

THE PHILOSOPHICAL ANALYSIS OF AGRICULTURAL EDUCATION, PROBLEMS AND PROSPECTS

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Abstract

Built around the advantages of two-way traffic in Agriculture, this paper has discussed the advent of modern agriculture, its positive effects in Nigeria. Efforts have been made to establish existing gaps in the philosophy of agriculture and food values, and preventive or cure to ailments, also food security in this part of the world and new technologies offer the agriculturalist platforms that can help bridge the gap which has been left in its trails mixed fortunes. Thus, the interdependence of human beings and their environment is often stressed by Nigerians (Africans) as a good sign for wholeness, health and prosperity.

Man has applied scientific knowledge to agricultural machines to boost food production and thus, stamp out hunger. Problem in agriculture manufacturing embody important or critical issues in national development and the application of technological innovations are relevant and urgent in agriculture.

Nigeria is blessed with abundant human and land resources. Yet mechanized agriculture is still to find its feet. In effect, there is need to develop technological innovations in agriculture so as to boost production to make the country self-sufficient in farm inputs like fertilizers and agricultural equipment as well as in food and cash production.

Here, development is seen as the growth and change in society, thus, development is a many-sided process involving changes in structure, institution and attitudes, as well as the acceleration of economic growth, the reduction of inequality and the eradication of hunger and poverty in a given society. That is, development involves positive change in the institution, structures and functions of the society in terms of social, political, economic, cultural and technological dimensions.

Agriculture has been the mainstay of the Nigerian economy. This sector has been neglected and is faced with many problems. Government policy has not been favourable for agricultural production. It is clear that there has been no participation of government in agriculture. A good point in mind is the River Basin Development Authorities and agricultural development projects scattered all over the country. In the

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first place, these projects are financed by the World Bank. The land tenure system is a serious problem to agricultural development. Farm inputs in terms of fertilizer, chemicals etc are sold at prices beyond the reach of the real farmers. The result has been a decline in agricultural output leading to hunger and starvation in the country. A nation that cannot feed its population cannot be a master of its own destiny.

In this light, when we compare the farming systems in Nigeria in the past to what we have now, we notice that there is a shift in production from small-scale farming to large-scale farming especially food production, using mechanical implementation. Such mechanical implement is a complex machine such as a tractor.

The paper shall examine the era of technological advancements in agriculture, its achievements and food security and national development.

Nigeria's Technological Advancements in Agriculture

The Nigeria's technological policy suggested transfer of well proven foreign technologies. Thus, the local research and development centres and companies were to be put in place for utilization by indigenous expertise's. In effect, a series of plans were made for the necessary scientific take off in Nigeria, through establishing several research institutes to enhance Nigeria's scientific and technological developmental plan. Thus, according to Ike, E.E. and Ugoduluwa (1999) page 67 – 69,

Several programmes were launched to enhance food production like, the Operation Feed the Nation (OFN), the Green Revolution, Back to land, the River Basin Development Authorities and the Agricultural Development Programmes (ADPS). The first Cocoa Research Institute of Nigeria (CRIN) was established in 1964 in Ibadan by an act of parliament. It was to research on cocoa, kola, coffee, cashew and tea, and the breeding and propagation of these crops, control of their pests and diseases, and also development of technologies to reduce storage losses. Much of the research on tea and Arabica coffee is done at this institute, and its sub-station is on Mambilla Plateau.

Ike, E.E. et-al (1999) goes on to state that the second institute established was the National Veterinary Research Institute (NVRI) with its headquarters in Vom, Plateau State. It has out stations at Kano, Kaduna, Maiduguri, Sokoto, Bauchi, Yola, Lagos, Oji River and Umudike. Her functions are to research different animal diseases, their control, and animal nutrition; to research and bring development in the production of vaccines and related biological materials. Also, it introduces high yielding exotic animals to improve local output of animal products, such as meat, milk, eggs, as well as to engage in the training of technological manpower at intermediate level, like livestock superintendents or assistants, medical laboratory technologists and laboratory assistants. The institute has accomplished the aims for which it was established. More than fifteen types of viral and bacterial vaccines for domestic animals have been developed; these include; anthrax, rinder pest vaccines and rats vaccine.

