A COUNTRY FRAMEWORK REPORT

Private Solutions for Infrastructure in Rwanda

PUBLIC-PRIVATE
INFRASTRUCTURE
ADVISORY FACILITY

THE WORLD BANK

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A Country Framework Report

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and the World Bank Group

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Preface

This Country Framework Report for Rwanda is one of the first in a series of country reviews aimed at improving the environment for private sector involvement in infrastructure. Prepared at the request of the Rwandan government, the report has three main objectives:

- To describe and assess the current status and performance of key infrastructure sectors
- To describe and assess the policy, regulatory, and institutional environment for involving the private sector in those sectors
- To assist, through the above processes, policymakers in framing future reform and development strategies and potential private sector investors in assessing investment opportunities.

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The report was prepared by a core team led by Lucy Fye and comprising Amadou Dem, Guido Rurangwa, Ibrahima Diong, Nikolay Mandinga, Fatiha Amar, Marie Jeanne Uwanyarwaya, Marie-Chantal Uwanyiligira, Serah Njoroge, and Aminetou Tidiani. The report also draws on inputs from various staff from the World Bank and other development agencies, as well as discussions with representatives of the private sector.

The Country Framework Report process was supported by a working group comprising representatives of the government, private sector, and bilateral donor agencies. Members of the working group from the Rwandan government include Jean Demacene Ntawukuriryayo, Minister of Infrastructure; Sam Nkusi, State Minister of Energy and Communications; Munyanganizi Bikoro, State Minister of Water; Antoine Munyakazi-Juru, Ministry of Finance and Economic Planning; Joseph Akilimali and Marlene Nyirubutama, Privatization Secretariat; François Xavier Havugimana, Makuza Kanamugire, Abraham Makuza, Bruno Mwanzafunzi, J. Baptiste Ngwijabanzi, Straton Nzeyimana, Felicien Rukiriza, and Silas Ruligana, Ministry of Infrastructure; Eugène Kivunangoma, Multisector Regulatory Agency; Jean Kanyamuhanda, Central Public Investments and External Finance Bureau; Patrick Rugumire, Ministry of Transport; Theogene Kayumba, Airports Authority; and Alfred Byigero, Gas Unit.

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Abbreviations and Acronyms

AIM	Alternative Investment Market
AIPA	Africa Institute for Policy Analysis and Economic Integration (South Africa)
AfDB	African Development Bank
ASI	Adam Smith Institute
BADEA	Arab Bank for Economic Development in Africa
BOT	Build, operate, and transfer
BUNEP	Bureau National d'Etudes de Projet
CEPEX	Central Public Investments and External Finance Bureau
CFR	Country Framework Report
DBFO	Design, build, finance, and operate
DEN	Department of Energy, Ministry of Infrastructure
DFID	Department for International Development (United Kingdom)
DRC	Democratic Republic of the Congo
DRFO	Design, rehabilitate, finance, and operate
ECA	Economic Commission for Africa, United Nations
EIA	Environmental impact assessment
ELG	Electrogaz
EMPA	Environmental Management and Protection Act
GDP	Gross domestic product
GNP	Gross national product
ICT	Information and communication technology
IFI	International financial institution
IPP	Independent power project
KIST	Kigali Institute of Science and Technology
MIED	Ministry of Infrastructure's Energy Division
MOI	Ministry of Infrastructure
MSR	Multisector Regulatory Agency
MTN	Mobile telephone networks
MW	Megawatt
NGO	Nongovernmental organization
NUR	National University of Rwanda
OBA	Output-based aid
OPEC	Organization of Petroleum Exporting Countries
PCM	Pulse code modulation
PDH	Plesiochronous digital hierarchy
PIP	Public Investment Program
PPI	Private participation in infrastructure
PPIAF	Public-Private Infrastructure Advisory Facility
PRSP	Poverty Reduction Strategy Policy
PSF	Private Sector Federation
PSP	Private sector participation
RFP	Request for proposals
RIPA	Rwanda Investment Promotion Agency
RITA	Rwanda Information Technology Authority
RMF	Roads Maintenance Fund
RPSF	Rwanda Private Sector Federation

SEA	Strategic environmental assessment
SIDA	Swedish International Development Agency
SME	Small and medium enterprise
UPEG	Unité de Promotion et d'Exploitation du Gaz du Lac Kivu (Department of Promotion and Exploitation of Methane Gas from Lake Kivu)
USAID	United States Agency for International Development
VOC	Vehicle operating cost
VSAT	Very small aperture terminal
WLL	Wireless local loop

Executive Summary

The Context for Reform

The systematic campaign of genocide and the civil war that took place in April to July 1994 inflicted incalculable harm on the social and economic fabric of Rwanda. One harmful aspect of the events of 1994 and their aftermath has been the enormous damage caused to the country's infrastructure endowment. This damage reflects not only the direct effects of war and social disruption but also the indirect consequences in terms of (a) the loss of staff members in utility companies and ministries—including many in senior managerial positions—and the consequent loss of institutional memory, and (b) the destruction of records and the effect this loss had on billing and payment systems and on financial performance. The ability of Rwanda's economic infrastructure to fulfill the country's needs has been further undermined by the lack of regular maintenance since 1994 and by the increased demands placed on the infrastructure as a result of the population resettlement, which has formed a vital part of the recovery process.

The achievements of the government and people of Rwanda in restoring the country have been remarkable. Political stability and security have been reestablished, and sound institutional and administrative frameworks have been put in place. Despite difficult circumstances, significant economic growth has been achieved, and the economy is recovering to prewar levels, although progress has slowed somewhat over the past two or three years.

While much has been achieved, the government of Rwanda fully recognizes that much also remains to be done. Its priority is not only to address the particular consequences of genocide and war but also to tackle longer-term structural difficulties already evident in the prewar economy, particularly those caused by the pressures of population growth in a relatively small country with an economy primarily dependent on agrarian activity.

Infrastructure Reform in Rwanda

The government's vision for the development of the country is set out in its development agenda, Vision 2020, which elaborates the economic goals that the government aims to achieve and a broad strategy for their realization. One theme that lies at the heart of Vision 2020 is the refurbishment and development of the country's core economic infrastructure. This commitment to infrastructure improvement reflects the government's recognition of the central role that reliable and accessible infrastructure plays in supporting and enabling poverty eradication and economic growth.

The progress that Rwanda has made since 1994 has been achieved primarily through effective partnership between the government and the international donor community. Looking ahead, however, the government fully recognizes the increasing importance of the private sector's contribution to realizing the country's development agenda. A core theme of the government's strategy for implementing Vision 2020 is the

promotion and encouragement of private sector participation (PSP) and of private investment, including investment by both foreign and local investors, in all sectors of the economy. Encouraging greater private participation in infrastructure is accordingly a major element in the government's policy for infrastructure refurbishment, operation, and improvement.

