

ANALYTICAL STUDY FOR THE LIBYAN GROSS DOMESTIC PRODUCTION OF AGRICULTURE UNDER AGRICULTURAL DEVELOPMENT PLANS

Allafi, Kh. A. M.

Omar Almkhtar University- Agricultural Economic Department

ABSTRACT

Since the discovery of oil in the 1950s of the previous century, Libya relied almost entirely on oil revenues as sponsor for economic development, where the oil contributes more than 50 % to GDP and about 75% of the export revenues. Libya sought to diversify its sources of income through plans and programmes for all intensive economic sectors depending on oil revenues, and this dependency a significant impact on GDP and Ag GDP as well as the per capita share of both. the economic development plans obviously influenced by world oil prices, as a result of lower oil prices in the early eighties and the economic embargo on Libya in 1992, GDP and Ag GDP has consequently been affected and also per capita of both. It is worth noting that after the settling international economic situation in Libya, GDP has considerably improved compared to development of Ag GDP and this has become clear through the great development in per capita of GDP, compared to per capita Ag GDP which has not seen remarkable development during the study periods.

Keyword list: Economic development, agricultural policy, Gross Domestic Production Gross Domestic Production (GDP), Agricultural Gross Domestic Production (Ag GDP), Per capita of GDP, per capita of Ag GDP, Growth rate and returns to scale.

INTRODUCTION

Agriculture plays vital role in stimulating growth and decreasing the rates of poverty especially in developing country, because the dominant feature of developing countries economics are the food and agriculture in terms of contributing to GDP and employment and incomes. In developing countries, the agricultural sector has an important place in the development strategies and economic and social plans (Wlfrid, Edwige, 2004). Libya is one of the four largest countries in Africa with a total area of 1,759,540 sq km. Over 93 percent of Libya's lands are covered by desert and there are no permanent rivers. Only 1 percent of the country's land supports agriculture. Libya is characterized by planned economy, depends almost entirely on oil sector, which represents the basis of Libyan exports and more than 50% of GDP. Libya has the largest oil reserves in the African continent. The revenues of oil represent about 95% of export revenues and 75% of government revenues. Oil revenues are the main source of foreign exchange. Despite efforts to diversify the economy and encourage other sector participation in diversification sources of national income, the contribution of the other economic sectors are still below the required level especially agricultural sector which was the second important sector in Libyan economy after the discovery of oil in 1958. Libya has sought, in the nineteen-seventies and eighties, to develop its agricultural through a set of plans (Three-year Plan 1973/1975), (Five-year Plan 1976/1980) and (Five-year Plan 1981/1986)

(GPCT, 1996). However, by the beginning of the 1990s, there was a change in the mechanism of these programmes and plans through adoption annual plans .the growth of the Agriculture industry is heavily dependent on the oil productivity” (Ham, 2002. P27).

Aims of study

This study aims to assess the evolution of GDP and Ag GDP in different two periods which have seen development plans to identify the relative importance of agriculture sector in Gross Domestic Production in different plans.

Methodology:

The overall research methodology is an analytical and descriptive approach. It is based on the statistical analysis of data and using particular econometrics tools. This study is based on secondary data that is obtained from internal sources of data such as literature review, printed and electronic articles, and previous studies related to the subject.

Results

The general time trend of the evolution of GDP and Ag GDP and per capita

The evolution of GDP

The evolution of GDP at current and constant prices during (1973-1985):

The period of study has seen several advances of economic through three economic plans. In addition, significant investments of capital were devoted in agriculture, industry and infrastructure in order to achieve a balanced growth, and the main objective of these plans was to achieve a balance between different economic sectors. The developments of GDP during this period are essential to identify the efficiency of economic development plans and its achieved objectives. Table (1-1) and Figure (1-1) shows that the value of the gross domestic product has seen a remarkable development during the period (1973-1985), where increased from U.S. \$ 2.1827 billion dinars in 1973 to about 7.8521 billion dinars in 1985 and that at current prices an average of about 6.5834 billion dinars, achieving a growth rate of 13.8% on average for the period, while constant prices increased from about 17290 million dinars in 1973 to about 22076.2 in 1985 and an average annual rate of about 31727 million, a growth rate estimated at 6.3% average for the first period of the study. While the highest value was in 1980, may be due to high oil prices, and then start to decline after 1980 and achieved a negative growth rate reached - 16.6%, -17.4% at current prices and constant respectively in 1981.

