Contribution of Productive Sectors to the Gdp of Gedarif State, Sudan

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ABSTRACT
Gross domestic product (GDP) is one of the most common indicators used to track the health of a nation's economy. It gives an overall picture of the state of the economy and enables policymakers and central banks to judge whether the economy is contracting or expanding and whether it needs a boost or restraint. This paper attempts to shed light on the contribution of productive sectors to the GDP of Gedarif state in 2003-2007. The study relies heavily on secondary data. It finds that agricultural sector plays a strategic role in the process of economic development of the state. It contributed the highest rates to the GDP of the State during 2003-2007 (i.e. 87.2%, 84.6 %, 83 %, 80.3 % and 78.3% respectively) and this proves that the economy of the State depends largely on agriculture. The average contribution rate of the agricultural sector was 82.7 % while the average contribution rates of the service and industrial sectors were 4.2 % and 13.1% sequentially during the period. It is recommended that conservation and development of natural resources and improvement of production and productivity are significant to enhance the contribution of the agricultural sector to the GDP of the state. Availability of foreign currency, spare parts, power and energy and reduction of taxes improve the efficiency of the industrial sector. Public sector investment on basic infrastructure and increased spending on education and other services are highly needed to enrich the GDP of the state.
Keywords: *Contribution, Productive Sectors, Gedarif, Sudan.*

INTRODUCTION
Sudan is a country in Northern Africa. It is bordered by Egypt to the north, the red sea, Eritrea, and Ethiopia to the east, South Sudan to the South, the Central Africa Republic to the Southwest, Chad to the west and Libya to the northwest. It is the third largest country in Africa and it won independence from the British in 1956.The Rive Nile divides the country into eastern and western halves. Sudan's population was estimated at 39.6 million in 2016. (Maha and Mustafa, 2015). Sudan's economic freedom score is 47.7, making its economy the 166th freest in the 2019 Index. Sudan is ranked 41st among 47 countries in the Sub-Saharan Africa region, and its overall score is well below the regional and world averages. Investment confidence has been undermined due to social conflict and civil war (Heritage Foundation, 2019). The oil sector contributed much to Sudan's GDP growth, but after the separation of South Sudan, two thirds of Sudan's oil revenue were lost. Sudan economy is basically agricultural. Agricultural sector employs 80% of the work force and contributes a third of the GDP. Much of the population will remain at or below the poverty line for years because of civil war, lack of basic infrastructure in large areas and reliance on subsistence agriculture (Fanack Home, 2019). Gedarif State which is one of Sudan,s eastern states is suited between lat .14° . 4¹ and 16°. 4¹ north and long .33°. 35¹ and 35°.36¹ East .It is composed of ten localities, namely: Gedarif municipality, Center of Gedarif, Botana, Eastern Gallabat, western Gllabat, Goraisha , Hawata, GualiAlnahal ,Fao and Fashaga. The area of the state is 72,000 sq.km and it is divided into three main types of lands (i.e. high lands, plains and valleys). The clay soil is the dominant soil and the natural ingredients

of this soil help greatly in making rainfed semi mechanized farming the main economic activity. Rainfed semi mechanized farming is practiced by 70% of the State's population. Agriculture is the backbone of the State's economy. The State is endowed with several natural resources, most important of which are arable &cultivable lands, Forestry resources, natural pastures, water resources and animal resources. Arable and cultivable lands amount to approximately12million Feddans (One feddan = 1.038 acres = 4201 square meters). The forestry resources cover more than 2.5 million Feddans and natural pastures exceed 4 million Feddans.2 the savanna grass land covers most of the State. Local population depends greatly on forests to satisfy their needs for fuel, charcoal and local building materials. Rains are the main source of water in the State. Rivers of Sayteet, Basalam, Rahad and Atbara in addition to underground water, represent the other sources of water. Dams and Hafirs are the only means for harvesting water. The Animal resources exceed 5 million heads and the State is endowed also with unexploited potentialities of minerals, fisheries and wild life. Industry depends largely on agricultural products while most of the services are provided to develop the agricultural sector. The State is not highly populated, the total number of population is estimated to be 1,567,814 persons and 75% of them are rural inhabitants, while those who live in the urban centers constitute the remaining 25% .The population density average is 22persons per sq. km (Gedarif State Encyclopedia, 2008). The aim of this paper is to examine the contribution of productive sectors to the GDP of Gedarif state of Sudan. The rest of the paper is structured into: A literature review, methodology, analysis and discussion and conclusion.

