9-1

Linkages between Government Spending, Growth, and Poverty in Uganda and Tanzania

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CASE STUDY #9-1 OF THE PROGRAM:
"FOOD POLICY FOR DEVELOPING COUNTRIES: THE ROLE OF GOVERNMENT IN THE GLOBAL FOOD SYSTEM"
2007

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Executive Summary

This case study presents a synthesis of the links between government spending— in areas such as agricultural research and development (R&D), irrigation, rural education, and infrastructure (including roads, electricity, and telecommunications)—and economic growth and poverty reduction in Uganda and Tanzania. The findings of this case study are intended to help explain how government spending on key investments can help meet the broader policy goals of improved growth and poverty reduction through various channels. This study, using a common framework, seeks to broaden and deepen understanding of the mechanisms through which government investment results in pro-poor economic growth.

The overall picture for public investment can be summarized as follows:

- For Tanzania, the results of household survey data show that investments in agricultural research, roads, and education have large effects on income growth. No clear pattern distinguishes the measured impacts for high- and low-potential areas. In many high-potential areas, returns to investments are still high with no signs of diminishing marginal returns, which suggests that public investment has been insufficient in all regions. Nonetheless, the results demonstrate that there are opportunities to improve the growth and poverty impacts of total public spending through better regional targeting of specific types of investment
- For Uganda, district-level data show that government spending on agricultural research and extension had the largest impact on agricultural productivity, followed by spending on rural roads. Across regions, the study demonstrated that investments in the northern region (a poor region) have the potential to contribute the most to reducing poverty, whereas in the western region (a high-potential region), most types of investment have the potential to achieve the highest returns in improving agricultural productivity.

Your assignment is to recommend a public sector investment strategy for rural infrastructure to be considered by the government of one of the two countries discussed in this case.

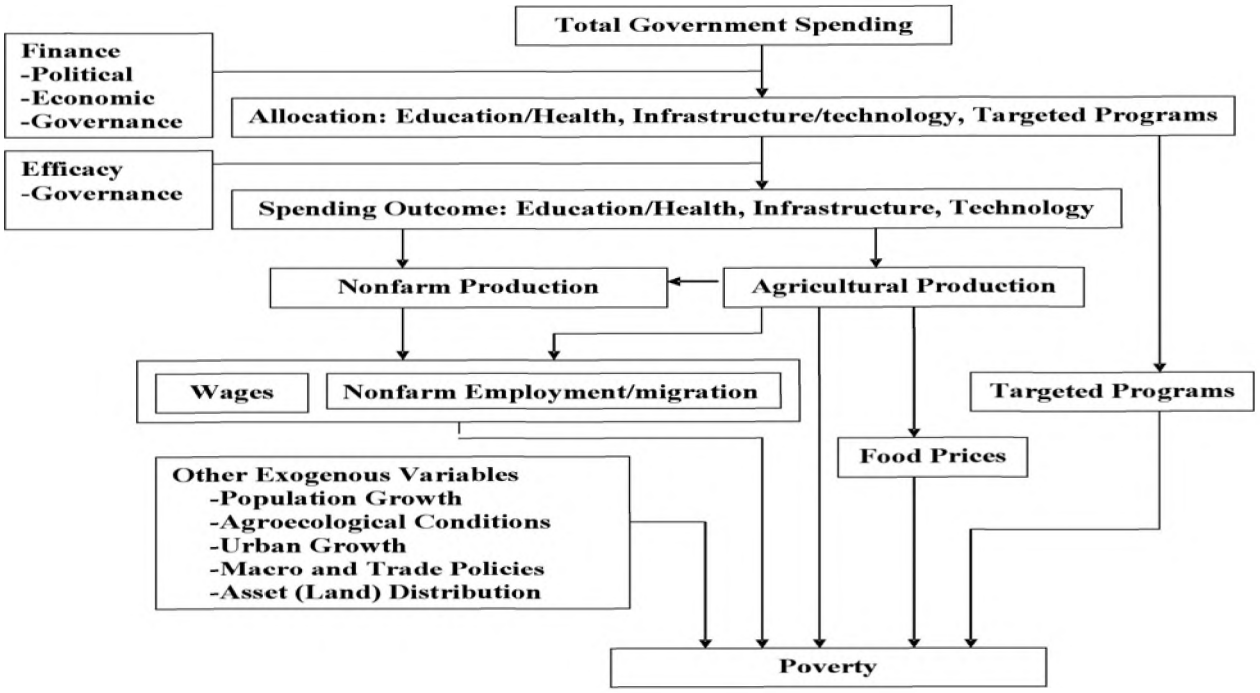
Background

Investment in Infrastructure, Technology, and Human Capital and Impact on Poverty: Conceptual Framework

The aim of this case study is to improve understanding of the relationship between government spending and poverty reduction through long-term growth by reviewing issues and synthesizing the findings of major studies from the International Food Policy Research Institute (IFPRI). As shown in Figure 1, public spending affects poverty reduction through different channels. Understanding these channels will enable policymakers to design more effective policies. This case study analyzes the differential impact not only on economic growth, but also on poverty reduction and regional inequality. Additionally, it distinguishes the effects by geographic region.

