

UNLOCKING THE POTENTIALS OF AGRICULTURE AND FORESTRY FOR GROWTH AND POVERTY REDUCTION

Introduction

Agriculture and forestry are critical economic sectors whose prospects are inextricably tied to the management and quality of renewable natural resources (RNRs), particularly arable land, forest, water and biodiversity. These resources are capable of indefinite regeneration (on a human time scale) so long as the prevailing environmental, social, political, economic and management conditions permit.

Depending on management and use, RNRs can be replenished, improved or degraded over time. Renewability is therefore not automatic and can only be achieved through deliberate rational resource management and environmental stewardship. In Nigeria, sustainable growth and poverty reduction hinge critically on RNRs since they constitute the productive base of agriculture and forestry upon which the livelihoods, employment and incomes of a large majority of Nigerians depend.

The productive base of agriculture and forestry has been taken for granted

Evidence however indicates that poor management of RNRs has over the years undermined the potentials of agriculture and forestry to drive growth and poverty-reduction. Past policies seemed to have taken for granted that agriculture and forestry would continue to supply economic goods, drive growth and reduce poverty, even without deliberate measures to ensure the integrity and sustainability of the productive resource base.

Evidence is essential to engage stakeholders and stimulate policy attention¹

An economic analysis was carried out to underscore the social and economic consequences of poor and unsustainable management of RNRs, in order to stimulate policy attention to sound management of the productive base of agriculture and forestry. The analysis provides evidence on the contribution of RNR-based sectors to economic growth and poverty reduction. It assesses the changes in quantity and quality of RNRs and the economic and social impacts that the changes have caused as well as implications for growth and poverty reduction.

In particular, insights from the study are critical in the design and implementation of appropriate and effective policies under NEEDS and SEEDS. Such policies would contribute to breaking the cycle of poverty, low productivity and resource degradation and unlocking the economic potentials of agriculture and forestry.

The management of renewable natural resources is crucial for growth

Despite the dominance of the oil sector in government revenues and foreign exchange earnings, RNR-based sectors comprising agriculture, forestry and fisheries constitute the largest single share of national output, income and employment. Agriculture, including forestry and fisheries, accounts for not less than 35% of GDP and is the backbone of rural livelihoods. But, this central role is not adequately reflected in official

¹ This Policy Brief is drawn from the study carried out by a research team comprising Prof. Eric C. Eboh, Dr. Kalu O. Oji, Dr. Ifeyinwa A. Achike, Oliver C. Ujah, Uzochukwu S. Amakom, Moses O. Oduh, and Chukwuemeka C.P. Nzeh of the African Institute for Applied Economics (AIAE), and Bjorn K. Larsen, International Consultant. The study was commissioned and funded by the UK Department for International Development, with facilitation by Jean-Paul Penrose, Environment Adviser.

national accounts. For example, non-marketed RNR-based products (such as fuel wood and medicinal plants), and the economic costs of RNR degradation are usually left out in conventional national accounts. Some estimates put the non-marketed consumption of non-wood forest products (NWFPs), fish and fuelwood to be up to an additional 10% of GDP.

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The RNR-based sectors have prevented a huge economic slump through their strategic, stabilizing and mitigating role. Developing the RNR sectors can trigger pervasive domestic resource mobilization and impart significant linkage effects throughout the entire economy. In the past, the negative effects of the volatile and highly restricted oil sector have been moderated by outputs and employment in the RNR-based sectors. Since GDP per capita reached its low in 1984, agricultural GDP per capita increased by over 30% to 2002. If not for this growth, per capita GDP would have been 20% below today's level.

RNR-based sectors are critical to realising the targets set by NEEDS

Against the backdrop of the link between Nigeria's poor economic performance and the volatile, restricted and distortive oil sector, sustainable growth and poverty reduction would hinge critically on non-oil sectors, particularly, RNR-based activities where the majority of Nigerians derive employment, income and consumption. Hence, the National Economic Empowerment and Development Strategy (NEEDS) and the State Economic Empowerment and Development Strategies (SEEDS) have set the policy framework to diversify the productive base away from oil, in order to

restore the country to the path of rapid, broad-based sustainable growth.

