



Agrarian reforms and the African Green Revolution

The African
Green Revolution

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Abstract

Purpose – Agricultural intensification is central to the Green Revolution (GR) programme. This initiative, which dates back to the early 1940s, revolves around the development of high-yielding and disease-resistant seed varieties that aims at bringing about efficient and secure food production. The purpose of this paper is to present a brief genesis and thrust of the GR. Focusing on Nigeria as a typical African case, the discourse addresses the political economy of the Nigerian agriculture, outlines the features of the Nigerian GR and highlights some crucial issues debated during the 2008 Salzburg Global Seminar (SGS) conference for a uniquely African GR as a pro-poor development strategy.

Design/methodology/approach – Using a critical discourse analysis and case study design, the paper analyses the political and bureaucratic lapses associated with the introduction and implementation of the reform.

Findings – Although wary of some of the socio-political and environmental issues surrounding the production of genetically-modified organisms (GMOs) and high external inputs (HEIs) in the push for a new African GR, the paper reports the proceedings of the Salzburg conference as a likely platform for the formulation of new pro-poor policies in the context of the African GR. If sincerely and properly implemented, the paper argues that an African-oriented GR framework is conceived as a possible policy window to address the challenges of the continent's poor majority.

Social implications – The policy issues raised in the paper would serve as a pool of information from which policy conceptualisation, formulation and implementation could be derived for the good of the African agrarian economies and poor majority.

Originality/value – Highlighted issues on the debates on a “uniquely” African GR during the SGS conference provide original insights to the implementation of agrarian reforms in Africa. The paper is valuable to policy makers and other stakeholders in re-shaping the agricultural sector in the continent.

Keywords Nigeria, Agriculture, Agricultural safety, Food crops, Green Revolution, Agrarian reforms, Food security, Political economy, Policy, Genetically modified organisms, Environment

Paper type General review

Introduction

Green Revolution[1] (GR) is an agrarian reform strategy with a long-standing history (see, for instance, AgBioWorld, 2011). Although the idea was first mooted in 1941 by Henry Wallace who was then the Vice President of the USA, the term GR was first used by William Gaud in 1968, who at the time, was Director of the US Agency for International Development (Wikipedia, 2011). Thinking on how to aid the Mexicans, Wallace had casually suggested to Raymond Fosdick, the President of The Rockefeller Foundation at the time: “Increase the yield per acre of corn and beans in Mexico, and you would do more for the country and its people than by any other means” (The Rockefeller Foundation, 2006, pp. 2-4). Consequently, having received the approval of the Foundation and that of the Mexican government, Fosdick commenced a research and development operation during which the Oficina de Estudios Especiales was created within the Mexican Department of Agriculture. Norman Borlaug was a leading member of the team of agricultural scientists that pioneered the initiative conceived as philanthropic. The thrust of the entire plan was agricultural



intensification through the development of high-yielding and disease-resistant seed varieties. This was with a view to achieving high efficiency in food production most especially in the developing world. By 1957, what looked like a revolution had spread like a wildfire to Asia (The Rockefeller Foundation, 2006, pp. 2-4).

If the GR had a chance in sub-Saharan Africa (SSA) as it did in Asia, many factors may have sabotaged it. Ironically, most countries in the SSA region were able to feed themselves at the time of independence in the early 1960s (Djurfeldt *et al.*, 2005, p. 2). However, in spite of its diverse agro-ecological systems and rich crop varieties, “[s]ub-Saharan Africa, with 16 of the 18 most undernourished countries in the world, [now] remains the only region where per-capita food production continues to worsen year by year” (The Rockefeller Foundation, 2006, p. 1). The reasons are not far-fetched. Apart from the fact that most SSA agriculture are rain fed, poor infrastructure, lack of access to farming inputs, inefficient agricultural extension delivery system, fragmented land holding, droughts, etc. are a major cause of low productivity *vis-à-vis* the demand for more food by the teeming population. Thus, the current global food crisis has further put pressure on the food demand of the sub-region. At the moment, relevant international development agencies and international non-governmental organisations are beginning to devise strategies to bring about a new GR in SSA. The Bill and Melinda Gates Foundation and Kofi Annan’s Alliance for a Green Revolution in Africa are playing a leading role in this respect.