In part, the importance given to private participation in infrastructure reflects the need to harness financial resources that substantially exceed what government and donors can be expected—or will be able—to provide. At least as important, however, are the wider benefits that flow from greater private sector involvement in the provision of infrastructure services. Significant among these benefits are

- The greater stimulus that private participation provides—within appropriate market and regulatory structures—to enhance efficiency in the use of resources and avoid wasted cost and effort
- The potential that exists to promote the involvement of the Rwandan private sector and local communities in infrastructure, providing both livelihood opportunities to individuals and scope for the development of the indigenous business sector and for the progressive enhancement of its wealth-generating capacity
- The greater potential that PSP offers for demand-led provision that is both more innovative and more responsive to economic and social needs than centrally planned development.

Reforming the infrastructure sectors through PSP is not simply a matter of selling a stake in public sector assets to the private sector or otherwise bringing the private sector into publicly owned businesses through concessions or management contracts, although these actions have an extremely important part to play. Infrastructure reform is also concerned with identifying and implementing structural changes to create competitive markets; implementing institutional reforms to provide legal and regulatory frameworks that ensure fair and even-handed protection of the interests of users, providers, and the public; and assessing the appropriate role for the public sector.

Achieving success in infrastructure reform also involves much more than identifying appropriate sector policies and the opportunities that exist to promote PSP within these policy frameworks. It is also, crucially, about effective implementation, which requires clearly appraising priorities and focusing scarce resources on their achievement. It also requires careful planning, allocation (and full acceptance) of institutional responsibilities, establishment of an appropriate enabling environment, effective monitoring and review of progress, and genuine political will. Moreover, it relies on removing or overcoming broader obstacles that cut across more than one sector and whose effect may, indeed, extend more widely through Rwanda's economy.

The Country Framework Report

The *Rwanda Country Framework Report* (CFR) sets out a review of Rwanda's infrastructure in the transport, energy, water and sanitation, and telecommunications sectors. Although the span of the CFR is broad, it is focused in particular on the potential that exists to involve the private sector in infrastructure and the policies and actions that are necessary to bring this involvement about.

The CFR is an objective assessment of the condition of Rwanda's infrastructure sectors and of the institutional and policy frameworks associated with them. Although the government has achieved much, it recognizes fully the room that exists for improvement. The CFR is not a sales prospectus for Rwanda's infrastructure. It is, however, intended to provide a clear route map for infrastructure sector reform and to highlight both the opportunities that exist for the private sector and the role that the donor community can play in helping the government realize its priorities in infrastructure.

The remainder of this executive summary highlights the main themes that have emerged from the CFR exercise for each infrastructure sector and then summarizes the core cross-cutting issues that have been identified. It concludes by outlining the main CFR recommendations.

Summary of the Sector Reviews

Transport

As a landlocked country with mountainous terrain, Rwanda faces unusually difficult problems in relation to both national and international transportation.

Inadequacies in its transport infrastructure impose significant additional costs on the country's economy and represent a serious impediment to improving per capita incomes. Because of such inadequacies, the poorest rural communities face considerable problems gaining access to markets for their produce. Inferior transport infrastructure—particularly, the inadequate rural roads—also affects the ability of the poor to gain access to key services, such as health and education, and represents a serious obstacle to alleviating poverty. Moreover, deficiencies in Rwanda's transport systems spill over into the other infrastructure sectors, adding to maintenance costs and reducing the quality of service.

Roads Overall responsibility for road policy rests with the Directorate of Roads, which is part of the Ministry of Infrastructure. Under the government's decentralization policy, responsibility for maintaining the unpaved national road and communal road network is, however, being transferred from the central government to the provincial governments. Maintenance of paved roads is now carried out by the private sector. The government's policy for the road subsector has not yet been fully articulated, but its core goals are clear. Their central thrust is (a) to enhance Rwanda's integration into the regional economy by improving the condition—and subsequently the extent—of the country's national road system, and (b) to improve the availability and quality of local road infrastructure in order to promote rural development by providing better access to markets. The promotion of PSP in road rehabilitation, maintenance, and development is a central objective in pursuit of these goals.

The condition of the whole road network has deteriorated substantially in the past decade, resulting in a significant cost to the economy. As far as can be ascertained, the condition of bridges, viaducts, and culverts mirrors that of the roads of which they form a part. Vehicle operating costs in Rwanda are high, as a direct consequence of the poor condition of the roads, and access to both product markets and essential public services is impaired, especially in poor rural areas.

There are significant opportunities for PSP in the road rehabilitation, maintenance, and development program. Initially, a significant proportion of this activity will be passed to the private sector through 5- or 10-year concession contracts. Attracting foreign contractors is likely to be a first priority, but after taking steps to help build local capacity, the program should also provide a real opportunity for the involvement of Rwandan businesses.

Although significant PSP opportunities exist, important issues must be addressed if these opportunities are to come to fruition. The Roads Maintenance Fund (RMF) is at present underfunded, there is a lack of clear prioritization of roads, and the institutional capacity to manage a contract program is wanting. Furthermore, a direct consequence of the current decentralization policy is likely to be that overall maintenance of unpaved roads—and its quality—will become very difficult to control.

Airports Overall responsibility for the airport subsector rests with the Ministry of Infrastructure. The state-owned Airports Authority carries out both planning and management. There are two airports and five airfields in Rwanda, including one international airport, Kanombe Airport at Kigali. The government's policy objectives are to promote regional integration, to establish Kanombe as a regional hub, and to promote the development of air transport.

Traffic at Kanombe is significantly below the capacity of the airport. Kanombe is currently served by only one European airline, four African airlines, and one local airline. As with road transport, the cost of air transport is high owing to the lack of competition and the small size of the market.

There seems little potential for significant PSP in the airport subsector in the short term. A number of options should be considered in the medium term, including contracting airport management out to the private sector or privatizing the Airports Authority itself, if the economy develops and passenger numbers grow. In the short term, it may also be possible to introduce PSP options on a smaller scale—for example, contracting airport car parking out to the local private sector.

The question of whether there is a need to develop a second runway at Kanombe has also been raised. While a second runway would clearly raise capacity at the airport, the question of whether the associated expenditure would be justified depends on expected future air traffic. Seeking to develop this project as a

PSP scheme would be one way to test the market view of the risk that future airport revenue might not adequately remunerate such an investment. A similar approach might be adopted at Kibuye, where it has been argued that an improved strip is needed to promote tourist traffic.

Careful design would be necessary to ensure that private investors would be remunerated on a basis that reflects any future traffic growth that is achieved. Again, the willingness of the private sector to become involved in such a scheme would provide a clear test of the market's view concerning achievable growth in tourist traffic at Kibuye.