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According to Ike, E.E. et-al (1999) the third institute, Raw Material Research and Development Council (RMRDC) was founded in 1987 to support and expedite industrial development and self reliance through maximum utilization of local raw materials as inputs into Nigeria's industries. RMRDC has designed and fabricated hydrated line and granulated limestone plants. There are also the agricultural and forestry research institutes, like CRIN, FRIN. They have produced improved planting materials, that is, seeds and seedling, equipment and technology for pests and disease control and plantation management, such as F3 Amazon and its hybrids and the CRIN – Elite 1 and 2.

Ike, E.E. also asserts that the River Basin and Rural Development Authorities (RBRDA) were initiated by the federal government to harness the water resources of the country in order to increase agricultural production, especially essential food crops. The authorities were to provide employment opportunities and improve the standard of living of the rural people. The schemes were established because the greater part of Nigeria has a limited rainy season, that starts in May and ends in September which in the past has restricted the period of cultivation each year. In effect these schemes will create opportunities for multi-crop agriculture, increased outputs of crops, livestock, fisheries, and the generation of hydro-electric power. Its other functions are provision of infrastructural facilities like feeder roads in their irrigated areas, land clearing, direct participation in the development of irrigation scheme on temporary basis for the benefits of farmers, and the inhabitants. These schemes are in Ogun, Osun, Oyin, Niger, Benue, Sokoto and Gongola River Basic projects.

Ike, E.E. further asserts that the National Accelerated Food Production Programme (NAFPP) was established to fulfil policies and strategies for accelerating the development of agriculture in 1972. It was made to aid the production of maize, rice, guinea corn, millet, wheat, cassava and cowpeas. With improved feeds, appropriate quantities of fertilizers, insecticides, supporting credit, storage and processing will lead to production in abundance at reasonable prices for the consumers and at reasonable profits to the farmers. This programme is of a cooperative nature between the federal, states and farmers. It also consists of 3 components – Research, Extension and Agro-Services. The co-operating and sponsoring agencies are the federal department of Agriculture, the National Cereals Research Institute at Ibadan, and the International Institute of Tropical Agriculture (IITA), Ibadan and the States Ministry of Agriculture. While the research centres for the programme are the National Cereal Research Institute, Ibadan for maize and rice; the Institute of Agricultural Research, ABU, Zaria for wheat, sorghum and millet; and the National Root Crop Research Institute, Umudike for cassava.

Based on such developments in Nigeria in the area of agriculture, modern agricultural business has tended to over emphasize production of cash crops instead of producing food to the population. For instance in Tivland we have people who are trained experts in farming techniques. They aid the ordinary farmers with improved

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methods of planting, with seeds and seedling, equipment and technology for pest and disease control and plantation management. Tyavyar (1979, page 43) rightly confirms this by saying,

That Tivland has always been the world's largest yam producing area. That the Tiv are agriculturalists who become persistent farmers in order to produce and sell to middlemen who would facilitate export to western industries. Thus, at the eve of technological breakthrough, farming was the main occupation of Tiv people farming merely to feed themselves. But now, emphasis has been moved from food to cash crops. So farming today in Tiv land is done for two reasons, first for the production of food for the family and for commercial purposes. Some people particularly women, are now involved in large scale commercial farming. They cultivate large plots of yam farms especially in Katsina-Ala, Zaki-Biam and other Tiv speaking areas in Taraba State.

