

Vol 4 Issue 1 Oct 2014

ISSN No : 2249-894X

*Monthly Multidisciplinary
Research Journal*

*Review Of
Research Journal*

Chief Editors

Ashok Yakkaldevi
A R Burla College, India

Flávio de São Pedro Filho
Federal University of Rondonia, Brazil

Ecaterina Patrascu
Spiru Haret University, Bucharest

Kamani Perera
Regional Centre For Strategic Studies,
Sri Lanka

Welcome to Review Of Research

RNI MAHMUL/2011/38595

ISSN No.2249-894X

Review Of Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double-blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

Advisory Board

Flávio de São Pedro Filho Federal University of Rondonia, Brazil	Delia Serbescu Spiru Haret University, Bucharest, Romania	Mabel Miao Center for China and Globalization, China
Kamani Perera Regional Centre For Strategic Studies, Sri Lanka	Xiaohua Yang University of San Francisco, San Francisco	Ruth Wolf University Walla, Israel
Ecaterina Patrascu Spiru Haret University, Bucharest	Karina Xavier Massachusetts Institute of Technology (MIT), USA	Jie Hao University of Sydney, Australia
Fabricio Moraes de Almeida Federal University of Rondonia, Brazil	May Hongmei Gao Kennesaw State University, USA	Pei-Shan Kao Andrea University of Essex, United Kingdom
Anna Maria Constantinovici AL. I. Cuza University, Romania	Marc Fetscherin Rollins College, USA	Loredana Bosca Spiru Haret University, Romania
Romona Mihaila Spiru Haret University, Romania	Liu Chen Beijing Foreign Studies University, China	Ilie Pinte Spiru Haret University, Romania
Mahdi Moharrampour Islamic Azad University buinzahra Branch, Qazvin, Iran	Nimita Khanna Director, Isara Institute of Management, New Delhi	Govind P. Shinde Bharati Vidyapeeth School of Distance Education Center, Navi Mumbai
Titus Pop PhD, Partium Christian University, Oradea, Romania	Salve R. N. Department of Sociology, Shivaji University, Kolhapur	Sonal Singh Vikram University, Ujjain
J. K. VIJAYAKUMAR King Abdullah University of Science & Technology, Saudi Arabia.	P. Malyadri Government Degree College, Tandur, A.P.	Jayashree Patil-Dake MBA Department of Badruka College Commerce and Arts Post Graduate Centre (BCCAPGC), Kachiguda, Hyderabad
George - Calin SERITAN Postdoctoral Researcher Faculty of Philosophy and Socio-Political Sciences Al. I. Cuza University, Iasi	S. D. Sindkhedkar PSGVP Mandal's Arts, Science and Commerce College, Shahada [M.S.]	Maj. Dr. S. Bakhtiar Choudhary Director, Hyderabad AP India.
REZA KAFIPOUR Shiraz University of Medical Sciences Shiraz, Iran	Anurag Misra DBS College, Kanpur	AR. SARAVANAKUMARALAGAPPA UNIVERSITY, KARAIKUDI, TN
Rajendra Shendge Director, B.C.U.D. Solapur University, Solapur	C. D. Balaji Panimalar Engineering College, Chennai	V. MAHALAKSHMI Dean, Panimalar Engineering College
	Bhavana vivek patole PhD, Elphinstone college mumbai-32	S. KANNAN Ph.D, Annamalai University
	Awadhesh Kumar Shirotriya Secretary, Play India Play (Trust), Meerut (U.P.)	Kanwar Dinesh Singh Dept. English, Government Postgraduate College, solan

More.....

Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.ror.isrj.org

Review Of Research
ISSN:-2249-894X
Impact Factor : 2.1002 (UIF)
Vol. 4 | Issue. 1 | Oct. 2014
Available online at www.ror.istj.org



IMPACT OF AGRICULTURAL DEVELOPMENT ON MAJOR GRAIN CROPS GROWN IN EGYPT AND TUNISIA

Mohamed Gamal Mady Abou El-Azayem, Nagwa Mosaad El-Agroudy
and Monia Bahaa El-Din Hassan

Department of Agricultural Economics, National Research Centre, Cairo, Egypt.