Rail Rwanda is currently not served by any railway system. The government's key policy objective for rail is to investigate the feasibility of establishing a railway to connect to the ports of Dar es Salaam or Mombasa through one of the other regional railway systems, with the aim of reducing costs for the transport of goods in bulk. The government is also keen to consider the possibility of establishing a southern transport corridor linking the countries of the Great Lakes region with South Africa, as part of the Great Lakes Railway Project. The main concern, however, relates to traffic potential. There is significant uncertainty about whether what would be a large investment could be justified given the current and projected volume of Rwanda's exports and imports.

Water Transport Although the water transport subsector is currently very limited in extent, there are potential opportunities for PSP in the further development of water transport on Lake Kivu. A serious constraint is the current absence of any boatyard facilities for construction or maintenance on the Rwandan shore of the lake.

Energy

Energy sector policy is the responsibility of the Department of Energy, within the Ministry of Infrastructure. The provision of electricity (and water) in the urban districts of Rwanda is the responsibility of Electrogaz (ELG), a parastatal organization. Microgeneration and small regional networks may be owned and operated at the community level. The Department of Promotion and Exploitation of Methane Gas from Lake Kivu (Unité de Promotion et d'Exploitation du Gaz du Lac Kivu, or UPEG) is responsible for developing the methane resource at Lake Kivu, which—if managed appropriately—represents a natural resource of enormous potential value to Rwanda and its long-term development.

The government of Rwanda has not prepared and published a single, comprehensive, and coordinated policy statement and program for the energy sector, although it has prepared a general strategy for the reform and development of the sector. The early advancement of such a policy statement is of great importance in helping shape the future development of the sector and in providing a clear framework within which PSP can flourish. The focus of the government's energy policy is to promote activities that will increase access to electricity and provide a quality and cost-effective service while simultaneously ensuring the financial viability of economic agents engaged in providing energy services and protecting the environment. The government plans to implement a range of policy measures to achieve this objective. These measures include promoting competition and PSP in the sector through regulatory change and the transfer of management responsibility for ELG to a private operator under a management contract. The government also plans to promote rural electrification, in terms of both network extension into rural areas and local power generation.

Approximately 4 percent of the population within ELG's urban area of operation is estimated to be connected to the network, an exceptionally low level of coverage. Rwanda's electricity generation portfolio is dominated by one hydroelectric plant, making it vulnerable to both climatic and environmental fluctuations. More than half of Rwanda's electricity needs are met through imports or through the purchase of Burundi's share of the output of the Sinelac operation (owned in equal shares by Burundi, the Democratic Republic of Congo, and Rwanda). Rwanda suffers from a deficit in generation capacity, which is exacerbated by poor standards of maintenance. Deficiencies in the transmission and distribution systems combine to undermine the quality and reliability of supply. Both technical and commercial system losses are high.

Operational assets in the gas subsector are currently limited to a single, small-scale, methane gas extraction facility on Lake Kivu.

There are a number of major opportunities for PSP in the energy sector. If the ELG management contract is successful in meeting its objectives, it should be possible to establish more extensive forms of PSP in urban electricity, which would involve a significant funding commitment by the private sector. Issuing a concession for a methane gas extraction plant at Lake Kivu and an associated generation facility offers the prospect of filling the urgent need for additional power generation capacity and represents another key opportunity. PSP will certainly be required—in combination with external subsidies from the government or the donor community—if a far-reaching rural electrification program is going to be implemented.

Key to the success of these potential opportunities will be the development of a clear policy framework for the energy sector setting out, among other things, the government's objectives and the structural and operational evolution that it intends and the competitive model that it will adopt (covering both electricity and gas). Also critical to success will be the introduction of new sector laws to provide an enabling framework for the execution of this policy and the introduction of effective regulatory arrangements, rules, and mechanisms. The success of the ELG management contract and the effectiveness of its performance will be of central importance too. It is vital that the function, responsibility, and jurisdiction of the Multisector Regulatory Agency—as far as energy sector operation is concerned—be specified as soon as possible. Great care will need to be exercised in negotiating and executing an agreement to develop the methane gas resource for power generation purposes: the terms of this agreement will affect the potential for competition and PSP in the energy sector for many years. A rural electrification plan—together with measures to promote small-scale, local private sector and community involvement in electricity supply—is also a key priority.

Water and Sanitation

Overall policy responsibility for water supply, sanitation, and water resource management resides with the Ministry of Infrastructure, in the Department of Water and Sanitation. Operational responsibility for the water supply belongs to ELG in urban areas and to the districts in rural areas. Responsibility for sanitation services resides at the district level in both urban and rural areas, although in practice almost no service is actually provided.

Overall access to potable water in Rwanda is poor by African standards. The great majority of the population in both rural and urban areas is served through one form or another of communal facility; individual connections are uncommon. Sanitation services are almost entirely self-provided and are agreed to be of a generally poor standard. As recognized both in the United Nations Millennium Declaration and at the 2002 Johannesburg summit, improvement in the provision of adequate water supply and sanitation services has a more direct effect on human health and welfare than improvement in any other infrastructure service. Although the direct effect of water and sanitation services on economic growth may be more limited than that of other infrastructure sectors, they contribute directly to the well-being of the poorest in society.

The government's core policy objectives for the water supply and sanitation sector are to improve the provision of water, extend the water supply network, and increase access to sanitation services, using means that promote technically and financially viable projects based on strong community participation, as well as to strengthen capacity at both the central government and the district levels. These policy objectives and the specific means to achieve them are, however, not currently set out in any formal policy statement, although a water supply policy document is being prepared.

ELG's technical and commercial performance has been weak, with high levels of both physical and administrative losses, in part reflecting the considerable resource problems that the company faces and the legacy of the events of 1994. A key aim of the ELG management contract is to address those performance weaknesses. The available evidence suggests that the price that Rwandans pay for their water is unusually high by regional standards, despite the generally poor level of service that they receive.

The way in which Rwanda manages its water resources has critical implications for water supply and for sanitation and vice versa. The government recognizes that serious issues must be addressed. Kigali suffers from very difficult water resource problems that can in part be attributed to serious deterioration in the quality of raw water resources. A clear policy

framework to address water resource management issues is in place but is not being implemented.

There are substantial opportunities for PSP in the water supply sector. They include (a) establishing new water sources to meet the current water supply deficit in Kigali, (b) deepening the extent of private involvement in Electrogaz (as discussed in relation to the energy sector), (c) promoting the development of networked rural service through complementary low-cost networks, (d) introducing arrangements to promote demand-led private participation in rural water supply, and (e) enhancing the role of urban standpipe operators, with the aim of improving their livelihoods and reducing urban water prices. A significant feature of a number of these opportunities is the extensive scope that they provide for—indeed, their reliance on—community participation and the involvement of locally based small businesses and entrepreneurs.