Table (1-1) the evolution of the value of GDP and Ag GDP at current and constant prices during the period (1973- 1985) M. D.

year	GDP at current prices (A)	GDP at constant prices(B)	Ag GDP at current prices (C)	Ag GDP at constant prices (D)	Growth rate of A	Growth rate of B	Growth rate of C	Growth rate of D
1973	2182.7	17290.0	60.0	475.3	----	----	----	----
1974	3795.7	28702.7	65.0	489.3	73.9	66.01	7.83	2.94
1975	3674.3	25175.5	83.0	568.0	3.1-	12.3-	28.1	16.1
1976	4768.1	30287	100.0	633.3	29.8	20.3	20.3	11.49
1977	5612.7	34546.4	90.0	554.0	17.7	14.06	9.7-	12.53
1978	5496.1	24961.8	122.1	554.5	2.1-	27.7-	35.7	0.107
1979	7603	39947.6	140.4	737.7	38.3	60.04	15	33.03
1980	10553.3	55449	236.4	1242.0	38.8	38.8	68.4	68.38
1981	8798.4	45818.2	273.6	1425.0	16.6-	17.4-	15.7	14.71
1982	8932.4	34097.7	285.7	1091.0	1.5	25.6-	4.42	23.4-
1983	8511.3	29375	303.0	1046.0	4.7-	13.9-	6.06	4.1-
1984	7804.7	24729.5	323.0	1023.0	8.3-	15.8-	6.6	2.1-
1985	7852.1	22076.2	342.2	962.1	0.60	10.7-	5.94	5.9-
Average	6583.4	31727.4	186	830.8	13.81	6.32	17	8.21

Source of A, B, C and D: Central Bank of Libya and AOAD during the period (1973-1985)

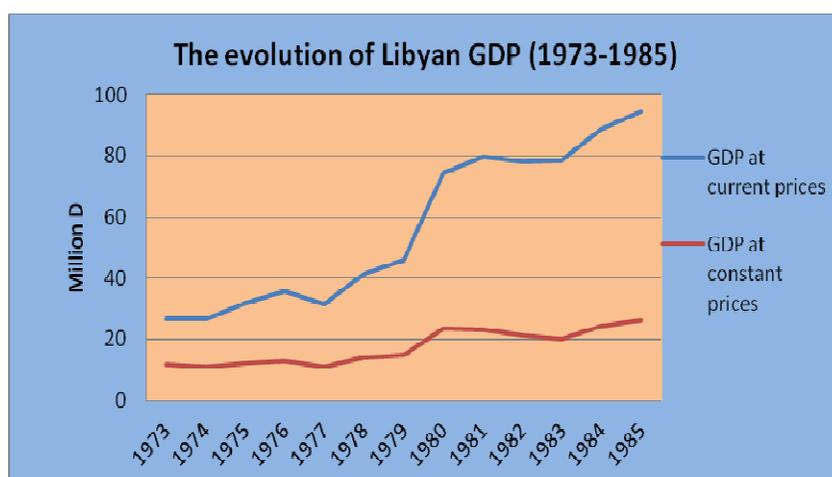


Figure (1-1) the evolution of Libyan GDP (1973-1985).

Through estimation of the general time trend of GDP at current and constant prices million dinars during the period (1973 - 1985).

Equation (1-1) shows that the value of GDP at current prices increased annually 534.8 million dinars by 8.1% of annual average which was 6583.4, and a compound annual growth rate by 9.9% also the value of R square is 69%, which mean that 69% of the changes in the value of GDP due to factors which reflect the impact of time while the rest changes attributed to factors

that not included in the equation. While equation (1-2) points out that the value of GDP at constant prices represented by a quadratic equation which explains that the annual change was not constant and fluctuated between the ups and downs, also, the equation illustrates the value of GDP at constant prices increased by 8567.8 and then decreased by 583.04 and compound annual growth rate was 1.6%.

