in CAPMS

Source: Center Agency for Public Mobilization and Statistics (CAPMS)

*Fayyad, S. M. S.*

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**Annex (4) Farm gate prices in the average period (2001-2005)(L.E./Ton)**

	Upper Egypt	Middle Egypt	Delta	New and desert lands*
<b>Grains Group</b>				
Wheat	869.28	854.39	863.81	859.00
Summer Maize	825.91	813.39	789.08	797.42
Nili Maize	825.91	813.39	789.08	797.42
Rice	0.00	926.61	868.87	935.18
Sorghum	619.76	821.70	1072.12	627.14
<b>Legumes</b>				
Fava Beans	1795.97	1701.19	1626.16	1669.12
Lintel	2369.68	1842.50	2264.31	2314.73
Chickpeas	2416.10	2435.07	2311.67	2433.33
Fenugreek	2327.45	2170.36	1935.95	2051.65
Lupines	2536.19	2467.60	2342.45	2398.53
<b>Oil Group</b>				
Sunflower	1475.80	1502.41	1496.79	1495.00
Soybeans	1482.03	1482.52	1485.41	1485.00
Sesame	3627.86	3626.42	3718.86	4135.03
Ground beans	2156.78	2152.45	2181.61	3005.37
<b>Fiber group</b>				
Cotton	3521.88	3485.06	3464.41	2424.20
Linen	—	—	298.53	177.87
<b>Fodder Group</b>				
Clover	135.60	151.82	131.45	130.77
Short Berseem	174.90	289.90	236.77	241.53
Alfa Alfa	31.38	16.06	42.64	24.92
<b>Sugar Group</b>				
Sugar Cane	119.00	119.00	119.00	119.00
Sugar Beet	88.00	118.60	128.60	96.00
<b>Vegetables</b>				
Winter Tomato	482.08	489.13	499.74	493.91
Sum Tomato	462.39	452.24	453.24	459.99
Nili Tomato	420.07	419.99	429.24	425.74
Sum Squash	470.75	464.44	470.78	465.86
Su Green Beans	195.00	496.92	509.79	502.80
Win Green Peas	658.21	641.74	631.03	710.90
<b>Fruits</b>				
Orange	738.78	738.78	738.78	738.78
Lemon	1091.33	1091.33	1091.33	1091.33
Grapes	869.26	869.26	869.26	869.26
<b>Other</b>				
Winter Potato	595.22	575.52	575.59	525.26
Summer potato	714.00	686.70	672.456	667.91
Nili Potato	476.43	464.34	478.72	382.60
Winter Onion	266.54	266.01	250.62	259.81
Summer Onion	—	355.60	365.95	224.80
Garlic	505.28	481.08	502.64	506.73

Source: Calculated from Data from Ministry for Agricultural and Land Reclamation



دراسة مقارنة للعائد من وحدة المياه بين الأراضي الجديدة والصحراوية والأراضي  
الأخرى للمحاصيل الرئيسية في مصر  
شريف محمد سمير فياض  
شعبة الدراسات الاقتصادية والاجتماعية - مركز بحوث الصحراء

تعانى مصر من ندرة في المياه وعلى الأخص في السنوات القادمة ، وتعتبر المياه من الموارد الاقتصادية الهامة في القطاع الزراعي. وأحد أهم التحديات التي تواجهها مصر في السنوات القادمة هو ارتفاع الطلب على المنتجات الزراعية مع عدم زيادة في عرض الأرض بالقدر اللازم. وبالتالي كان من الأهمية بمكان الإتجاه إلى الأراضي الجديدة والصحراوية، وذلك لمقابلة الزيادة المتوقعة في الطلب على المنتجات الزراعية. ولكن محدودية عرض المياه سوف تقف كعائق كبير أمام التوسع في المساحات بالأراضي الجديدة والصحراوية.

وبالتالي تهتم تلك الدراسة بدراسة إنتاجية عنصر المياه والفقد فيها والعائد منها في الأراضي الجديدة والصحراوية مقارنة بالأراضي الأخرى في مصر ( الدلتا، مصر الوسطى، مصر العليا) وذلك لأنواع مختلفة من المحاصيل وهي تمثل محاصيل الغذائية بالإضافة إلى محاصيل الأعلاف والألياف، وذلك خلال الفترة الممتدة من ١٩٩٦ إلى ٢٠١٠، مقسمة إلى ثلاث فترات. (١٩٩٦-٢٠٠٠)، (٢٠٠١-٢٠٠٥)، (٢٠٠٦-٢٠١٠).

وتشير النتائج إلى أن أعلى إنتاجية للمياه للمحاصيل المنزرعة في الأراضي الجديدة والصحراوية كانت لمحاصيل مجموعة الأعلاف، بنجر السكر، الطماطم، البطاطس البصل والثوم، في الفترات الثلاث. بينما أدنى إنتاجية للمياه في الأراضي الجديدة والصحراوية كانت للقطن، مجموعة البقوليات والزيتون في الفترات الثلاث.

بينما العائد على وحدة المياه بالجنية المصرى فقد بينت الدراسة أن ذلك العائد في الأراضي الجديدة والصحراوية بلغ نحو ٢٦.١٧ جنية / م<sup>٢</sup> كتوسط للفترة الأولى الممتدة من ١٩٩٦-٢٠٠٠ ثم ازدادت لتبلغ نحو 49.03 جنية / م<sup>٢</sup> في الفترة الثالثة الممتدة من ٢٠٠٦-٢٠١٠، وذلك بمعدل نمو بلغ نحو ٨٧.٤%. ويعتبر ذلك المعدل هو أعلى معدل مقارنة بمعدلات النمو للعائد من وحدة المياه بالجنية التي تحققت في المناطق الأخرى في الدلتا ومصر الوسطى ومصر العليا.