Abstract:-Grain crops occupy top priority in the Arab Food Security Strategy, especially with the continuously increasing population. Although increasing production of grain crops is a priority goal in Egypt and Tunisia's Agricultural Development Strategies, the achieved increase in production does not match the increasing consumption needs, which increased by 22.25% and 31.04% during the sub-period 2008-2012 compared with the sub-period (1998-2002) in Egypt and Tunisia, respectively. In Egypt, production quantity of wheat, maize, and barley increased by 30.41%, 0.81%, and 19.75, respectively. However, rice production declined by 0.78% during the third sub-period compared with the first sub-period as a result of reductions in the rice area, which is one of the goals of Egypt's Agricultural Development Strategy due to consuming large quantity of irrigation water. In Tunisia, wheat and barley production increase by 16.5% and 101.6% between the same mentioned sub-periods, respectively. Tunisia depends on imports to cover the consumption needs of maize and rice, and therefore does not cultivate any of them. The research inspected the grain crops area, yield, consumption, self-sufficiency rates, and quantity and value of imports over the period 1998-2012, which has been divided into three five-year sub-periods. Based on the achieved findings, the study offered a set of recommendations including: exerting efforts to raise self-sufficiency in the study crops by expanding wheat, maize, and barley areas; improving yields of the three crops by developing new high-yielding varieties; rationalizing per capita consumption and working hard to reach world per capita consumption rates; and finally exerting efforts to reduce losses during all the marketing stages.

Keywords: grain crops, Egypt, Tunisia, Arab World.

INTRODUCTION

The food problem comes on top of the economic problems currently facing Arab countries. It is a well known fact that most of the Arab World countries became net food importers. In 2011, Arab World's food imports value amounted to a high of US\$ 64.874 billion representing 84% of the total agricultural imports value. It should be noted that grains occupy top Priority in the Arab Food Security Strategy (Salwa Amer, 2011), especially in the light of the lately witnessed fluctuations in the world prices of grains, in addition to using grains for biofuel production in some advanced countries. The problem is further complicated by the increasing population in general, the increasing

Title: IMPACT OF AGRICULTURAL DEVELOPMENT ON MAJOR GRAIN CROPS GROWN IN EGYPT AND TUNISIA", Source: Review of Research [2249-894X] Mohamed Gamal Mady Abou El-Azayem, Nagwa Mosaad El-Agroudy and Monia Bahaa El-Din Hassan yr:2014 | vol:4 | iss:1

number of population living under poverty line in specific, and the slow rates of development, which makes strategic planning an inevitable tool for improving management of the agricultural sector (Moshira Mohamed, 2011).

Research Problem: Although increasing production of grain crops represents top priority in Egypt and Tunisia's Development Strategies; and despite the actually achieved increase in grains production, the achieved increase does not match the increasing consumption needs, which calls for more increase in grains production, either by expanding cultivated areas, or by improving the achieved yield of grain crops.

Research Objectives: The research aims to identify what has so far been realized from the previously set goals of agricultural development strategies with respect to increasing production of grain crops, including wheat, maize, rice, and barley in both Egypt and Tunisia, and to what extent such increase contributed to solving food security problems in both countries.

METHODOLOGY AND SOURCES OF DATA

To achieve the research objectives, some descriptive and quantitative analysis methods have been applied. The research mainly depended on applying the inductive approach, in addition to some statistical tools such as percentages, arithmetic means, regression analysis, and T test. As for the sources of data, the research relied on various published and unpublished data issued by the Arab Organization for Agricultural Development (AOAD). The research also relied on results of some previous scientific studies related to the research subject. The overall study period (1998-2012) has been divided into three sub-periods for analysis and comparison purposes; these are 1998-2002, 2003-2007 and 2008-2012.