Telecommunications

Telecommunications development, which is the policy responsibility of the Department of Communications within the Ministry of Infrastructure, plays a central role in the government's vision of economic development in Rwanda—a vision in which information and communication technology (ICT) takes the lead. Unless there is rapid and sustained expansion of Rwanda's telephone network, which is currently one of the least extensive in Africa, it is clear that this vision will be impossible to realize. Privatization and liberalization of telecommunications have been shown—in numerous countries at a variety of stages of economic development—to represent the core requirement in galvanizing rapid increases in access to modern telephony services and in making quick improvements to the range and quality of services offered to consumers.

There is currently one parastatal fixed-line operator, Rwandatel, and one major mobile operator, Rwandacell, which is jointly owned by Rwandatel, Mobile Telephone Networks (MTN), and a local investment vehicle. The government has embarked on a strategy to open the sector fully to competition, to unwind Rwandatel's cross-holding in Rwandacell, and to sell a majority stake in Rwandatel, which is wholly owned by the government, to a strategic investor. Some key elements of the regulatory framework that will be needed if these policies are to be successful remain to be finalized.

Rwandatel's performance has been poor across a wide range of service attributes. The legacy of 1994 had a particularly deleterious effect on the company's performance. Compared with other African telecommunications service providers, Rwandatel's market penetration is exceptionally low, with only 0.27 fixed lines installed per 100 people, although this deficit is balanced somewhat by the extent of connection to the mobile network. The overall teledensity of 1.1 in 2001 is, nevertheless, low by regional standards.

With successful restructuring and liberalization, there will be significant opportunities for PSP in Rwanda's telecommunications sector, both through investment in Rwandatel and through new entry to the market. For these opportunities to materialize, however, it is critical that an effective and fair regulatory framework be established as soon as practicably possible, in particular covering interconnection and licensing arrangements. Unless an open and fair competition regime is established quickly, Rwandatel can be expected to continue to underperform—with or without PSP—and private operators and capital will not be drawn into the sector through the entry of new competitors.

There are further opportunities for PSP in ICT, particularly in the context of Rwanda's strategy of ICT-led development. Most of these opportunities are relatively small in scale and particularly well suited to exploitation by the country's indigenous businesses.

Cross-Cutting Issues

Some of the most important constraints on the development of Rwanda's infrastructure—and, in particular, on the exploitation of PSP to improve infrastructure services—are not specific to individual infrastructure sectors but act across a range of sectors. They may also have an important affect on private sector development in the wider economy. These cross-cutting issues are summarized below:

- *Institutional capacity*. Insufficient institutional capacity in government and parastatal organizations is a constraint that is commonly encountered in developing countries. In Rwanda, however, capacity weaknesses in both the government and the parastatals have been significantly exacerbated by the impact of the genocide. Within the government,

Table ES.1 Sector-Specific Opportunities

Sector	Opportunity	Main project	Supporting policies and actions
First-priority recommendations			
Energy	Exploit potential of Lake Kivu gas to meet electricity generation needs.	Proceed with Lake Kivu gas concession agreement.	Make project structure and agreements consistent with long-term energy policy framework and new sector laws (for example, regarding future energy sector reform). Ensure required experience and expertise is engaged to conclude an agreement that will be attractive to banks and that will achieve full value for Rwanda.
Transport	Attract private sector participation in road rehabilitation and maintenance.	Move all rehabilitation and maintenance contracts to a 10-year concession basis.	Return control of maintenance to Directorate of Roads of the Ministry of Infrastructure. Prioritize roads in order of their importance to the economy. Prepare a fully costed 10-year road rehabilitation and maintenance plan. Enforce axle-load restrictions. Consider penalties for vehicle-caused environmental damage. Strengthen law to protect and enforce rights of way. Immediately increase all Roads Maintenance Fund charges and improve collection procedures. Consider establishing Directorate of Roads as an independent roads agency. Agree with donors on a financing plan for road rehabilitation plan.
Other priority recommendations			
Energy	Promote partnerships in provision of rural electricity service to harness combined potential of government and donor funding with local private sector, community, and nongovernmental organizations (NGOs).	Conduct feasibility study of flexible, demand-led funding approach to rural electricity supply, with competitive bidding for capital subsidies from a rural electricity supply fund.	Establish close cooperation with donors and with both national and international NGOs. Ensure that ELG is able to participate in the provision of rural electricity services and able to obtain capital subsidy where efficient and effective. Structure rural energy with measurable objectives, clear funding policy, and prioritized action plan.
Transport	Exploit potential for PSP in development of water transportation on Lake Kivu.	Update and reconsider 1985 study.	Update 1986 boatyard study.
Water and sanitation	Promote partnership arrangements in provision of rural water services to harness combined potential of government and donor funding with local private sector, community, and NGOs.	Conduct feasibility study of flexible, demand-led funding approach to rural water supply, with competitive bidding for capital subsidies from a rural water supply fund.	Establish close cooperation with donors and with both national and international NGOs. Ensure that ELG is able to participate in the provision of rural water services and able to obtain capital subsidy where efficient and effective.
	Address Kigali water supply problems through PSP scheme to develop Ruhengeri-Kigali long-distance pipeline.	Conduct full feasibility study and financial appraisal, including review of appropriate PSP model.	Carry out environmental impact assessment.

Table ES.2 Cross-Cutting Constraints

Category	Constraint	Main action	Supporting policies and actions
First-priority issues and recommendations			
Local financial markets	Availability of microfinance facilities	Support provision of additional microfinance facilities through local banks.	
	Lack of a medium- and long-term debt market	Encourage and support local banks in providing medium- and long-term bank debt and financing for company start-ups.	
Legal framework	Insufficient security of tenure over land acquired by investors for the purposes of PSP schemes	Amend land law.	
	Conflict between certain provisions of company legislation and privatization requirements	Review company (and concession) law to ensure private sector investor can protect its ability to manage its investment.	
	General provisions for dispute resolution that are unlikely to be acceptable for outside investors	Amend 1998 statutory disputes resolution methods to accord with international practices, including measures to improve transparency.	
	Laws that are not fully accessible to international investors	Make all laws relevant to the privatization process available in official translations into English.	
Regulatory framework	Risks that demands on Multisector Regulatory Agency (MSR) will exceed capacity in the near term.	Procure technical assistance for MSR department heads with measurable targets for knowledge transfer.	
	Lack of MSR institutional independence from government	Review composition and appointment of Regulatory Board.	Establish predominance of independent members.
	MSR internal governance arrangements that impede efficient, timely decisionmaking	Amend the Regulatory Law to make Regulatory Board role supervisory and transfer executive authority to MSR managing director.	Adopt open and transparent public selection procedures (for example, through public selection committee).
	Inadequate arrangements for appeal against regulator decisions	Evaluate and implement effective institutional and procedural arrangements for appeal against regulatory decisions.	
Tax system	Overaggressive taxation procedures	Abandon confrontational approach currently adopted by tax authorities.	
	Weak incentives, by international standards	Align tax incentives with regional practice.	Consider a tax holiday for investors of five years from start of operations. Increase carryforward period for tax losses to five years.
Accounting system	No national accounting standards system and lack of confidence of lending institutions in corporate accounting information	Introduce reforms of accounting standards and procedures.	Establish international accounting standards. Allow only qualified accountants to audit accounts.
Other priority issues and recommendations			
Local financial markets	Lack of opportunities for raising private equity	Government, with donor assistance, should consider establishing a small informal equity trading market.	
	Inadequate local bank expertise, knowledge, and experience in project finance techniques	Set up technical assistance and training programs to train bank staff in medium- and long-term lending, project finance techniques, and provision of financing for start-up companies.	

