

Alleviating Rural Poverty in Nigeria: A Challenge for the National Agricultural Research System

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Abstract

Rural poverty is a serious threat to food and nutrition security in sub-Saharan Africa (SSA) and specifically in Nigeria. Land degradation, caused by human-induced soil erosion, deforestation, over-grazing and other human activities, accounts for much of rural poverty occurring in Nigeria. Apart from low external inputs, land degradation brings about low productivity in subsistence farming, while also fostering land conversion to marginal agricultural lands with fragile soils. Farm households respond to declining land productivity in diverse ways. Prospects for economic growth and future human welfare are also threatened by land degradation, whose environmental damage leads to losses in farmers' income and greater risks for poor households. An urgent reversal of this trend is necessary in order to rescue from the cycle of poverty the rural populace, whose economic livelihood is directly dependent on land exploitation. Unfortunately, over half of Africa's rural poor are located on "low potential" and "fragile" lands. Other contributors to rural poverty in Nigeria are agricultural and economic policies of previous governments, which negatively affect farming communities. Of the many technology-related constraints of farmers, only a fraction can be addressed effectively through agricultural research. Worse still, most resource-poor farmers are unable to formally articulate their technology needs. Besides, farmers' constraints are not always researchable problems, leading to farmers' despondency, and difficulty in research priority setting. The national agricultural research system (NARS), which is expected to contribute to agricultural development and rural poverty alleviation in Nigeria, is beset by enormous constraints of low funding, poor infrastructure, and instability in staff, policy, governance and institutional arrangements, all of which are not conducive to sustained agricultural growth. The public sector research cannot do the task alone, so private sector research needs to be encouraged. Universities, with their comparative advantage, should also play active role in agricultural research activities and programmes. The various agricultural development and rural poverty alleviation programmes being embarked upon will be discussed.

Keywords: agricultural research; environmental degradation; food security; Nigeria; rural poverty.

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Introduction

Rural poverty appears to be endemic in sub-Saharan Africa (SSA), and this situation has attracted much attention. Particularly disheartening is the fact that this problem, rather than abate, is proving intractable, at least in certain regions. One of the serious effects of rural poverty, of course, is food and nutrition insecurity, and its attendant socio-economic and political costs. A food-secure household is one that can reliably obtain food of adequate quality and quantity to support a healthy and active life for all members of the household (Heidhues *et al.*, 2004).

Poverty contributes to poor agricultural productivity, as many farmers in Nigeria cannot afford to purchase necessary farm inputs such as fertilizers, pesticides and improved seeds, which would bring

about increased productivity. Also, the ability of poor consumers to purchase food necessary for maintenance of health and productive life is reduced. The fact that food security in Africa has greatly worsened since 1970 (Rosegrant *et al*; 2005) has resulted in decline in per capita consumption of food in some African regions in recent times. Agricultural research, a vital component of integrated strategies for poverty reduction, has a crucial role to play in creating escape from food insecurity and poverty by improving farm income, generating employment for farm workers, reducing food prices and fueling economic growth. Boosting agricultural growth by applying new technologies is one important way to reduce rural poverty. This paper examines the problem of rural poverty in Nigeria and the role the country's national agricultural research system can play in alleviating this all-important socio-economic problem.

Poverty in Nigeria and its Causes

According to the Federal Office of Statistics, incidence of poverty in Nigeria increased sharply between 1980 and 1985 and between 1992 and 1996. Critical factors responsible for these are rapid population growth or over-population, the use of poor or inappropriate technology, low growth rate of the economy, prevalence of inappropriate resource allocation, particularly in the public sector, and low rate of investment. The interaction of these variables places a large segment of the society in the vicious cycle of poverty. The rural areas and vulnerable groups, especially women, were affected more by the worsening poverty situation Nigeria experienced in the 1980s and 1990s, when the incidence of poverty rose from 46.3% of the population in 1985 to 65.5% in 1996. Available data indicate that majority of the poor are located in the rural areas. In 1985, 1992 and 1996 the share of the poor in the rural areas were 49.9%, 46.1% and 67.8% respectively, making poverty largely a rural phenomenon using consumption and income analysis (Table 1). The situation in the SAA is that rural poverty accounts for 65-90% of overall poverty (Khan, 2000). Of serious concern is the statistic that about 77% of farmers are poor, out of which more than 48% are extremely poor.

Table 1: Poverty Trends in Nigeria by Sector (%) in 1980-1996

Year	Urban	Rural
1980	17.2	28.3
1985	37.8	51.4
1992	37.5	46.0
1996	58.2	69.8

Source: Federal Office of Statistics: Poverty Profile for Nigeria, 1980-1996

One of the causes of poverty in Nigeria is the country's production base that has remained narrow and weak. The Nigerian economy has remained largely dualistic and monolithic, in that her economy depends on one primary product for export. The emergence of the oil sector led to the neglect of the agricultural sector, leading to unfavourable consequences on the overall national economy.