This case study considers public spending at different levels of government that leads to long-term growth from which the poor benefit. This type of spending is very different from targeted welfare or social safety net programs, which often help the poor in the short run. The case study first reviews a framework for assessing public investment for poverty reduction. Particular attention is paid to how public investment affects rural poverty through various channels. The study then illustrates how different types of public investment can have differential impacts. Finally, it discusses the policy issues and offers policy options for a public investment strategy to achieve the twin goals of economic growth and poverty reduction.

Figure 1: Government Spending and Rural Poverty



How Does Public Investment Affect Rural Poverty?

Public investment affects rural poverty through many channels, as depicted in Figure 1. For example, public investment in agricultural research, rural education, and infrastructure increases agricultural productivity, which directly increases farmers' incomes and in turn reduces rural poverty. Indirect impacts come from higher agricultural wages and improved nonfarm employment opportunities induced by growth in agricultural productivity. Increased agricultural output from rural investment often leads to lower food prices, again helping the poor indirectly because they are often net buyers of food grains. Redistribution of land caused by higher agricultural growth also affects rural poverty. Public investments in rural education, health, and infrastructure not only have indirect effects on wages, nonfarm employment, and migration through increased productivity, but also directly promote rural wage increases, nonfarm employment, and migration, thereby reducing rural poverty. For example, improved infrastructure access will help farmers set up small rural nonfarm businesses such as food-processing and marketing enterprises, electronics repair shops, transportation and trade, and restaurants.

Investments in rural sectors not only contribute to growth, employment, and wages in rural areas, but also help the development of the national economy by providing labor, human and physical capital, cheaper food, and markets for urban industrial and service development. Growth in the national economy reduces poverty in both rural and urban sectors. Understanding these different effects provides useful policy insights for improving the effectiveness of national poverty reduction strategies. In particular, an understanding of these effects shows how public investment can be used to strengthen weak links between poverty reduction channels and thus to target public resources more efficiently. More efficient targeting has become increasingly crucial as many developing countries have committed to achieving poverty reduction goals using the Millennium Development Goal (MDG) framework with limited public resources.

Channels through Which Public Investment Affects Rural Poverty

Agricultural growth. This section will focus on evidence of the impacts of agricultural growth on poverty reduction for the following reasons: (1) the majority of the world's poor live in rural areas and a large share of their income comes from agriculture; (2) growth in agriculture contributes to poverty reduction indirectly through increased rural wages and farm and nonfarm employment; and (3) agricultural growth may also contribute to poverty reduction in urban areas by lowering food prices for urban residents and contributing to national economic growth.

The most remarkable evidence on the poverty reduction effects of agricultural growth probably comes from the Green Revolution in South Asia from the late 1960s to the 1980s. In the late 1960s, the incidence of rural poverty in India fluctuated widely between 50 and 60 percent. The Green Revolution, based on the widespread use of high-yielding varieties (HYVs) developed jointly by national and international agricultural research centers, began in the mid-1960s. Over the next two decades farmers' wheat and rice yields doubled, tripled, or even quadrupled. The incidence of rural poverty declined from 64 percent in 1966 to 34 percent in 1989.

There is also strong evidence of the effect of growth on poverty in rural China, which has seen a tremendous reduction in poverty over the past three decades. The number of poor declined from 260 million in 1978 to 26 million in 2004 (Ministry of Agriculture of China 2005). The fastest reduction occurred during the initial phase of rural reforms from 1978 to 1984, which was highly correlated with agricultural growth stemming from institutional and policy changes in agricultural production. Between 1984 and 1989, however, rural poverty began to rise and is attributed to stagnation of agricultural growth during this period. The Chinese evidence convincingly shows that whenever agricultural growth is strong, poverty falls rapidly, and whenever agricultural growth is lacking, poverty reduction is slow.

In summary, agricultural growth is conducive to poverty reduction. The patterns of growth, however, and its distributional impacts also matter. Better distribution of productive assets and more growth in the less-developed areas and in the small farm sector will foster more poverty reduction for the same rate of agricultural growth.

Rural wages. In the majority of developing countries, the bulk of poor people are either landless or live on small farms with inadequate land to meet their food needs. As such, they depend heavily upon the only available factor of production—labor. The poor gain from economic growth by increasing their productivity if they own land, by participating in the labor market, or both. For example, with the advent of the Green Revolution in India, the poor took advantage of extra labor demand and higher wages. Another factor of production—land—is also crucial in giving small-scale and landless farmers access to rural wages. Thiesenhusen and Melmed-Sanjack (1990) found that land distribution from large-scale farmers to small-scale farmers sharply increased family labor use per hectare and, to a lesser extent, labor hired per hectare.

