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Status quo of education and agricultural mechanization as a tool for poverty alleviation in Nigeria: a brief review

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ABSTRACT

Education and agricultural performance are inseparable parameters in measuring the status quo of poverty in every given country. Specifically, this indicates that countries that have increased their agricultural productivity the most, have also achieved the greatest reductions in poverty. Agriculture has been playing a key role in a global food security and has been lifting many people out of poverty. In this review work, we collected data on agricultural mechanization and educational systems in Nigeria. We analyzed the data and brought out the status quo of higher education in relation to mechanized farming as well as poverty index. In this study, the status of Nigeria's economy was also investigated. For the purpose of achieving a sustainable mechanized farming, we critically examined the role of science and technology, the role of mass media education and peasants' engagement. In the end, we highlighted some recommendations and future prospects of agricultural mechanization and poverty alleviation strategies in Nigeria.

KEYWORDS

Poverty eradication;
Mechanized farming;
Nigeria's economic status;
Nigeria's system of education

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INTRODUCTION

In the year 2015, the United Nations General Assembly adopted "The 2030 Agenda for Sustainable Development", which set out a 15-year plan to achieve the stipulated goals as a universal call to action to end poverty, end hunger, protect the planet and improve the lives and prospects of everyone, everywhere. The general assembly outlined "No Poverty" and "zero Hunger" as its first and second goals respectively, and proposed eliminating all forms of poverty in the world by 2030.

POVERTY STATUS IN NIGERIA

Although Nigeria's poverty rates have gone down significantly in the last decade because of economic growth, but last year notably confirmed that, 40% of its citizens live in poverty, and this number still shows the growth of the developing country, with a previously counted 61% of the population living in poverty in 2012 [1, 2].

However, the World Bank reported that Nigeria has had a 7.4% growth of the economy in July 2019 which has been the highest yet since the gross domestic product rate decreased to 2% [2]. Having made their plans to reduce this number, Nigeria has presented a plan to the World Bank Group to lower this number tremendously. Instability of the country's government, which affects the rate at which citizens are employed, is the major reason for the poverty levels being higher in certain periods.

NIGERIA'S ECONOMIC STATUS

Mismanagement of funds, long-term military rule and corruption had remarkably retarded the economic development in Nigeria. Nigeria's mixed economy is the largest in Africa, and the 26th largest in the world by nominal GDP. It is a lower-middle-income economy [3], with its abundant supply of natural resources, well-developed financial, legal, communications, transport sectors and Stock Exchange. The restoration of democracy and subsequent economic reforms have successfully put Nigeria back on track towards achieving its full economic potential.

Nigeria accumulated a significant foreign debt to finance major infrastructural investments during the oil boom of the 1970s. With the fall of oil prices during the 1980s oil glut, Nigeria struggled to keep up with its loan payments and eventually defaulted on its principal debt repayments, limiting repayment to the interest portion of the loans [4, 5]. Arrears and penalty interest accumulated on the unpaid principal, which increased the size of the debt. After negotiations by the Nigerian authorities, in October 2005 Nigeria and its Paris Club creditors reached an agreement under which Nigeria repurchased its debt at a discount of approximately 60%. Nigeria used part of its oil profits to pay the residual 40%, freeing up at least $1.15 billion annually for poverty reduction programmes [4]. In April 2006, Nigeria made history by becoming the first African country to completely pay off its debt worth an estimated $30 billion, owed to the Paris Club [4].

NIGERIA'S SYSTEM OF EDUCATION

Education in Nigeria is overseen by the ministry of education. Local authorities take responsibility for implementing policy for state-controlled public education and state schools at a regional level. The education system is divided into kindergarten, primary education, secondary education, and tertiary education. Tertiary education in Nigeria consists of universities (public and private), polytechnics, monotechnics, and colleges of education. The country has a total of 138 universities, with 40 federally owned, 39 state-owned, and 59 privately owned. Nigeria was ranked 117th in the Global Innovation Index in 2020, down from 114th in 2019 [6 - 10]. About sixty-eight percent of the Nigerian population is literate, and the rate is higher for men with seventy six percent than that for women which has sixty-one percentage [9].

Nigeria provides free, government-supported education, but attendance is not compulsory at any level, and certain groups, such as nomads and the handicapped, are under-served. The education system consists of six years of primary school, three years of junior secondary school, three years of senior secondary school, and four, five or six years of university education leading to a bachelor's degree [10]. The government has majority control of university education.

STATUS QUO OF HIGHER EDUCATION IN NIGERIA

In Nigeria, the government is currently targeting all colleges and universities for spinning off the spirit and culture of agricultural mechanization in the country by setting up a committee on the introduction and implementation of agricultural mechanization education in all tertiary institutions with the strategies of incorporating the field of agricultural mechanization into the national plan on educational curriculum.