The various austerity measures that were put in place by the various governments in the 1980s merely pushed many people further into poverty rather than produce the desired results. They therefore accentuated the poor standard of living of the majority of the country's populace during the period, notably the rural dwellers. One of such measures was the Structural Adjustment Programme (SAP) launched in 1986, with mixed results.

Environmental Degradation and Rural Poverty

The long-term sustainability of any system entails complex trade-offs between benefits and losses. The use of fertilizers is no exception as the adverse effects of their use result from inadequate knowledge among farmers. Their over-use or misuse can produce effects which support the thesis that fertilizers degrade soil fertility. On the other hand, comparatively low level of the use of external inputs such as fertilizer and irrigation water is also of concern from both food production and the environmental standpoints (Barbier, 1998).

Evidence on land degradation and use suggests that Africa, Nigeria inclusive, is undergoing rapid land conversion, human-induced soil erosion being a major contributor. Approximately 25% of the world's degraded land is found in Africa (Barbier, 1998), where over-grazing, agricultural activities and deforestation and wood harvest (for firewood) account for most of the human-induced erosion. There is loss of permanent pastureland to cropland, which is associated with agricultural expansion. Unfortunately, many pastoralists and farm households respond to declining land productivity by choosing to stay on degraded land, even if it cannot support the growing rural population.

Land degradation and the depletion of soil resources have economic implications for low-income and poor rural areas. The environmental damage resulting from soil erosion leads to losses in income of farmers and increases risks, particularly for poor households. The loss in agricultural production from land degradation can be substantial (Barbier, 1998). The urgent priority today is to begin reversing the vicious cycle of land degradation and conversion. Since the rural population engaged in agricultural activities in Nigeria is very poor, a critical question, therefore, is "what is the role of rural poverty in influencing the process of land degradation?" The economic livelihoods of a large majority of poor rural households appear to be directly dependent on the exploitation of lands that are highly vulnerable to degradation. The extreme poverty of these households influences their ability and willingness to control land degradation. Location of many of the rural poor on "low potential" and "fragile" lands has its implications as well (Barbier, 1998). Hence, the problems of rural poverty and human-induced soil degradation in Nigeria are related. Poverty may act as a constraining factor on poor rural households' ability to avoid land degradation or invest in mitigating strategies. It may also severely constrain the ability of such households to compete for resources, including high-quality and productive land.

Poverty Alleviation Measures and Programmes

The over-riding objective of government's poverty alleviation policy is to broaden the opportunities available to the poor and ensure that every Nigerian has access to basic needs of life, food, potable water, clothing, shelter, basic health services and nutrition, basic education and communication. The overall goal is improved living conditions for the poor. The goals are, of course, an array of sector-specific objectives to be pursued in order to ensure the success of the policy. Nigeria's poverty alleviation is buttressed on the integration of the citizens into an economically, politically and socially sound society with equal opportunities to live a healthier, richer and fuller life. It is now obvious that rural poverty alleviation cannot be accomplished without ensuring rural dwellers' access to resources and opportunities.

National Economic Empowerment and Development Strategy (NEEDS) is Nigeria's home-grown poverty alleviation medium-term (2003-2007) strategy, which derives from the country's long-term goals on poverty reduction, wealth creation, employment generation, and value orientation (Federal Government of Nigeria, 2004). It is a nationally-coordinated framework of action in close

collaboration with the state and local governments (with their State Economic Empowerment and Development Strategy, SEEDS) and other stakeholders to consolidate on the achievements of the last four years (1999-2003). Fortunately, a number of the programmes of the current administration are consistent with the major thrusts of NEEDS.

Threats to Food Security

If a household can reliably gain access to food of a sufficient quality in quantities that allow all its members to enjoy a healthy and active life, that household can be said to be food secure (Benson, 2004). Nutrition security is only achieved when secure access to food is coupled with a sanitary environment, adequate health services, and the knowledge and care needed to secure the good health of all individuals in a household.

Because poverty is the main cause of food insecurity, both of these conditions are strongly correlated. Apart from poverty, other factors influencing food security include consistent access to food, nutrition, food production, the availability of resources and coping strategies (Rosegrant *et al*, 2005).

The special programme for food security in Nigeria was a follow up to the November 1996 World Food Summit. The programme, which is to be executed over a 4-year period, would be at a total cost of about US\$ 45.2 million. Its broad objective is to contribute to sustainable improvements in the national food security, through rapid increase in productivity and food production on an economically and environmentally sustainable basis, reduce year-to-year variability in agricultural production, and improve people's access to food.