Thus, improvement in wages has strong linkages to rural poverty. Public investment in infrastructure, health, and education promotes these wages by supporting agricultural productivity and nonfarm employment activities.

Nonfarm employment. Traditional rural households in developing countries are viewed mainly as agricultural producers and agricultural wage laborers. There is increasing empirical evidence, however, that rural households often diversify their activities, with nonagricultural sources of income often contributing significantly to household incomes. For the poor, different forms of nonfarm employment are a source of supplementary income and are ways to diversify and spread risk across a number of livelihood strategies. For the nonpoor, nonfarm activities are an avenue to generate more income and assets in addition to other factors of production such as land, capital, and technology.

Research shows that nonfarm activities are generally associated with reduced levels of absolute poverty. Newman and Canagarajah (2000) found that between 1988 and 1992 poverty reduction in Ghana can be attributed mainly to improvements in both average levels of income and the pattern of its distribution in the informal and nonfarm sectors in cities other than Accra and in rural areas outside Accra. Datt and Ravallion (1997) showed that

growth in nonfarm output, in addition to growth in agricultural output, played an important role in reducing poverty across Indian states. The impact of the nonfarm economy on inequality is less clear-cut. A recent study of Ecuador explores these questions directly (Elbers and Lanjouw 2001). One key finding is that irrespective of income inequality, employment shares in both high-productivity and low-productivity nonfarm activities are associated with sharply lower absolute poverty rates. Thus, although inequality and poverty are clearly related, they are not equivalent. The authors suggest that the high-productivity subsector acts as an engine of growth by lifting the poor out of poverty either directly or by generating higher wage rates, while the low-productivity subsector acts as a safety net that helps prevent more households from falling below the poverty line.

Migration. Public investment can have a large impact on both rural-to-rural and rural-to-urban migration. For example, the Green Revolution in South Asia was initially concentrated in irrigated regions and only later spread to more favorable rainfed areas. Technological change, therefore, can contribute to widening disparities between regions. Worse, if technology leads to lower production costs per unit of output in the adopting regions, producer prices may fall, leaving non-adopting regions with lower prices and stagnant yields, so that their incomes actually decline. Interregional migration acts to buffer these gaps and provides an efficient way of spreading the benefits to poorer regions with limited agricultural growth potential. In such instances, migrants leave their villages to settle permanently or temporarily in other parts of the country where there is a need for surplus labor or where there is a substantial increase in productivity.

Land distribution. Improving the asset base of the poor is viewed as one way to lift them out of poverty, and in a poor agrarian economy, this means improving their access to land. The relationship between agricultural growth and changes in land distribution has been debated over the past several decades. The consensus is that better land distribution through land reform not only improves income distribution and consequently poverty reduction, but also helps agricultural growth, which in turn alleviates poverty. The effect of agricultural growth on land distribution, however, has been less clear-cut. In fact, one of the earliest controversies about the Green Revolution concerned whether higher agricultural growth worsened land distribution.

Critics argue that large farm owners who had better access to irrigation water, fertilizers, seeds, and credit were the main adopters of new technologies and that smallholders were either unaffected or made worse-off because the Green Revolution resulted in lower product prices, higher input prices, and attempts by owners to increase rents or force tenants off the land. A recent study by Fan et al. (1999) using state-level data from India for several decades found that both the relationships—between poverty reduction and changes in land distribution and between agricultural growth and land distribution—have been very weak. The fact that agricultural growth did not contribute to worsening land distribution, however, does not mean that rural poverty is not correlated with land ownership. The rural poor are still either landless laborers or smallholders today. Therefore, future growth must be designed to benefit these landless or marginal landholding peasants.

Food prices. Public investment in rural areas can lead to an increase in aggregate agricultural output, and this increased output will in turn reduce food prices. This process has proved to be one of the most important ways through which rural and urban poor people are affected by public investment (Scobie and Posada 1978; Rosegrant and Hazell 2000; Fan et al. 2003). The impact of reduced food prices is particularly important for the urban poor because they often spend more than half of their income on food. These price reductions may not be very large in an open economy with low transport costs. Indeed, owing to recent market liberalization policies, many more countries now fall into this category than in the past. Many poor countries still face high transport costs, however, because of poor infrastructure, remoteness from world markets, or inefficient marketing institutions, and these countries may face considerably higher endogenous domestic prices even after market liberalization. For example, in many Asian countries, such as China and India, and in landlocked African countries, domestic prices still fall sharply when domestic food production increases suddenly. Furthermore, the prices of many traditional food crops also continue to be endogenously determined within countries because they are not traded on world markets.

The impact of reduced food prices on rural poverty is less clear-cut and depends largely on whether rural poor are net sellers or buyers of food.

The Case of Uganda

Background on growth and poverty. At independence in 1962, Uganda showed prospects for sustainable development with high growth and savings rates. The country had a well-developed education system and was running a trade surplus, thanks to its exports of agricultural and textile products. It was self-sufficient in terms of food, and small-scale industry supplied the domestic market with basic inputs. From the early 1970s until the mid-1980s, however, it suffered from political turmoil and economic mismanagement.