وتوصى الدراسة بإنتاج وزراعة المنتجات التصديرية مثل الخضروات والفاكهة ومنتجات أخرى مثل البصل والثوم والبطاطس وبنجر السكر في الأراضي الجديدة والصحراوية، عند النظر إلى العائد من وحدة المياه. بينما المنتجات الزراعية الأخرى مثل مجموعات الحبوب، الزيتون والألياف وقصب السكر فيوصى أن يتم زراعتها وإنتاجها في أراضي الدلتا ومصر الوسطى والعليا طبقا للموائمة البيئية للاحتياجات المناخية لتلك المحاصيل. ومثل تلك السياسات لا يمكن أن يتم تطبيقها بدون العودة لنظام سياسة الدورة الزراعية وسياسة الحوافز السعرية لتلك المنتجات بهدف تحفيز المنتجين لإنتاج منتجات ذات عائد مرتفع لوحدة المياه.

قام بتحكيم البحث

كلية الزراعة – جامعة المنصورة  
مركز بحوث الصحراء

أ.د / محمد عبد السلام عويضة  
أ.د / حماده عبد الحليم عبد العال





**Table (1): Water Productivity for the Main Crops in the Three Average Periods in Upper, Middle, Delta and New & Desert Lands in Egypt (Ton/100M<sup>3</sup>)**

	Average (1996-2000)				Average (2001-2005)				Average (2006-2010)			
	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands
<b>Grains Group</b>												
Wheat	1.25	1.64	1.73	0.97	1.12	1.43	1.54	0.95	1.06	1.35	1.50	1.08
Summer Maize	0.85	1.00	1.21	0.87	0.76	0.90	1.11	0.84	0.74	0.87	1.10	0.81
Nili Maize	0.69	0.81	1.17	0.80	0.63	0.76	1.13	0.73	0.64	0.87	1.14	0.93
Rice	-	0.48	0.62	0.48	0.41	0.49	0.57	0.46	0.45	0.49	0.58	0.49
Sorghum	0.73	0.75	-	0.70	0.65	0.69	-	0.56	0.64	0.65	-	0.54
<b>Legumes</b>												
Fava Beans	0.69	0.81	1.11	0.91	0.63	0.76	0.94	0.79	0.64	0.78	0.99	0.83
Lintel	0.36	0.53	0.57	0.29	0.31	0.47	0.61	0.18	0.31	0.44	0.53	0.25
Chickpeas	0.36	0.48	0.56	0.34	0.38	0.54	0.55	0.13	0.40	0.50	0.53	0.53
Fenugreek	0.51	0.69	1.16	0.38	0.45	0.64	0.49	0.47	0.44	0.64	0.53	0.48
Lupines	0.51	0.67	0.52	0.30	0.44	0.56	0.42	0.23	0.41	0.60	0.55	0.36
<b>Oil Group</b>												
Sunflower	0.39	0.40	0.49	0.39	0.31	0.34	0.36	0.38	0.32	0.35	0.40	0.38
Soy beans	0.41	0.37	0.47	0.25	0.34	0.36	0.43	0.31	0.36	0.38	0.39	0.45
Sesame	0.17	0.21	0.18	0.17	0.16	0.18	0.17	0.15	0.17	0.18	0.19	0.15
Ground beans	0.32	0.28	0.35	0.29	0.28	0.26	0.31	0.26	0.29	0.26	0.32	0.26
<b>Fiber group</b>												