The evolution of GDP at current and constant prices during the period (1986 - 2007):

This period has seen important economic changes at the local level. the lower export prices of oil since the mid of 1980s has impacted on the revenues of the Libyan economy which led to decrease the allocated investments for development plans and led also to non completion of a large agricultural projects and also some actions has been taken to control and rationalize spending and limited to what was necessary, but with the beginning of 1990s there was a relative improvement in crude oil prices But, unfortunately, Libya came under economic blockade in 1992, which prevented the development of the Libyan economy as desired. However, at the beginning of the second half of 1999, the problem of the economic blockade finished. Therefore, the national economy has seen again many developments. In addition, the price of crude oil increased in international markets which led to achieve a significant improvement in the income of the national economy, where the price of oil increased between 1999- 2000 by 59%. Which led to increase the value of GDP at current prices of about 6960.7 in 1986 to about 7000.5 in 2007 and an average estimated growth rate of about 12.9%, while at constant prices rose from about 18.9465 billion dinars in 1986 to about 51.28812 billion dinars in 2007 and the average growth rate estimated at 9.1% for the period (1986-2007), as shown in Table (1-2) and Figure (1-2).

Equation (1-3) shows that the value of GDP at current prices increased annually 2197 million dinars by 11.3 % of the annual average which was 19429.9 million, and a compound annual growth rate by 10 % also the value of R^2 is 70%, which mean that 70 % of the changes in the value of GDP due to factors which reflect the impact of time while the rest changes attributed to factors that not included in the function. While equation (1-4) points out that the value of GDP at constant prices represented by a quadratic equation which explains that the annual change was not constant and fluctuated between the ups and downs, also, the equation illustrates the value of GDP at constant prices decreased by 3766 million and then in the second period increased by 224.9 and compound annual growth rate was 5 %, also the value of R^2 is 88%.

The evolution of Ag GDP at current and constant prices:

Agricultural production and its contribution to gross domestic product are the most important indicators for the performance of the agricultural sector in terms of achieving its objectives. Because of the agricultural production is a component of GNP. Therefore, through the agricultural output or added value of this sector can be inferred the progress of agricultural sector.

Table (1-2): the evolution of the value of GDP and Ag GDP at current and constant prices during the period (1986- 2007) M. D.

year	GDP at current prices (A)	GDP at constant prices (B)	Ag GDP at current prices (C)	Ag GDP at constant prices (D)	Growth rate of A	Growth rate of B	Growth rate of C	Growth rate of D
1986	6960.7	18946.5	384.7	1047.1	11.35-	14.2-	12.4	8.8
1987	6011.6	15680.1	411.2	1073.0	13.64-	17.2-	6.89	2.4
1988	6186.0	15209.2	423.3	1041.0	2.9	3.0-	2.94	2.9-
1989	7191.0	17416.9	439.0	1065.0	16.2	14.5	3.9	2.4
1990	8246.4	18416.6	482.9	1078.0	14.7	5.7	9.8	1.2
1991	8757.3	17478.3	542.4	1083.0	6.2	5.1-	12.3	0.38
1992	9231.9	16848.6	630.2	1150.0	5.4	3.6-	16.2	6.2
1993	9137.7	15014.1	708.9	1165.0	1.0-	10.9-	12.5	1.3
1994	9670.8	13850.0	827.9	1186.0	5.8	7.8-	16.8	1.8
1995	10672.2	13773.1	933.4	1205.0	10.4	0.56-	12.7	1.6
1996	12327.3	14054.7	1074.5	1225.0	15.5	2.0	15.1	1.7
1997	13800.5	13800.5	1267.0	1267.0	12.0	1.8-	17.9	3.4
1998	12610.6	11266.7	1394.3	1246.0	8.6-	18.4-	10	1.7-
1999	14075.2	11070.2	1449.7	1140.0	11.6	1.7-	3.99	8.4-
2000	18456.9	14950.3	1439.7	1166.0	31.2	35.1	0.7-	2.2
2001	18720.2	16637.2	1392.0	1237.0	1.4	11.3	3.3-	6.1
2002	25914.1	25541.3	1348.0	1329.0	38.4	53.5	3.1-	7.5
2003	31731.8	31954.3	1375.0	1384.6	22.5	25.1	1.9	4.2
2004	30892.0	44096.76	1107.0	1325.65	-2.6	37.9	-19.4	-4.2
2005	41632.0	46893.88	1186.0	1341.87	34.7	6.3	7.1	1.2
2006	55227.0	49091.00	1254.0	1358.09	32.6	4.6	5.7	1.2
2007	70005.0	51288.12	1434.0	1374.00	26.7	4.4	14.3	1.1
Average	19429.9	22421.7	977.5	1203.9	12.9	9.1	7.4	2.1
General Average	13006.6	27074.5	581.7	1017.3	13.3	7.7	12.2	5.1