Nonetheless, this paper partly intends to address the Nigerian GR (a good case in Africa) as one of the series of agrarian reforms in the country since independence in 1960. Contrary to the claim of The Rockefeller Foundation that the first GR was not universal and that it stopped in Africa (The Rockefeller Foundation, 2006, p. 1), SSA has, in one form or the other, had its share of the process although without much success. In Nigeria, for instance, interventionists policies aimed at agricultural intensification had always been in place during and after independence. Thus, the Nigerian GR “is a continuing process” (Akande, 2005, pp. 161-2). Over the years, policy issues have been woven around the importance of the agricultural sector in the Nigerian economy: provision of food and meat; employment; foreign exchange earnings; provision of industrial raw materials; and income generation for farmers and farm workers. With a population of about 150 million people, well over 70.0 per cent of the Nigerian population solely depends on agriculture. Unfortunately, this sector has been besieged by myriads of problems ranging from socio-political, economic and environmental. Akande (2005, pp. 165-6) puts the bleak situation during the first decade of independence thus:

[...] the agricultural sector was characterised by little growth of output per capita, low productivity, pervasive illiteracy, static and poorly developed institutions, restrictive markets and unprogressive policy stance [...] The Green Revolution efforts at this period were not dispensed to make knowledge, inputs and marketing opportunities available to staple crop producers but to enhance the productive capacity of export crop producers. The policy makers did not see the apparent discriminating practice as having any long-term repercussions on the ability of the nation to feed itself [...].

The observation above is a pointer to the lop-sidedness of the Nigerian agricultural sector. At the moment, Nigeria is ranked among the poorest countries in the world, with per annual capita income hardly reaching \$1,190 as compared to \$1,500 of the 1960s and 1970s (see World Bank, 2009a). Malnutrition has, thus, become a serious problem as 43.0 per cent of children under five years have stunted growth. Current

statistics show that 27.0 per cent of the children are malnourished (World Bank, 2009b). About 36.0 per cent are underweight and nearly 10.0 per cent are being lost (Federal Office of Statistics (FOS), 1993; World Bank, 2009b). Some questions are then asked: why has Nigeria not been able to feed itself in spite of all the potentials residing within the country? What pro-poor policy reforms in agriculture have been introduced to alleviate food shortages? Why has the implementation of such seemingly pro-poor policy reforms not been effective? What is the way forward for a new GR in Africa as a whole? These are some of the questions that shall be addressed in this write-up.

Thus, in finding a plan for this paper, I shall address the historical, socio-political and economic thrusts of the Nigerian agricultural sector as an African case in the next section; explore the features of the Nigerian GR and analyse the political and bureaucratic lapses in the introduction and implementation of the reform as an intended pro-poor initiative in the following section; make a critical analysis of the current push for a new GR in Africa in the penultimate section; and draw policy lessons from the debates of the 2008 Salzburg Conference on the proposed “Uniquely” African GR in the final section.

Political economy of the Nigerian agriculture

Nigeria is basically an agrarian economy. Ever before the attainment of independence in 1960 and up to the early 1970s, Nigeria’s agricultural sector seemed to be doing well. But then, the British legacy bequeathed on the country was meant to focus attention on cash crops for exports to feed the British factories, which in return found markets for their finished goods in the Nigerian economy. With the illusion that the country had no problem producing staple food crops, the Nigerian leadership began to pay less attention on the need to increase production. Thus, the political and administrative entities comprising the northern, eastern and southern regions were responsible for producing groundnuts and cotton, palm produce and cocoa, respectively. These constituent parts had “[...] adopted policies favouring plantations and transformatory production processes, which involved the setting up of farm settlements” (World Bank, 2009b).

However, the discovery of crude oil in the 1960s and the eventual oil boom of early 1970s became a problem for the country. Thus, the shift in emphasis from agriculture to oil served as a major setback to the Nigerian economy. The Nigerian civil war prosecuted between 1967 and 1970 was also contributory to the down turn in food and livestock production. During the war period, food production and distributions were affected. Many people (particularly in the eastern region) got enlisted in the army. Most people who had been engaged in agriculture also sought white-collar jobs at the urban centres. These scenarios eventually impacted negatively on agricultural labour force.

The age-long power tussles and power relations between the northern and southern regions were rooted in the colonial rule of the British government. Thus, resource allocation and management became a power game. Of particular interest was the incessant incursion of military administrations beginning from 1966 (Nigeria has had more of military than civilian rule since independence). “The first major action of the military was to begin the systematic dismantling of the existing state structures including the Native Authority system and a move towards centralization of state power” (Akande, 2005, p. 169). Invariably, the huge revenue from petroleum never had any significant and favourable effect on government spending in agriculture. Less than 5.0 per cent of the revenue went to agriculture (The Nigerian Institute of Social and

Economic Research (NISER), 2001). Ironically, the problems associated with Nigeria's growth and development was not as a result of lack of investible funds but the inability of the Nigerian administrators to identify the appropriate projects and other investments that could lead to poverty reduction and enhanced well-being of the populace. Added to this were other intertwined macro-economic scenarios. The increasing oil wealth of the country engendered a relatively strong Naira, which thus meant that agricultural exports became more and more expensive making such products less competitive in other countries. On the contrary, imported food items became cheaper than locally produced ones. A good example is rice imported from Thailand, which became cheaper and having higher value additions than those produced locally! Then, the question to ask is: what has been the role of subsidies in the Nigerian agricultural production even before the celebration and promotion of the western neo-liberal ideology (Nigeria's agriculture had always been subsidised right from independence up to 1986)? Although being a burden on the national treasury, "[...] the beneficiaries [of subsidies] were not those intended. Instead the elite cornered the supplies and resold them to farmers at much higher prices than stipulated by the state" (Akande, 2005, p. 170).