THE CONCEPT OF AGRICULTURAL SCIENCE WHICH GAVE BIRTH TO AGRICULTURAL MECHANIZATION

In Nigerian higher educational institutions, agricultural science is a degree course worth considering as a very important field of study in the country. It usually takes about five years to complete its study in any Nigerian university. While studying agriculture in school, students do complete variety of courses to prepare them to work at a wide range of jobs such as to work in an organization or on the fields. There are various specialties under the department of agriculture such as horticulture, resource management, food production, agricultural administration, crop science, soil science, and many others to enable the students to diversify and build a career of choice.

HIGHER EDUCATIONAL INSTITUTIONS PRIORITIZED IN THE FIELD OF AGRICULTURAL MECHANIZATION

In Nigeria, there are numerous good universities that offer quality education in agricultural sciences and the best of which are:

(1) **Federal University of Technology,** Minna, this university has a school of agriculture and agricultural technology which offers six agricultural departments, namely; agricultural economics and extension technology, crop production, animal production, food science and technology, aquaculture and fisheries technology, soil science and

land management and water resources. Upon completion of study in any of the above mentioned courses, a student is awarded a B.Tech (Bachelor of Technology). Currently, the alumni of agriculture from this university are employed in various capacities, solving problems and generating sustainable improvement in all aspects of agriculture.

(2) **Landmark University,** has the department of agricultural and biosystems engineering. The department teaches engineering solutions to many agricultural challenges in Nigeria and the world at large.

(3) **University of Ibadan,** Faculty of Agriculture. A degree in agriculture at the university of Ibadan runs for 5 years with a mandatory twelve months practical period. Each department in the faculty is equipped with facilities such as teaching and research laboratories, lecture rooms, research farms, administrative offices, and reading rooms to aid high-quality learning.

(4) **Ahmadu Bello University,** has faculty of agriculture that was established in 1962. The institution aims to train its agricultural students to have the manpower and capacity to direct and implement programs to improve Nigeria's agricultural sector.

(5) **Federal University of Agriculture,** Abeokuta, this university has the college of agricultural management and rural development which was established in 2009. The college aims to produce skilled manpower who engage in economic agricultural production. The college has been involving in various research activities that have been providing innovative solutions to scientific, engineering or societal problems in the area of agriculture.

STATUS QUO OF AGRICULTURE IN NIGERIA

Agricultural sector is a very giant institution in Nigeria. Currently about thirty percent of Nigerians are employed in agricultural sectors [11]. Agriculture used to be the principal foreign exchange earner of Nigeria [12]. Major crops include sesame, beans, cashew nuts, cocoa beans, cassava, gum Arabic, groundnuts, melon, kolanut, millet, maize, palm oil, rice, plantains, sorghum, yams, and soybeans [13]. Cocoa is the leading non-oil foreign exchange earner [13]. Rubber is the second-largest non-oil foreign exchange earner [13].

Before the Nigerian civil war, Nigeria was self-sufficient in food [13]. Agriculture has failed to keep pace with Nigeria's rapid population growth, and Nigeria now relies upon food imports to sustain itself [14]. The Nigerian government promoted the use of inorganic fertilizers in 1970s [15]. However, in August 2019, Nigeria closed its border with Benin and other neighboring countries to stop rice smuggling into the country as part of the efforts to boost local production [15, 16].

POVERTY ALLEVIATION THROUGH EDUCATION AND AGRICULTURAL MECHANIZATION

In this 21st century, education is the fundamental key to success in every field. It is obvious that agricultural knowledge and technical skills are acquired through training, sharing of experience and passage of information [17]. Education and agricultural mechanization are inseparable as well as inevitable solution to providing conditions that would enable the rural population managing their farmlands with limited resources at hands and taking care of the expensive labor, while allowing skilled peasants and entrepreneurs investing and innovating, and by so doing drastically reduces the level of poverty. Research funding and provision of training facilities for agricultural mechanization will bring a promising development in the field, pave a way to deploy and engage more peasants and thereby alleviate the rate of existing poverty. More awareness and campaigns would also enlighten the majority of the poor peasants to have sufficient access to credit, loans and insurance products.