Conceptual Framework
Gross domestic product (GDP) is one of the most common indicators used to track the health of a nation's economy. It is the monetary value of all the finished goods and services produced within a country's borders in a specific time period and includes anything produced by the country's citizens and foreigners within its borders. GDP is important because it gives an overall picture of the state of the economy and enables policymakers and central banks to judge whether the economy is contracting or expanding, whether it needs a boost or restraint, and if a threat such as a recession or inflation looms on the horizon (Investopedia, 2019). Many economists recognize the following five economic sectors .Firstly, the primary sector which is sometimes known as the extraction sector, because it involves taking raw materials. Primary sector includes agriculture, mining and other natural resource industries .Secondly,   the secondary or manufacturing industry sector which takes raw materials and combines them to produce a higher value added finished product. It covers manufacturing, engineering and construction. Thirdly, Service / tertiary sector which is concerned with the intangible aspect of offering services to consumers and business. It involves retail of the manufactured goods and also provides services, such as insurance and banking. Fourthly, the quaternary sector which deals with the intellectual aspects of the economy. It includes education, training, the development of technology, and research and development. It is the process which enables entrepreneurs to innovate better manufacturing processes and improve the quality of services offered in the economy. Lastly,

the quinary sector which is the part of the economy where the top-level decisions are made. This includes the government which passes legislation. It also comprises the top decision-makers in industry, commerce and also the education sector (Pettinger, 2017).

Literature Review

Agricultural sector plays a strategic role in the process of economic development of the state. The predominant agricultural activities in Gedarif state include sorghum and sesame cultivation, livestock rearing and forestry. Sorghum is the major cereal crop and considered as main pillar of food security in the country providing about 60% of the quantity of the cereal consumed (Karim, 2002). Sorghum production in 2001 in the mechanized rain-fed farming areas of Gedaref constituted 26% of the total production in Sudan and 45% of mechanized rain-fed farming sub-sector. Gedaref is the major supplier of sesame in Sudan during the last forty years. It represented about 21% and 58% of the total production in the Sudan and mechanized rain-fed farming sub-sector in 2002 respectively. The River Gash Irrigation Scheme is located to the northeast of Gedarif, while the Rahad Scheme and the famous Gezira Scheme lie to the west. With the cultivation of sesame seed, sunflower, cotton, peanuts and cereals, especially sorghum, Gedarif has become the country's granary. (Mustafa, 2006). Livestock production is the second major economic activity in the state. The total number of animals is estimated in 1999 to be 3,896,134 heads. Livestock provides a mean for risk management during drought and crop failure period. Cattle, sheep, camel and goats are raised, but sheep is by far the dominant in the herd. The prevailing livestock are mainly local breeds. Gedaref state is classified within the woodland savanna ecological division which includes mixed type of vegetation composed of grass along with bushes and trees. The total area of forests in the Gedaref state is estimated at 1,600,000 feddans (672,268 hectares). The dominant tree in the region is the Acacia Senegal; its local name is Hashab, providing gum arabic, wood fuel, fodder and poles and improving the soil. The Gedaref state average share was about 14% of the total production of gum arabic throughout the period 1970-1998 in the country (MFNE, 2002).