Towards the economic diversification objective, NEEDS set growth targets including annual agricultural growth of 6% and agricultural exports of up to x3 billion (\$22.5 million) per year. Given the cyclic, narrow and unstable oil sector, the pressure is on RNR-based

sectors to deliver the NEEDS targets of non-oil growth of more than 8%. In the longer term, Nigeria requires an average annual growth rate of 7% in order to meet the Millennium Development Goals (MDGs) of halving poverty by 2015. According to the analysis provided in this report, assuming the oil sector continues to grow at its historic rate over the last two decades, agricultural growth needs to be 7.5-9.0% a year to bring the economy to a 6% GDP growth rate if other non-oil sectors also grow at 6%. The pressure on agriculture is somewhat less, that is, 7.0-7.5% a year if other non-oil sectors grow equally well.

RNR-based sectors are a key to poverty reduction (MDGs)

Recent Nigeria Living Standard Survey (NLSS) shows that poverty in Nigeria was 54.4% in 2004, down from 65.7% in 1996. The national poverty rate masks sharp differences in poverty profiles across states, with poverty incidence above 70% in parts of the Northwest and Northeast compared to less than 30% in parts of the southeast.

Regional variations in poverty are linked to conditions of the RNR base. Per capita GDP was static from 1996-2004, but poverty increased in 10 states from 1996 to 2004. With one exception these increases were all in the North-West, North-East, and North-Central regions that are characterized by lower rainfall, lower agricultural crop yields, and lower rangeland productivity than in the south. The

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northern regions also experienced the most serious losses in vegetation density from 1976/78 to 1993/95. All this may contribute to the high poverty incidence, and its increase in many of the states in those regions.

The RNR-based sectors are central to Nigeria's realization of the MDGs of halving poverty by 2015. Currently, agriculture and forestry has the highest poverty incidence (67%) among all economic sectors, and about 62% of Nigeria's poor are in agriculture. The rural sector contributes 65% to national poverty and 86% of households engaged in agriculture live in rural areas. In a nutshell, about 7 out of every 10 farmers are poor and 6 out of every 10 poor households are farmers. Hence, growth in RNR-based sectors (and in rural sector) will prove essential for improving the welfare of the vast majority of Nigeria's poor. Farm productivity and production costs largely determine the prices of basic foodstuffs, which account for 52-60% of total household consumption expenditures by the lowest 60% of the country's population. Inevitably therefore, significant reductions in poverty will hinge to a large extent on the success of the federal and state governments in stimulating broad-based and sustainable agricultural growth.

Policy and institutional failures hold down agriculture

Despite its potentials to drive growth and poverty reduction, agricultural growth has not been impressive particularly during most of the 80s and 90s. Sustainable management of RNRs has been constrained by a wide variety of social, economic, institutional, technological and policy bottlenecks, which have in turn reduced the ability of the sectors to meet their acknowledged social and economic responsibilities to the country. Since agriculture cannot grow without significant private sector investments and given that NEEDS identifies the inadequate incentive framework as one factor limiting private sector participation in agriculture, it is proposed that the existing incentive framework be reviewed and aligned to stimulate greater quantum and quality of private sector investments in agriculture.

Resource Degradation threatens sustainable agricultural growth

Despite its potentials to drive growth and poverty reduction, agricultural growth has been episodic and per capita growth was not impressive for most of the 80s and 90s. Sustainable management of RNRs is critical to agricultural growth and poverty reduction. On the other hand, poor environmental management and unsustainable use of RNRs (arable land, forest, and water) undermine the economic potentials of agriculture, forestry and fisheries. Nigeria's soils are rated from low to medium in productivity. However, most of Nigeria's soil would have medium to good productivity if the country's soil resources were managed properly.