The agricultural and forestry research institutes in Nigeria such as CRIN, FRIN, IAR, have produced improved planting seedlings and equipment. With such technological know-how the agrarian states like Benue, Nasarawa, Taraba etc. thus, Aboh, M.M. (2006) page 16, asserts that the Tiv people have new improved yam seedlings known as *Dicorea Spp* that matures within nine months, '*Paper*', *da-anaisa*, *amoulia*, *punch*, *hembamkwase* that yield bulky harvest. In this vein Folusi, A.O. and Adeleye, I.O.A. (2002) page 9, confirms that there are various species of cassava plants or tubers like *manihot spp* specie that mature within eight months *dianie*, *panya*; the same thing applies to sweet potatoes. Tropical *impomia bata spp*, matures within four or five months. In the class of seeds there are new varieties of soya beans (legume) tropical glycinemax (soya glurine), it matures within five to six months (grain), groundnuts (legume) *anachis hypoca* it matures within four to five months, guinea corn, tomatoes (vegetable) *hycopeticum esculentum*, it matures within four months. Pepper (spice) *Allum*, *sophramum* it matures within four months, but here it varies with the nature of the soil. Maize (cereal) *zeamays*, it matures within three to four months etc. Thus, these improved varieties formed the basis for the establishment of new plantations, and rehabilitation of old ones.

According to Iwe, N.S.S. (1960) page 17 developments in agriculture has improved livestock production, for many have embarked on rearing large flocks and herds of animal of different kinds, such as pigs, turkey, fish, poultry, goats and sheep. Many have orchards and palm plantations. They now have hybrid seeds and seedlings, and farms are enlarged with the aid of farming equipments such as tractors, or graders. They have fertilizers of different types, herbicides, insecticides and pesticides to ensure crop safety, growth and better yield. This results in a bounteous harvest, much of which is sold for financial income. Today farming system has shifted from food crop production to cash crop production. The former system of subsistence farming was on a small scale, and was for immediate consumption. The new system has improved the living standard of the people particularly in economic sphere.

According to Dzurgba, A. (1999-2001) page 162, asserts that culturally, some Nigerians respect tubers and cereals are never eaten at the same as alternative foods. Thus, these foods are eaten seasonally, like pound yam or fufu is during the heat of raining season from August to January, while the shreds food starts in the dry season and springs in the early part of rainy season from February to July, so each food is restricted to its season, but at the period of eating stirred food, pounded food can be eaten with a sense of nobility, dignity, honour, respect and prestige. To the point that festivals are held in some parts of Nigeria tagged “New Yam Festival”. With this we have social or status stratification in our societies. For instance in areas where yam happens to be the staple food, qualities like prestige, nobility, honour etc are given to a man or woman in whose house pounded food is eaten at the season of stirred food. Thus, he or she is regarded as wealthy at least, in terms of abundant yam, cassava, potato and cocoyam. Culturally and socially such people are considered to be great and prominent personalities. In Tivland they are referred to as *shagbaor* – wealth man or wealthy woman. It is a wonderful achievement for a household to eat pounded food throughout the year. While eating of stirred food during the period of eating pounded food, is a sign of abject food poverty and it is looked upon with derision, mockery, scorn, contempt and disdain in a manner that local public laugh at such a household. As such poor people save themselves from such shame and embarrassment by resorting to pounded cassava, pounded potato and pounded cocoyam, but culturally these foods are degraded because they are prepared without yam, all the same at least they are pounded foods.

Dzurgba, A. page 163 goes on to say that leguminous crop like beans, cowpeas, groundnut, bambara nuts and soya beans, and rice are consumed along with pounded food and stirred food. These crops are available throughout the year, but their abundance, depends on their harvest, and they are taken to be supportive, supplementary foods serving the function of a temporary suspension of hunger. This is based on their light and fine texture. These foods are not heavy so they cannot quench or stop hunger. Tiv people refer to them as foods that do not last long in the stomach. As soon as they are eaten they disappear from the stomach leaving it empty.

He further asserts that vegetable and spices are today found throughout the year. Some fresh leaves and fresh fruits do not last for a long time, in the irrigation system, but some are dried in the sun and even ground into flour to last for a long time. However, vegetables and species are principally meant to provide soups, tastes and smell. All add flavor to tubers, cereals and legumes, supplement and aid to other foods.