Table 1: Gum Arabic Production in Gedarif State of Sudan, Average 1970-1998

State	Production (MT)	Percentages
Gedarif	103,584	13.6

Source: (MAF, 2000)

The industrial sector provides the necessary inputs to other sectors of the economy. It is an important employer for both skilled and unskilled labour. Industry in Gedarif state depends largely on agricultural products such as sesame, groundnut and sunflower. There are some factories of animal feed industry in Gedarif State. Animal feed industry is becoming increasingly important since natural pastures in Sudan suffered significantly from drought, desertification, fires, and overgrazing (Babiker, 2015). Water and electricity are essential for the social and economic development of the state. The border areas in Gedarif state suffer from an acute deficiency of water, where boreholes are the main source of supply and the only year-round source. About 6% of households in Gedarif depend on the Atbara River, while some 40% rely on unprotected sources. The largest segment of households depends

on vendors for its water supply (61%). Only 5.8% in Geadrif state have access to electricity. The state heavily depend on wood and charcoal for cooking, which impacted vegetation around settlements. Cooking gas is only used by 7.2% of households (Hamed Elneel, et al 2017). The service sector in Gedarif state makes an important contribution to GDP, providing jobs, inputs and public services for the economy. The state is linked with the capital Khartoum by a net of roads, railway, airway, and seasonal direct roads. There are roads and railway linking the different cities, towns and villages in the north east part of the country with the capital of the state Gedarif city. There is a high way linking Gedarif city, Gallabat town at the edge of the boundary with Ethiopia and the Ethiopian city of Gonder, and from there to the Ethiopian capital Addis Abeba. The state has also an airport called Azaza Airport. It is distinguished also by digital city located in Gedarif city and Public Organization for Water and Development. Education in Gedaref state has been extended in the last decades. There are four levels of education i.e. pre basic, basic, secondary and universal education. The state embodies tens of schools of different levels besides Gedarif University (Gedarif State Encyclopedia, 2008). In spite of the efforts made by the state authorities, about 87% of households in the state have children of school age who are currently outside the education system and who either never enrolled or dropped out of school (Hamed Elneel, et al 2017). Gedarif State involves 22 hospitals, 32 health centers, 223 clinics, 35laboratories, 2blood banks and 4 x-ray units. The state involves seven hotels serving tourism. In addition to pest control service, the state provides some technical and mechanical services to agriculture (Gedarif State Encyclopedia, 2008).

METHODOLOGY
This paper relies heavily on secondary data. The data used is generated from secondary sources such as textbooks, journals, papers, magazines, publications, studies conducted by researchers and websites. Descriptive statistics is used to analyze the data.

ANALYSIS AND DISCUSSION:
Productive sectors include, agricultural sector, industrial sector and service sector. Agricultural sector is composed of irrigated farming, rain-fed farming, animal resources and forests, while industrial sector involves agro-industries, water and electricity and construction. The service sector consists of government services and other services. The agricultural production in Gedarif state is associated with a high degree of uncertainty arising from a variety of factors among which, dependence of agriculture on unpredictable events like weather, unexpected prices changes and unexpected changes in governmental policies. The output prices are observed to be very low especially during harvest time. This is mainly the consequence of farmers' inability to store their products for long as they have to pay labor wages and repay their loans. As a result, farmers are obliged to deliver their produce directly after harvest to the market, creating a surplus which in turn leads to a sharp decrease in output prices (Mustafa, 2006). Industry in the state depends on agricultural products such as sesame and sunflower. Therefore, the most important industries are oils, soap and sweets industries which are concentrated in the city of Gedarif. Services represented in storage and processing of crops in grain silos and other stores, telecommunication and banking services, technical and mechanical services related to

agriculture and agricultural pests control service (Gedarif State Encyclopedia, 2008). The following table shows the contribution of the productive sectors to the GDP of Gedarif State during 2003-2007.

Table 2: GDP of Gedarif State in Current Prices (000,000 SDG) During the Period (2003-2007).