During the late 1980s and 1990s, the government introduced a series of economic reforms. First, liberalization of prices and trade in the domestic market boosted agricultural growth. Second, liberalization of foreign exchange and the trade system led to the diversification of Uganda's exports and improved the competitiveness of traditional agricultural products, such as coffee and tea, in external markets. The government also controlled the growth rate of the money supply, which led to price stability and helped restore confidence and external competitiveness (IMF 2000). As a result of these policies, the Ugandan economy outperformed most other countries in Sub-Saharan Africa. From 1982 to 1999, Uganda's economy grew at 5.2 percent a year, and this rate accelerated to 6.9 percent a year in the 1990s.

Trends in wages, employment, poverty, and inequality. Both agricultural and nonagricultural earnings are important sources of income for rural residents in Uganda. Data from Uganda's National Household Surveys show the following features: First, both agricultural and nonagricultural wages rose substantially between 1992/1993 and 1999/2000. Second, nonagricultural wages rose more than agricultural wages on average. Third, women were paid less than men in both sectors.

The number of new job entrants into Uganda's economy was about 306,500 people a year (MFPED 2000). Agriculture employed the majority of people—about 85 percent in most regions. The 1992/1993 National Household Survey showed that 6.7 percent of all households in rural areas in Uganda were engaged in nonfarm activities. Thus, it is likely that nonfarm employment could become an important avenue for supplemental income generation for poor people in rural Uganda.

Trends in public expenditures. Uganda's government expenditures in constant 1997 prices increased from 264 billion shilling in 1982 to 1,043 billion shillings in 1999, an annual growth rate of more than 8.4 percent. As a percentage of gross domestic product (GDP), Uganda consistently increased its spending during the 1980s, from 9 percent in 1980 to 16 percent in 1990 (Fan and Rao 2003). Total government revenue was 10–11 percent of GDP, and Uganda thus experienced a severe fiscal deficit in the 1990s. The analysis here focuses on public spending on agricultural R&D, roads, education, and health.

Data on public spending on agricultural research in Uganda are available only in the 1990s. Total spending on agricultural R&D was US$27 million in 1995, measured in 1993 prices, and increased to US$49 million in 2000 (Beintema and Tizikara 2002). As a percentage of agricultural GDP, agricultural research spending increased from 0.32 percent in 1995 to 0.5 percent in 2000. This percentage was much lower than the African average of 0.85 percent in 1995.

Uganda's mountainous and hilly topography hinders the development of roads, but the effects of economic growth and improved transport links were evident in improved access of *matatu* taxis. These taxis were on average within six kilometers of homes in 1999/2000, compared with nine kilometers in 1997. The 2000 service delivery survey found that 65 percent of communities held the view that public transportation had improved over the previous five years, largely owing to improved road maintenance.

Lack of electricity provision and access are major problems facing rural households in Uganda. Only 12 percent of villages and 2.1 percent of rural households have electricity connections. This rate is significantly lower than the rates achieved in China and India, for example, several decades ago.

Uganda has achieved tremendous success in containing the incidence of HIV/AIDS. The rate declined from more than 30 percent in early 1990s to less than 6 percent today (CIA 2003). In other

areas of health care, however, Uganda has not performed well.

Although the infant mortality rate has declined, all other indicators, such as crude death and life expectancy, deteriorated over the period 1980–1999 as the result of an inefficient health management system. In 1993 the Ministry of Health (MOH) decentralized health care on the grounds that local councils were better informed. These councils were so overwhelmed with the huge demand for services in rural areas, however, that they were unable to deliver the required services to the poor effectively. Because inputs did not reach the intended facilities, actual service delivery was often lacking despite nominally adequate funding.

The government has increased the budget allocation for primary health care through the Poverty Action Fund, whose purpose is to direct and monitor funds to improve the welfare of poor people. Another prominent feature of the health plan is to shift from tertiary and curative services to primary and preventive services.

The government's policy on education in the 1990s emphasized increasing access to primary education and economic opportunities for poor people. Since 1991/1992, expenditures on education have shifted from secondary or tertiary education toward primary education. Rural literacy improved across all regions in Uganda during 1991–1999. The Universal Primary Education (UPE) policy aims at providing free education to four children per family, and this policy led to a substantial increase in primary school enrollment, from 2.7 million students in 1996 to 6.6 million students in 1999. Dropout rates, however, remained high owing to lack of facilities and poor health of children.

Marginal returns to public investments. The marginal returns to different kinds of government expenditures were calculated in two steps. First, the marginal returns in agricultural output and poverty reduction per physical unit were calculated. Then the unit cost of these physical units—for example, shillings per kilometer of road—were calculated to determine the returns per unit of investment. The returns are measured as a ratio of shillings of agricultural output or the number of poor individuals brought out of poverty per unit of spending. The results are presented in Table 1.