Source of A, B, C and D: Central Bank of Libya and AOAD during the period (1986-2007)

This stage is a turning point for the agricultural sector, where three plans for agricultural development had been applied which aimed to some essential goals that were seeking as a whole to increase the rate of growth in the agricultural sector and to ensure its contribution to GDP and achieve a large rate of self-sufficiency in agricultural and food products, and work to find some kind of integration between the agricultural sector and other sectors other. Furthermore, large investments had been allocated to achieve these objectives, as a result of this concern to the agricultural sector; the value of agricultural GDP has seen a remarkable development during the period (1973 - 1985).

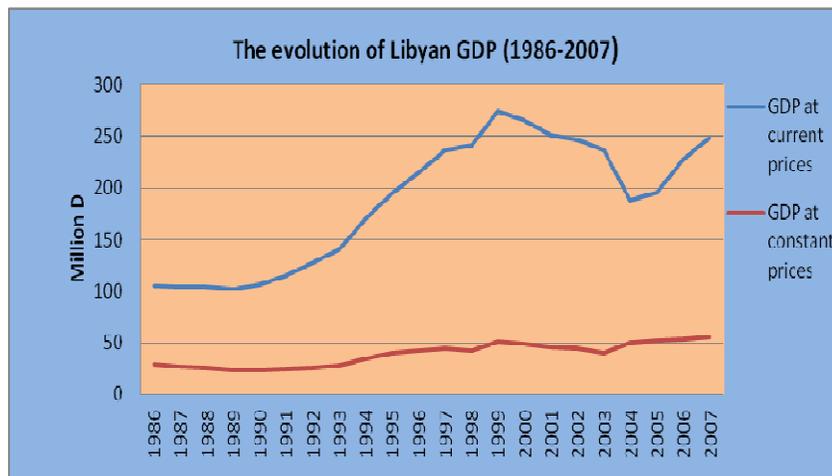


Figure (1-2) the evolution of Libyan GDP (1986-2007).

the evolution of Ag GDP at current and constant prices during the period (1973 – 1985):

Data of table (1-1) and Figure (1-3) show that the value of agricultural GDP increased at current prices from about 60 million dinars in 1973 to about 342.2 in 1985, the average growth rate is estimated at 17% average for the period (1973-1985) while, in constant prices, the value of agricultural GDP increased from 475.3 million dinars in 1973 to about 962.1 million dinars in 1985, and the average growth rate is estimated about 8.2%. To assess the evolution of agricultural GDP at current prices and constant, the equation of general time trend has been estimated as follows:

Equation (1-5) shows that the value of Ag GDP at current prices increased annually at 26.93 million dinars by 14.4 % of the annual average which was 186 million, and a compound annual growth rate by 16.3 % also the value of R^2 is approximately 93%, which mean that 93 % of the changes in the value of Ag GDP due to factors which reflect the impact of time while the rest changes attributed to factors that not included in the equation, also proved significant regression coefficient and significant form as a whole at the model level at 95% . While equation (1-6) it is clear that the value of Ag GDP at constant prices increased annually 62.1 million dinars by 7.48 % of the annual average which was 830.8 million, and a compound annual growth rate by 8.07 % also the value of R^2 is 58 %, also proved significant regression coefficient and significant form as a whole at the model level at 95%.