Narration	2003	2004	2005	2006	2007
Agricultural Sector :					
Irrigated Farming	31.67	25.15	21.04	25.02	27.15
Rainfed Semi Mechanized Farming	151.99	135.71	201.26	137.39	113.47
Animal Resources	1152.63	1188.89	1205.06	1243.64	1287.13
Forests	0.90	0.95	0.91	0.99	1.11
Sub-Total	1337.19	1350.70	1428.27	1407.04	1428.86
Industrial Sector:					
Agro-Industries	0.20	0.21	0.22	0.22	0.22
Water and Electricity	32.93	30.48	35.99	32.82	37.32
Construction	29	33.50	36.31	44.41	44.05
Sub-Total	62.13	64.19	72.52	77.45	81.59
Service Sector:					
Government Services	65.40	85	123.25	168.65	192.26
Other Services	68.15	97.12	96.16	99.66	123.24
Sub-Total	133.55	182.12	219.41	268.31	315.50
GDP	1532.87	1597.01	1720.20	1752.80	1825.95
Growth Rate	0.7%-	4%	7.7%	1.9%	4.2%
Average Growth Rate	3.4%				

Source: Third Economic Overview, 2008

Figure 1: GDP of Gedarif State (000,000 SDG) (2003-20007
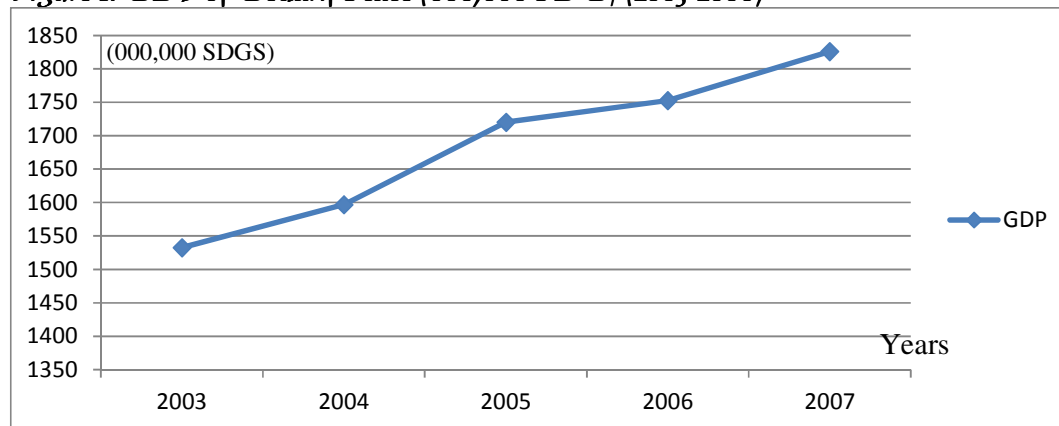
Source: Third Economic Overview, 2008

Table (2) and figure (1) show the GDP of Gedarif State during the period 2003-2007. With the exception of the year 2003 in which the Growth rate of the GDP of the State was negative (i.e.-0.7% ,the growth rates in the rest of the years (i.e.2004,2005,2006 and 2007) were positive and they were 4% ,7.7%,1.9% and 4.2% successively. The average growth rate in 2003- 2007 was 3.4% and the highest GDP Growth Rate was in 2005 and it was 7.7%. The