Table 1: Marginal Returns to Government Investment in Rural Uganda

Investment	Central	East	North	West	Uganda
Benefit–cost ratio					
Agricultural R&D	12.49	10.77	11.77	14.74	12.38
Education	2.05	3.51	2.10	3.80	2.72
Feeder Roads	6.03	8.74	4.88	9.19	7.16
Murram Roads	n.s.	n.s.	n.s.	n.s.	n.s.
Tarmac Roads	n.s.	n.s.	n.s.	n.s.	n.s.
Health	1.37	0.92	0.37	0.96	0.90
Number of poor people reduced per million shillings					
Agricultural R&D	21.75	66.31	175.52	48.91	58.39
Education	3.57	21.60	31.38	12.62	12.81
Feeder Roads	10.51	53.85	72.82	30.49	33.77
Murram Roads	4.08	11.88	14.80	9.77	9.70
Tarmac Roads	2.59	13.12	62.92	9.39	9.73
Health	2.60	6.15	5.95	3.46	4.60

Source: Fan et al. 2004.
Note: n.s. indicates that the respective coefficients are not statistically significant.

Most of these government investments reduced poverty while increasing agricultural productivity. There were, however, sizable differences in production and poverty reduction gains among expenditure items and across regions. In terms of productivity effects, government expenditure on agricultural R&D had the highest returns, at 12 shillings per marginal shilling invested. Investments in feeder roads ranked second, with a benefit-cost ratio of about 7. Education also had positive returns, with a benefit-cost ratio of about 3. Health was the only government investment whose return was lower than its cost, at only 0.9 shillings per shilling spent.

In terms of poverty reduction, agricultural R&D again ranked first, followed by feeder roads. The effect of education on poverty was smaller than the effects of agricultural services and feeder roads. Government investment in health had the smallest impact on poverty reduction. For all types of investment except health, the northern region had the highest returns. The impacts of health expenditures on poverty were similar in the north and east. All types of investment had their smallest impacts on poverty in the central region.

Summarizing the Main Findings

Government spending on agricultural R&D improved agricultural productivity substantially and had the largest returns to growth in agricultural production. Agricultural R&D spending also had the largest impact on poverty reduction. In addition, government expenditures on rural roads had a substantial marginal impact on poverty reduction. Low-grade roads such as feeder roads had a larger impact than did high-grade roads such as murram and tarmac roads. The effect of education ranked after agricultural R&D and feeder roads. These poverty reduction effects came from growth in agricultural productivity, improved nonfarm employment, and increased rural wages.

Government spending on health did not have a large impact on agricultural productivity growth or rural poverty reduction. The main reasons for this result could be that (1) health investments affect growth and poverty reduction only in the long run; (2) a large share of health expenditures went toward prevention and treatment of HIV/AIDS-related diseases, which had obvious significant impacts only in the long run; and (3) the Ugandan health system contained significant inefficiencies.

The Case of Tanzania

Background on macroeconomic reforms, growth, and poverty. Before its recent policy reforms, Tanzania pursued a policy of economic growth under the political ideology of Ujamaa, or African socialism. During the mid-1980s the country began undertaking major macroeconomic policy reforms to create the macroeconomic stability required for achieving sustained economic growth. The reforms called for rationalization of government spending and more conservative fiscal policies, including removal of some government subsidies to sectors like agriculture.

As a result of these macroeconomic reforms, the country has experienced a significant improvement in its economic indicators. Inflation declined from 30 percent in 1995 to 4.4 percent in 2004; foreign exchange reserves increased from 6 weeks of merchandise imports in 1995 to 18 weeks in 2002; and GDP grew by 5.2 percent in 2004, up from 2.6 percent in 1995.

In spite of these achievements, the decline in poverty has been disappointing, especially in rural areas. The household surveys show that poverty declined by only 3 percent during the 1990s (from 39 percent to 36 percent). The failure to reduce poverty has raised concerns about the effectiveness of the reforms in improving the welfare of Tanzanians, particularly in rural areas. In 2001 the Government of Tanzania adopted a medium-term strategy for poverty reduction, which envisaged increasing public investments in strategic social sectors such as basic education, primary health care, rural roads, water supply, agricultural research and extension, and HIV/AIDS.

Trends in government spending and public capital. Total government expenditures increased from 326 billion shillings in 1986 to 602 billion shillings (measured in 1985 constant prices) in 1999. Since GDP grew at about the same rate, public spending as a share of GDP remained almost unchanged at 17 percent. Spending on social services grew the fastest, at an annual rate of 9 percent. As a result, its share in total government expenditure grew from 14 percent in 1986 to 25 percent in 1999. Spending on economic services (such as agriculture, infrastructure, and industrial development) was erratic, however, increasing from 64 billion shillings in 1986 to 135 billion shillings in 1995, and then declining to 36 billion shillings in 1996.