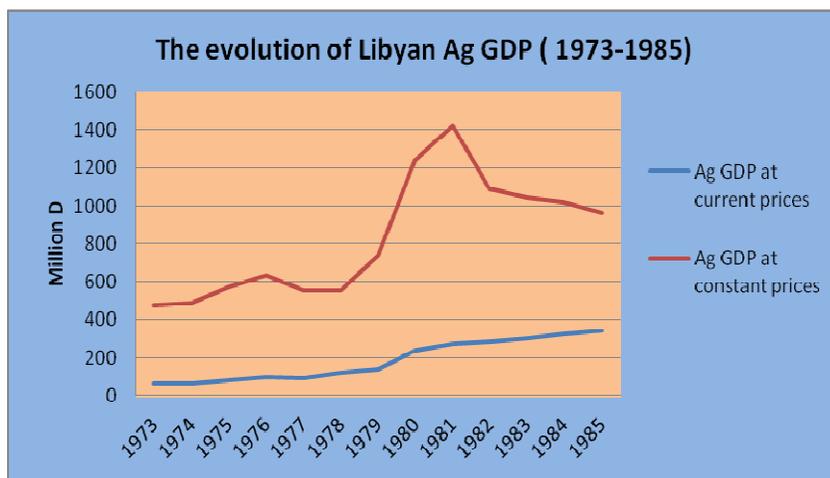


Figure (1-3) the evolution of Libyan Ag GDP (1973-1985).

The evolution of Ag GDP at current and constant prices during the period (1986 – 2007):

During this period, the approach of economic and social plans has stopped, as a result of the sharp decline in oil prices, which is the main sponsor of economic development plans and after that began working according to the budgets of transformation, 22 transition budget have formulated and carried out during the period from 1986 to 2007. With respect to the evolution of agricultural GDP during (1986 - 2007) which has seen remarkable development as shown in Figure (1-4), where the value of agricultural GDP at current prices increased from about 384.7 million dinars in 1986 to about 1434 million dinars in 2007 and the average growth rate is estimated about 7.4%, either at constant prices, the value of agricultural GDP has increased from about 1047.1 million dinars in 1973 to about 1374 million dinars in 2007 and the average growth rate was estimated at 2.1% for the period (1986-2007). To assess the evolution of agricultural GDP at current prices and constant, the equation of general time trend has been estimated as follows:

Equation (4-1) shows that the value of Ag GDP at current prices increased annually by 25.42 million dinars represented 2.6 % of the annual average which was 977.5 million, and a compound annual growth rate by 6 % also the value of R^2 is approximately 79%, which mean that 79 % of the changes in the value of Ag GDP due to factors which reflect the impact of time while the rest changes attributed to factors that not included in the equation, also proved significant regression coefficient and significant form as a whole at the model level at 95% while equation (1-8) it is clear that the value of Ag GDP at constant prices increased annually by 16.21 million dinars represented 1.3 % of the annual average which was 1203.9 million , and a compound annual growth rate by 1 % also the value of R^2 is 86 %,

also proved significant regression coefficient and significant form as a whole at the model level at 95%. during the period (1973-1985) during the period (1973-1985)

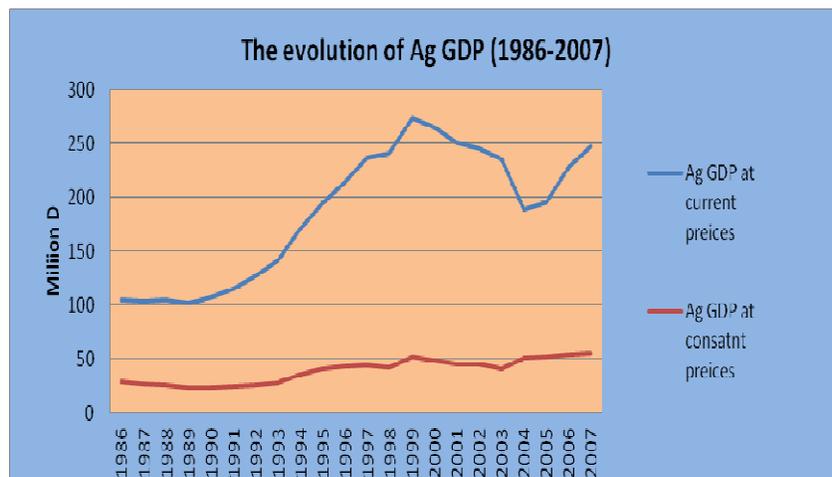


Figure (1-4) the evolution of Libyan Ag GDP (1986-2007).