Table ES.2 ***(Continued)***

Category	Constraint	Main action	Supporting policies and actions
Legal framework	Absence of laws dealing specifically with concession contracts; build, operate, and transfer arrangements; and so forth.	Consider upgrading existing laws on concession contracts.	
	Unduly restrictive privatization law with respect to PSP schemes not involving sale of assets	Amend Privatization Law.	
Tax system	Cumbersome and slow importation procedures	Revise importation procedures.	
Environmental issues	Environmental policy, law, and practice that fall short of best practices for developing countries	Clarify government environmental policies and update National Environmental Action Plan.	
		Update and improve framework legislation, and eliminate duplication with other draft laws.	
		Use environmental impact assessments as key tools to identify and mitigate impacts arising from specific forms of infrastructure development.	
		Introduce range of reforms to improve treatment and handling of liquid and solid wastes.	
Other issues and recommendations			
Bid evaluation process	Slow and unwieldy procedures for evaluating bids	Review current system and speed up procedures to remove unnecessary delays and reduce project costs.	
Project selection, prioritization, and planning	Possibility of misuse of current system	Review current procedure to ascertain whether additional checks are necessary, ensure that procedure is not misused, and see that the right balance is maintained between needs and resources.	
Policy communication	Weaknesses in communication with general public and with parastatals	Introduce reforms to improve government communications.	Consider single-agency responsibility for publicizing policy for private participation in infrastructure.
			Improve communication between ministries and parastatals through allocation and clarification of responsibilities.

capacity constraints are also magnified in the immediate term by the effects of the country's decentralization policies.

- *Local financial markets*. Constraints arise in relation to, among other things, the lack of local markets to raise both equity and medium- and long-term bank debt, the lack of sufficient local microfinance facilities, and the lack of banking staff capability in relation to project financing.
- *Regulation*. Cross-cutting issues arise in connection with the urgent short-term need to build regulatory capacity, the lack of independence of the Multisector Regulatory Agency, and the inadequate arrangements for appeals against the regulator's decisions.
- *Accounting system*. Cross-cutting constraints on Rwanda's accounting system include the lack of a national accounting standards system, the lack of confidence among lending institutions in corporate accounting information provided to support loan requests, and problems with tax payments arising from Revenue Authority disputes of corporate tax and profit calculations.

- *Taxation system*. Cross-cutting issues include overaggressive taxation procedures and weak tax incentives, by international standards.
- *Legal system*. Issues include insufficient security of tenure for investors over land acquired in PSP schemes; conflicts between provisions in the company legislation and privatization requirements; need for amendment of dispute resolution provisions; weak sector law in the telecommunications, water and sanitation, and road sectors; and inaccessibility of key laws to international investors.
- *Bid evaluation process*. Procedures for evaluating bids are slow and unwieldy.
- *Project selection, prioritization, and planning*. The design of the current system may allow it to be misused.
- *Government policy communication with the general public*. Weaknesses exist in communication with the general public and with parastatals.
- *Environmental issues*. Environmental policy, law, and practice fall short of best practices for developing countries.

Prioritized Recommendations

Table ES.1 summarizes, by priority, the main sector-specific PSP opportunities identified in the course of the CFR exercise. It identifies projects and supporting policies or actions required in order to exploit those opportunities. Table ES.2 sets out cross-cutting constraints that have been noted and, again, identifies the range of actions necessary to address these constraints.

1 Introduction: Policies, Objectives, and the Role of the Private Sector

This Country Framework Report (CFR), prepared by the government of Rwanda with the support of the World Bank and the Public-Private Infrastructure Advisory Facility (PPIAF), is an infrastructure policy assessment and a review of the potential for private sector participation (PSP) in providing public infrastructure services. It presents a balanced assessment of the current state of the country's infrastructure, policies, and policy reform, together with practical recommendations to implement and achieve government objectives for infrastructure rehabilitation and development with the participation of the private sector. The CFR is intended to provide a key roadmap to assist both public and potential private sector participants in Rwanda's infrastructure development.

Background

The transition from conflict and emergency to sustainable development and growth is now under way. The economy is recovering to the 1990 prewar level, although there has been a slowdown over the past two or three years. The government has adopted a number of long-term perspectives for the development of the country, which are set out in its development agenda, Vision 2020. This vision centers on critical policy strategies that are designed to generate high levels of growth and rapid poverty reduction. Vision 2020 is the government's mission statement and ultimate national goal. It represents a broad, long-term view of the desired economic position of the country to be reached by 2020. These are the six key criteria for Vision 2020:

- Strengthening and maintaining good governance
- Transforming the agricultural sector into a high-value and high-productivity sector
- Developing human resources
- Developing a knowledge-based service sector with emphasis on information, communication, and technology
- Reducing risks and costs of doing business by establishing an enabling environment and developing the requisite infrastructure
- Promoting the entrepreneurial class and regional integration.

The government realizes that it does not on its own—even with the considerable assistance of the donor community—have the resources to implement Vision 2020. It has, therefore, embarked on a strategy to encourage the involvement of the private sector on a public-private partnership basis, to implement Vision 2020. Measures have already been taken. Structural reforms have focused on opening up the economy and enhancing the economic and regulatory environment for private sector activity. To promote private sector development, the government of Rwanda has simplified business licensing requirements, revised the labor code, and established the Rwanda Investment Promotion Agency to facilitate investment and business development. In 2000, the government-controlled Chamber of Commerce was replaced by an independent Private Sector Federation, which represents private sector

interests in its dialogue with the government. Much still remains to be done, but the government has made a good start.

The status of Rwanda's infrastructure is the consequence of the civil war and the genocide in 1994, which destroyed major economic sectors, particularly the infrastructure sectors. With the support of the donor community, some infrastructure has been rehabilitated during the past 10 years, but much remains to be repaired. In addition, the infrastructure has not been sufficiently maintained, and the quality of the country's infrastructure has declined in the past few years. Poor infrastructure constitutes a major barrier to the country's economic activity, reduces competitiveness of exports, and discourages investment.