Guided by personal interests and incentives rather than ideologies, wrong policies and failings of successive administrations to diversify the economy then resulted in economic down turn beginning in the late 1970s. Subsequently, the agricultural sector's performance in food production has not been able to match the pace of the country's rapid population growth rate. Thus, the economy, which was once a net exporter of food, now relies on imports to sustain itself.

Over the years, foreign aids had been given in various forms. However, the World Bank policy not to further support any programmes that are subsidised was a turning point in the Nigerian economy and other ailing developing economies. Thus, the introduction of the structural adjustment programme (SAP) in 1986 by the military administration of General Ibrahim Babangida, which of course was poorly implemented, aggravated the mystery of the already impoverished citizenry. The SAP and its associated conditionalities of the Bretton Woods institutions (in form of subsidy removal, deregulation of the economy and currency devaluation) without any commensurate industrial growth leading to the down-sizing of the civil service labour force and massive unemployment became an albatross (see, for instance, Olukoshi, 2006). Perhaps, making a quick digression is appropriate here. It must not go without saying that the unwholesome economic policies of the West have partly been responsible for the woes of Africa. Its "organised hypocrisy" (see Brunsson, 1989) cannot be glossed over by any discerning individuals and stakeholders. While America and Europe are busy subsidising their farmers, these developed economies, under the obnoxious neo-liberal policy of the 1980s feel the African smallholder farmer (who apparently is poor and highly vulnerable) should and must no longer be subsidised. This appears to be a contradiction. It smacks of the deceit of the West. Reasons suggest that the provision of assistance, in its many forms, is more meaningful where it is most needed. Given that African leaders are in most cases corrupt and parochial, one would think that the continent's poor majority should be given a genuine consideration and utmost priority in any development policy enacted by the Bretton Woods. Perhaps, the intention is to further cause confusion in Africa.

The commencement of a democratic process in Nigeria in 1999 was another turning point in the history of the country. Then, the new civilian administration seemingly

was determined to face the economic problem headlong. Although not completely jettisoning the IMF/World Bank policies, new measures were introduced to ease the burden of the effect of SAP through guided deregulations. New pro-poor policies (including those bordering on agricultural reforms) were introduced. Whether such policies have been properly implemented is another ball game. I shall, in the following section, outline the various features of the Nigerian GR and their associated implementation constraints.

GR and the Nigerian experience: a typical case

Although with serious defects, government interventionist policies in agriculture in the pre- and post-independence era point to the various efforts at intensifying agricultural production in Nigeria. As earlier indicated, the strategy adopted by the colonial Britain in the Nigerian agricultural revolution was by placing emphasis on the production of cash crops to feed the industrial West in return for finished goods. Invariably, the import-substituting economic development framework held sway for so long. Hence, agriculture was not conceived as an engine to drive the development process. Although agriculture and rural development go hand in hand (Leonard, 1982, p. 1), the Nigerian policy makers seemed to have conceived agriculture and rural development as mutually exclusive. Earnings from agricultural exports were thus used to build infrastructures in the cities without any serious attention devoted to rural growth and development. This mentality continued even after independence during which subsequent administrations continued to adopt the strategy of the Imperialist Britain.

Features of the Nigerian GR

Various agricultural intensification efforts under the general framework of a Nigerian GR have certain peculiarities, which are addressed in this sub-section. The following are the features of the Nigerian GR (see Akande, 2005, pp. 161-77):

- (1) The Nigerian GR during the first decade of independence favoured the enhancement of the productive capacity of export crop producers at the expense of staple crop farmers because policies “[...] were not dispensed to make knowledge, inputs and marketing opportunities available [...]” to the latter category. (This discriminatory policy was to favour powerful political elite and also as a result of a parochial leadership being unable to see the long-term repercussions on food security.)
- (2) The Nigerian GR has always been a perpetuated process implemented through different framings such as the National Accelerated Food Production Projects, Operation Feed the Nations, GR, the World Bank sponsored Agricultural Development Projects, River Basin Development Authorities, National Agricultural and Land Development Authority (NALDA), etc.
- (3) It is “[...] a series of activities and processes inspired, initiated and executed by the state and directed at making the nation achieve self sufficiency in staple commodities” such as yam, cassava, millet, sorghum, maize, cowpeas, etc.
- (4) The smallholder farmer who cultivates <5 ha of farmland plays a central role in the Nigerian GR.
- (5) The Nigerian GR, in similarity to that of Asia, is technologically driven but on the contrary has never been inward looking as it has “relied almost exclusively

on external technology sprinkler irrigation facilities, imported [inorganic] fertilizers and pesticides". (This appears to be an attempt to create opportunities for political elite who feed fat from the importation of these items.)