reason behind this was the great improvement which took place in the animal resources sub-sector. The contribution of rain-fed semi-mechanized farming sub-sector to the GDP increased from 135.71 million SDGS in 2004 to 201.26 million SDGS in 2005 to decrease again in 2006 and 2007 i.e. 137.39 and 113.47 respectively. The Growth Rate of this sub-sector reached 48% in 2005, while the Growth Rate of the GDP of the State   decreased to 1.9% in 2006 and that was due to the deterioration which took place in the rain-fed semi mechanized farming sub-sector. This sub-sector registered a negative Growth rate of - 32%in 2006 because of poorly distributed rains. The GDP of the State grew by 4.2% in 2007 and this rate was greater than the average Growth Rate during the period 2003-2007 (i.e.3.4%). This growth was because of the growth which took place in all the sub-sectors with the exception of rain-fed semi-mechanized farming and construction sub-sectors. Rain-fed Semi Mechanized Farming Contributed 10%, 8.5%, 11.7%, 7.8% and 6.2% to the GDP of Gedarif State in 2003,2004,2005,2006 and 2007 respectively. The average contribution for the period was 8.8%. However, animal resources sub-sector contributed 75.2%, 74.4%, 70%, 71% and 70.5% to the GDP of the State in 2003,2004,2005,2006 and 2007 consecutively. The average contribution of animal resources sub-sector to the GDP in 2003-2007 was 72.2% and this shows the importance of integration of animals into rain-fed semi-mechanized farming sub-sector. It deserves mentioning that a considerable number of farmers in the rain-fed semi mechanized farming sub-sector started to breed animals. The above analysis explains clearly the low contribution of rain-fed semi mechanized farming sub-sector to the GDP of Gedarif State during 2003-2007.

Table 3: Contribution of the Productive Sectors to the GDP of the State (%) (2003-2007).

Year / Sector (%)	2003	2004	2005	2006	2007
Agriculture	87.2	84.6	83	80.3	78.3
Industry	4	4	4.2	4.4	4.5
Services	8.8	11.4	12.8	15.3	17.2
Total	100	100	100	100	100

Source: Third Economic Overview, 2008

According to table (3) above, the agricultural sector contributed the highest rates to the GDP of the State during 2003-2007 (i.e. 87.2%, 84.6 %, 83 %, 80.3 % and 78.3%) sequentially and this proves that the economy of the State depends largely on agriculture. The average contribution rate of the agricultural sector was 82.7 % while the average contribution rates of the service and industrial sectors were 4.2 % and 13.1% respectively .Thus the agricultural sector was dominant. The rate of contribution of this sector to the GDP was decreasing during 2003-2007and it reached 78.3%in 2007 compared to 87.2% in 2003 .This happened because there was a decrease in the   contribution of rain-fed semi-mechanized farming sub-sector to the GDP in 2004 compared to 2003. The contribution of the sub-sector decreased

again in 2006 and 2007 compared to 2005. The contributions of the industrial and service sectors to the GDP were low compared to the agricultural sector. The contribution rates of the industrial sector during the period were 4%, 4%, 4.2%, 4.4% and 4.5% respectively while the contribution rates of the services sector were 8.8%, 11.4%, 12.8%, 15.3% and 17.2% successively.

Table 4: Average Contribution of Productive Sectors to the GDP of the State during the Period 2003-2007 (%).

Sector	Percentage
Agricultural Sector	82.7 %
Industrial Sector	13.1%
Service Sector	4.2 %

Source: Own computation

Figure 2: Average Contribution of Productive Sectors to the GDP of the State during the Period 2003-2007 (%).