The country's poor infrastructure also significantly impedes the government's central policy objectives of reducing poverty and improving social welfare. This is especially true in the rural community. As stated above, the government does not have sufficient resources to address the inadequacies of its national infrastructure. The government has therefore recognized that Rwanda, like many other developing countries, must harness the resources and skills of private sector infrastructure service providers and operators if it is to successfully meet the challenge of transforming its infrastructure and realizing the goals of Vision 2020.

Successfully involving the private sector in the construction, maintenance, expansion, life-cycle replacement, and improvement of infrastructure confronts developing countries like Rwanda with the need to achieve fundamental change in the financial, regulatory, and operating environments within which the infrastructure sector functions. Because of a longstanding tradition of public sector provision, operation, and financing of core infrastructure services, the institutional and legal frameworks of developing countries like Rwanda are generally not well adapted to the needs and priorities of the private sector. Furthermore, administrative, managerial, and resource capacities constrain the ability of the public sector to handle the change to PSP in providing infrastructure services.

With these facts in mind, the government approached the World Bank and PPIAF for assistance. The PPIAF recommended the preparation of a CFR on Rwanda's infrastructure to provide a roadmap of how the government and the people of Rwanda can, together with the private sector, best rehabilitate, maintain, and develop the country's infrastructure.

In addition to this CFR, the World Bank is also currently assisting Rwanda with three infrastructure projects: the Energy Sector Rehabilitation and Urban Waste Management Project, the Transport Sector Policy, and the Rural Water Supply and Sanitation Project.

Objectives and Scope of the Country Framework Report

A central purpose of this CFR is to set out guidelines for implementing the government's objectives and policies. The CFR will specifically look at the following areas:

- Identify where infrastructure development or improvement can contribute most effectively to furthering the wider government economic policy objectives, including poverty reduction.
- Ascertain where and how the private sector can most fruitfully be involved in providing infrastructure services.
- Develop practical policies to attract the private sector to participate in providing infrastructure services.
- Identify significant obstacles to attracting and retaining PSP in providing infrastructure services.
- Review the provision of infrastructure services to the poorer members of society and find ways of improving these services.
- Review the involvement of small- and medium-size enterprises in the delivery of infrastructure services and investigate ways of increasing this involvement.
- Target the lending support of the World Bank and donor agencies to meet agreed objectives in the short-, medium-, and long-term improvement and development of infrastructure, which are essential to the economic development and poverty reduction in Rwanda.

The CFR is organized as follows. The present chapter sets out the government's overall objectives—the key policy content for this report—and the general infrastructure sector policies that fit within the overall objectives. It also provides information about the investment climate in Rwanda. Chapters 2 through 6 analyze each infrastructure sector, highlighting each sector's

current performance and key issues. Chapter 7 analyzes cross-cutting issues that arise across all infrastructure sectors and that can have wide-ranging effects on PSP. The appendixes provide additional information for clarifying and detailing matters, such as contacts made during the course of the CFR exercise and the membership of the working group. Specific appendixes are also devoted to more detailed discussions of environmental and legal issues.

Principles of Private Sector Participation

The government, supported by the World Bank and PPIAF, has adopted a policy to encourage the private sector, both local and foreign, to participate in the rehabilitation, maintenance, and construction of the country's infrastructure, as well as in the provision of public infrastructure services. The targeted sectors are transportation, energy, water and sanitation, and telecommunications. In addition, the government seeks the support of the donor community in its policy of restoring the country's infrastructure to an acceptable level on a coordinated basis instead of through the uncoordinated programs of the past.

To implement such a policy requires an understanding of what motivates the private sector and private investors in infrastructure projects. In relation to international investment, it is important to consider the policies and institutional arrangements needed to differentiate Rwanda from other developing countries facing similar problems. First, in seeking to promote international PSP in infrastructure, Rwanda is competing in what is effectively a worldwide market. Second, the private sector and private investors require a stable political and economic environment. Third, the private sector and its investors will seek to earn a profit margin or investment return commensurate with the risks they consider they will be taking.

Consideration of the potential for PSP in Rwanda's infrastructure should not, however, be restricted to the scope of international investment in larger-scale projects. Especially in relation to rural infrastructure and to the improvement of core services (and poverty reduction) for the 80 percent or more of Rwandans who live in rural communities, the development of policies and programs to promote small-scale indigenous PSP is likely to be of equal importance.

International Investment

A worldwide market and a stable environment mean that the private sector will only participate if it can earn an acceptable return for the risks it is taking; if it can manage the work with a lack of political interference, provided that it obeys the laws of the country in which it is operating; and if the country offers attractive opportunities to do business and invest. The country must have an acceptable commercial law environment, an acceptable tax system, and an acceptable system for foreign service providers and investors to transfer their profits and dividends and any net disposal of their investment to their home countries within a reasonable time frame. Profit margins will vary from project to project, depending on a number of factors, and will need to be negotiated as part of the pricing for any particular project. Regarding investment returns, a rough guide is that investors in developing countries seek returns in their own countries between 12 to 14 percent per year before taxes. Although during the current worldwide recession not many investors are achieving those returns, nevertheless they remain the target. For a project in a developing country, the required return would increase to a minimum of 18 to 20 percent per year before taxes, assuming that the overall tax rate is no more than that normally payable in their own country, which is usually between 30 and 40 percent. Such a return would normally require a double tax agreement to be in place between Rwanda and the home country of the service provider or investor. In all other circumstances, the investment return would have to be higher to mitigate the different tax rates.

International private sector investors and operators also usually want to insure against political risk. There are several options for doing so. One is to use the World Bank's political risk guarantee facility, available through its Project Finance and Guarantee Group and supported by the government of Rwanda. Another option for investors is to use the facilities offered by the Multilateral Investment Guarantee Agency, which is part of the World Bank Group. Some national export credit agencies also offer investment insurance including political risk to resident corporations. Finally, there is investment insurance available by way of the international insurance market through centers such as Lloyds of London, although this insurance is often short term

Table 1.1 Foreign Direct Investment in Rwanda

Year	Amount (US$)
1979	13,000,000
1989	16,000,000
1998	7,000,000
1999	2,000,000
2000	8,000,000
2001	5,000,000
2002	5,000,000

Source: World Bank 2003.

only. The World Bank has recently assisted in establishing the African Trade Insurance Agency, which is based in Nairobi, to provide insurance services to aid the development of regional trade.

Foreign direct investment figures for Rwanda since 1979, shown in table 1.1, are useful as a benchmark to assess future progress. Rwanda has yet to achieve prewar levels of investment.