- (6) Although market-mediated, the state has not allowed the market to operate "unfettered" in the Nigerian GR – government has played a crucial role in the provision, distribution and pricing of inputs such as fertiliser. (The bureaucracies involved meant that government officials would make this a covert avenue for corruption through bloated budgetary allocations and spending. It is also an avenue for corrupt officials to deal directly with their rent-seeking cronies in terms of inputs distribution.)
- (7) It has been replete with lack of endogenous capacities needed for a radical agricultural transformation.

The foregoing shall form the basis of my analysis on the introduction and implementation of the Nigerian GR. Conceived as a pro-poor policy initiative, some political and administrative shortcomings associated with the entire process shall be discussed in the following sub-section.

Political and bureaucratic lapses in the introduction and implementation of the Nigerian GR

The GR is undoubtedly one of the series of pro-poor policy reforms put in place by the Nigerian government. A reform means a deliberate effort of the government to "[...] redress perceived errors in prior and existing policy and institutional arrangement" (Grindle and Thomas, 1991, p. 4). Basically, actions of policy elites are engendered by their ideologies, institutional structure and function and incentives. Essentially then, whether the urge for policy change is informed by a crisis situation or politics as usual (Grindle and Thomas, 1991, p. 5), they both could be summed up in the words of Grindle and Thomas that "[...] societal pressures and constraints and historical, cultural, and international contexts are essential variables in reform initiatives because they shape the perceptions, options, and actions of those who make authoritative decisions or because they affect the consequences of those decisions" (1991, p. 7).

Thus, it is my opinion that most pro-poor policies enacted in the framework of the Nigerian GR have been induced both by crisis situations and politics as usual. They are crisis induced in the sense that Nigeria's eventual inability to conveniently feed its teeming population beginning from the early 1980s and "[...] the concern with which the political class views the problem of agriculture and the urgency to make amendments [...]" (Akande, 2005, p. 162) informed the need for policy change in the agricultural sector. Policy change and direction are seen as politics as usual amongst elite because each Nigerian administration is perceived to relish change as a way of scoring political points against its successor or political rival, while not minding the social and cost implications for policy discontinuity. This is evident in many duplicated initiatives and white elephant projects of successive administrations in the country (I refer here to the series of framings of the GR initiatives as earlier identified). The introduction of a pro-poor policy reform such as the GR has been bedeviled by many challenges. For instance, decisions makers have been pressured either by their cronies (who are rent-seeking politicians) to enact policies, which favours the latter; there have been external pressures from multi- or bilateral agencies;

issues of immediate exigencies or even personal interests have loomed large in policy making, etc. In any case, it seems policy elite have been involved in decision-making processes for which they lack thorough understanding of what the issues entailed. So, the “[...] characteristics of a policy have a powerful influence on whether it will be implemented as intended or whether the outcome will be significantly different” (Grindle and Thomas, 1991, p. 6). Evidences show that most policy reforms made to bring about a Nigerian GR have not made much impact apparently because bureaucrats are accustomed to carrying out their statutory obligations perfunctorily or that political elite are busy engaged in politics as usual. This takes me to the implementation of the agrarian reform in light of the GR.

Max Weber’s (1947) ideal bureaucracy is about organisational and administrative efficiency. Ironically, however, bureaucracy is now associated with inefficiency, corruption, clientelism, arbitrariness and unaccountability (Heredia and Schneider, 2003, p. 6). In real terms, the bureaucratic red-tapism involved in the implementation of the Nigerian GR is most apparent in the way some of the services are discharged. For example, the provision, distribution and pricing of farm inputs such as fertiliser, herbicides and improved seeds have been politicised to the extent that the inputs became inaccessible to the smallholder farmer who ordinarily is central to the GR initiative. Parts of government unwholesome revenues are derived from this approach (see Bates, 2005, p. 3). Take land reform as an example. Land nationalisation brought about by the Land Use Decree of 1978 was put in place to make land accessible to whoever wanted it most especially for agricultural production but the “[...] highly placed and influential individuals in the society and bureaucracy used this policy to help themselves to more than their fair share of state land” (Akande, 2005, pp. 170-1). This was at the expense of smallholder farmers. General Olusegun Obasanjo under whose administration the reform was made eventually became a culprit as he had to pave the way for his ambition of becoming a big farmer!