DISCUSSION

Evolution of Libyan GDP

The first period (1973-1985):

The value of the gross domestic product has seen a remarkable development during the period (1973-1985) and that at current prices an average of about 6.5834 billion dinars, achieving a growth rate of 13.8% on average for the period, while constant prices growth rate estimated at 6.3% average for the first period of the study. While the highest value was in 1980, may be due to high oil prices, and then start to decline after 1980 and achieved a negative growth rate reached - 16.6%, -17.4% at current prices and constant respectively in 1981. This can be proved through the value of GDP at constant prices which represented by a quadratic equation which explains that the annual change was not constant and fluctuated between the ups and downs, also, the equation illustrates the value of GDP at constant prices increased by 8567.8 and then decreased by 583.04.

The second period (1986-2007):

This period has seen important economic changes at the local level. the lower export prices of oil since the mid of 1980s has impacted on the revenues of the Libyan economy which led to decrease the allocated investments for development plans and led also to non completion of a large agricultural projects and also some actions has been taken to control and rationalize spending and limited to what was necessary, but with the beginning of 1990s there was a relative improvement in crude oil prices But, unfortunately, Libya came under economic blockade in 1992, which prevented the development of the Libyan economy as desired level.

However, at the beginning of the second half of 1999, the problem of the economic blockade finished. Therefore, the national economy has seen again many developments. In addition, the price of crude oil increased in international markets which led to achieve a significant improvement in the income of the national economy, where the price of oil increased between 1999- 2000 by 59% . Which led to increase the value of GDP at current prices of about 6960.7 in 1986 to about 7000.5 in 2007 and an average estimated growth rate of about 12.9%, while at constant prices rose from about 18.9465 billion dinars in 1986 to about 51.28812 billion dinars in 2007 and the average growth rate estimated at 9.1% for the period (1986-2007. the economic blockade and the lower export prices of oil reflected in the value of GDP at constant prices which represented by a quadratic equation which explains that the annual change was not constant and fluctuated between the ups and downs, also, the equation illustrates the value of GDP at constant prices decreased by 3766 million and then in the second period increased by 224.9 and compound annual growth rate was 5 %.

Evolution of Libyan Ag. GDP

The first period (1973-1985):

This period is a turning point for the agricultural sector, where three plans for agricultural development had been applied which aimed to some essential goals that were seeking as a whole to increase the rate of growth in the agricultural sector and to ensure its contribution to GDP and achieve a large rate of self-sufficiency in agricultural and food products, and work to find some kind of integration between the agricultural sector and other sectors other. Furthermore, large investments had been allocated to achieve these objectives, as a result of this concern to the agricultural sector; the value of agricultural GDP has seen a remarkable development during the period (1973 - 1985). the data shows that the value of agricultural GDP increased at current prices from about 60 million dinars in 1973 to about 342.2 in 1985, the average growth rate is estimated at 17% average for the period (1973-1985) while, in constant prices, the value of agricultural GDP increased from 475.3 million dinars in 1973 to about 962.1 million dinars in 1985, and the average growth rate is estimated about 8.2%.

The second period (1986-2007):

During this period, the approach of economic and social plans has stopped, as a result of the sharp decline in oil prices, which is the main sponsor of economic development plans and after that began working according to the budgets of transformation, 22 transition budget have formulated and carried out during the period from 1986 to 2007. With respect to the evolution of agricultural GDP during (1986 - 2007) which has seen remarkable development , where the value of agricultural GDP at current prices increased from about 384.7 million dinars in 1986 to about 1434 million dinars in 2007 and the average growth rate is estimated about 7.4%, either at constant prices, the value of agricultural GDP has increased from about 1047.1 million dinars in 1973 to about 1374 million dinars in 2007 and the average growth rate was estimated at 2.1% for the period (1986-2007).