Up to 50% of forests and woodlands may have been lost in the last 4-5 decades, judging from both Food and Agricultural Organisation (FAO) and LUV data over the last 3 decades.

Forestry GDP was x31 billion (\$0.2 billion) in 2003, or close to 0.5% of GDP. While loss in potential timber production is the most visible measure of the cost of deforestation, the economic cost goes far beyond this measure of forestry's contribution in the national accounts. The rural

population traditionally relies on the forest for various food products and fuel wood (NTFPs), both for own consumption and for sales to the urban sector. Five decades ago, with almost twice as much forest and forests being more accessible to a substantially larger share of the population than now, per capita income and consumption from NTFPs might have been twice as high.

Nigeria's livestock resources have been estimated to be in excess of US\$6 billion (x801 billion), providing income for more than 44 million of Nigeria's poor. The rising population of livestock, combined with losses in rangeland areas, aggravates pressure on rangelands, predisposing the land to degradation, including Fadama lands, which are a critical resource for about two-thirds of the national cattle population. The LUV data from 1976/78 to 1993/95 reveal a decline in savannas and other grazing lands from 50% to 42% of total Nigerian territory. During the subsequent decade,

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another 6-8 percentage points of rangelands might have been lost to crop cultivation and other land use. Moreover, the LUV data reveals severe losses in savannah vegetation density, and recent estimates obtained from sources at National Animal Production Research Institute (NAPRI) indicate declines in fodder yields of 10-20% from 1985 to 2003.

Degradation and Poor Management of RNRs Cost at least 6.4% of GDP a year

The economic cost of poor cropland management is highly deleterious. From 1995 to 2004, a period of relatively constant fertilizer consumption, the annual cost of yield declines of roots and tubers, cereals, and pulses is estimated at $\times 210$ billion (US\$ 1.57 billion), or nearly 3 percent of GDP in 2003. The annual cost of yield declines from peak years is even higher, amounting to $\times 500$ billion (US\$3.7 billion) for cereals (1981-2004), roots and tubers (1990-2004) and pulses (1990-2004), or nearly 7% of GDP. These losses are highly significant given that the total federal capital budget in 2004 was $\times 350$ billion (US\$ 2.6 billion).

While there is no hard data available to assess the exact magnitudes, the cost of deforestation and losses in NTFPs in the last 5 decades are at least $\times 120$ billion (\$0.8 billion) per year, or 1.7% of GDP in 2003, if losses of NTFPs are in proportion to forest and woodland losses. This is roughly the size of the federal budget for health and education in 2004 ($\times 153$ billion or \$1.1 billion). Deforestation is also impacting fuel wood supply. Real fuel wood prices in various parts of the country have doubled in the last two decades due to increased collection and transportation costs. This is

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estimated to have an economic cost of at least $\times 45$ billion (US \$0.3 billion) per year. This cost can be viewed as being included in the above total cost estimate of NTFP losses of $\times 120$ billion (\$0.8 billion) per year.

If Nigeria loses its remaining forest resources, the economic cost will be substantially higher than the current

losses. Not only would the current non-wood forest products and timber revenues be lost, but so also would a considerable part of the fuel wood supply. If the population currently depending on fuel wood for cooking were to switch to kerosene, the annual cost would be on the order of $\times 650-980$ billion (\$4.8-7.3 billion) per year.

Table A: Estimated annual Cost of RNR degradation and poor management.

Degradation issues	N billion (US\$ billion)	Percent of GDP (%)
Poor crop land management	210 (1.5)	2.8
Rangeland degradation	135 (1.0)	1.9
Forest resources degradation/losses	120 (0.9)	1.7
Total	465 (3.4)	6.4

These estimates represent a lower bound of the cost of degradation and poor management. A plausible range is presented in the main report.