Thus, Dzurgba, A. (1999-2001) confirms that with the advancement of technological changes in the field of agriculture, fruits are widely grown in orchard plantations. For commercial purposes and with the awareness that fruits are valuable sources of vitamins and mineral salts as such they should accompany their meals in order to make the meal a balanced diet.

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Today, fruits of different varieties are discovered through technological advancement and are known to be of health values to prevent and cure certain ailments, such as strokes and prostrate cancers, like apples and pears may keep stroke away. According to a Dutch study published in *Stroke: Journal of the American Heart Association*, researchers found that eating a lot of fruits and vegetables with white flesh may protect against stroke. It is clear that, they had previously linked high consideration of fruits and vegetables with lower stroke risk, and this is the first to examine association of fruits and vegetable colour groups with stroke. As the colour of the edible portion of fruits and vegetables reflect the presence of beneficial photochemical such as caretenoids and founroids. Here apples and pears are high in dietary fibre and a flavonad called quercetin. In effect, previous research on the preventive health benefits of fruits and vegetables focused on the food's unique nutritional value and characteristics, such as the edible part of the plant, colour, botanical family and its ability to provide antioxidants.

In this vein, it becomes clear that as men age they are bound to have prostate problems. This case varies, in some men the common prostate enlargement turns cancerous, which for now it is said to have no cure. The conventional treatment known available are mainly palliatives and very delicate surgery which is rarely successful.

Today, with the naturopaths backed with scientific evidence claim that if men start early eating meals rich in coconut, milk, ginger, garlic, onions, tomatoes and local spices like alligator pepper, and like active lifestyles they will not develop prostate problems late in life. They went further to say that the mixture can also stop prostate enlargement and cancers growth.

In this same view according to Dayo Oyekole, a professor of Epidemiology and natural medicine and the chairman of Oyo State of Nigeria Advisory Board on traditional medicine, asserts, that a special blend of cast or bean, alligator pepper, ginger, coconut, and west African black pepper could be used to successfully shrink and remove prostate and fibroid growths.

Now Nigerian researchers have investigated the effect of different doses of coconut milk on the prostate gland. They discovered that coconut milk reduced testosterone level and body weight, which are key risk factors for prostate cancers.

According to a Nigerian journal of Biotechnology and Molecular Biology by Scientists from the department of Biochemistry, Faculty of Biological Sciences, University of Nigeria, Nsukka, the dosage of the coconut milk increased the concentration of testosterone disease in a corresponding pattern. Thus, this confirms what was put forward by Ross and Henderson (1994) that reduction in dietary fat (particularly long-chain saturated fat) in adulthood will reduce circulating testosterone levels, in effect a lot dietary fat in adulthood might further alter prostate cancer cases.

It is clear that Fife (2004) in a book titled *Coconut Lovers Cookery* book stated the beneficial effect of coconut in line with coconut having the potential to induce loss

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of excess body fat and increase in metabolic rate as a result of its medium chain fatty acids (MCFA).

According to scientists at Georgia State University, United States, they have discovered that whole ginger extract has promising cancer preventing activity in prostate cancer.

Based on the online article in *First View* published in the British Journal of Nutrition, according to Associate Professor of Biology, Rita Aneja, ginger extract has significant effects in stopping the growth of cancer cells, and inducing cell death in a spectrum of prostate cancer cells.

Still on the issue of discoveries in fruits and other food values, today, researchers have discovered that garlic and onions could help prevent men developing prostate cancer. As it is certain that men, who ate the most vegetables had a 50 percent lower risk of having prostate cancer than those who ate the least. Here, the benefits could be due to alliums, a sulphur-based compound, which is responsible for the characteristic smell.

It is clear now, through researchers' advise that a daily serving of tomatoes could protect against prostate cancer and slow the growth of a tumour in an existing sufferer. Thus, according to a journal cancer prevention research, it is clear that a daily diet rich in tomato extracts were less likely to fall ill and survived longer if they did.