Various challenges face Nigeria in the building of food security and these include physical, political, and socio-economic factors. Poverty has serious effects on food and nutrition security because it contributes to poor agricultural productivity as many farmers cannot afford to procure inputs which would help to increase productivity. Food insecurity and malnutrition impair people's ability to develop skills and reduce their productivity. Poor consumers lack the ability to purchase the food required to maintain a healthy and productive life.

Low agricultural research investment is also a serious threat to food security. The poorest performance in annual growth rate of agricultural research expenditures is in sub-Saharan Africa, where public agricultural investment grew at only 1.5% per year during 1976-1996 and actually declined in the first half of the 1990s (Pardey and Beintema, 2001).

Strategies for Improving Food Security

Put in place are government policies to address constraints to achieving food and nutrition security. Support is given to more efficient functioning of food, nutrition and agriculture system, leading to improvement of the food and nutrition security of poor people. To restore food production to the point where food insecurity no longer poses a threat, there is need to invest in the soil, the farmer's most important natural resource (IFPRI, 2004). Since hunger is one of the most apparent consequences of poverty, pro-poor development strategies must include presenting farmers with innovations for increasing their production.

Food and nutrition security can be assured by adopting strategies along the following lines: a) enhancing political commitment and resources; b) increasing agricultural productivity; and c) addressing the complete food and nutrition cycle to reduce hunger and under-nutrition. Programmes to

reduce chronic hunger could play an important role in reducing poverty, since hunger is often as much a cause as an effect of poverty. With about 45% of its population living on less than US\$1 per day, Africa is one of the regions most affected by poverty (IFPRI, 2004), the corresponding proportion for Nigeria being 65%. With two-thirds of Africans living in rural areas, smallholder farmers account for 80% of Africa's poor. The attainment and sustenance of food and nutrition security in Nigeria is therefore a Herculean task.

Current Situation of Agricultural Research System in Nigeria

In recent years, investment in agricultural research has declined in Nigeria, even as research agenda has expanded beyond straightforward production and productivity concerns to include rural development and environmental issues. Much of the agricultural research activities in Nigeria fall into three categories of applied research, adaptive research and testing and verification (Okigbo, 1994). Although different institutions such as universities and government research institutes are by design, mandate and convention required to focus on certain kinds of research and not others to the same extent; linkage among these institutions in the national agricultural research system (NARS) is unfortunately generally weak.

The performance of the agricultural sector usually reflects the effectiveness of agricultural research in generating technologies and facilitating appropriate management decision-making for boosting agricultural production (Okigbo, 1994). Notable achievements in Nigeria's NARS include: a) development of improved crop varieties in various crops; b) development of simple mechanical equipment; c) some improved management and crop production practices in different ecological zones; d) improved processing techniques for some crops; e) improved forest regeneration and management; f) fresh water ecology and inland fisheries management; and g) contributions to improved management of research through linkage of research, training and extension.

The instability elements sometimes observed in Nigeria's NARS include those of policy, institution, programme, funding, research personnel, and research governance (Idachaba, 1997). The national agricultural research system in Nigeria is beset with some problems. Organization and operational management of research need to be improved upon to ensure better interaction and more effective coordination. Other management organization problems relate to: (i) presence or absence of coordination mechanism for setting priorities, redefining mandates and dealing with such issues as resource allocation at the macro or national level; (ii) periodic assessment or evaluation; (iii) staffing of research institutes, (iv) equipment maintenance and deteriorating facilities, (v) lack of incentives, poor enabling environment and frequent changes in staffing; (vi) deficiencies in the linkage of education, planning, extension and the farmer, and (vii) poor communication among researchers and research institutes, between researchers and policy makers, and between researchers and the public. A serious bottleneck is the fact that Nigerian agricultural institutes have generally not been well provided for, such that enabling environment is lacking, particularly in terms of deficiencies in facilities and equipment availability, servicing and maintenance, inadequate funding, unnecessary bureaucratic delays and constraints, and so on.

Other major factors militating against the effectiveness of agricultural research in Nigeria include frequent changes in management; inadequate, obsolete, and poorly maintained facilities; weak research/extension/farmer linkage resulting in little impact of agricultural research; and some factors in the socio-economic and political milieu under which the NARS is supposed to make impact is inimical to progress.

According to Okigbo (1989), past research efforts have performed poorly in Nigeria due to: a) lack of adequate funding, facilities and equipment; b) low staff quality; c) deficiencies in research management and coordination; d) high attrition rates; e) universities not effectively linked with NARS; f) poor linkage of research, and extension and the farmers; g) ill-defined priorities, and h) considerable amount of human and financial resources spread thinly over many disciplines. Of great concern is the over-reliance of the NARS on public funds, with no financial support from the private sector (Table 2). This scenario has been arguably attributed to weak funding incentives for private research.