Local Investment

Local private sector investors that benefit from more intimate knowledge of local markets and customs are better able to protect themselves from some of the risks faced by the international community. These investors will often be prepared to become involved in PSP schemes that international investors would not contemplate. Local businesses, however, are also limited in their ability to participate in such schemes because of their lack of technical expertise, particularly in relation to the completion of larger and more complex projects, and because of their lack of access to financing, even at the microlevel necessary to implement extremely small-scale and localized projects.

Aid and Pro-Poor Private Sector Participation

If PSP is to be genuinely pro-poor, it may be necessary to provide subsidies to ensure that the financial burden of serving the needs of the least well-off customers—and the risks that are associated with such groups—do not deter private sector involvement. In some cases, it may be possible to ensure that the poorest citizens are able to afford a basic level of service by applying tariff structures that incorporate a significant element of cross-subsidy from high-volume users of a particular service to those who use it in relatively small quantities. There are well-recognized drawbacks with such an approach, however. Disproportionately high charges to large users—particularly to business and industrial customers—may deter them from, for instance, using water in productive ways that would otherwise have promoted economic development. Moreover, a tariff system that forces an operator to serve the least well-off on a loss-making basis while adding to the profitability of serving the better-off will inevitably create incentives for the operator to focus its attention on the rich while ignoring the poor. Despite these potential drawbacks, some element of cross-subsidy in tariffs is generally acceptable as long as it is kept to relatively modest levels.

An external subsidy for operating and maintenance costs is widely regarded as inconsistent with efficient and sustainable provision of service. The private sector generally perceives that a high level of risk is associated with external subsidy because of the possibility that support will be withdrawn in the future. Therefore, relying on an external operating subsidy is also likely to discourage private operators from taking part in PSP schemes.

The case for up-front capital subsidies, where necessary, is much stronger. Capital subsidies may enable the extension of service to poorer groups that cannot afford the full costs of connection but are able to pay tariffs that cover operating and maintenance costs. The private sector is likely to be less concerned about a subsidy that is committed up front or at least over a relatively short initial period of the project. In addition, the ability of customers to pay tariffs that cover operating expenses is consistent with long-term sustainability of providing services. Until recently, the principal means of providing capital subsidies have been through cofinancing of concession arrangements. Under this approach, one or more international lending agencies, usually through the host government or a parastatal agency, will provide a package of grant or soft-loan financing to the project company. The company will then apply the grant or loan, alongside funds provided by its parents or shareholders and the commercial banks, toward capital projects that serve both poor and relatively wealthy customers.

The main drawback associated with cofinancing is the weak incentives for the operator to actually achieve

the level of performance—for example, utility connections to poor households—that underlies the financial aid provided. Alternative forms of support that involve the disbursement of subsidized financing only as and when there is tangible achievement against measurable targets are currently being seen as a preferable alternative. This performance-related approach to the provision of aid funding is generally termed output-based aid (OBA). OBA can be applied in a wide variety of ways, though it is not appropriate to examine this subject further in this report. This said, the use of OBA to provide clear incentives to private operators to serve poorer communities should have important applicability in Rwanda. Its use should be an important consideration in relation to many of the potential PSP schemes identified in the CFR and may contribute to efficiency of provision as well as promote a reduction in poverty.

2 The Transport Sector

As a landlocked country with mountainous terrain, Rwanda faces unusually difficult problems in relation to both national and international transportation. Inadequacies in its transport infrastructure impose significant additional costs on the country's economy and represent a serious impediment to improving per capita incomes. Because of such inadequacies, the poorest rural communities face considerable problems gaining access to markets for their produce. Inferior transport infrastructure—particularly the inadequate rural roads—also affects the ability of the poor to gain access to key services, such as health and education, and represents a serious obstacle to alleviating poverty. Moreover, deficiencies in Rwanda's transport systems spill over into the other infrastructure sectors, adding to maintenance costs and reducing the quality of service.

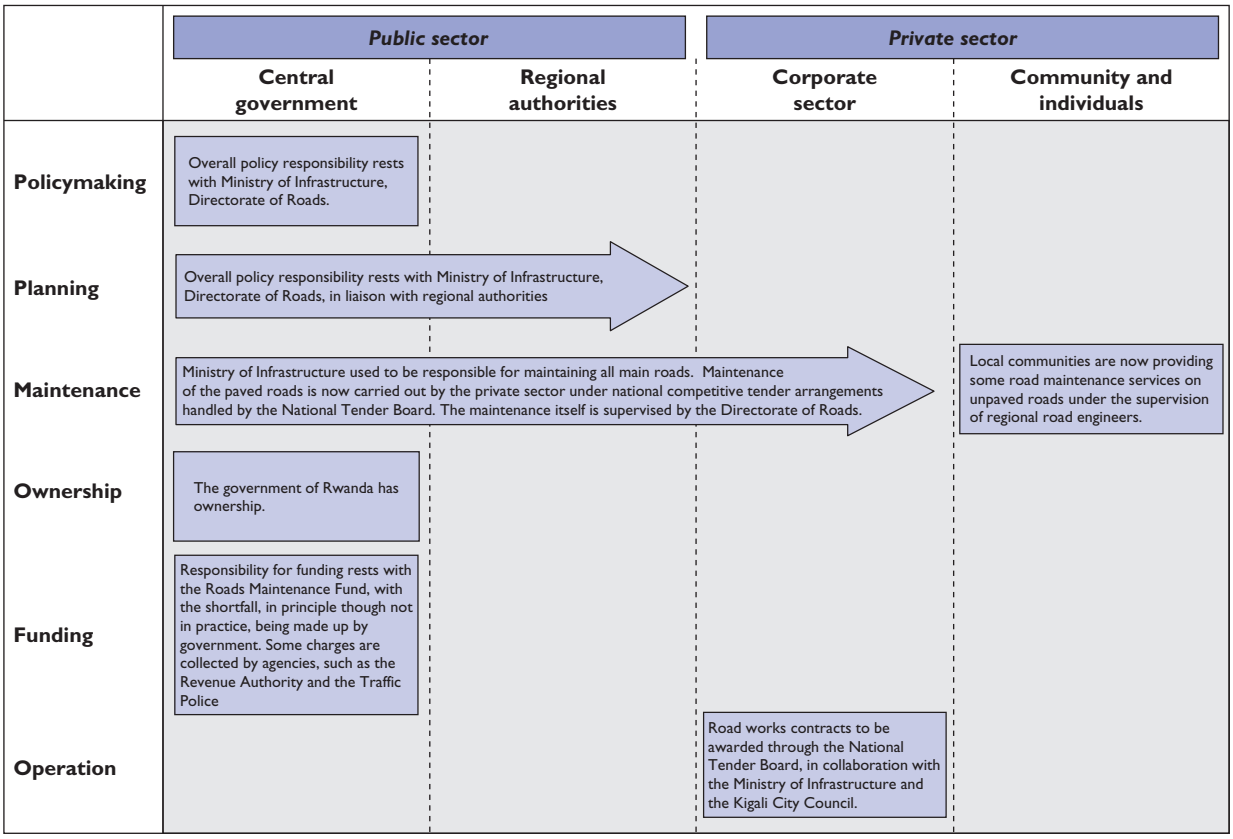
This chapter first considers the current organization and performance of the road subsector and sets out recommendations concerning how the subsector might be improved, with particular reference to the role of private sector participation (PSP) in this process. It then addresses the airport subsector, before examining the key issues raised in connection with the potential development of a railway infrastructure in Rwanda and the manner in which a railway development project might best proceed. The chapter concludes by considering the potential to develop water transport, with particular reference to Lake Kivu.