With the above account, culturally, socially and agriculturally, the Nigerian (Tiv) people place much value on yam. To them yam is worth more than all other crops put together. This goes with pounded food, which has gained supremacy over all other cooked foods. This evaluation on yam with its pounded food has encouraged and promoted the increasing production and the widely destruction of yam in Nigeria. This syndrome has affected the production of other crops like millet, guinea corn, bean seed, that have been neglected.

Technological Achievements in Agriculture

Agricultural technology has introduced to the Nigerians the use of different types of machines, irrigation, and planting, insecticides, fertilizer of different brands, different seeds and seedlings, and large scale farming. But all these technological changes lack food security both on the people and their environment. In the use of agro-chemicals for food production, there are certain negative effects of these compounds on man and the environment. Frazer, rightly confirms this when he said "some of these materials when applied to the soil, and plant produce will find their way into water bodies where they have undesirable effects. That is to say, the problems that result from intentional use of chemicals in food production are numerous. Braine (1988) confirms this, by saying "that certain substances are liable to create hazards to human health, to harm living resources and marine and aquatic life, to damage amenities or to interfere with the legitimate use of fresh water and marine resources".

All these are evident in Nigeria (Tiv) where many people today are complaining of one health problem or the other. Fishing activities too, which involves the use of chemicals for fishing, instead of fishing nets, have affected the health of Nigerians. Fishermen were killing too much fish, and the government has to intervene by

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cautioning them on the use of these chemicals. Sometimes, the chemicals used in mortuaries are in turn used for preservation. Recently the federal government banned the importation of these items due to such wrong use of chemicals.

Nigerians have engaged in large scale farming, which has led to ownership of land, against the former system of the free use of land, fifty years ago. The use of agricultural equipments and fertilizers have their effects on land as most farmers in Nigeria today feel the land has been over used. Majority move to other states like Taraba State, to look for more fertile land. And this has its own effect. Now persons who are not related by blood are joined together by economic reason, in raising and contributing money for farms. Labour is commercialized, so that a sizeable number of people now depend on the sale of their manpower. We note division of labour and occupational specialization. This has led to increase in the price of food and other related commodities. Some youth prefer making money in this way, rather than going to school. Some combine the two, and as a result of this the educational section keeps suffering.

The practical aspect of development of modern science can be seen on the application of scientific knowledge in agriculture from the old type of work at a time to the present sophisticated agricultural machines which can make ridges and plant at the same time, that harvest corn, shell it and put it into bags or sacks all in the same operation. The agricultural practice was also crude and often characterized by a small number and variety of such crops like cassava, maize, sorghum etc. A piece of land was cultivated continuously until it became necessary to move to a new area because the fertility of the land has been exhausted. With practice there was use of fallow which often lasted between three and four years on the least. The use of organic manure, like animal drops and ashes to enrich the fertility of the soil was adopted. Today, science has tried to control the bad effects of weather in scientific manner for higher crop yield. The idea of crop rotation has been introduced and this has helped to increase crop yield. Advance in technology has also made it possible for new and more efficient agricultural machinery to be introduced in Nigeria.

With technological development in Nigeria, there are three major types of industries, which are, the traditional industries, consumer goods industries and capital goods industries. While agriculture falls within consumer goods industries which constitute the early stage of modern industrial development in Nigeria, they ranged from small to medium scale industries using mainly local agricultural raw materials for processing activity. They employ a higher level of technology than traditional industries. According to Aboh, M.M. (2006) page 16, there are several industries, they include food processing industries like tomato paste, vegetable products which are located in many parts of Nigeria such as in Bauchi State, Kaduna, Lagos and Benue State – we have Taraku Mill specialized in the processing products of oil from soya beans, tomato and pepper paste, Hule and sons, soya oil industries which are under construction at Wannune, Newland Industries that mil rice and Utaku Soya Flour

Company located at Km 20 Aliade road and other products like chicken feeds etc. Other agricultural processing products include beer and soft drinks located in Kano, Kaduna, Jos, Lagos, Aba, Makurdi, etc. Sugar in Kware and Adamawa States, tea in Adamawa, Biscuits in Jos and beverages of different sorts in other parts of the country.