Nevertheless, the small farms, which were central to transforming food productivity, were sidelined by the state as “[...] the rent-seeking behaviour of its officials and the bureaucracy truncated the benefits of the GR to the small farmers. Influential and town-dwelling ‘farmers’, aristocrats, input contractors and transport owners constituted the unintended beneficiaries of the policies introduced” (Akande, 2005, p. 176). Also, as foreign technologies were in all ramifications alien to the non-literate smallholder clientele, coupled with poor agricultural extension service delivery, the implementation of the Nigerian GR became a problem. This is because the dispersed and impoverished farming clientele were left out in the process. Nonetheless, there seems to be no rationality in the use of heavily laden high external inputs (HEIs) agriculture in the African context because of its associated hydra-headed problems. I shall return to this later.

Most of all, as successive administrations shifted attention almost completely to oil exploration, the economy became monolithic. Thus, the subsequent huge export earnings from petroleum made the contribution of agriculture of no effect. This had two implications for the entire economy. One, the seemingly single source but huge revenue beclouded the foresight and thinking of the military administrators and politicians alike. Two, “[t]he petroleum earnings strengthened the role of the state, which assumed a commanding control and influence on the economy [...] The investment behaviour of the state also changed in the face of unprecedented resources” (Akande, 2005, p. 167). Corruption in the form of kickbacks from unwholesome

allocations of oil blocs and inflation of contracts became rampant. Building urban infrastructure at the expense of rural communities also became popular! The urban wages that rose to over 400 per cent (Akande, 2005) in the wake of industrial growth in the mid 1970s attracted rural dwellers leading to mass rural-urban migration. This eventually had a negative impact on the agricultural labour force.

In the recent times, however, the civil service, accountability and managerial aspects of governance are a part of the administrative reforms (Heredia and Schneider, 2003, pp. 6-7) being addressed to complement the ongoing political reforms in Nigeria. This is intended to bring about an efficient service delivery in agricultural and other sectors. Thus, smallholder farmers who constitute 90.0 per cent of food producers in Nigeria (Van Buren, 2001, p. 757) at some point continue to have attention through the new policies of guided deregulation. These are a shift in some of the SAP policies and they are meant to favour the development of privately owned endogenous industries by putting a check on the production and service activities of foreign conglomerates and firms operating within Nigeria. In the recent times, some fierce debates on how best to do agricultural business is gaining popular attention amongst stakeholders. Nonetheless, the new thinking of the western philanthropic organisations, multi-national agencies and businesses on the need to promote the use of HEIs agriculture in a bid to enhance a new GR in Africa may have significant but negative consequences on biodiversity, human and environmental health as well as agro-allied endogenous businesses. The following section addresses the issues in detail.

Push for a new African GR: what implications?

The new African GR is a radical approach intended to revamp Africa's agriculture and by so doing enhance food security and alleviate poverty. While the original GR cannot be entirely equated with the "ruthless" push for genetically modified (GM) crops in agricultural development, the new African GR aims at a heavy reliance on western technological packages geared towards the use of GM crops, inorganic fertilisers and herbicides as well as the deployment of massive infrastructure to enhance agricultural productivity (Dano, 2007). Much as there are real-term benefits, which genetically modified organisms (GMOs) could offer, there are also potential risks to food safety and the environment (Magnus and Caplan, 2002). Despite the hues and cries about GMOs, organisations and private individuals blatantly pushing the idea for a new GR do not see any other alternative solutions to Africa's food problem. This in itself is self-limiting and suspect. Certain biotech companies' activities in seed science and multiplication have been questioned by well-meaning individuals. Levitt (2010), for instance, reports that "[s]ince the mid-1990s, just five biotech giants – Monsanto, Syngenta, Bayer, Dow and DuPont – have bought up more than 200 other companies between them to dominate our access to seeds".

As its products are patented, farmers enter into licensing agreement with Monsanto. This implies that farmers do not reserve the right to save seeds for the following planting season. They must buy seeds from Monsanto every year. As observed by Duvvuru (2009), this has a huge cost implication for the resource-poor farmer. Besides, the perpetuation of a particular seed variant automatically encourages the emergence of a monoculture, which in the long run invariably leads to altering the biodiversity of the environment. But more importantly, the planting of most, if not all, GM seeds is not mutually exclusive from the use of inorganic fertilisers and a selective herbicide called Roundup (which is also a product offered by Monsanto). This has two

implications. The first is that farmers begin to depend heavily on the use of toxic herbicides and fertilisers to control weeds, and enhance soil fertility, respectively, at the expense of the health conditions of the environment. Although Guerinot (2002) and Trewavas (2002), just like other sympathisers of genetic engineering, are somewhat entirely upbeat about the contribution of the GR to alleviating human mystery particularly in the Global South, concerns have been raised in various quarters about the effects of GM crops on human health and the risks, which their production process may constitute to the environment (see, for instance, Organic Consumers Association (OCA), 2011; Persley and Siedow, 2002; Sagar *et al.*, 2002; Johnson and Hope, 2002). The second implication is that of economic pressure on the resource poor farmer who has no other alternative but find chemicals to control weeds. Otherwise, his or her production effort becomes futile.