Cotton	0.34	0.30	0.30	0.20	0.24	0.24	0.30	0.18	0.21	0.23	0.29	0.18
Linen	---	1.98	1.89	2.80	--	--	2.77	1.82	--	3.14	3.01	2.34
<b>Fodder Group</b>												
Clover	8.70	9.05	10.38	9.48	7.16	7.70	9.89	8.85	7.56	7.25	9.86	8.70
Short Berseem	12.85	9.89	12.41	9.64	11.16	8.32	11.29	8.99	7.29	8.05	11.72	7.99
Alfa Alfa	7.47	9.72	6.42	8.59	6.51	14.48	6.15	8.71	9.16	16.71	7.49	11.33
<b>Sugar Group</b>												
Sugar Cane	5.31	5.72	5.45	5.26	4.59	5.26	4.56	4.78	4.60	5.15	4.59	4.96
Sugar Beet	8.02	13.66	9.52	7.07	7.57	8.81	8.59	6.26	10.09	8.18	8.81	6.45
<b>Vegetables</b>												
Winter (Tot.)	9.01	6.10	4.84	3.65	7.69	5.70	4.24	4.01	7.68	6.16	4.70	4.59
Summer (Tot.)	2.49	3.66	3.64	2.79	2.17	3.24	2.94	2.33	2.28	3.34	2.95	3.89
Nili (Tot.)	5.22	4.31	2.58	3.14	4.26	4.11	2.82	2.61	3.62	4.25	2.59	3.13
Winter Tomato	6.46	4.10	5.91	4.13	5.68	4.04	5.51	3.99	5.78	4.42	6.17	4.39
Sum Tomato	3.47	3.77	5.62	3.01	2.98	3.39	4.96	2.61	3.07	3.64	4.91	3.13
Nili Tomato	3.95	3.17	3.67	2.53	3.81	2.94	3.93	2.25	3.63	3.19	3.56	2.54
Sum Squash	1.64	1.73	3.22	1.85	1.30	1.53	2.65	1.60	1.40	1.68	2.69	1.77
Su Green Beans	0.68	1.16	2.05	0.67	0.48	1.13	1.94	0.63	0.92	1.27	2.06	0.75
Win Green Peas	1.51	1.33	2.18	0.71	1.30	1.03	1.84	1.10	1.52	1.09	1.75	0.91
<b>Fruits</b>												
Fruits (Tot.)	0.99	0.87	1.20	0.74	1.05	0.86	1.30	0.90	1.27	1.03	1.40	1.24
Orange	1.05	1.02	1.64	0.72	0.90	1.00	1.51	1.10	0.93	1.03	1.56	1.39
Lemon	0.78	0.48	1.55	0.90	0.84	0.61	1.70	1.25	0.93	0.70	1.41	1.32
Grapes	1.17	1.19	1.48	1.26	1.01	1.02	1.20	1.30	0.97	1.01	1.23	1.45
Guava	0.85	0.99	1.72	1.20	0.80	0.83	1.50	1.04	0.83	0.86	1.55	0.96
<b>Other</b>												
Winter Potato	4.21	2.74	4.18	2.94	3.55	2.35	4.07	2.85	3.86	2.55	3.84	2.69
Summer potato	2.31	2.14	3.98	2.55	2.17	1.86	3.94	2.36	2.73	2.05	4.13	2.38
Nili Potato	2.60	1.85	3.05	2.43	2.34	1.34	2.78	1.75	2.47	1.53	3.12	2.14
Winter Onion	5.30	5.08	7.25	4.79	5.35	5.24	6.33	4.58	5.86	5.74	6.81	5.20
Summer Onion	---	2.33	3.06	1.63	---	3.67	3.01	3.12	---	4.53	3.14	3.49
Garlic	4.42	6.69	6.77	3.85	4.25	5.51	6.44	3.19	4.57	5.62	6.16	3.42