But the demands of industries have also led to the depletion of natural resources. One that affects us is the disappearance of forest and plant cover. This situation contributes to the so called global warning-up of the earth's surface. Owing to this, Nigerians are now being urged by their governments to stop cutting down trees and where they do to plant new ones in replacement.

Problems and Prospects of Mechanisation of Agriculture and Food Security in Nigeria.

In the area of food production, the mechanization of the production process has led to a relative increase in food crop production. But it is surprising to discover that there is food scarcity in the midst of plenty, due to lack of adequate storage systems. Pollution of the environment through excessive use of chemicals is a health hazard. The production of food has become a political issue being more issue of discussion or capitalized on by the politicians, during and after their campaigns for elections in Nigeria. The change in system of agricultural production, means change in social relationship of families. They no longer work on the farms together, since it leads to land dispute, because each wants to own a private land. There is then crisis between brothers, and clans. Lack of food security have negative effect on the religious life of the people. Also it affects their religious worship as they no more comfortably worship in the same place. Even references to God's command by mediators, especially priests, do not change their resolution to own land at all cost, and by all means. They even stop going to church to avoid embarrassment and castigation or public sanctions. In effect they resort to magic to eliminate their opponents.

In this line, it is clearly stated in "STUP" course book that, one major problem affecting mechanization of agriculture in Nigeria is difficulty in finding spare parts for the agricultural equipments already provided. The problem is aggravated by the fact that component technicians to carry out repair and maintenance services are not available. There is lack of maintenance culture. The complete lack of minimum maintenance (oil, grease, changing worn parts) consequently reduces the life span of the equipment and its economic profitability. In some cases, these expensive equipments are abandoned resulting in "grave yards" of equipments.

Another problem of mechanization of agriculture in Nigeria is poor management of agricultural resources. Mechanized agriculture creates management problems. In the case of high yields of perishable commodities like tomatoes, additional technical storage problems are created. In Nigeria's circumstances, there are no adequate storage facilities. Besides, electric power supply to ensure safe preservation of such products is unreliable. Apart from these problems, there is also the problem of lack of business

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patronage of several agricultural machines such as prototype machine for the mechanization of cassava production and the shelling of melon and rice. These have been fabricated in some engineering faculties of our universities to process indigenous agricultural products. But business promoters are not forthcoming to back up such projects to ensure commercialization of these agricultural machines.

Nigerian investors seem more inclined to invest on short-term, quick profit ventures. In line with the above problems, the question now is, what then are the prospects of mechanization of agriculture in Nigeria.

First the solution to the problems of spare parts and maintenance of equipment is for the foreign agricultural equipment manufacturers to appoint local dealers to stock, sell and service their equipment through a dispersed dealer network. In the purchase of agricultural equipment, it is advisable not only to take account of the purchase, price, but also the costs of servicing the life and costs of wearing parts and other basic spare parts.

Funds should be provided by government for the purchase of adequate storage facilities for perishable agricultural products. Also, electricity supply be improved to guarantee safe preservation of these products.

The government could go into partnership with some business promoters to encourage and sustain indigenous inventions aimed at increased agricultural output.

The major inputs of interest to small farmers are land, labour and capital. In terms of seed, stock and fertilizers, the Nigerian small farmers use very poor seeds with very low germinating potentials. The seeds are non-resistant to pest neither are they responsive to fertilization. The problem of price relates to increase in land and labour prices. Land prices have been affected by speculation, arising from expanding urbanization and general economic growth. Structurally, rural communities concentrate on primary production with the end result of a high rate of rural-urban migration of able-bodied youths. Thus, depriving the rural work-force of effective labour force. The small farmers are very poor financially. This problem has stunted the growth of agriculture, the financial facilities of the government notwithstanding. It is however, expected that these problems will reduce with continued assistance from the government.

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