Unable to gain an easy access into the SSA economies, Monsanto waited for an opportunity to strike a deal. It eventually capitalised on Malawi's severe drought crisis of 2004 to offer a helping hand in donating "quality hybrid maize seeds" to the Malawian farmers in 2005 (Grant, 2006). Monsanto's strategy would be to use Malawi as a launch pad to other SSA economies. The questions thus arise: what informs a one-fit-for-all solution to the SSA divergent problems? Do all SSA economies have the same socio-politico-cultural features as to warrant the same approach in solving their divergent problems? Admittedly, the push for a new GR in Africa (with its attendant use of chemical fertilisers, toxic herbicides and other external inputs) at a time when millions of Americans and Europeans are worried about GMO foods is somewhat questionable[2]. Apparently chiding the organic agriculture apologists for their parochial viewpoints, Trewavas (2002) inadvertently exposes one of the negative impacts of GMOs (which he intends to defend) on human health when he alludes to the reports on *Bacillus thuringiensis* (*Bt*) spores, which could constitute a potential danger for mankind if used as insecticides as canvassed by the campaigners of organic agriculture (see also MacKenzie, 1999). If *Bt* spores could pose some threats to human health, then is it logical to infer that there is a likelihood that GM corn and cotton with the insecticidal genes from *Bt* could probably (through mutation) also pose health risks at some point.

Using computable general equilibrium models, Breisinger *et al.* (2011) posit that a GR in Ghana would lead to the country's agricultural growth, which would in turn translate to a positive growth of the rest of its economy. Nonetheless, their study only addresses the economic dimension of development without due recognition accorded the socio-cultural, human and environmental issues in a new GR. As such, they fail to address the shortcomings and negative impact of the much flaunted GMOs and other HEIs associated with GR programmes on biodiversity, socio-economic well-being, human and environmental health. Interestingly, the admittance of their modelling regarding a persistent poverty condition in Northern Ghana in relation to the rest of the economy even in a GR scenario and their viewpoint on "[...] the need for additional and target measures beyond the green revolution" is a proof that the new African GR may not necessarily solve the region's poverty and food insecurity problem after all. The Ghana's scenario thus presented by Breisinger and the rest of his team is a profound attestation to the relevance of context in devising different pathways out of Africa's poverty and food insecurity. Somehow, the implication of the insistence of multinationals and other private individuals on a one-fit-fall prescription for Africa's food crises is indeed the beginning of writing another obituary for development in the sub-region (see Manyozo, 2010).

The thesis of this paper is rooted in the postulation, which underscores the need for an eclectic approach (multiple pathways) to (agricultural) development issues. But then, it is acknowledged that GMOs (as a part of the approaches) have their strengths in food security (see, for instance, Trewavas, 2002; Persley and Siedow, 2002; Guerinot, 2002; Potrykus, 2002; Magnus and Caplan, 2002). Nonetheless, the question is whether the disadvantages of producing them outweigh the advantages. Nonetheless, classic crossbreeding which has existed for several decades in the scientific knowledge frontier appears more plausible than gene isolation and splicing. As a student, and up to now, remembering the exploits of plant scientists in my alma mater (Obafemi Awolowo University, Nigeria) is always a delight. Senior faculty members' activities in traditional plant breeding in the 1980s or thereabout cannot be forgotten in a hurry. Borrowing ideas from Mendel's approach to crossbreeding, the lofty achievement in the production of a new variety of cowpea, *Vigna unguiculata*, named Ife Brown (known for its erect feature, brown colour and sweet taste as opposed to the creeping, white coloured and not-too-tasty local variety), which, however, has not displaced the latter and other local varieties, was highly commendable. There are other variants of this cowpea known as Ife Bimpe and the likes, which were developed in quick succession at the Institute of Agricultural Research and Training in Ibadan. Also, a new variety of tomato known as Ife Plum, with its beautiful oblong feature and palatability as opposed to the round-shaped, sour local type was quite ingenuous and innovative of the Ife scientists. The research exploits of the breeders at the International Institute of Tropical Agriculture in Ibadan, Nigeria cannot go unnoticed. Of particular interest is the development of a new variety of cassava, which is drought resistant and as such could thrive in an arid environment. Whether these countless innovations have their side effects is what is still not clear. But what is clear is that those scientists utilised local resources to bring about an improvement in what are available locally in order to enhance local well-being. Nonetheless, a marked difference exists between GM and classic hybrid research: farmers are not regimented and as such are entirely not compelled to rely solely on markets for seeds. It appears they have the autonomy to adapt those innovations to their own taste and conditions.