Agriculture spending accounted for only 4 percent of total government spending in 1998, down from 5.8 percent in 1986. This trend is disturbing despite the fact that the government made agriculture a high priority. Agricultural R&D expenditures in Tanzania doubled between 1996 and 2000 in constant dollars, and as a percentage of agricultural GDP, agricultural R&D spending increased from a low of 0.2 percent in 1996 to 0.4 percent in 2000.

Total government expenditures on education increased from 22 billion shillings in 1986 to 82 billion shillings in 1999 in constant prices. As a percentage of GDP, they rose from 0.9 percent in 1988 to 2.3 percent in 1999. As a share of total expenditures, they increased gradually from 6.9 percent in 1986 to 14 percent in 1999. This share compares favorably with other African countries, which averaged 15 percent in 1998 (Fan and Rao 2003).

In terms of educational outcomes, there has been some improvement in the levels of education attained in recent years. The number of people who had completed primary school increased from 60.9 percent to 62 percent for males and 51 percent to 54.3 percent for females between 1992 and 1996.

Health expenditures increased from 14.6 billion shillings in 1986 to 39.2 billion shillings in 1999, in constant prices. In terms of health outcomes, the average life expectancy at birth for Tanzanians increased from 40.7 years in 1960 to 50 years in 1990. It declined to 48 years by 2000 owing to the rapid increase in the prevalence of HIV/AIDS. The child mortality rate also declined substantially in most regions. The number of child deaths under five years of age was 244 per 1,000 infants in 1975 and declined to 169 deaths in 1995. Lack of availability of health services is also a critical problem in Tanzania. In 2000/2001, people in most regions had to travel at least 10–30 kilometers to reach the nearest hospital.

Public expenditures on roads and transport systems increased over the years, but the total length of available roads remained low. Rural roads accounted for more than 60 percent of the total road length, and less than 1 percent of rural roads are paved. There is large variation in access to road infrastructure.

Marginal returns to physical public capital. The returns to investment are shown in Table 2. For every shilling invested in education by the government, household income increased by 9 shillings on average. This is the benefit/cost (B/C) ratio for the country as a whole. The B/C ratios were large for all zones, ranging from 5.8 in the southern coast and northern zones to 14 in the western zone.

At the national level, the B/C returns to road investment were similar in magnitude to those for education. Every shilling invested by the government increased household income by 9.13 shillings. The regional differences are large, however, with the largest returns arising in the south highlands and the central and western areas.

For every shilling spent on agricultural research, average household income rises by 12.5 shillings. This is the largest B/C ratio among all investments. The regional differences for agricultural research spending are also large, with the central zone having the largest return, followed by the southern coast, Lake Victoria, and south highlands. The northern coast and the western areas had negative returns.

Table 3 presents the estimates of the number of poor households that would be lifted out of poverty for every 1 million shillings invested. The results show that on average, another 1 million shillings of investment in education will lift 43 people out of poverty. This is larger than the number of people lifted out of poverty for a similar investment in agricultural research or roads.

Table 2: Returns to Investment per Shilling Invested in Tanzania, 2000/2001

Zone	*Education*	*Roads*	*Agricultural Research*
Northern Zone	5.81	1.78	9.23
Northern Coast	13.41	0.18	n.s.
Lake Victoria	9.50	n.s.	15.79
Western Zone	14.01	12.00	n.s.
Central Zone	8.66	14.22	46.92
South Highlands	7.71	19.73	14.69
Southern Coast	5.75	0.92	21.51
Average	9.00	9.13	12.46

Source: Fan et al. 2005.
Note: n.s. indicates statistically not significant.

Table 3: Poverty Reduction per Million Shillings Invested in Tanzania, 2000/2001

Zone	*Education**	*Roads**	*Agricultural Research**	*Electricity***
Northern Zone	18.23	1.86	16.54	28,003
Northern Coast	30.02	0.56	n.s.	75,479
Lake Victoria	43.40	n.s.	57.03	379,323
Western Zone	91.49	65.72	n.s.	87,400
Central Zone	54.56	74.60	81.13	150,715
South Highlands	26.48	60.37	21.38	108,915
Southern Coast	29.91	13.78	40.91	93,278
Average	43.10	26.53	40.39	141,962

Source: Fan et al. 2005.
Note: n.s. indicates statistically not significant. * denotes the number of poor reduced per million shillings. ** denotes the number of poor reduced for 1 percent increase in connection.

For roads, every 1 million shillings invested would lift 27 poor people out of poverty. Road investments had differential effects on poverty across regions. Although roads had large poverty impacts in the central and western regions and in the south highlands, they had negligible poverty impacts in the northern zone and Lake Victoria.

Investments in agricultural research were almost as beneficial for the poor as similar investments in education. They did not, however, have a significant impact on poverty in the northern coast and western zones.

Summarizing the Main Findings

Despite some recent improvements in Tanzania's economic performance, poverty remains widespread and shows few signs of diminishing. Thus, additional investments in rural education can have very favorable impacts on poverty, raising about 43 people above the poverty line per million shillings spent. Given that education investments lead to sizable increases in per capita income, with an average B/C ratio of 9, increased investments in education should be a priority in all regions of the country.