RESULTS AND DISCUSSION

Grains in the Arab World:

Data in Table (1) show that average production of grain crops in the Arab World increased from 43.84 million tons during the first sub-period 1998-2002 to 54.81 million tons during the second sub-period 2003-2007, but then declined to 53.2 million ton during the third sub-period 2008-2012. In the same time, average consumption of grains increased from 87.73 to 103.3, then to 113.76 million tons during the three sub-periods, respectively, which resulted in increasing average imports of grains from 45.76 to 51.16, then to 61.82 million tons during the three sub-periods, respectively. Moreover, self-sufficiency in grains increased from 49.97% to 53% between the first and second sub-period, but declined to 46.83% during the third sub-period.

Table 1: The production of Grain crops in the Arab world during the period from 1998 to 2012.

Period	production	exports		Imports		Consumption	Self-sufficiency (%)
		Quantity	Value	Quantity	Value		
Total grain:							
1998-2002	43840.48	1870.32	402.97	45761.28	7112.28	87731.44	49.97
2007-2003	54810.48	3293.65	711.53	51158.82	9971.19	103289.03	53.04
2012-2008	53198.91	2187.15	1277.38	61821.08	22320.10	113760.69	46.83
Wheat							
2002-1998	20187.61	919.85	185.52	23205.8	3260.54	42473.56	47.53
2007-2003	26850.04	1544.14	274.78	24629.33	5670.25	51436.31	52.25
2012-2008	25736.06	897.94	267.18	31959.03	10744.18	56851.33	45.24
Maize							
2002-1998	7116.05	51.51	10.49	10836.3	1337.5	17930.81	39.85
2007-2003	7626.58	47.91	10.35	12158.32	1935.27	19780.62	38.86
2012-2008	7335.01	94.44	43.52	15669.42	4561.48	22932.0	32.66
Rice							
2002-1998	5861.36	639.16	177.00	2725.12	1158.95	7947.32	73.75
2007-2003	6890.73	1081.14	330.37	3409.5	1588.95	9378.02	64.30
2012-2008	6383.18	891.9	492.45	4768.81	4325.8	10511.16	60.52
Barley							
2002-1998	4461.99	62.08	10.4	7696.83	853.35	12096.74	36.89
2007-2003	5915.13	161.17	16.64	8397.02	1304.93	14264.50	41.80
2012-2008	6078.45	86.06	49.71	9668.88	2684.11	15693.54	38.33

Source: www.aoad.org

Average production of wheat accounted for 47.05% of Arab World total production of grain crops over the study period 1998-2012. Self-sufficiency in wheat reached 48% during the same period, whereas wheat imports quantity accounted for 50.7% of the total imported quantity of grains, the value of which represented 45.84% of the total value of imported grains during the study period 1998-2012. Maize ranked second after wheat in terms of importance, followed by rice and barley, with average production quantities that accounted for 16.3%, 13.4%, and 10.2% of the total production of grain crops during the first sub-period (1998-2002); whilst accounted for 13.9%, 12.6%, and 10.8% during the second sub-period (2003-2007); and accounted for 13.8%, 12%, and 11.4% during the third sub-period (2009-2010), respectively. Average imported quantity of maize, rice, and barley accounted for 23.7%, 5.35%, and 16.8% of the total quantity of imported grains during the first sub-period, whilst accounted for 25.3%, 7.7%, and 15.8% during the third sub-period, respectively. Imports value of the three mentioned crops accounted for 18.8%, 16.3%, and 12% of the total imports value of grains during the first sub-period, whilst accounted for 20.4%, 19.4%, and 12% during the third sub-period, respectively. Self-sufficiency in maize, rice, and barley reached 39.8%, 73.75%, and 38.33% as averages of the first sub-period, whilst reached 32.66%, 64.30%, and 38.33% as averages of the third sub-period, respectively.