(--) Means no Cultivated Area for this crop in this region

Source: Calculated from tables (1) & (3) in Annex

Table (2) Sacrificed Productivity in the New and Desert Lands Comparing to the other Lands in the three average periods (Ton /,000 Fed.)

	Average (1996-2000)			Average (2001-2005)			Average (2006-2010)		
	1	2	3	1	2	3	1	2	3
<b>Grains Group</b>									
Wheat	(275.4)	(517.6)	(300.3)	(170.3)	(365.4)	(192.7)	22.0	(1346.7)	(1499.1)
Summer Maize	17.1	(238.6)	(312.0)	73.1	(158.0)	(237.3)	73.4	(873.8)	(1102.9)
Nili Maize	112.8	(183.5)	(408.2)	97.6	(118.8)	(257.5)	283.3	(871.5)	(1141.7)
Rice	0.0	(75.6)	(129.4)	49.1	(35.6)	(79.1)	34.0	(492.9)	(577.4)
Sorghum	(37.1)	(94.6)	0.0	(90.8)	(52.1)	0.0	(96.0)	(649.7)	0.0
<b>Legumes</b>									
Fava Beans	222.3	(180.7)	(352.7)	160.6	(117.8)	(168.5)	189.4	(776.1)	(993.9)
Lintel	(75.8)	(227.1)	(96.8)	(126.5)	(164.1)	(170.0)	(54.4)	(444.2)	(525.7)
Chickpeas	(22.1)	(95.7)	(25.2)	(249.5)	(138.9)	(45.8)	128.9	(503.0)	(529.3)
Fenugreek	(131.1)	(240.1)	(521.9)	13.1	(194.6)	141.0	38.4	(635.5)	(532.0)
Lupines	(212.4)	(230.0)	41.4	(201.0)	(152.1)	184.2	(48.5)	(603.7)	(546.4)
<b>Oil Group</b>									
Sunflower	(3.7)	(95.1)	(151.9)	77.7	(15.1)	(10.6)	61.8	(352.8)	(396.6)
Soybeans	(156.7)	(27.2)	(104.8)	(27.2)	(6.4)	(55.7)	86.9	(376.7)	(391.9)
Sesame	(3.8)	(44.5)	6.6	(15.1)	(15.8)	12.8	(17.3)	(183.4)	(194.0)
Ground beans	(29.0)	1.0	(89.7)	(17.7)	27.7	(45.0)	(21.1)	(264.8)	(315.3)
<b>Fiber group</b>									
Cotton	(138.2)	(57.4)	(62.7)	(57.6)	(31.0)	(69.5)	(26.1)	(226.7)	(292.5)
Linen	—	(1984.4)	(1886.2)	0.0	0.0	364.5	0.0	(3136.9)	(3014.7)
<b>Fodder Group</b>									
Clover	778.4	(1893.7)	(2675.8)	1691.6	(147.8)	(2640.1)	1141.0	(7252.6)	(9855.8)
Short Berseem	(3209.4)	1270.2	(4085.0)	(2172.1)	(1036.2)	(3227.0)	708.3	(8064.1)	(11715.1)
Alfa Alfa	1118.9	(3205.4)	8064.9	2201.8	(5321.3)	10557.9	2163.4	(16712.7)	(7491.4)
<b>Sugar Group</b>									
Sugar Cane	(51.7)	(1128.4)	(191.8)	196.6	(659.2)	591.7	361.3	(5152.6)	(4594.8)
Sugar Beet	(948.1)	(6089.3)	(715.8)	(1311.9)	1284.5	(407.2)	(3636.8)	(8183.1)	(8806.3)
<b>Vegetables</b>									
Winter (Tot.)	(5363.5)	1586.5	858.0	(3684.0)	1981.8	1917.3	(3096.1)	(6160.9)	(4697.2)
Summer (Tot.)	298.4	(1495.0)	(399.5)	156.9	(959.8)	403.5	1615.1	(3339.1)	(2953.6)
Nili (Tot.)	(2082.1)	(52.2)	1528.6	(1648.9)	(487.2)	1428.1	(488.9)	(4250.4)	(2585.9)
Winter Tomato	(2331.7)	1584.4	(1864.8)	(1692.4)	1734.3	(1090.7)	(1392.7)	(4417.2)	(6166.0)
Sum Tomato	(456.3)	(788.4)	(2237.8)	(368.2)	(312.2)	(1316.6)	60.0	(3641.5)	(4906.4)
Nili Tomato	(1420.6)	644.5	(737.2)	(1561.7)	693.3	(743.8)	(1088.3)	(3190.9)	(3563.7)
Sum Squash	211.9	(433.7)	(1684.6)	297.0	(131.8)	(966.0)	366.3	(1680.6)	(2692.3)
Su Green Beans	(0.7)	(685.4)	(920.3)	156.7	(203.7)	(666.6)	(175.7)	(1271.3)	(2055.4)
Win Green Peas	(803.1)	(25.3)	(1145.4)	(209.3)	487.2	(757.4)	(607.0)	(1085.1)	(1752.8)
<b>Fruits</b>									
Fruits (Tot.)	(253.1)	187.6	(334.0)	(149.1)	406.4	(268.0)	(32.7)	(1032.9)	(1400.3)
Orange	(327.9)	(110.5)	(635.4)	195.9	(70.1)	(473.8)	458.6	(1031.5)	(1564.2)
Lemon	119.8	357.6	(938.8)	415.2	318.7	(995.9)	387.6	(704.5)	(1410.8)
Grapes	95.4	(177.4)	(461.9)	293.3	(43.1)	(188.5)	473.3	(1007.6)	(1233.9)
Guava	349.1	(197.1)	(888.3)	243.8	(0.9)	(639.3)	122.9	(860.9)	(1546.2)
<b>Other</b>									
Winter Potato	(1274.6)	810.8	(1825.4)	(700.8)	1510.0	(1523.5)	(1170.0)	(2547.6)	(3841.1)
Summer potato	238.6	30.1	(2117.7)	186.4	864.5	(1890.1)	(347.3)	(2049.5)	(4132.4)
Nili Potato	(172.2)	496.6	(1712.8)	(590.0)	1135.1	(1247.5)	(326.0)	(1533.5)	(3118.3)
Winter Onion	(505.5)	272.6	(2004.5)	(777.3)	622.7	(584.1)	(662.9)	(5743.9)	(6813.8)
Summer Onion	—	(2327.2)	603.2	—	(3668.2)	1518.5	—	(4528.5)	(3140.5)
Garlic	(573.7)	(2441.6)	(1252.3)	(1062.7)	(942.3)	(821.8)	(1153.6)	(5622.6)	(6157.9)