The cost of yield losses from 1985-2003 is at least $\times 135$ billion (\$1.0 billion) per year, or 1.9% of 2003 GDP. The estimated annual loss from rangeland degradation is close to the federal budget for health and education in 2003 ($\times 143$ billion or \$1.07 billion).

This amount, in addition to the non-wood forest products and timber values foregone, is equivalent to 9-14% of current GDP prices, the present value of annualized cost of yield losses from 1985-2003 is at least $\times 135$ billion (\$1.0 billion) per year, or 1.9% of 2003 GDP. The estimated annual loss from rangeland degradation is close to the federal budget for health and education in 2003 ($\times 143$ billion or \$1.07 billion).

Overall, poor management and degradation of crop land, rangeland degradation, and forest losses and degradation is costing at least x465 billion (US \$3.4 billion) per year, at least 6.4% of GDP in 2003. This is just the direct cost and does not include the economic multiplier effects and dynamic gains of increased rural incomes that would have prevailed in the absence of degradation and poor management.

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Much of these significant losses can be avoided if arable land, rangelands and forests are managed in a sustainable manner to guarantee long-term productivity and incomes.

Agricultural Growth has come from Land Expansion and not Productivity Gains, exacerbating Land Competition and Conflict

Degradation of the resource base and the lack of sustained agricultural growth reflect a failure of past policies to promote rational management of the RNR base and environmental stewardship. Rather, agricultural policies have led to increased outputs through expansion in cultivated land, not by sustained increases in productivity. Agricultural growth in the past two decades has been driven by a tripling of area harvested, while yields of many major crops have stagnated or fallen. Land under crop cultivation is now near its maximum in many states. Satellite land use and vegetation change data shows that already by 1995, cropland occupied nearly 70% or more of total land area in 40% of the states. Analysis indicates that cropland expansion is increasingly taking place on marginal land with lower yields, forced by lack of productivity gains in agriculture and lack of off-farm and urban income opportunities for a rapidly increasing population.

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This trend has aggravated competition between cropland and forest, and between cropland and rangeland. For instance, analysis of the land use and vegetation change

data in Nigeri (1976/78S1993/95) shows that while area under forest declined by 16%, area under arable cropland increased by 13%. The apparent competition between forest and cropland can be attributed to the fact that the pressure to increase outputs has over the years led to the expansion of cultivation into forest. Increased land productivity and integrated land management systems would help to avoid

simplistic forest clearance (agricultural extensification) for increasing agricultural outputs. For example, if the national average yield of cassava were 20 mt/ha, the current annual output of about 34 million tonnes would be obtained from about 1.7 million ha compared to 3.1 million ha that is currently cultivated. Ironically, past agricultural policies and programmes seemed to have led to increased outputs through expansion in land under cultivation rather than by increased productivity. This is clearly an unsustainable pattern of growth.

Productivity improvements are indispensable

The key challenge of Nigeria's agricultural strategy is to stimulate and sustain agricultural growth through increased productivity, not by mere expansion in cultivated area.

Due to low yields and high production costs, Nigeria agriculture is not internationally competitive. Productivity improvements through wise management of the productive base and appropriate institutional and policy reforms can make agriculture more competitive and sustainable. Increased productivity is the key to harnessing the growth potential of Nigeria's renewable natural resources. The overriding

priority to sustainable RNR management, economic growth and rural poverty reduction is increased crop productivity. Only this can prevent

land use conflicts, loss of remaining forests, and halt the non-sustainable expansion onto marginal lands that in the near future may not provide sufficient income for rural livelihood. Our analysis shows for example, that Enugu State can realise up to $\times 7.5$ billion (\$56 million) from a 5% increase in productivity of five major commodities in 2005. This figure is about half the entire capital budget of Enugu state in 2005 ($\times 16$ billion or \$119 million).