Percentage
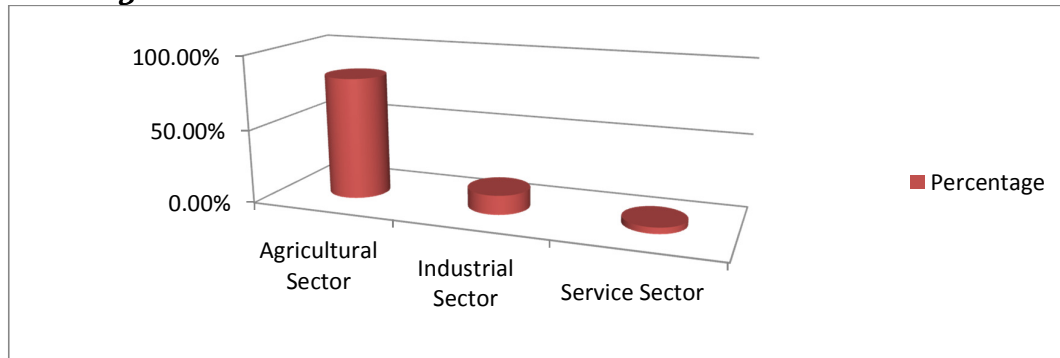
Source: Own computation

Table (4) and figure (2) show that the agricultural sector contributed 82.7% while the industrial and service sectors contributed 13.1% and 4.2% respectively to the GDP of the State.
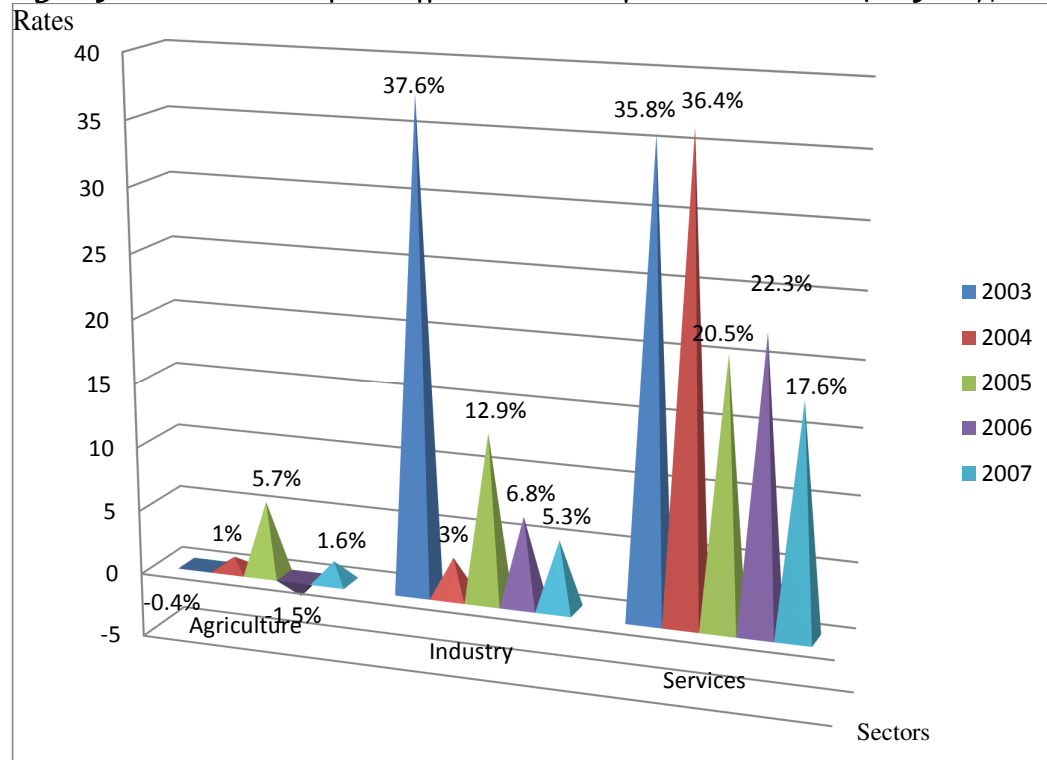
Table 5: Growth Rates of the Different Sectors of the State's GDP (2003-2007).

Year \\ Sector	2003	2004	2005	2006	2007
Agriculture	-0.4	1	5.7	-1.5	1.6
Industry	37.6	3	12.9	6.8	5.3
Services	35.8	36.4	20.5	22.3	17.6

Source: GSMF, 2009

Figure 3: Growth Rates of the different Sectors of the State's GDP (2003-2007).