1 = Productivity in the new and desert lands – productivity in Upper Egypt

2 = Productivity in the new and desert lands – productivity in Meddle Egypt

3 = Productivity in the new and desert lands – productivity in Delta

Values between Brackets are negative values

Source: Calculated from table (3) in Annex

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Table (4) Revenue per Unit of Water for the Main Crops in the Three Average Periods in Upper, Middle, Delta and New & Desert Lands in Egypt (L.E./M<sup>3</sup>)

	Average (1996-2000)				Average (2001-2005)				Average (2006-2010)			
	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands
<b>Grains Group</b>												
Wheat	359.40	541.65	1480.04	255.72	387.48	576.83	1687.53	248.35	390.96	583.08	1982.25	431.76
Summer Maize	225.95	521.42	579.94	62.33	172.76	341.04	753.15	95.58	194.45	369.88	735.13	117.07
Nili Maize	15.87	75.33	96.24	10.73	18.73	84.30	101.05	20.02	19.23	84.58	110.01	38.08
Rice		11.75	627.44	8.79		10.58	708.60	12.39		8.01	717.79	23.32
Sorghum	107.12	38.28		2.11	107.97	48.43		3.80	93.02	50.94		5.77
<b>Legumes</b>												
Fava Beans	37.36	38.82	281.22	95.00	23.97	19.46	252.67	85.11	37.23	8.82	152.84	71.16
Lintel	3.19	0.01	2.66	0.30	2.35	0.01	0.62	0.18	0.96	0.00	0.80	0.01
Chickpeas	10.24	0.71	0.63	0.50	11.95	1.68	0.90	0.16	8.36	0.98	0.50	0.32
Fenugreek	3.03	11.03	8.91	2.04	3.42	13.58	0.41	1.42	3.45	8.73	0.11	2.01
Lupines	1.31	1.76	2.64	1.28	0.70	0.81	2.71	1.05	0.37	0.28	1.74	1.37
<b>Oil Group</b>												
Sunflower	4.01	9.11	3.52	1.93	4.33	9.65	3.82	1.61	2.93	7.70	3.30	2.95
Soybeans	0.74	10.48	1.29	0.19	0.33	10.02	0.33	0.20	0.60	10.60	1.01	0.15
Sesame	9.93	7.31	4.91	15.51	7.86	7.54	4.06	23.53	6.34	8.77	9.07	27.64
Ground beans	4.15	4.23	15.03	55.37	3.78	6.02	14.80	84.44	2.83	6.78	16.82	85.85
<b>Fiber group</b>												
Cotton	47.97	109.26	496.51	0.06	29.88	87.30	541.97	0.04	12.01	40.50	348.65	1.58
Linen			6.94	0.21			20.97	0.06			13.51	0.18
<b>Fodder Group</b>												
Clover	173.51	381.68	1208.03	150.25	200.59	421.87	1480.18	175.40	188.85	347.49	1242.90	212.82
Short Berseem	266.16	240.09	986.73	31.41	56.18	169.34	1167.9	21.00	25.10	120.58	885.12	31.10
Alfa Alfa	0.46	0.01	0.03	4.12	1.48	0.03	0.20	7.78	1.36	0.28	0.22	15.36
<b>Sugar Group</b>												
Sugar Cane	135.60	17.23	2.09	5.20	134.71	25.92	2.07	16.63	132.73	25.68	1.65	21.93
Sugar Beet	0.08	10.44	80.91	5.29	0.12	12.62	139.01	5.48	1.68	52.40	191.17	27.17
<b>Vegetables</b>												
Winter Tomato	116.40	53.11	148.69	45.23	136.66	79.77	163.15	69.08	106.68	101.46	177.78	165.55
Sum Tomato	8.71	31.49	176.18	107.16	9.85	46.64	192.13	97.59	10.02	61.51	196.10	191.05
Nili Tomato	13.82	32.21	21.97	11.96	10.93	40.04	24.28	17.57	7.29	42.14	18.41	18.18
Sum Squash	0.15	2.18	32.06	14.95	0.32	3.61	35.05	22.41	0.28	4.48	28.81	19.51
Su Green Beans	0.00	2.03	9.04	1.35	0.00	2.75	7.19	3.20	0.00	2.88	6.46	4.06
Win Green Peas	0.15	2.34	30.14	7.57	0.10	2.30	40.38	14.16	0.07	1.77	35.17	12.87
<b>Fruits</b>												
Orange	6.81	6.19	144.48	17.85	6.39	7.13	155.77	32.31	5.17	6.77	173.22	59.24
Lemon	1.86	2.48	26.29	5.25	2.37	3.62	33.59	12.41	5.95	3.79	26.94	16.73
Grapes	4.70	19.95	30.66	61.51	4.37	23.31	32.13	84.29	3.60	24.58	32.37	111.27
<b>Other</b>												
Winter Potato	1.05	10.59	85.68	21.44	2.90	10.54	161.47	25.22	3.31	17.75	206.59	38.29
Summer potato	0.26	15.17	139.34	13.63	0.35	13.53	165.00	14.19	8.89	16.48	228.12	15.79
Nili Potato	2.24	16.89	40.04	3.72	2.13	14.85	31.37	0.04	2.11	22.50	25.97	0.52
Winter Onion	9.82	16.29	27.95	15.42	12.42	20.81	48.09	17.67	15.33	24.12	79.73	32.60
Summer Onion		3.97	4.90	0.46		7.91	5.48	0.63		8.77	7.80	2.39
Garlic	2.75	46.60	9.28	1.13	3.05	38.74	8.41	2.95	3.35	43.39	6.64	4.34
<b>Total</b>	<b>37.70</b>	<b>43.17</b>	<b>175.30</b>	<b>26.17</b>	<b>35.22</b>	<b>47.02</b>	<b>204.88</b>	<b>33.28</b>	<b>33.80</b>	<b>46.93</b>	<b>198.13</b>	<b>49.03</b>

Source: Calculated from tables (1) & (5) in the Annex

Annex (2) Cultivated Area for the Main crops in the Three Average Periods in Upper, Middle, Delta and New & Desert Lands in Egypt (,000 Fed.)