GRAIN CROPS IN EGYPT:

Egypt's agricultural development strategies targeted expanding grain crops area and yield in order to cover consumption needs. Suggested tools involved expanding cultivations of high yielding varieties, cultivating improved seeds and early-mature high-yielding varieties, adjusting fertilization rates, providing pesticides and chemicals, developing irrigation systems, improving land and water resources' management programs, improving agricultural intensification programs, improving the competitive ability of exportable goods, and increasing self-sufficiency in grain crops (Ghada Abd El-Fattah, 2011). Grain crops area increased from 2.67 million hectares during the first sub-period (1998-2002), to 2.91 million hectares during the second sub-period (2003-2007), and then to 30.12 million hectares during the third sub-period (2008-2012). As for yield, it increased from 7.244 ton/hectare to 7.555 tons/hectare, but then declined to 7.430 tons/hectare during the mentioned sub-periods, respectively. Data in Table (2) show that Egypt's average production of grain crops increased from 19.37 million tons during the first sub-period (1998-2002), to 22.02 million

IMPACT OF AGRICULTURAL DEVELOPMENT ON MAJOR GRAIN CROPS GROWN IN EGYPT AND TUNISIA

tons during the second sub-period (2003-2007), and then to 22.39 million tons during the third sub-period (2008-2012). As for average consumption of grain crops, it amounted to 28.36, 30.22, and 34.67 million tons during the three sub-periods, respectively. Self-sufficiency rates reached 68.32%, 72.98%, and 66.16% during the mentioned sub-periods, respectively. Such lack in self-sufficiency resulted in increasing the imported quantity of grains, which amounted to 9.45, 9.2, and 12.72 million tons worth US\$ 1.27, 1.6, and 4.34 billion during the three study sub-periods, respectively. Regression equations listed in Table (3) indicate that grain crops area followed a statistically significant increasing trend at an annual rate of 0.027 million feddan. Both imports and consumption quantities of grain crops also followed statistically increasing trends at annual rates of 0.847 and 1.106 million tons, respectively. Analysis results regarding other variables proved statistically insignificant.

Table 2: The production of grain crops in the Arab Republic of Egypt during the period (1998-2012).

Period	production	exports		Consumption		Self-sufficiency %	
		Quantity	value	Quantity	value		
Total grain							
2002-1998	19372.33	471.31	118.26	9455.1	1277.53	28356.12	68.32
2007-2003	22021.30	1118.58	288.06	9196.83	1602.88	30223.92	72.98
2012-2008	22389.65	494.87	278.58	12720.16	4339.54	34673.01	66.16
Wheat							
2002-1998	6376.66	12.67	2.42	4978.68	727.38	11342.66	56.22
2007-2003	7563.33	15.98	3.20	5176.75	967.34	12124.14	59.64
2012-2008	8322.33	120.46	37.3	7476.44	2256.74	15798.77	52.68
Maize							
2002-1998	6164.36	0.54	0.33	4361.96	533.57	10525.78	58.56
2007-2003	6435.00	1.56	0.37	3939.41	623.17	10948.92	58.33
2012-2008	6209.00	5.49	1.38	4415.31	1232.16	10620.33	60.39
Rice							
2002-1998	5599.82	457.53	114.49	2.3	1.38	51144.59	108.85
2007-2003	6433.91	781.44	235.31	489.31	75.52	6258.92	106.50
2012-2008	5555.4	388.31	227.10	38.039	21.44	5595.44	106.23
Barley							
2002-1998	111.3	0.01	0.02	7.64	0.91	118.93	93.58
2007-2003	160.55	0.32	0.06	2.96	0.63	163.23	98.39
2012-2008	133.28	8.55	5.165	16.39	5.53	149.68	93.42

Source: www.aoad.org

Table 3: Regression equations for grain crops grown in Egypt over the period 1998-2012.

No.	Equation	R ²	T	F
1	$\hat{Y}_1 = 2.775 + .027x$	0.353	2.322	5.370
2	$\hat{Y}_2 = 5.739 + .847x$	0.412	2.583	6.671
3	$\hat{Y}_3 = 25.419 + 1.106x$	0.587	3.575	12.777

Where:

\hat{Y}_1 = estimated grain crops area in million feddans/year.

\hat{Y}_2 = estimated quantity of imported grains in thousand tons/year.

\hat{Y}_3 = estimated quantity of grains consumption in million tons/year.

X = time variable = 1, 2, 3, 13.

Source: Collected and calculated from reference No. (4).

