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ROLE AND IMPORTANCE OF CHEMICAL INDUSTRY IN NIGERIA

The Chemical Industry is a very important constituent of a developing country as Nigeria and it is the mainstay of industrial and agricultural development of the country, providing several building blocks and raw materials for a number of industries. This essay explores the roles of the chemical Industry in Nigeria and how it has contributed immensely to every other sector of industry in Nigeria. The Chemical Industry is one of the largest industries which drive the country's economy and account for the bulk of its annual GDP. Recommendations were given on how to initiate the growth of sustainable chemical industry in Nigeria.

Keywords: *Chemical Industry, sustainable, GDP, economy, Nigeria, challenges, expectations*

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РОЛЬ И ЗНАЧЕНИЕ ХИМИЧЕСКОЙ ПРОМЫШЛЕННОСТИ В НИГЕРИИ

Химическая промышленность является очень важной составляющей развивающейся страны Нигерия. Она является основой промышленного и сельскохозяйственного развития страны, предоставляя ресурсы для ряда отраслей промышленности. В данной статье рассматривается роль химической промышленности в Нигерии и то, какой огромный вклад она внесла в развитие всех других отраслей промышленности Нигерии. Химическая промышленность является одной из крупнейших отраслей, которые стимулируют экономику страны и составляют большую часть ее годового ВВП. Даны рекомендации о том, как инициировать рост устойчивой химической промышленности в Нигерии.

Ключевые слова: *химическая промышленность, устойчивость, ВВП, экономика, Нигерия, вызовы, ожидания*

Chemical industry is a complex of processes, operations, and organizations engaged in the manufacture of chemicals and their derivatives. The chemical industry comprises the companies that produce industrial chemicals (Fig. 1).



Fig. 1. An overview of Chemical Industry in Nigeria

Nigeria’s chemical industry is diverse and includes chemicals for automobile industries, rubber, pharmaceuticals, paper, soap, detergents, fertilizers, machinery, steel, cement, furniture, footwear, electronics and appliances, petrochemicals, oil, and textiles. Given the economic growth of Nigeria, it is an attractive country for chemical trade [1].

The chemicals industry grew by 1.7 % in the first quarter of 2019 from 1.5 % in the fourth quarter of 2018. In spite of its low state of development – the chemical industry in Nigeria is fulfilling one of the characteristic roles of the industry – ability to create wealth through added value. Using 2006 World Bank data, it was estimated that among the ten sectors of the manufacturing industries in Nigeria – chemical sector comes third in value added (91.90 million) after machinery and equipment sector (399.00 million) and electrical sector (424.00 million). Such an industry is worth developing.

It is obvious that chemical industry as a whole makes a great contribution to society by improving the welfare of mankind and providing employment around the world.

Robert A. Smiley and Harold L. Jackson, authors of the book, *Chemistry and Chemical Industry* have this to say «On how three chemical industry contributes to our daily lives: For example, when you get up in the morning, you brush your teeth using toothpaste, which is a mixture of chemicals squeezed from a plastic tube onto plastic bristles mounted in a plastic handle. You may take a shower using soap and shampoo, each made by the chemical industry; and finally dry, brush, or comb your hair with other articles made of plastic. While doing this, you will likely be looking into a mirror over porcelain or cultured marble sink while standing on vinyl plastic floor covering, tile, or carpeting, all of which are products of the chemical industry. The varnish coating, the wooden floors of your house and the paint of wallpaper covering the walls are products of the chemical industry. The car or bus that you go to work in is totally chemical dependent, from the anti-corrosion treatment of the metal, the protective paint and the plastic parts and tires to the chemical battery that starts the vehicle, the oil that lubricates it, and the gasoline that fuels it. And so it goes». Indeed, life as we know it today could not exist without chemistry and the chemical industry [2, p. 2–3].

The chemical sector is of strategic importance to the sustainable development of national economics and plays a vital role in the economic development of any country (Fig. 2) [3].

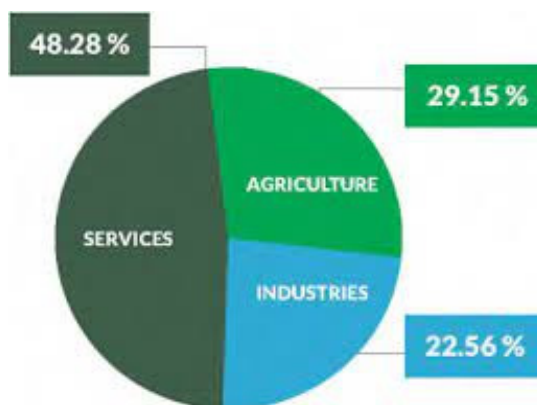


Fig. 2. Bar chart representing GDP of various sectors of the Nigeria’s economy

Gross Domestic Product (GDP) is an internationally recognised measure of economy size and strength. It is importance to have up-to-date data so the rebasing is a step in the right direction. Owing to the numerous oil resources that contribute most of its GDP in Nigeria; It’s well-known that chemical industries are the main contributors to the wealth of the country. For instance, it contributes at least 1 % to the Gross National Product. The chemical production companies have a large portion of various specialists who contribute to the development of the country. Thanks to the chemical industry, raw materials can be converted into nearly any product that we need in our daily lives. In 2020, the Industry contributed about 28.22 percent to Nigeria’s GDP.