Devote greater investment and attention for productivity gains

Sustainable management of RNRs requires agriculture-friendly macroeconomic policies (compensatory measures) to correct structural distortions and adverse domestic terms of trade against RNR-based sectors. There is large scope for substantial improvements of public and private investments in sustainable agriculture, forestry and fisheries. Despite its economic potentials, the RNR-based sectors have the lowest capital accumulation and the lowest quality of private sector investment. There is a vicious low-investment trap that plagues RNRs and precipitates the dominance of smallholders operating low-input, low-technology and low-efficiency and unsustainable production systems. There seems to be an erroneous assumption that the agricultural sector can grow and develop without substantial public and private investments.

Statistics from the Central Bank of Nigeria reveals a disproportionate flow of funds and resources to RNR-based sectors agriculture, forestry and fisheries. Sector distribution of commercial banks' total loans and advances shows that agriculture, forestry and fisheries was $\times 242.2$ billion compared to a total amount of

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$\times 4,339.4$ billion, that is, 0.06% Agriculture, forestry and fisheries together accounted for only 0.7% of total cumulative foreign private investment in Nigeria in 2003 compared to 25.6% for manufacturing and processing, and 34.6% for mining and quarrying. Fund sourcing from the formal sector is constrained by the generally high interest rates charged by banks, the unsuitable short maturity of bank loans and the predominantly informal character of small-scale producers. The acute low public agricultural investment is also exemplified by the fact that the total capital budgets (federal government and 28 states) of RNR-based sectors were mere 1.3% and 2.8% of agricultural GDP in 2003 and 2004 respectively.

Increase support for sustainable land management policies and practices

There should be a clear strategy of incentives which influence RNR-based producers (such as crop and livestock farmers, herdsman, foresters, fishermen) to adopt management practices for preserving the quality and integrity of the resource base land and soils, forests, water. Targeted promotion of proven locally suitable soil and crop management practices as well as integrated land use systems is important to promote soil-conserving technologies and farm management practices that simultaneously increase productivity and enhance the quality of environmental resources. Land capability knowledge (analysis and planning) needs to be continuously updated and disseminated through Land Data Banks accessible to producers, in order to promote rational land use and prevent degradation. Existing research-extension-farmer linkages should be harnessed to demonstrate and promote model land

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management practices, for example, soil-compatible rotation, relay cropping, soil enrichment, agroforestry, optimal water harvesting and use, soil erosion control, conservation planting and cultural methods, afforestation, tree planting/husbandry and so on. Given that community participation in forest and water resources management is crucial for sustainability, models of community-government partnership in sustainable forest management should be promoted by federal and state forestry policies and institutions.

Develop vibrant agribusiness and dynamic agricultural entrepreneurship

Nigeria requires new capacities and incentives for agricultural entrepreneurship. Given the aging agricultural labour force, there is need to systematically evolve younger, innovative, dynamic and market-oriented generation of RNR producers. It is also important to develop agribusiness systems to stimulate productive and sustainable farming systems. Agribusiness provides incentives for investments in longer commodity value-chain.

Irrigation development is central to improving agricultural productivity

The bulk of the country's irrigation potential is undeveloped and unutilised, implying missed economic benefits. The loss in irrigation benefits is buttressed by our model estimates of yields (1960-2004) which show that irrigated area has had significant positive effect on yield. The gains achieved under Fadama I and the projected benefits from Fadama II clearly demonstrate the critical role of irrigated farming and water management in increasing productivity and incomes. There is need to reappraise the irrigation development strategies of the Federal and State Governments to ensure local ownership, efficiency, viability and sustainability.

Strengthen data and statistical systems to improve targeting and monitoring

At the national level, measures should aim at enhancing horizontal coordination of data systems between the PCU, the PRS of FMARD and the FOS (now National Bureau of Statistics). Between the state and federal levels, measures should target greater vertical coordination involving the States' ADPs, the PCU, the PRS of FMARD and the FOS. Capacity building and institutions strengthening are essential to achieve desired levels of coordination, in order to meet the growing demand for high quality data by policymakers, private sector and civil society.