Source: GSMF, 2009

Table(5) and figure (3) illustrate the growth rates of the three main sectors which contribute to the GDP of Gedarif State .The growth of the agricultural sectors witnessed an observable fluctuation during 2003-2006.The highest rate of growth was recorded in 2005 and it was 5.7% while the lowest growth rate was recorded in 2006 and it was -1.5%. The highest rate of growth in the industrial sector was 37.6% and it was registered in 2003 while the lowest rate was registered in 2004 and it was 3%.The highest rate of growth in the service sector was 36.4% and it was recorded in 2004 while the lowest rate which was 17.6% was recorded in 2007.
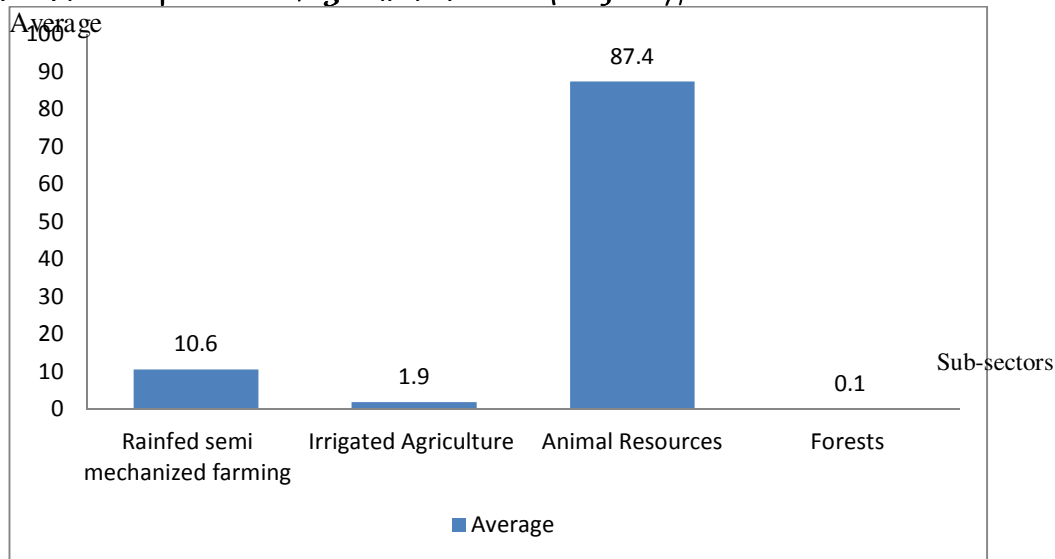
Table 6: Contribution of the State Agricultural sub-Sectors to the Total Production of the State Agricultural Sector (2003-2007)

Year Particular	2003	2004	2005	2006	2007	Average
Rainfed semi mechanized farming	11.4	10	14	9.8	7.9	10.6
Irrigated Agriculture	2.3	1.9	1.5	1.8	1.9	1.9
Animal Resources	86.2	88	84.4	88.3	90.1	87.4
Forests	0.1	0.1	0.1	0.1	0.1	0.1
Total	100	100	100	100	100	100

Source: Third Economic Overview, 2008

Figure 4: Average Contribution rates of the State Agricultural Sub-sectors to the Total Production of the State Agricultural Sector (2003-2007).

Source: Third Economic Overview (2008)

Table (6) and figure (4) highlight the high contribution of animal resource sub-sector to the total production of the agricultural sector and the low contribution of rain-fed semi mechanized farming sub-sector to the sector. The average contribution rate of the rain-fed semi-mechanized farming sub-sector relative to agricultural sector during 2003-2007 was 10.6%, while the animal resource sub-sector constituted the largest component of the agricultural sector. It contributed an average of 87.4% to the total agricultural production of the State and an average of 72% to the State's GDP during 2003-2007. This shows clearly that the State depends greatly on animal resources to improve the GDP of the State and this reflects the importance of livestock integration into the rain-fed semi-mechanized farming sub-sector.

Table 7: Contribution of the State Agricultural Sub-sectors to the GDP of the State (2003-2007). (000.000SDG).