Farmers and other clients of agricultural research have a large number of technology-related constraints. Only a fraction of these can be addressed effectively through agricultural research, while also, the set of farmers' constraints is not equivalent to the set of researchable problems (Mills, 1998).

Table 2: Public and Private Agricultural Research Investments, 2000

Region/Country	Total spending			Shares	
	Public	Private	Total	Public	Private
	(million 1993 international dollars)			(percentage)	
East Africa (7)	341.4	5.4	346.8	98.4	1.6
South Africa	365.6	15.6	381.2	95.9	4.1
Other Southern Africa	62.4	2.8	65.2	95.7	4.3
Nigeria	106.0	-	106.0	100.0	-
Other West Africa	209.3	1.8	211.1	99.1	0.9
Total (27)	1084.7	25.6	1110.3	97.7	2.3

Source: N.M. Beintema and G.J. Stads (2005).

Notes: Figures in parentheses indicate the number of countries. A number of private companies in some countries were excluded because they chose not to share their financial and human resource data. Data for West Africa, with the exception of Nigeria, are for 2001.

Towards a More Effective Agricultural Research System for Agricultural Development and Rural Poverty Alleviation

A NARS is usually made up of a number of research organizations, each with its own unique goals and mandate. As research systems become more pluralistic, universities provide alternative sources of supply of research output and they can help NARS function in a more cost-effective manner (Michelsen and Shapiro, 1998). The comparative advantage universities have is based on their strength in scientific disciplines, their flexibility to apply their knowledge in many areas, and the relative freedom of staff to take on contract research.

Agricultural research is one of the instruments for achieving the various goals and objectives of agriculture (Adetunji, 1994). It is also plays a crucial role in creating and sustaining the escape from food insecurity and poverty. The agricultural research policy, therefore, should take due cognizance of socio-economic goals of the nation; the fact that agricultural production is still predominantly peasant; the inter-relationships of the different sub-sectors of agriculture in production practice; and the crucial role of agricultural research in generating and developing technologies to improve agricultural production, developing sustainable system, provision of efficient methods of processing, storage, reservation and marketing contribution to food security. An effective agricultural research institute should provide solutions to existing constraints to increased productivity; develop improved technologies usable by different categories of farmers; and assist in result dissemination to ultimate

end-users. By so doing, it should enable poor farmers to increase their food production; provide greater rural employment opportunities and growth in the rural non-farm economy; and lower food prices to poor consumers.

According to ISNAR's strategy document, "How to sustain performance when funding is stagnant or declining and demands on research are growing" will be the single greatest challenge facing national research systems in the 1990s and even beyond (ISNAR, 1992). What this calls for is the need to increase client-based public funding for research, which ought to be supplemented with funds from the private sector.

An important research issue is the ways and means of inducing the private sector to play a more active role, both in agricultural research and in the provision of agricultural services to small farmers. The challenge for the NARS in the coming decades will be to define its contribution to sustainable rural development. This places a heavy burden on the private sector and market forces.

Specifically, the NARS needs to ensure that research reaches small and poor farmers. Increasing agricultural productivity and food security will require new and improved technologies and their broad dissemination, and agricultural research and development institutions are the channels through which this can occur. Research effectiveness will be enhanced by the participation and involvement of all stakeholders and as such, future research should use holistic approaches. There is therefore the need to expand research agenda beyond straightforward production and productivity concerns to embrace a range of poverty, equity and environmental issues. Farmer-centred approaches will engender high relevance, high adoption level by end-users (farmers) of research results, and hence great impact. This is instructive because sometimes "solutions" remain on the shelves as a result of their poor adaptation to the complex situations within which they are intended to be adopted (Jones, 2004). With farmers' participation in on-farm experimentation and their active involvement in testing, many innovations have worked on participating farms.

Apart from substantially reducing rural poverty, agricultural research investments have played a major role in the reduction of urban poverty because agricultural investments increase agricultural production, which, in turn, lowers food prices (Fan, 2003). This same situation can be expected in the case of Nigeria. To solve the problem of under-funding, there is need for private sector participation and devotion of a higher percentage of gross national product (GDP) to agricultural research than is presently the case. Towards the year 2000, agricultural research in Nigeria became increasingly dependent on donor funding (Beintema and Stads, 2005); while in the 1990s considerable funding was provided through a World Bank loan as part of the National Agricultural Research Project (NARP).

Conclusion

Eliminating rural poverty and attacking the problem of food insecurity can be achieved through sustainable food production. Nigeria's NARS is faced with some problems and these are hindering its expected favourable impact on agricultural development. An effective agricultural research system in Nigeria can contribute substantially to rural poverty alleviation and the promotion of the economic wellbeing of both rural and urban dwellers. The active participation of the private sector in research will move the NARS forward. Dramatic increases are needed in agricultural research investments if the wish for food and nutrition security is to be achieved.

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