	Average (1996-2000)				Average (2001-2005)				Average (2006-2010)			
	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands
<b>Grains Group</b>												
Wheat	331.2	367.2	991.7	306.0	396.9	473.0	1269.1	303.5	423.5	506.8	1530.7	463.7
Summer Maize	321.2	394.7	608.6	89.9	274.4	468.0	859.0	143.5	319.2	520.3	844.7	181.0
Nili Maize	27.8	113.8	104.3	16.8	36.0	136.0	113.4	34.5	36.2	119.3	122.1	51.6
Rice		26.3	1167.9	19.7	0.004	23.4	1425.8	29.1	0.082	17.5	1430.8	51.2
Sorghum	235.3	62.3		4.8	266.7	85.5		10.8	235.7	95.4		17.0
<b>Legumes</b>												
Fava Beans	30.1	28.2	155.8	62.2	21.3	15.1	164.5	64.7	32.4	6.68	94.6	51.4
Lintel	3.7	0.009	2.1	0.45	3.2	0.007	0.44	0.42	1.32	0.003	0.67	0.01
Chickpeas	11.8	.62	0.5	0.61	13.0	1.3	0.71	0.49	8.65	0.8	0.41	0.25
Fenugreek	2.5	7.3	4.0	2.6	3.2	9.8	0.43	1.5	3.37	6.33	0.11	2.04
Lupines	1.0	1.1	2.2	1.8	0.63	0.6	2.7	1.9	0.35	0.19	1.36	1.57
<b>Oil Group</b>												
Sunflower	6.98	15.12	4.80	3.35	9.59	19.05	7.01	2.80	6.17	14.52	5.56	5.14
Soybeans	1.22	19.30	1.86	0.52	0.66	18.54	0.52	0.43	1.12	18.97	1.73	0.22
Sesame	16.01	9.73	7.43	22.44	13.33	11.26	6.40	38.60	10.35	13.18	12.57	44.14
Ground beans	6.03	7.05	19.81	63.47	6.27	10.84	21.90	107.21	4.60	11.89	24.45	107.94
<b>Fiber group</b>												
Cotton	40.22	105.27	476.50	0.13	35.28	105.22	528.14	0.08	16.47	51.27	344.11	3.59
Linen		0.18	12.32	0.42			25.33	0.18		0.02	15.02	0.42
<b>Fodder Group</b>												
Clover	147.02	277.76	885.37	121.17	206.98	360.67	1138.3	151.57	184.31	315.58	959.39	187.11
Short Berseem	118.40	83.74	335.89	13.48	28.78	70.19	436.8	9.67	19.70	51.58	319.10	16.11
Alfa Alfa	1.96	0.09	0.99	19.27	7.27	0.15	0.78	35.85	4.72	1.04	0.70	54.39
<b>Sugar Group</b>												
Sugar Cane	214.57	25.33	3.22	8.31	246.76	41.42	3.81	29.20	242.46	41.89	3.01	37.15
Sugar Beet	0.12	6.44	66.07	7.79	0.17	12.08	125.83	9.13	1.89	53.99	168.81	43.85
<b>Vegetables</b>												
Winter (Tot.)	48.88	60.67	166.88	78.68	68.35	87.71	213.59	94.82	52.83	95.57	207.78	199.71
Summer (Tot.)	15.84	45.16	184.13	128.74	23.27	75.02	246.32	169.73	23.91	99.51	283.24	207.16
Nili (Tot.)	10.99	49.18	48.62	16.16	10.52	62.00	57.99	31.30	9.20	62.90	62.33	35.26
Winter Tomato	37.39	26.49	50.36	22.19	49.88	40.33	59.27	35.04	38.30	46.96	57.69	76.26
Sum Tomato	5.43	18.48	69.12	77.37	7.15	30.46	85.50	81.24	7.05	37.35	88.18	132.54
Nili Tomato	8.33	24.19	13.93	11.10	6.82	32.48	14.38	18.32	4.78	31.45	12.03	16.54
Sum Squash	0.20	2.71	21.18	17.10	0.52	5.07	28.23	30.12	0.43	5.75	22.73	23.72
Su Green Beans	0.001	3.52	8.67	3.97	0.005	4.91	7.28	10.04	0.02	4.56	6.16	10.83
Win Green Peas	0.15	2.74	21.93	15.08	0.11	3.47	34.73	18.18	0.07	2.55	31.80	19.83
<b>Fruits</b>												
Fruits (Tot.)	33.71	70.21	274.05	345.64	41.16	98.83	361.62	446.73	38.61	85.06	362.04	458.63
Orange	8.79	8.25	119.42	33.49	9.55	9.62	140.07	39.73	7.50	8.89	149.90	57.67
Lemon	2.19	4.71	15.53	5.35	2.58	5.41	18.10	9.06	5.85	4.93	17.50	11.62
Grapes	4.62	19.35	23.86	55.97	4.99	26.41	30.90	74.47	4.26	28.06	30.18	88.56
Guava	0.72	0.76	15.61	2.50	0.82	0.88	22.81	20.30	0.78	0.64	29.62	4.32
<b>Other</b>												
Winter Potato	0.42	6.71	35.63	13.90	1.37	7.79	68.91	16.84	1.44	12.11	93.44	27.08
Summer potato	0.16	10.30	52.08	7.99	0.22	10.58	62.28	9.00	4.57	11.71	82.09	9.94
Nili Potato	1.81	19.70	27.44	4.00	1.91	23.94	23.56	0.06	1.79	31.61	17.40	0.63
Winter Onion	6.95	12.04	15.39	12.38	8.71	14.92	30.32	14.86	9.81	15.78	46.69	24.12
Summer Onion	1.68	4.80	4.37	1.26		6.06	4.97	0.90		5.45	6.79	3.05
Garlic	1.23	14.47	2.73	0.58	1.42	14.61	2.60	1.83	1.45	16.04	2.15	2.51

(--) Means no cultivated area in this average period

Source: Calculated from Data from Ministry for Agricultural and Land Reclamation

Fayyad, S. M. S.

Annex (3) Productivity for the Main crops in the Three Average Periods in Upper, Middle, Delta and New & Desert Lands in Egypt (Ton/Fed.)