Year Explanation	2003	2004	2005	2006	2007
	1.Irrigated farming				
Dura	3.28	1.60	0.64	0.84	1.06
Cotton	7.50	6.75	4.39	7.38	9.82
Groundnuts	5.89	3.80	2.01	2.81	4.10
Horticulture	15	13	14	13.99	12.17
Sub-Total	31.67	25.15	21.04	25.02	27.15
	2.Rainfed semi mechanized farming				
Dura	20.96	39	98.67	66.40	63.74
Sesame	128.25	74.44	88.58	62.89	45.28
Millet	2.78	22.27	13.81	7.87	4.09
Sunflower	-	-	0.20	0.23	0.36
Sub-Total	151.99	135.71	201.26	137.39	113.47
	3.Animal Resources				
Cows	383.75	399.10	407.08	417.26	427.27
Sheep	300	318	319.49	341.85	366.81
Goats	70.72	72.13	73.21	74.67	76.16
Camels	388.02	388.37	393.42	397.35	401.32
Hens	8.35	9.10	9.56	10.10	12.62
Milk	0.25	0.27	0.28	0.29	0.30
Eggs	1.54	1.92	2.02	2.12	2.65
Sub-Total	1152.63	1188.89	1205.06	1243.64	1287.13
	4.Forests				
Gum-arabic	0.50	0.45	0.28	0.20	0.12
Timber	0.40	0.50	0.63	0.79	0.99
Sub-Total	0.90	0.95	0.91	0.99	1.11
Grand Total	1337.19	1350.70	1428.27	1407.04	1428.86

Source: GSMF (2008)

The above table indicates that the contributions of Dura ,Sesame ,Millet and Sunflower to the rain-fed semi mechanized farming sub-sector in 2003-2007 were 58 , 79.9 , 10.16 and 0.16 million SDGS respectively while the average contribution rates of the same crops (i.e. Dura ,Sesame ,Millet and Sunflower) to the State's GDP mean (i.e. 1826 million SDGS) in 2003-2007were 3.2% , 4.4 % , 0.6 % and .01 % sequentially.

CONCLUSION

Productive sectors include, agricultural sector, industrial sector and service sector. Agricultural sector plays a strategic role in the process of economic development of the state. It is composed of irrigated farming, rain-fed farming, animal resources and forests. The industrial sector involves agro-industries, water and electricity and construction. It provides the necessary inputs to other sectors of the economy. Industry in Gedarif state depends largely on agricultural products such as sesame, groundnut and sunflower. The service sector which involves government services and other services plays an important role in the development of the state. It provides jobs, inputs and public services for the economy. With the exception of the year 2003 in which the Growth rate of the GDP of the

State was negative (i.e.-0.7%),the growth rates in the rest of the years (i.e.2004,2005,2006 and 2007) were positive and they were 4% ,7.7%,1.9% and 4.2% successively. The average growth rate during 2003- 2007 was 3.4%. The agricultural sector contributed the highest rates to the GDP of the State during 2003-2007 (i.e. 87.2%, 84.6 %, 83 %, 80.3 % and 78.3% respectively) and this proves that the economy of the State depends largely on agriculture. The average contribution rate of the agricultural sector was 82.7 % while the average contribution rates of the service and industrial sectors were 4.2 % and 13.1% consequently. The analysis shows the high contribution of animal resource sub-sector to the total production of the agricultural sector and the low contribution of rain-fed semi mechanized farming sub-sector to the sector. The average contribution rate of the rain-fed semi-mechanized farming sub-sector relative to agricultural sector during 2003-2007 was 10.6% followed by the irrigated sub-sector and forests sub-sector which constituted 1.9% and 0.1% respectively ,while the animal resource sub-sector constituted the largest component of the agricultural sector. It contributed an average of 87.4% to the total agricultural production of the State and an average of 72% to the State's GDP during 2003-2007. This shows that the State depends greatly on animal resources to improve its GDP and this reflects the importance of livestock integration into the rain-fed semi-mechanized farming sub-sector. It is recommended that conservation and development of natural resources focusing on the development of forests, range land and pasture and improvement of production and productivity are significant to enhance the contribution of the agricultural sector to the GDP of the state. Availability of foreign currency, spare parts, power and energy and reduction of taxes are essential to better the efficiency of the industrial sector in the state. Public sector investment on basic infrastructure and increased spending on education and other services are highly needed to enrich the GDP of the state.

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