Wheat Crop:

Wheat production represented 32.9% of Egypt's total production of grain crops during the study period 1998-2012 (Table 2). Average wheat area increased from 1.01 million hectares during the first sub-period (1998-2002), to 1.16 million hectares during the second sub-period (2003-2007), and further increased to 1.28 million hectares during the third sub-period (2008-2012), which complies with the goals of Egypt's Agricultural Development Strategy. Wheat yield amounted to 6.297, 6.491, and 6.315 tons/hectare during the three sub-periods, respectively. It is clear from Table (2) that wheat production has been steadily increasing during the three sub-periods, where it increased from 6.38 to 7.59, and then to 8.32 million tons, respectively. In the same time, wheat consumption increased from 11.34 to 12.12, and then to 15.8 million tons during the three sub-periods, respectively, which resulted in increasing average imported quantity of wheat from 4.98 million tons worth US\$ 727.8 million during the first sub-period to 7.48 million tons worth US\$ 2.26 billion during the third sub-period. Self-sufficiency in wheat increased from 56.22% to 59.64% between the first and second sub-periods, and then declined to 52.68% during the third sub-period due to the continuously increasing population. Regression analysis equation listed in Table (4) indicate that wheat area followed a statistically significant increasing trend at an annual rate of 0.058 thousand feddans. Similarly, wheat imported and consumed quantities followed statistically significant increasing trends at annual rates of 0.530 and 0.725 million tons during the study period, respectively. Analysis results regarding other variables proved statistically insignificant.

Table 4: Regression equations for wheat crop grown in Egypt over the period 1998-2012.

No.	Equation	R ²	T	F
1	$\hat{Y}_1 = 1.040 + .058x$	0.663	4.206	17.695
2	$\hat{Y}_2 = 3.024 + .530x$	0.625	3.162	10.016
3	$\hat{Y}_3 = 9.605 + .725x$	0.690	4.473	20.008

Where:

\hat{Y}_1 = estimated wheat area in million feddans/year.

\hat{Y}_2 = estimated quantity of imported wheat in thousand tons/year.

\hat{Y}_3 = estimated quantity of wheat consumption in million tons/year.

X = time variable = 1, 2, 3, 13.

Source: Collected and calculated from reference no. (4).

Maize Crop:

Maize ranked second after wheat in terms of importance to Egypt, where it is used for extraction of vegetable oil, in addition to mixing with wheat flour for bread making. Maize is also used in several food processing industries and in processing of animal feed (3). Maize area increased from 807.63 thousand hectares during the first sub-period (1998-2002) to 825.1 thousand hectares during the third sub-period (2008-2012), which is the result of efforts exerted to achieve the goals of various agricultural development strategies. Maize yield amounted to 7.633 and 7.821 tons/hectare between the two mentioned sub-periods, respectively. Average production of maize increased from 6.16 million tons during the first sub-period (1998-2002) to 6.43 million tons during the second sub-period (2003-2007) due to the achieved improve in yield that recorded a high of 8.071 tons/hectare; then declined to 6.21 million tons during the third sub-period (2008-2012) as a result of the political turbulences that prevailed as of 2011. In the same time, maize consumption increased from 10.52 to 10.95, and then to 10.62 million tons during the three sub-periods, respectively, which resulted in increasing average imported quantity of maize from 4.36 million tons worth US\$ 553.6 million during the first sub-period to 4.41 million tons worth US\$ 1.232 billion during the third sub-period. As for average self-sufficiency in maize during the three sub-periods, it recorded 58.56%, 58.33%, and 60.39%, respectively. Regression analysis results regarding the mentioned variables proved all

statistically insignificant.