	Average (1996-2000)				Average (2001-2005)				Average (2006-2010)			
	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands
<b>Grains Group</b>												
Wheat	3.13	3.33	3.17	2.07	2.82	2.90	2.83	2.02	2.67	2.73	2.75	2.30
Summer Maize	3.64	3.75	3.94	3.27	3.26	3.35	3.63	3.14	3.15	3.27	3.60	3.05
Nili Maize	2.52	2.44	3.13	2.50	2.30	2.29	3.02	2.26	2.34	2.62	3.06	2.88
Rice		3.78	4.40	3.66	3.53	3.83	4.07	3.49	3.93	3.86	4.11	3.73
Sorghum	2.78	2.47	---	2.43	2.48	2.27	---	1.96	2.41	2.14	---	1.88
<b>Legumes</b>												
Fava Beans	1.39	1.24	1.60	1.52	1.26	1.16	1.36	1.31	1.29	1.19	1.43	1.38
Lintel	0.86	0.94	0.92	0.55	0.72	0.83	0.99	0.34	0.73	0.78	0.84	0.48
Chickpeas	0.78	0.79	0.87	0.60	0.823	0.89	0.85	0.23	0.87	0.83	0.82	0.95
Fenugreek	1.03	1.07	1.66	0.64	0.92	0.98	0.71	0.78	0.89	0.98	0.76	0.80
Lupines	1.17	1.16	0.84	0.56	0.99	0.99	0.67	0.44	0.94	1.06	0.88	0.68
<b>Oil Group</b>												
Sunflower	1.26	1.14	1.19	1.10	0.99	0.96	0.89	1.09	1.04	1.01	0.97	1.09
Soybeans	1.66	1.30	1.45	0.90	1.38	1.30	1.34	1.11	1.46	1.34	1.21	1.59
Sesame	0.64	0.67	0.50	0.54	0.61	0.60	0.48	0.48	0.63	0.59	0.54	0.49
Ground beans	1.80	1.45	1.52	1.47	1.58	1.34	1.35	1.33	1.61	1.38	1.38	1.34
<b>Fiber group</b>												
Cotton	1.61	1.24	1.11	0.84	1.15	0.99	1.10	0.77	0.99	0.94	1.08	0.76
Linen		3.13	2.76	4.79			4.06	3.11		4.94	4.42	4.01
<b>Fodder Group</b>												
Clover	37.39	30.97	31.79	34.07	30.74	26.36	30.30	31.03	32.46	24.81	30.19	31.25
Short Berseem	21.10	12.42	13.86	12.90	18.32	10.45	12.61	123.03	11.96	10.12	13.09	10.70
Alfa Alfa	38.53	42.50	24.49	38.21	33.59	63.36	23.48	38.76	47.27	73.11	28.58	50.40
<b>Sugar Group</b>												
Sugar Cane	59.14	52.59	44.11	49.84	51.09	48.39	36.91	45.34	51.23	47.41	37.18	47.02
Sugar Beet	26.43	36.18	22.53	19.58	24.95	23.33	20.32	17.34	33.27	21.68	20.83	17.88
<b>Vegetables</b>												
Winter (Tot.)	23.77	14.02	11.37	8.85	20.28	13.10	9.96	9.72	20.26	14.15	11.02	11.13
Summer (Tot.)	11.67	14.35	12.13	11.10	10.16	12.68	9.79	9.25	10.67	13.08	9.85	15.49
Nili (Tot.)	21.28	13.82	7.40	10.61	17.36	13.17	8.10	8.83	14.77	13.62	7.42	10.60
Winter Tomato	27.06	17.17	15.97	15.25	23.81	16.94	14.89	14.74	24.21	18.51	16.67	16.20
Sum Tomato	18.48	20.09	16.66	13.67	15.88	18.05	14.69	11.86	16.38	19.41	14.53	14.23
Nili Tomato	23.19	18.61	11.98	12.65	22.39	17.23	12.83	11.26	21.30	18.73	11.62	12.70
Sum Squash	8.75	9.24	9.52	8.45	6.93	8.16	7.84	7.25	7.46	8.96	7.97	8.02
Su Green Beans	3.60	6.19	6.06	3.06	2.54	6.00	5.74	2.88	4.91	6.78	6.09	3.39
Win Green Peas	6.32	5.57	5.89	2.61	5.47	4.33	4.98	4.08	6.37	4.55	4.74	3.37
<b>Fruits</b>												
Fruits (Tot.)	8.69	6.39	7.61	5.54	9.22	6.38	8.26	6.78	11.12	7.62	8.89	9.28
Orange	9.18	7.50	10.39	5.41	7.92	7.40	9.55	8.25	8.16	7.61	9.93	10.42
Lemon	6.82	3.56	9.85	6.74	7.35	4.52	10.79	9.40	8.15	5.20	8.95	9.88
Grapes	10.23	8.76	9.38	9.74	8.83	7.49	7.59	9.76	8.51	7.44	7.83	10.83
Guava	7.47	7.33	10.93	9.01	6.96	6.16	9.52	7.79	7.29	6.35	9.81	7.16
<b>Other</b>												
Winter Potato	17.64	11.48	11.29	10.85	14.88	9.85	11.00	10.53	16.18	10.67	10.38	9.94
Summer potato	12.33	11.43	11.79	11.59	11.59	9.92	11.67	10.72	14.53	10.92	12.24	10.80
Nili Potato	15.28	10.84	9.94	12.15	13.75	7.84	9.07	8.76	14.50	9.00	10.17	10.72
Winter Onion	15.20	11.37	14.48	11.35	15.36	11.73	12.64	10.84	16.83	12.86	13.62	12.32
Summer Onion		11.40	11.04	6.92		17.97	10.85	13.25		22.19	11.32	14.82
Garlic	10.09	11.90	9.88	7.08	9.71	9.80	9.41	5.87	10.44	10.00	8.99	6.29

(--) Means no cultivated area in this average period

Source: Calculated from Data from Ministry for Agricultural and Land Reclamation

**Annex (5) Production Value for the Main crops in the Three Average Periods in Upper, Middle, Delta and New & Desert Lands in Egypt (Million L.E./ton)**