Research and extension are crucial

Nigeria requires new capacities and better incentives for agricultural entrepreneurship

Research is essential to develop sustainable farming systems in different eco-regions of the country. Nigeria's agricultural research institutes are weakened by shortage of funds, inadequate

infrastructure, poor coordination and lack of effective research-extension-farmer linkages. Nigeria's research institutes deserve better funding, improved management and dynamic incentive structure to promote innovations. Productivity cannot improve without use of more efficient inputs and technologies. Given the present distorted nature of inputs markets, there is need for reforms and deliberate measures to elicit greater private sector investments in procurement, distribution and marketing of agro-inputs including fertiliser. Currently, low effective demand for modern inputs and the distortionary public sector involvement deter private sector participation in agro-input markets.

Effective agricultural extension is crucial to promote the adoption and use of modern inputs, technologies and efficient farming systems, but extension system is weak as exemplified by the current state of the Agricultural Development Programmes and the low extension agent farmer ratios.

Funding of RNR-based sectors needs to be improved

Budget space for RNR-based sectors does not match the priority status proclaimed in policy documents (NEEDS and SEEDS). At the federal level, funding for agriculture has been very low and unstable. Currently, agriculture share of federal capital budget (1.5%) falls short of the NEEDS target of 4%. There is need to align the funding of RNR-based sectors to befit their priority status in the economy.

Beyond mere volume of funding is the need to improve quality of funding of agriculture. This entails value for money, proper project appraisal and effective targeting of agricultural budgets. The proposed Agricultural Development Fund would contribute to improved stability and sustainability of funding.

Policy and institutional reforms are essential

Overall, greater political will is imperative to implement key policy and institutional reforms to halt the degradation of RNRs and promote sustainable agriculture and environmental conservation. The NEEDS and SEEDS provide a unique framework for agricultural reforms to secure RNRs sustainability and ensure a prosperous future for Nigeria. The analysis in this

report aims to inform policy reforms to maximise agricultural development and the sustainable management of renewable natural resources in the country. A first step is to support development of NEEDS and SEEDS policies and strategies which both recognise and then effectively support the need for sustainable management of Nigeria's environmental assets. The express goal of such sustainable management is not just to ensure environmental protection but to deliver both economic growth and poverty reduction now and for generations to come.

Greater political will is imperative to implement key policy and institutional reforms to halt the degradation of RNRs and promote sustainable agriculture and forestry

What Next?

The African Institute for Applied Economics will take this agenda forward in partnership with key Government of Nigeria institutions, civil society groups such as farmers associations, private sector organizations and international development partners. The research findings clearly underscore the case for policies and measures to make agriculture more competitive and sustainable. Agriculture would not deliver desired levels of growth and poverty reduction if past and current scenarios of performance do not improve significantly. In line with its mission to promote evidence-based policies in Nigeria, AIAE will intensify research and advocacy to promote better funding and strategies for sustainable RNR management under NEEDS and SEEDS.

This Brief is drawn from the larger report of a study aimed at assessing the current economic contribution of Renewable Natural Resources (RNR) and the changes in their quantity and quality over time, and to contribute towards policies for their sustainable use in economic growth and poverty reduction. The study was commissioned by DFID Nigeria in order to support the development of an evidence base to invigorate policy debate towards promoting the sustainable management of renewable natural resources for improved economic growth and poverty reduction.



AFRICAN INSTITUTE FOR APPLIED ECONOMICS
128 Park Avenue, GRA, P.O.Box 2147 Enugu, NIGERIA
Phone: (042) 256644,300096 Fax: (042)256035
Email: aiaeinfo@aiae-nigeria.org www.aiae-nigeria.org

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The views expressed in this Brief are those of the authors and not necessarily representative of the African Institute for Applied Economics or the agencies which sponsored or supported the research.