Rice Crop:

Rice is a major grain crop for Egypt, where it ranks on top of the export crops. Average area of rice increased from 608.99 thousand hectares during the first sub-period (1998-2002) to 653.3 thousand hectares during the second sub-period (2003-2007), but then declined to 597.26 thousand hectares during the third sub-period (2008-2012), which is a result of efforts exerted to achieve the goal of reducing rice area in Egypt's Agricultural Development Strategy Till 2017 due to consuming large quantities of water. Efforts exerted to develop new high yielding varieties achieved success, where average yield of rice reached 9.195 tons/hectare during the first sub-period, and further increased to 9.586 tons per hectare during the third sub-period. Average production of rice amounted to 5.599, 6.433, and 5.555 million tons during the three sub-periods, respectively. In the same time, rice consumption amounted to 5.144, 6.259, and 5.593 million tons during the three sub-periods, respectively, which opened the door for rice exports that amounted to 457.53 thousand tons worth US\$ 114.49 million during the first sub-period; 781.44 thousand tons worth US\$ 235.31 million during the second sub-period; and 388.31 thousand tons worth US\$ 227.1 million during the third sub-period. As for average self-sufficiency in rice, it recorded 108.85%, 106.5%, and 106.23% during the three sub-periods, respectively (Table 2). Regression analysis results regarding the mentioned variables proved all statistically insignificant.

Barley Crop:

Barley is considered a low-importance feed crop in Egypt because it is grown in the same season as wheat, and therefore wheat has the priority due to the high importance it represents in bread making. Barley is usually grown under rainfed irrigation on the coastline of the Mediterranean Sea, and in Sinai. Average area of barley reached 49.65, 72.65, and 51.85 thousand hectares during the three study sub-periods (1998-2002), (2003-2007) and (2008-2012), respectively. Barley yield reached 2.242, 2.352, and 3.053 tons/hectare during the three study sub-periods, respectively. It is also clear from Table (2) that average production quantity of barley amounted to 111.3, 160.55, and 133.28 thousand tons during the three sub-periods, respectively. As for average self-sufficiency in barley, it recorded 93.58%, 98.39%, and 93.42% for the three sub-periods, respectively. Average imported quantity of barley amounted to 7.64, 2.96, and 16.39 thousand tons during the three study sub-periods, respectively. Regression analysis results regarding the mentioned variables proved all statistically insignificant.

Grain Crops in Tunisia:

Average area of grain crops in Tunisia increased from 1.405 million hectares during the first sub-period (1998-2002), to 1.568 million hectares during the second sub-period (2003-2007), but then declined to 1.37 million hectares during the third sub-period (2008-2012). Average production quantity of grain crops amounted to 1.038, 2.304, and 2.149 million tons during the three sub-periods, respectively (Table 5). Average consumption quantity of grain crops amounted to 3.685, 4.657 and 4.859 million tons during the three sub-periods, respectively. As for imports, average quantity of imported grain crops amounted to 2.590 million tons worth US\$ 372.9 million; 2.473 million tons worth US\$ 469.8 million; and 2.735 million tons worth US\$ 862.4 million during the three sub-periods, respectively. In Tunisia, average self-sufficiency in grains reached 35.49%, 49.59%, and 43.19% during the three sub-periods, respectively. Regression analysis results regarding the mentioned variables proved all statistically insignificant.

Table 5: The production of grain crops in Tunisia during the period (1998-2012).

Period	production	exports		Imports		consumption	Self-sufficiency (%)
		quantity	value	quantity	value		
Total Grain							
2002-1998	1307.88	212.8	40.19	2589.86	372.91	3684.94	35.49
2007-2003	2303.73	119.45	42.36	2472.66	469.80	4656.91	49.59
2012-2008	2149.09	58.26	9.61	2735.07	862.44	4828.68	43.19
Wheat							
2002-1998	1026.52	159.13	30.26	1434.18	227.47	2301.57	44.60
2007-2003	1605.17	53.26	13.17	1279.87	273.45	2831.77	56.79
2012-2008	1226.29	18.12	5.27	1615.74	521.55	2826.99	42.94
Maize							
2002-1998	-	41.92	8.1	701.47	90.99	662.55	-
2007-2003	-	32.85	5.17	654.13	105.37	635.29	-
2012-2008	-	1.10	0.27	853.45	225.67	853.23	-
Rice							
2002-1998	-	-	-	13.59	4.56	13.59	-
2007-2003	-	-	-	16.99	5.98	16.99	-
2012-2008	-	-	-	11.93	7.70	11.93	-
Barley							
2002-1998	255.2	11.75	1.82	434.13	49.03	677.58	37.66
2007-2003	577.25	-	-	512.22	94.18	1089.07	53.84
2012-2008	514.49	-	-	297.15	79.30	811.64	63.39