Nigeria's economy and budget has been largely supported from income and revenues generated from the petroleum industry since 1960. Nigeria is Africa's main oil producer. With 18 operating pipelines and an average daily production of some 1.8 million barrels in 2020, Nigeria is the eleventh largest oil producer worldwide [4].

According to the Nigeria Bureau of statistics, the country's oil sector fell to 7.24 % in 2021 from 8.16 % in 2020, attributable to the downturn recorded in the performance of oil sector. The petroleum industry accounts for about nine percent of Nigeria's GDP and for almost 90 percent of all export value. Although oil revenues contributed 2/3 of state revenues, oil only contributes about 9 % to the GDP. The petroleum sector is an important one as government revenues still heavily rely on this sector, although it consist a small part of the country's overall economy. Statistics as of February 2021 shows that the Nigeria's oil sector contributes to about 9 % of the entire country's GDP.

Top chemical industries in Nigeria provide a wide range of benefits to the country. It also provides a large portion of jobs to the country. Moreover, chemical industries assist in providing a large variety of goods not only for the consumers' market but also for other production companies throughout Nigeria. Chemical industries in Nigeria provide a great portion of jobs both for specialists and artisans. Therefore, it's needed to be provided with the conditions for the development. Chemical industries also attract foreign investors to the country, which increases the national development and improves bilateral trade relationships.

A large percentage of the chemical industries focus on the manufacturing of plastics and polymers. These products are not only useful for packaging but are used in many other products as well. For example, clothing, electronics, home décor, furniture, and wiring. In addition, storage containers, PVC piping, and water tanks are produced using plastics. The effective role played by the chemical industry has brought about production of other by-products which when recycled make economic and environmental sense and greatest benefits. The properties of plastics make them inherently recyclable at several different levels. Plastics as a material can drive innovative designs to support this effort. For instance, modern solar water heaters containing plastics such as Polyethylene and Polyvinyl chloride can provide up to 65 per cent of a household's annual hot water demand. Products made from polymer are clothing made from synthetic fibers, polyethylene cups, fiberglass, nylon bearings, plastic bags, polymer-based paints, epoxy glue, polyurethane foam cushion, silicone heart valves, and Teflon-coated cookwares.

It is evident from the foregoing that the chemical industry occupies a central position in relation to the other industrial sectors underscored by the fact that it is the producer of the primary raw materials which are feedstocks for the manufacture of a wide range of products. Because it is at the root of any industrialization process, the need for chemical industry in Nigeria for sustainable development cannot be overemphasized. For example, the use of fertilizers and pesticides, both products of the Chemical Industry can be of tremendous boost to agriculture and promotes output. Similarly, the processing of solid minerals into products of high economic value through appropriate chemical technology is within the domain of the Chemical Industry. Secondly, sulphuric acid an inorganic chemical; is used on a wide scale as feedstock by many industries. Indeed, it is hard to find any important branch of the economy in which either sulphuric acid and or products derivable from it are not used.

Agriculture also gets a great benefit from various fertilizers and pesticides available due to the chemical industry development. The pesticides and fertilizers not only increase the yield of the crop but prevent the products from pest attack. Therefore, it drastically helps to export fruits, vegetables and grains to other countries of the world. It means the increase of GDP due to the development of various types of chemical industries in the country.

The green revolution has happened only due to the advancement of chemical industry in India. The fertilizers and pesticides, not only increase the yield of the crop, but prevent from pest attacks.

The cement industry in Nigeria stands out for its excess capacity, but also its prices, which have at times been the world's highest. In 2013 the country became a net exporter of cement for the first time which has in so many boost the country's economy. Through the construction, renovation and rehabilitation of major roads, bridges, networks and public infrastructure, the cement industry plays a major role in overall economic development and enhancement of social welfare.

Other Industrial Sectors that the chemical industry has greatly influenced:

Fundamentally, the chemicals industry can be divided into two sectors; commodity/basic chemicals and specialty chemicals.

Commodity chemicals are manufactured by many different companies however the end product is generally the same with very little variations.

Specialty chemicals are also called fine chemicals; include industrial gases, adhesives, sealants, industrial cleaning chemicals, coatings, and electronic chemicals. A Specialty Chemical is a chemical produced for specialized use and are generally more expensive than commodity chemicals (Fig. 3) [4].