THE ROLES OF SCIENCE AND TECHNOLOGY IN ACHIEVING SUSTAINABLE AGRICULTURAL MECHANIZATION IN NIGERIA

Science and technology are prerequisite for developmental modernization, because education and economic advancements lie under technological and scientific revolutions. In Nigeria, inability to adopt and adapt technologies to raise productivity has been a major problem in agricultural mechanization [18]. The adopted conventional mechanized agriculture needs to be modernized for productivity and profitability with particular emphasis on bio-technology and nano-technology innovation, agro-processing, and upgrading the use of technologies for value addition and employability [19]. If properly put in place, the mechanized agricultural products will elevate the business practices across the country, and transform the lives of the local citizens. Hence, through breakthroughs in agricultural mechanization and education, these technological advancements will have the power to change the lives of poor people and alleviate a greater percentage of poverty in the country [20].

Moreover, increased investments in mechanized farming are highly advocated, putting more efforts on efficient and cost-effective infrastructure provision for energy, transportation, information and communication technologies, and with special attention to opening up rural and other areas with economic potential. These advocacies will address the promotion of education in science and technology as well as actualize the poverty alleviation policies.

However, after embracing science and technology the next step is, to ensure human services leading to tackling poverty effectively by growing and developing the country's economy. The degree to which a developing economy emerges as a giant one depends on the creativity in human capacities and services in science and technology. Adopting appropriate technologies may lead directly to prosperous productivity because a country with limited number of creative, skilled and professional citizens, such country will experience a hardest poverty and dependency.

Therefore, to promote technological advancement in agricultural mechanization and poverty reduction, Nigeria should invest in high-quality education for youth, embrace continuous skills training for peasants and should ensure that knowledge is spread as widely as possible across various levels in the country.

THE ROLE OF MASS MEDIA EDUCATION AND PEASANTS' ENGAGEMENT TOWARDS ACHIEVING SUSTAINABLE AGRICULTURAL MECHANIZATION IN NIGERIA

In Nigeria, poverty, agriculture and education are interlinked. Historically, agriculture is known as rural or nomad phenomenon and poverty is also hugely concentrated in those areas. With this, poverty eradication through implementation of agricultural mechanization became one of the cardinal points of Nigeria's present administration so as to strategize and uplift the economic and social condition of the citizens. Perhaps, this might never be achieved without the introduction and implementation of science and technology into agricultural sector. Ensuring and actualizing the agricultural mechanization in Nigeria is necessary for food security and saving people from deadly hunger and effect of malnutrition. Recently, the government has reiterated its commitments to achieving the millennium development goals by improving the performance of educational roles in agricultural sector.

However, we are currently in the era of information and communication; no any sector can do well without a proper involvement in the field of information and communication. Yet, the peasants remain voiceless in Nigeria. The farmers and food producers are being neglected by media industries. Despite a huge allocation to agricultural sector from Nigeria's annual budget, this sector has so far gained the lowest attention from the country's mass media. The peasants have the knowledge of agricultural problems but they hardly write and forward their request to the government. The mass media industries have skills of writing and reporting but have little experience about the real issues of agricultural mechanization. Therefore, the gap that exists between the media personnel and the food growers should be bridged by unifying the two sectors and by sharing and imparting each other's knowledge and experience.

RECOMMENDATIONS

In response to address the international competency in realizing the motives for agricultural mechanization and poverty reduction in Nigeria, the following recommendations should not be neglected:

(1) To enhance productivity in agriculture and reduce the rate of poverty in the country, the Nigerian government should strongly focus on the involvement of all stakeholders for the improvement of agricultural mechanization.

(2) Government should greatly provide funding for researches in science and technology for the development of human resources and agricultural mechanization.

(3) The stakeholders should also concentrate on creating various models that will optimize the efficiency of mechanization services in the country.

(4) The available machineries at hand must be given a deserved attention by designing and manufacturing agricultural implements using available local materials.

(5) Due to cost liabilities of importing agricultural machines, the government should encourage the development of local agricultural machinery industry by giving soft loans and inceptives.

(6) Government should also encourage and support the production of quality machines with approved safety standards.

(7) Research should be given a good priority to train and push the local enterprises to venture vehemently in producing locally accepted agricultural implements.

(8) The Standard Organization of Nigeria (SON) is an accredited body for the protection of consumers' rights, peasants and other end users inclusive. Therefore, government should ensure the standardization and quality control for effective production and consumption.

(9) Modern farming intensification will be achieved through huge investments in research and training and this will bring a positive change and make a difference in struggles to achieving the demand for agricultural mechanization.

FUTURE PROSPECTS

The future prospect of agricultural mechanization and poverty alleviation strategies in Nigeria remains resolute and the successful implementation of the process of mechanization not only depends on the availability of agricultural implements but also on the positive response and decision of Nigerian government as well as perception of other stakeholders. However, the future viewpoint for agricultural mechanization, it is imagined that the demand for agricultural machineries shall continue to grow and the government has a very critical role to play in realizing the future of "poverty alleviation programs" and "agricultural mechanization".

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