It has been proven that "[l]ocally adapted seed varieties increase yields" (Africa Research Institute (ARI), 2009). New varieties of potato plants developed by scientists at Agribiotech company in the University of Harare, Zimbabwe, are said to be resistant to viruses, which affect yields. The New Rice for Africa's project in West Africa – where locally adapted rice seed varieties have been developed – is a success story. A rice yield of 2.5 tonnes per hectare without fertiliser application has been obtained leading to "a 6% increase per annum in Africa's rice output" (ARI, 2009).

Agreed that not all the classic innovations gained the desired popularity amongst Nigerian farmers (e.g. yellow maize) due to certain cultural barriers, they have made tremendous positive impacts in people's livelihoods. Thus, there is nothing wrong for Axis Genetics[3], for instance, to breed a "cholera-vaccine-expressing banana" or plantain for the purpose of use in cholera infested communities in the south (see Trewavas, 2002) if such biotechnology is proven beyond any reasonable doubt that it is not counter-productive to both human and environmental well-being. What is essential is that we need to be mindful of the importance of the context and endogenous content of whatever research is being conducted. Interestingly, a team of experts commissioned by the (erstwhile) UN Secretary General, Kofi Annan, in 2002

to provide answers on how to achieve higher agricultural productivity, nay, a GR in Africa reports:

[...] the diverse African situation implies that no single magic “technological bullet” is available for radically improving African agriculture. A comprehensive set of strategies will thus be necessary in Africa for the effective harnessing of science and technology to meet human needs [...] African agriculture will require numerous “rainbow evolutions” that differ in both nature and extent among the many different types of farming systems and institutions throughout Africa – rather than a single Green Revolution (InterAcademy Council (IAC), 2003).

Indeed, a GMO project that seeks to alleviate poverty in Africa needs to be mindful of good ethical conduct and sincerity in its research and development procedure. A poverty reduction initiative must be perceived and seen by all stakeholders as a win-win endeavour. It must not be just another western agenda to further purloin poor economies of the south. It is thus important that development corporations and agencies desist from any strategies that could significantly disrupt the livelihoods patterns and adjustments from which local people not only derive economic well-being but also social satisfaction and fulfilment. As such, Africa-specific projects need to recognise the importance of a context-specific approach in their operational and production strategies. Although not without their associated constraints, however, a number of success stories have been recorded in participatory farming systems and commodity research in some contexts in Africa and elsewhere (see Chambers *et al.*, 1989; Scoones and Thompson, 1994). In other words, it will not be out of place to conduct some broad-based longitudinal and regional/trans-boundary field research on GMOs in Africa long enough to determine whether such long-term research are relevant to local contexts before releasing them for public consumption. GMOs research and products that are clear, simple and which raise little or no anxiety about human and environmental health may in the long run be appropriate in the African context after all.

Paradigm shift on Africa’s GR

Rather than follow the pathway of the “dominant corporate approach”, which emphasises HEIs and monocultures, Mushita and Thompson (2008) have proposed agricultural biodiversity as an alternative route to the African GR. Perhaps the newly conceived and holistic initiative on a “uniquely” African GR, which was debated at a high level in Salzburg, Austria in late April and early May 2008, possibly would serve as a new window for the African agricultural policy reform. If properly fashioned out and implemented on a contextual basis, SSA economies including Nigeria’s, may well be placed on a good footing for agricultural transformation in the coming years.

Salzburg conference on African GR: a new policy platform or another charade?

I was privileged to be part of the planning process of the Salzburg Conference on Towards a uniquely Green Revolution in Africa[4]. The week long programme (from 30 April to 7 May 2008) – co-organised by the Institute of Development Studies (IDS), Salzburg Global Seminar (SGS) and the Future Agricultures Consortium – brought together an array of high level delegations (including Kofi Annan) and grassroots farmers to deliberate on burning issues on how to move Africa forward in the area of agricultural production in the twenty-first century and beyond. The heated debate never lost focus on the benefit of hindsight regarding the Asian GR experience.

It recognised the strengths and weaknesses of the Asian GR and wished to build on those strengths. Unlike the Asian GR that promoted the production of cereals alone, the African GR seeks a more robust and farmer and environment-friendly programme. While recognising the role, which external donor agencies could play, participants resolved to address Africa's problems in Africa's own way using Africa's resources. They had recognised the significant role of national governments (including Nigeria's) but public-private partnership was to them of paramount importance in the entire process.