Source: www.aoad.org

Wheat Crop:

Wheat ranks on top of the grain crops grown in Tunisia. Production quantity of wheat represented 78.5% of the total production of grain crops during the study period 1998-2012. Average wheat area increased from 907 thousand hectares during the first sub-period (1998-2002) to 984.6 thousand hectares during the second sub-period (2003-2007) due to the efforts exerted in the framework of Agricultural Development Strategies. However, it then declined to 751 thousand hectares during the third sub-period (2008-2012). But efforts seeking agricultural development succeeded in developing new high-yielding varieties of wheat, which resulted in increasing average yield of wheat from 1.132 tons/hectare during the first sub-period (1998-2002), to 1.637 tons/hectare during the second sub-period (2003-2007), then further to 1.764 tons/hectare during the third sub-period (2008-2012). It is clear from Table (5) that average production quantity of wheat amounted to 1.03, 1.61, and 1.2 million tons during the three sub-periods, respectively. Average consumption of wheat amounted to 2.3, 2.8, and 2.8 million tons during the three sub-periods, respectively. As for self-sufficiency, it reached 44.6%, 56.79%, and 42.94% on average during the three sub-periods, respectively, which resulted in increasing average quantity and value of wheat imports from 1.43 million tons worth US\$ 227.27 million during the first sub-period, to 1.615 million tons worth US\$ 521.5 million during the third sub-period.

Maize crop:

Maize is not grown in Tunisia. Rather, the country depends on imports to cover consumption needs. It is clear from Table (5) that average quantity consumed of maize amounted to 662.5 thousand tons during the first sub-period (1998-2002), and 853.23 thousand tons during the third sub-period (2008-2012). Average quantity and value of imports amounted to 701.47 thousand tons worth US\$ 90.4 million during the first sub-period; whilst amounted to 853.45 thousand tons worth US\$ 225.7 million during the third sub-period. The quantity of re-exported maize declined from 4.92 thousand tons during the first sub-period to 1.1 thousand tons during the third sub-period.

Rice Crop:

Rice has no importance in Tunisia thus is not at all grown there; especially that it requires large amounts of irrigation water, whereas most cultivations in Tunisia are rainfed. Based on that,

rice is not a major crop for Tunisia, either in terms of production or consumption. Findings showed that rice consumed quantity in Tunisia exactly equals the quantity of imported rice, estimated at 13.59 thousand tons on average during the first sub-period (1998-2002); 16.99 thousand tons on average during the second sub-period (2003-2007); and 11.93 thousand tons on average during the third sub-period (2008-2012).

Barley Crop:

Barley ranks second after wheat in terms of importance based on the production quantity that accounted for 32.73% of Tunisia's total production of grain crops during the study period 1998-2012. Average barley area increased from 497.58 thousand hectares during the first sub-period (1998-2002), to 556.54 thousand hectares during the second sub-period (2003-2007), and then to 631.70 thousand hectares during the third sub-period (2008-2012). But the exerted agricultural development efforts succeeded in improving barley yield, which resulted in increasing average yield from 0.513 tons/hectare during the first sub-period (1998-2002), to 1.017 tons/hectare during the second sub-period (2003-2007), and then to 1.22 tons/hectare during the third sub-period (2008-2012). It is clear from Table (5) that average production of barley amounted to 255.2, 577.25, and 514.49 thousand tons during the three sub-periods, respectively. In the same time, Average consumption of barley amounted to 677.58, 1089.1, and 811.64 thousand tons during the three sub-periods, respectively. As for self-sufficiency, it recorded 37.66%, 53.84%, and 63.39% during the three sub-periods, respectively.