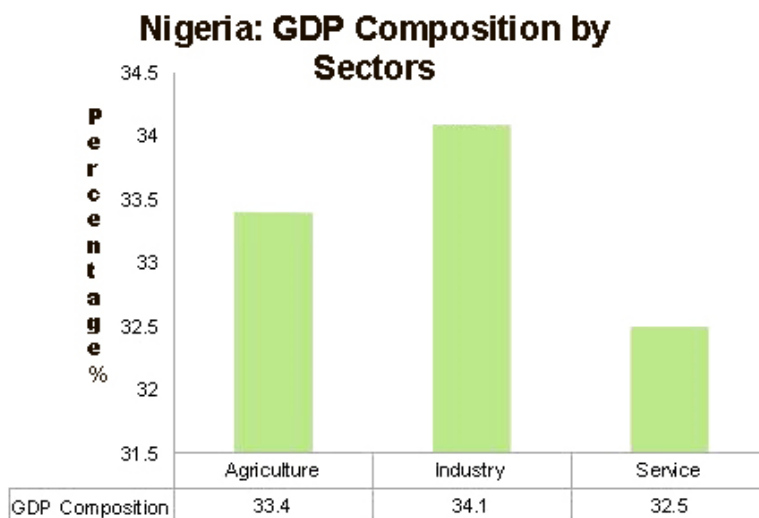


Fig. 3. GDP Composition of different Industrial Sectors in Nigeria

Oil and Gas Industry is the largest industry in Nigeria and the tenth-largest industry in the world. It is also referred to as the petroleum industry, which involves exploring, extracting, refining, and selling petroleum products. It accounts for about 70 % of the country's total revenue and 14 % of Nigeria's GDP. Nigeria uses various imported chemicals, basically because the demand for chemicals is higher than it can produce. Camachem has supplied mining chemicals such as Collectors, Hydroxamic acid, and activated carbon to Nigeria.

In Nigeria, Chemicals play a major role in our food. The preservatives, taste enhancers and flavours helps the food to be palatable and increase the shelf life. Food Industry thrives for the reason, that the preservatives not only help them to maintain the quality of the food, but also helps them to import food to different parts of the world. Due to these advancements in the food industry, we are able to enjoy fruits, canned food products, and ready-to-eat food products across the world. With the constant expansion in Nigeria's economy, such as industrialization, urbanization, agriculture, population growth is eminent with the changing consumption patterns

The pharmaceutical industry is one of the fastest-growing industries in Nigeria. The petrochemicals industry has evolved out of oil and gas processing by adding value to low value by-products, which have limited use in the fuels industry. Numerous laboratories are also set-up to study various drug for the endemic and epidemic diseases. The industry now produces a remarkable range of useful products, including plastics, synthetic rubber, solvents, fertilizers, pharmaceuticals, additives, explosives and adhesives. These materials have important applications in almost all areas of modern society.

Petrochemical products are used in cars, packaging, household goods, medical equipment, paints, clothing and building material. The sector that strongly relies on importing pharmaceuticals is slowly changing its tune to grow its pharmaceutical industry to international standards. Expanding this industry will translate to an increased demand for pharmaceutical chemicals. Camachem has supplied pharmaceutical chemicals such as Sodium Isopropyl Xanthate (SIPX) and Liquid Caustic Soda Lye 32 % to Nigeria [1].

The major challenges in the development of chemical Industries in Nigeria are:

- the technologies involved in most cases are capital intensive;
- lack of regular supply of electricity. Similarly, the lack of steady electricity supply – Nigerians get about three hours of power a day overall – means that manufacturers spend around 30 % of their capital on power, according to a 2015 report from the International Finance Corporation (IFC). This has seriously hindered a lot of developments in virtually all sectors of the economy;
- lack of political will for industrialization and the crave for getting rich quick. As a result, those who have the money are not willing to invest it in the development of the chemical industry or any project that will not yield quick profit. The mentality of buying and selling has eaten deep into our system. Nigeria have become a country where the industrialized countries dump their goods;
- the propensity for importation of materials that we can produce in the nation. A good example of sugar. The Bacita Sugar Factory and the allied product, ethanol in Kwara State, Nigeria were doing well in the late 1960s to mid-1970s. The molasses from the sugar factory was to be feedstock for the production of ethanol. The sugar factory was «killed» when a Nigeria business tycoon became the sole importer of virtually all the required sugar needed in the country. As a result of the «demise» of the sugar factory, the ethanol factory also died when there were no molasses to feed it;
- transport infrastructure is another challenge for industry, as getting goods from factories to markets can be a slow and expensive process. This is particularly true for goods with short shelf lives [5].

Nigeria is well endowed with abundant natural resources: petroleum, natural gas, coal, agricultural products and minerals. These are essential raw materials required for establishing viable and strong chemical industries. Towards this end, the Federal Government of Nigeria established The Raw Materials Research and Development Council (RMRDC) by Decree No 39 of 1987 with the mandate to promote the development and utilization of Nigeria's industrial raw materials. Its mission is to promote the growth of process technology and resource-based industries in Nigeria. Although much has been achieved by RMRDC since it was established, there is much more to be done particularly in the basic chemical industry sector.

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