Some of the cross-cutting issues that emerged from the programme were capacity development; knowledge production and dissemination; farmers fund; incentives for public sectors to deliver public goods/infrastructures; empowering public extension services; building synergies through the New Partnership for Africa's Development's Comprehensive Africa Agricultural Development Programme; agricultural insurance; media advocacy; community-based initiatives; the need to situate the Peer Review Mechanism of NEPAD in committing African national governments to actualise a uniquely African GR; creating spaces for (African) innovations; women's and pastoralists' roles in GR; etc. To further refine the process in the light of Africa's cultural and ecological diversity, three regional workshops were, during the meeting, perceived as appropriate to address contextual issues in SSA region's GR. If the outcomes of these debates are properly translated into good policy statements (that is the intention) and so implemented on a country-by-country basis, bearing in mind the unique differences associated with African states, then Nigeria's GR among others, could then become truly pro-poor. Again, bottom-up participatory farming systems research and extension (PFSR&E) will be crucial to capacity development and appropriate agricultural knowledge production in Africa. Key lessons learnt in past successful PFSR&E activities will provide a veritable launch pad for a uniquely GR in the continent.

That said, it appears there is no clear indication whether the initiative will take off in the foreseeable future. It has been three years down the line. There is no indication as yet whether the proposed regional workshops, which supposedly would mark the second phase of the programme, have taken off or will take off soon! Although Kofi Annan is central to this initiative, the effort might just be political[5]. From a personal perspective, the zest and passion with which the GR issues were deliberated at the time are now totally in dissonance with the current lull. But we do hope plans are still underway to drive the thrust of the programme to a logical conclusion.

Regardless of whether the SGS is willing to carry out the plans to the letter as designed, it, however, gladdens one's heart that a framework and a foundation are already laid. Hopefully, African participants (including Nigerians) at the conference – most of whom are government officials and policy makers in their respective countries – are already reflecting on the information and strategies they came away with during the conference and seminar at Salzburg. Indeed, the current scenarios point to the fact that Africa and Africans would need to solve Africa's own problems!

Concluding reflections

By and large, this paper has briefly explored the political economy of the Nigerian agriculture; outlined the features of the Nigerian GR and analysed the political and bureaucratic lapses associated with the introduction and implementation of the

Nigerian GR; provided a critical argument on the push for a new GR in Africa; and gave a brief on the 2008 African GR confab as a new pro-poor policy platform on GR and then situated Nigeria in the entire picture of the initiative (Section 5).

Political and bureaucratic failings in the introduction and implementation of a Nigerian GR are associated with lack of seriousness for a genuine GR by successive administrations; lack of priority for the smallholder farmers; non-divestment of the monolithic Nigerian oil economy; corruption; prioritising the selfish interests of the rent-seeking political elite, etc. However, a genuine push for a new GR in Nigeria or elsewhere in Africa will entail a rainbow approach, which thoroughly considers contextual issues in differing ecological and socio-cultural communities across the SSA region. It is therefore adequate to suggest that research and development activities of relevant and giant corporations need to be designed and tailored towards the peculiarity of the African environment.

Drawing inspiration from the Salzburg event, a GR that takes into account the contexts and interests of the small farmers, the need for developing appropriate technologies, infrastructures and market development, value-chain additions, etc. is argued and advocated for in order to bring about a genuine African GR. That way, the mystery of the African poor majority may have been turned around.

Notes

1. The term Green Revolution is used in the context of this paper as a generic concept from which its other variants such as the new African GR and a “uniquely” GR were derived.
2. The OCA in its initiative “Million Against Monsanto” made it clear that scientists had warned that GMOs may trigger allergies; increase the risk of cancer; damage soil fertility; produce pathogen-resistant antibiotic; damage food quality; harm monarch butterflies and beneficial insects such as ladybugs; create super-pests and super-weeds; enhance the emergence of new plant viruses; produce dangerous toxins; increase use of toxic pesticides; and contaminate organic and non-GMO crops (OCA, 2011).
3. Axis Genetics is a small firm, which produces medical GM products. An example of such products is the cholera-vaccine-expressing banana.
4. I am grateful to Ian Scoones and John Thompson, both of the Institute of Development Studies (IDS) at the University of Sussex, who initially invited me to assist the International Advisory Board of the SGS on the planning and implementation of a uniquely African GR conference and seminar in Austria. I was at the time an MA student of Development Studies at IDS. I am also grateful to Edward Mortimer and Nancy Smith, who were the initiator and Director of programme, respectively, for giving me the opportunity to work with them.
5. It appears the programme was primarily put in place by the initiators to honour Kofi Annan (a former Secretary General of the United Nations). Edward Mortimer who is Senior Vice President and Chief Programme Officer of the SGS was the speechwriter to Kofi Annan (from 2001 to 2006) and later as Director of Communications when Annan was head of the UN. Mortimer initiated the uniquely African GR with a view to bringing his former boss to the SGS for interactive deliberations on African agriculture, a key interest area of Kofi Annan himself.

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