It is also clear from Table (5) that average quantity and value of barley imports amounted to 434.13 thousand tons worth US\$ 49 million during the first sub-period; 512.22 thousand tons worth US\$ 94.18 million during the second sub-period; and 297.15 thousand tons worth US\$ 79.3 million during the third sub-period. Regression analysis results regarding the mentioned variables proved all statistically insignificant.

The T test performed to compare between the outcomes of agricultural development strategies with respect to improving wheat and barley yields in Egypt and Tunisia proved insignificant, where the T value for wheat crop reached 29.193, whilst reached 6.402 for barley, but efforts exerted to achieve agricultural development in Egypt outperformed those exerted in Tunisia.

RECOMMENDATIONS:

1. It is recommended to expand wheat area in Egypt to 2.43 million hectares by 2017, in addition to exerting efforts to achieve the goals of the planned Agricultural Development Strategy, which targets increasing maize area to 21 million hectares, and reducing rice area to 5.6 million hectares in order to rationalize the use of irrigation water as set in Egypt's Agricultural Development Strategy Till 2030. As for Tunisia, it is recommended to exert efforts to increase wheat and barley areas to 1700 and 600 million hectares.

2. It is recommended to increase wheat yield to a figure higher than that achieved during the period 2003-2007, which amounted to 6.491 tons/hectare. Cultivating the new high-yielding varieties such as Misr 1, Misr 2, Sods 12, Sods 13, and Bani Swaif 6 can help increase wheat production to 15.773 million tons by 2017. Moreover, increasing maize yield to 8.321 tons/hectare can help increase maize production to 8.321 million tons, which can be achieved by cultivating the newly developed high-yielding single and triple hybrid varieties. In addition, efforts should be exerted to increase rice yield until 2017 at the same rate of increase achieved during the sub-period 2003-2007 as compared to that achieved during period 1998-2003, i.e., 7.5%, especially after developing the new high-yielding, low water-consuming varieties such as Orabi 1 and Orabi 2. As for Tunisia, it is recommended to grow the new high-yielding varieties of wheat and barley.

3. It is highly recommended to rationalize per capita consumption of wheat, maize, and rice in Egypt. Wheat consumption is supposed to remain at the level of 190 kgs/year, whereas per capita consumption of maize should be reduced from the current 160 kgs/year to 130 kgs/year, which is the average consumption at the world level, assuming that rice consumption remains at the currently prevailing level of 74 kgs. As for Tunisia, efforts should focus on reaching the world level of wheat and barley consumption.

IMPACT OF AGRICULTURAL DEVELOPMENT ON MAJOR GRAIN CROPS GROWN IN EGYPT AND TUNISIA

4. It is highly recommended to reduce losses during storage, which can be achieved by building new recent silos. Losses during all the marketing and processing stages should also be reduced. In addition, it is recommended to improve bread making to reduce losses in the consumed bread, which finally leads to reducing per capita consumption of wheat in turn.

REFERENCES

1. Salwa Amer Khidr 2011. "Analytical Study of Food Grain Crops Production in Egypt", The Egyptian Journal of Agricultural Economics, 21(4): from pag 1129 -1144.
2. Ghada Abd El-Fattah Mostafa Ismael 2011. "Analytical Study of Egypt's Agricultural Development Strategies and the Role They Play In Developing Production of Major Grain Crops", The Egyptian Journal of Agricultural Economics, 21(4): from pag 1305 -1318.
3. Moshira Mohamed Abd El-Magueed ElBatran 2011. "Variables Influencing The Food Gap in Wheat and Maize in Egypt", The Egyptian Journal of Agricultural Economics, 21(4): from 1333-1344.
4. www.aoad.org.

Publish Research Article International Level Multidisciplinary Research Journal For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper, Summary of Research Project, Theses, Books and Books Review for publication, you will be pleased to know that our journals are

Associated and Indexed, India

- ★ Directory Of Research Journal Indexing
- ★ International Scientific Journal Consortium Scientific
- ★ OPEN J-GATE

Associated and Indexed, USA

- DOAJ
- EBSCO
- Crossref DOI
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Database
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database

Review Of Research Journal
258/34 Raviwar Peth Solapur-413005, Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com
Website : www.ror.isrj.org