The averages of the indicators value during the study periods

Indicator		First Period	Second period
		1973-1985	1986-2007
GDP	Current prices A	6583.4	19429.9
	Constant prices B	31727.4	22421.7
Ag GDP	Current prices C	186	977.5
	Constant prices D	830.8	1203.9
	Growth rate of A	13.81	12.9
	Growth rate of B	6.32	9.1
	Growth rate of C	17	7.4
	Growth rate of D	8.21	2.1

REFERENCES

- Adegeye, A and Dittoh, J (1985), Essentials of agricultural economics: Centre for Agricultural and Rural Development: Agricultural policy and food reference group .Australian treasury, [Online], Last accessed 27-12-2009 at:http://www.agfoodgroup.gov.au/__data/assets/pdf_file/0006/254607/australian_treasury.pdf.
- Awosola, O., et al, (2008), Indicators for monitoring and evaluation of agricultural performance and shared goals in Southern Africa. Working Paper No.24. Regional strategic analysis and knowledge support system. Pretoria, South Africa.
- Central Bank of Libya, the economic bulletin. Tripoli.
- Ethridge, D. (2004), Research methodology in applied economics. Blackwell .UK.
- Eyo, E. (2008), Macroeconomic Environment and agricultural sector growth in Nigeria: World Journal of Agricultural Sciences. Department of agricultural economics and extension. University of Calabar, Nigeria.
- Ham, A. (2002), Libya. London: Lonely Planet Publications.
<http://ajol.info/index.php/jasr/article/viewFile/2811/11378>.
- The Arab organization for the Agricultural Development (AOAD), (2000-2007), Year book, Al- Khartoum.
- The General Planning Council of trade. (GPCT), (1996), Report of agricultural policies in Libya the General Planning Council, Libya.
- Wlfrid, A and Edwige, K (2004), Role of agricultural economic development of developing countries; case study of China and Sub Sahara Arica (SSA).4(2).

دراسة تحليلية للنتائج المحلي الإجمالي والزراعي في ليبيا ودوره في خطط التنمية
الزراعية
خالد عبد العاطي موسى اللافي
قسم الاقتصاد الزراعي - كلية الزراعة - جامعة عمر المختار

منذ اكتشاف النفط في ليبيا في نهاية الخمسينات في العقد الماضي وليبيا تعتمد بشكل كبير على عوائد النفط كممول لجميع مشاريع التنمية بما فيها مشاريع التنمية الزراعية، حيث يساهم النفط بما يزيد عن ٥٠% من الناتج المحلي الإجمالي وبحوالي ٧٥% من عوائد التصدير. وقد سعت ليبيا إلى تنويع مصادر الدخل من خلال مجموعة من الخطط والبرامج الاقتصادية معتمدة على عوائد النفط في تمويل هذه الخطط، وهذا الاعتماد أثر بشكل كبير على الناتج المحلي الإجمالي والزراعي بشكل خاص من خلال اثر انخفاض أسعار النفط العالمية في بداية الثمانينات. وبعد رفع العقوبات الاقتصادية على ليبيا كان هناك تطور في الناتج المحلي الإجمالي ولكن الناتج الزراعي لم يشهد أي تطور خلال فترة الدراسة وانخفاض أسعار النفط أثر على الخطط الزراعية من حيث التمويل و ثم أدى إلى انخفاض الناتج المحلي الزراعي خلال فترة الدراسة.

Statement		First Period	Second period
		1973-1985	1986-2007
Equation of GDP	Current prices A (1-1)	$Y = 289.95 + 534.8 X$	$(1-2) Y = -5836 + 2197 X$
	Constant prices B (1-3)	$Y = 7854.83 + 8567.1 X - 583.04 X^2$	$(1-4) Y = 26929 - 3766 X + 224.9 X^2$
	compound annual growth rate A	9.9%	10%
	compound annual growth rate B	1.6%	5%
Equation of Ag GDP	Current prices C (1-5)	$Y = -2.03 + 26.93 X$	$(1-6) Y = 340.1 + 55.42 X$
	Constant prices D (1-7)	$Y = 396.1 + 26.1 X$	$(1-8) Y = 1017 + 16.2 X$
	compound annual growth rate C	16.3%	6%
	compound annual growth rate D	8.07%	1%