Rural road investments also have a large impact on per capita incomes, with an average B/C ratio of 9.13. Their impact on poverty per shilling spent, however, is about half that of investments in education. The poverty and growth impacts are most favorable in the south highlands and central and western zones and least favorable in the northern parts of the country. Regional targeting is therefore appropriate.

Investments in agricultural research also have large impacts on rural poverty and the largest impact on

incomes, with an average B/C ratio of about 12. Again, regional targeting is important because the impacts are different across regions.

Policy Issues

Given that significant increases in public rural investments seem unlikely, countries will have to focus on using their public investment resources more efficiently. This effort requires better targeting of investments to achieve growth and poverty alleviation goals, and improved efficiency within the agencies that provide public goods and services. Despite vast differences in economic systems, natural sources endowments, socio-economic conditions, and sizes, these case studies offer some important lessons.

First, governments in Africa need to increase their investments in agriculture and rural areas. Agriculture accounts for 30–40 percent of the national economy, but its share in the total government budget is only about 4 percent. In contrast, Asian countries often spent 10–15 percent of their total government budget on agriculture during their Green Revolution period (Fan and Rao 2003). Lower productivity and lack of access to infrastructure and markets in Africa today are due to the governments' failure to invest adequately in rural infrastructure, education, and agricultural research and extension.

Second, African governments also need to set the right priorities in allocating their limited public resources to maximize their impact on growth and poverty reduction. Evidence from the cases presented here clearly shows that more investment in agricultural R&D, rural education, and rural roads have high returns in terms of both growth and poverty reduction.

Third, unlike China and India, many African countries have not invested fully in their high-potential areas and hence have not yet reached the point of diminishing returns. Preliminary evidence from Uganda has shown that its high-potential areas will continue to be the major breadbaskets for the region, and agricultural productivity will need to increase further in these areas to provide much of the additional food needed to supply growing urban populations. But because large numbers of the rural poor do not live in high-potential areas, it will be important to make sufficient investments in less-favored areas as well.

Stakeholders

The previous sections have highlighted the importance of investments in rural infrastructure and other key public services that are necessary for achieving growth and reducing poverty in rural areas. The challenge for many developing countries is to find more effective ways to pay for additional public investments and to develop suitable institutional arrangements for their delivery. This section discusses the institutional reforms that could make delivery of infrastructure services more efficient and considers the potential role of the private sector.

The Public Sector

In most countries the public sector is the dominant supplier of infrastructure services. The results have generally been disappointing in Africa. The state-owned monopoly on provision of infrastructure has resulted in high levels of waste and inefficiency (Brook and Smith 2001). According to one estimate, in the early 1990s technical inefficiencies in power, roads, railways, and water alone led to losses of US$55 billion a year—equivalent to 1 percent of all developing countries' GDP, a quarter of annual infrastructure investment, and twice the annual development finance necessary for infrastructure (World Bank 1994).

At present policy makers interested in expanding access to infrastructure services in remote rural areas can draw on a rich body of experience that challenges existing ideas. Governments must address the question of how infrastructure services are paid for, which centers on pricing issues. Second, for delivering services to the poor, governments should allow for a range of service options in developing private participation schemes. Third, encouraging competition can help reduce prices and expand access and thus should be used to the maximum extent feasible. Fourth, the quality of regulation matters, and regulatory frameworks must be credible to investors and viewed as serving consumers. Finally, the politics of all of actions matters. Although technocratic solutions may exist, building consensus and trust and ensuring support for these policies will remain challenging.

The key questions to ask when allocating public expenditures and designing institutional reforms include the following:

- Are market failures being tackled? If so, which ones, and how?
- Are public expenditures for the sector adequate in addressing the sector's issues?
- Are distributive concerns being addressed by narrowly based targeting mechanisms?
- Are services being provided efficiently, at least cost, and are they responsive to user demand?
- Is there any way to reform the recurrent cost funding mechanism?

The Private Sector

A global trend toward liberalizing and privatizing infrastructure activities began in the early 1980s and was strengthened in the 1990s. Developing countries have at the forefront of this movement, motivated by the desire to increase the efficiency of service delivery, accelerate the expansion of improved services, and bring a greater and more consistent consumer focus to service delivery (Brook and Smith 2001).

Between 1990 and 2000, private infrastructure projects in developing countries attracted more than US$680 billion of investment (World Bank 2007). Privatization can be an effective way to improve efficiency, because private firms are more responsive to end-user needs. Privatization also encourages and facilitates the imposition of cost-covering tariffs or user fees, thus addressing the problems of underpricing that vex many public sector enterprises. Greater efficiency and cost recovery allow firms to make investments and provide services that might not otherwise have been possible (Fan 2004). They simultaneously improve efficiency and the government's fiscal condition by making available the same quality and quantity of services with smaller budgetary subsidies.