	Average (1996-2000)				Average (2001-2005)				Average (2006-2010)			
	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands	Upper Egypt	Middle Egypt	Delta	New & Desert lands
<b>Grains Group</b>												
Wheat	902.16	1044.7	2716.4	543.4	972.65	1171.1	3097.2	527.79	981.37	1183.7	3638.1	917.56
Summer Maize	966.13	1203.9	1893.4	234.5	738.79	1277.4	2458.9	359.58	831.44	1385.4	2400.1	440.42
Nili Maize	57.83	226.07	257.5	33.33	68.24	253.0	270.4	62.21	70.08	253.84	294.39	118.32
Rice		92.02	466.2	67.33		82.86	5044.0	94.98		62.73	5109.4	178.69
Sorghum	405.94	126.24		7.35	409.16	159.70		13.23	352.49	167.97		20.07
<b>Legumes</b>												
Fava Beans	75.22	59.67	404.87	158.02	48.25	29.92	363.77	141.57	74.97	13.57	220.04	118.37
Lintel	7.53	0.02	4.28	0.57	5.54	0.01	0.99	0.34	2.27	0.004	1.29	0.01
Chickpeas	22.25	1.18	0.97	0.89	25.97	2.79	1.39	0.28	18.18	1.62	0.77	0.57
Fenugreek	6.09	16.96	12.77	3.39	6.88	20.87	0.58	2.37	6.95	13.42	0.16	3.34
Lupines	2.97	3.07	4.24	2.41	1.60	1.42	4.35	1.97	0.84	0.49	2.80	2.58
<b>Oil Group</b>												
Sunflower	12.98	26.01	8.57	5.49	14.01	27.54	9.30	4.57	9.49	21.96	8.05	8.39
Soybeans	3.01	37.24	3.99	0.69	1.35	35.61	1.03	0.71	2.42	37.66	3.12	0.53
Sesame	37.01	23.64	13.79	50.51	29.30	24.38	11.40	76.64	23.63	28.36	25.47	90.02
Ground beans	23.46	21.98	65.61	280.74	21.37	31.29	64.63	428.15	16.00	35.23	73.43	435.33
<b>Fiber group</b>												
Cotton	228.54	453.52	1836.6	0.26	142.34	362.35	2004.7	0.15	57.24	168.12	1290.0	6.62
Linen	—	—	10.16	0.36	—	—	30.71	0.10	—	—	19.79	0.30
<b>Fodder Group</b>												
Clover	745.32	1305.9	3700.2	539.88	681.62	1443.4	4533.8	630.26	811.19	1188.9	3807.0	764.7
Short Berseem	436.85	301.39	1102.3	42.03	92.22	212.6	1304.7	28.10	41.19	151.37	988.83	41.61
Alfa Alfa	2.37	0.06	1.03	18.35	7.66	0.15	0.78	34.63	7.00	1.22	0.85	68.32
<b>Sugar Group</b>												
Sugar Cane	1510.1	158.55	16.89	49.26	1500.3	238.51	16.75	157.56	1478.2	236.32	13.32	207.86
Sugar Beet	0.27	27.65	191.41	14.64	0.38	33.42	328.85	15.19	5.53	138.80	452.25	75.26
<b>Vegetables</b>												
Win Tomato	487.73	222.52	401.91	167.09	572.62	334.25	440.99	255.20	447.00	425.10	480.54	611.59
Sum Tomato	46.41	167.86	521.84	486.64	52.53	248.62	569.09	443.17	53.41	327.91	580.84	867.62
Nili Tomato	81.12	189.08	71.63	59.80	64.17	235.05	79.186	87.85	42.81	247.38	60.03	90.92
Sum Squash	0.82	11.64	94.97	67.90	1.71	19.23	103.80	101.79	1.50	23.91	85.32	88.61
Su Green Beans	0.001	10.83	26.78	6.12	0.003	14.64	21.29	14.52	0.01	15.35	19.12	18.45
Win Green Peas	0.61	9.81	81.47	27.98	0.41	9.64	109.14	52.29	0.30	7.43	95.07	47.55
<b>Fruits</b>												
Orange	59.63	45.68	914.01	133.73	55.89	52.60	988.67	242.13	45.20	49.98	1099.5	443.92
Lemon	16.28	18.27	166.88	39.35	20.72	26.75	213.22	92.98	52.07	237.96	170.99	125.35
Grapes	41.11	147.28	194.60	460.91	38.28	172.06	203.90	631.62	31.49	181.43	205.460	833.76
<b>Other</b>												
Winter Potato	4.41	44.36	231.58	79.20	12.16	44.16	436.46	93.14	13.88	74.36	558.41	141.45
Summer potato	1.39	80.84	412.74	61.87	1.84	72.10	488.73	64.44	47.40	87.82	675.69	71.72
Nili Potato	13.17	99.12	130.57	18.59	12.53	87.14	102.31	0.19	12.39	132.10	84.70	2.58
Winter Onion	28.17	36.45	55.85	36.52	35.65	46.58	96.10	41.85	43.99	53.98	159.31	77.22
Summer Onion		19.47	17.66	1.97		38.73	19.73	2.69		42.97	28.10	10.17
Garlic	6.29	82.87	13.55	2.08	6.97	68.89	12.29	5.44	7.65	77.15	9.70	7.99
<b>Grand Total</b>	<b>6233.2</b>	<b>6315.9</b>	<b>20050.3</b>	<b>3703.3</b>	<b>5823.0</b>	<b>6876.6</b>	<b>23433.1</b>	<b>4709.7</b>	<b>5589.6</b>	<b>6865.5</b>	<b>22661.5</b>	<b>6937.8</b>

(--) Means no cultivated area thus no value in this average period

Source: Calculated from tables (2) (3) and (4) in Annex