Although some results of private sector intervention in providing infrastructure services are potentially positive, empirical testing remains difficult because ownership reforms in infrastructure usually take place in a context of broader economic reforms. Additionally, many infrastructure privatization programs are relatively recent, limiting the availability of time-series data to test propositions about poverty impact. Based on the broad experience, however, it is evident that whether ownership reforms systematically expand access will depend critically on their detailed design (Estache et al. 2000).

The critical question that remains is, what strategies should government follow in focusing on reforms and pursuing private provision? One possible course of action might be to delay introducing private participation to allow time for market ideology to improve and to boost the performance of inefficient public sector enterprises, thus making them more attractive to potential bidders.

This approach has several potential drawbacks. First, it has often proven difficult, if not impossible, to improve the performance of public sector enterprises. The private sector has demonstrated that even in very difficult environments (for example, the power sector in Georgia), it can substantially improve efficiency and quality of service. Relying on public provision can increase the pressure to adopt a more rational pricing policy for infrastructure, which will not only increase efficiency, but also increase reliance on funding from taxpayers rather than users. This situation may reduce the resources available to invest in expanding services for the rural poor, which in turn has implications for poverty reduction and economic growth. Second, because the private sector can be reluctant to place its capital at risk in developing-country infrastructure projects, governments may pursue options such as leases and management contracts. Management contracts, however, are often short term and may not lock in efficiency and productivity improvements.[1] Moreover, because the private sector typically does not finance investment, approaches such as management contracts provide fewer pressures on them to commit to cost-covering tariffs. Thus, there should be some realism about the likely impact and benefits of these types of private participation schemes.

Whatever policies countries choose, governments cannot avoid the most important reality that infrastructure services must be paid for, whether the

[1] For example, the Northern Electric Company in Namibia saw a major reduction in losses during a five-year private management contract. Management was then taken back by the public sector, however, and it was not evident that the utility would maintain its efficient performance.

provision is public or private. The real issue regarding infrastructure provision in developing countries is not whether it is public or private, but whether less infrastructure or more will be provided.

The Role of Communities in Infrastructure Provision

Poor people and communities in developing countries are often viewed as beneficiaries or passive targets of interventions. They can, however, play a major role in improving physical access to services, and government agencies need to understand that the role of poor people goes beyond participation in public consultations.

The financial reality in many developing countries is that communities have no choice but to get involved in improving roads, ports, and bridges. Thus, community ownership and management of these types of infrastructure is a viable way of providing sustainable access to all. Some strong evidence shows that when communities voluntarily own and manage infrastructure, the cost of maintenance is significantly lower than when the same type of infrastructure is owned and managed by a public sector enterprise.

Policy Options

Future investments in public infrastructure require sustained efforts over a considerable period of time to develop stable and competent public sector institutions that support market development and address market failures. Several policy options can contribute to attaining the objectives already described.

Investing Resources More Efficiently

Returns to public investments vary drastically across different regions and types of investment, even within the same country. This reality implies that there is great potential for more growth and poverty reduction even with the same amount of investment if these public resources can be allocated optimally. For governments to make sound investment decisions that make efficient use of their resources, information on the marginal effects of various types of government spending is crucial. Without such information, it is difficult for governments to home in on investment priorities that will achieve national development goals. It is important therefore to include all (or most) types of public investment when assessing their impact on growth and poverty reduction. To date, very few studies have done so.

The limited evidence from Uganda and Tanzania suggest that investments in agricultural R&D, rural education, and infrastructure have large returns, not only in terms of growth, but also in terms of poverty reduction. The regional disaggregated analysis indicates that in both high- and-low potential areas, returns to investments are still high in Africa, suggesting that more investment is needed across all types of regions in Africa.

Concluding Remarks

Agricultural R&D, rural education, infrastructure, and other rural services are critical to agricultural development and poverty reduction. Many developing countries, especially in Africa, have woefully inadequate levels of agricultural R&D, rural infrastructure, and human capital, and these gaps are major constraints to their development. Despite this fact, many governments and donor agencies have reduced investment levels in these areas in recent years. This case study demonstrates that this trend is imprudent. Many public investments in rural areas give high rates of return in Africa, as well as making important contributions to reducing rural poverty. Spending on rural roads, agricultural research, and rural education are some of the best win-win investments.

At the same time, developing countries need to improve the efficiency with which most of these public goods and services are supplied. Meeting this goal will require new institutional reforms, new forms of financing arrangements, and partnerships with private and other nongovernmental agencies. Since developing countries differ in their levels of economic development and in the capacities of their government agencies at various levels, it is important to determine the appropriate degree of centralization or decentralization and private sector participation for each country.

Assignment

Your assignment is to recommend a public sector investment strategy for rural infrastructure to be considered by the government of one of the two countries discussed in this case.

Additional Readings

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Fan, S., D. Nyange, and N. Rao. 2005. *Public investment and poverty reduction in Tanzania: Evidence from household survey data.* Development Strategy and Governance Division Discussion Paper No. 18. Washington, DC: International Food Policy Research Institute.

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