Roads

Overall responsibility for roads policy rests with the Directorate of Roads within the Transport Department of the Ministry of Infrastructure. Until recently, the Roads Department, which was part of the Ministry of Infrastructure (and formerly was part of the Ministry of Transport, Public Works, and Communications), held direct responsibility for maintaining all main roads and, it is understood, possessed the necessary equipment to carry out this task.[1] Under the government's decentralization policy, responsibility for maintaining the unpaved national road and communal road network management is, however, being transferred from central government to the provincial governments. Maintenance of paved roads is now carried out by the private sector under national competitive tender arrangements administered by the National Tender Board, with supervision of road maintenance works carried out by the private sector. Local communities undertake simple paved road maintenance activities, such as clearing verges and drains, under the supervision of the Directorate of Roads.

The entire road network is state owned. Funding for road maintenance is provided through the Roads Maintenance Fund (RMF), which was established as a road fund about 12 years ago but was made an independent body in 1996. Income to the fund is derived variously from a charge on fuel, a toll on foreign vehicles, an axle-load charge, penalties for vehicle

Figure 2.1 | **Roads: Roles and Responsibilities**



Source: Adam Smith Institute research.

overloading, and road damage compensation, plus, in principle, a government contribution.

The overall allocation of roles and responsibilities within the roads sector is summarized in figure 2.1.

Policymaking, Planning, and Regulation

Although the overall policy framework in transport is currently under review, it is understood that these are the government's policy objectives with respect to road transportation:

- To enhance Rwanda's integration into the regional economy and to make Rwanda a regional trade and transit center
- To focus transport sector investment on expanding and improving Rwanda's infrastructure, protecting existing capital investments, and improving road safety
- To institute a policy framework for the accelerated development of the road subsector
- To have road works contracts awarded through the National Tender Board, in collaboration with the Ministry of Infrastructure and the Kigali City Council
- To finance road maintenance works through the RMF, which is funded through the budget, a direct levy on fuel, a cross-border charge, and various penalty charges
- To encourage community participation in road maintenance through the district development committees
- To improve the availability and quality of local road infrastructure, thereby enabling the rural community to market its crops
- To create an environment conducive to the encouragement of PSP in rehabilitating, maintaining, and developing roads infrastructure.

A number of measures have been taken or are being introduced to implement these policy

objectives, including the following:

- The RMF has been established to finance road maintenance and to strengthen the Directorate of Roads. The incorporation of the Directorate into the new Ministry of Infrastructure is also expected to add to the department's strength.
- Road works contracts are awarded through the National Tender Board.
- In line with Rwanda's broader decentralization policy, responsibility for maintaining both the unpaved main roads and the unpaved rural road network is now being moved to the provinces and is being carried out by the local communities. Supervisory responsibility is to rest with the regional road engineers of the former Roads Department, who are being transferred to the various provincial governments.

Condition and Performance of the Road Subsector

This section sets out available information on the extent, condition, and performance of road assets. In addition to information provided directly by the Ministry of Infrastructure, which is used as the base data for this Country Framework Report (CFR), the principal sources used were Scetauroute's report on roads prepared for the European Union (EU) in January 2002 and relevant sections of the report titled "The Rwandan Economy: A Strategy for Investment," which was prepared for the Rwanda Investment Promotion Agency (RIPA) in mid-2002 by the Africa Institute for Policy Analysis and Economic Integration (AIPA) of South Africa. The latter report appears to be based on a review of other transportation reports dating from 1997 to 1998.

Extent of the Road Network The total road network length is about 14,000 kilometers, of which some 5,350 to 5,408 kilometers (depending on source—see table 2.1) constitute the classified main road network.[2] The coverage of the network is said to be adequate. The extent of the paved main road network is on the order of 1,000 kilometers, although estimates again vary according to source (see table 2.1). The unpaved main road network extends some 4,300 to 4,400 kilometers, with exact estimates again varying, as shown in table 2.1. The paved road network connects the capital to the main regional centers, as well as linking some of the important regional centers to each other. It also provides thoroughfares for corridor transport between Burundi, the Democratic Republic of Congo, Tanzania, and Uganda.

Table 2.1 Extent of the Classified Road Network (Kilometers)

	Data Source		
Type of road	RIPA report by AIPA (mid-2002)	EU report by Scetauroute (January 2002)	Ministry of Infrastructure data (December 2002)
Paved main roads	930	1,022	1,100
Unpaved main roads	4,436	4,386	4,250
Unengineered gravel roads	1,750		
Total	5,366	5,408	5,350

Source: Data from AIPA 2002, Scetauroute 2002, and Ministry of Infrastructure.

The balance of the road network amounts to about 8,000 kilometers of unclassified roads, comprising over 6,500 kilometers of unpaved rural roads and between around 900 and 1,300 kilometers of urban roads (approximately 500 kilometers of which are located within Kigali).

Records of the number of bridges, viaducts, and culverts are not available, although the number of such assets is considerable because of the hilly nature of the country and the many rivers and streams that the road network has to cross.

Performance The condition of the classified road network was discussed in both the Scetauroute and AIPA reports and is summarized in table 2.2. (The Scetauroute report is thought to be the more accurate of the two reports.). The poor condition of the main road network can be attributed to the extensive damage caused by unusually high rainfall in recent years, as well as to a lack of equipment and the absence of both regulations and enforcement measures to control the axle loads of heavy vehicles at the borders. It is understood, however, that a vehicle inspection center has been built, although it is not yet in operation, and that eight weigh bridges have been purchased but not yet installed. It is essential that those facilities be put into operation as quickly as possible. The return on this investment should be rapid—especially if higher penalty

Table 2.2 Condition of the Classified Road Network (percentage)

Category of road	Data source: EU report by Scetauroute (mid-2002)	Data source: RIPA report by AIPA (January 2002)
Category 1: international or cross-border roads		
Very good and good	23	45
Acceptable	37	
Fair		30
Mediocre	30	
Poor		35
Bad or very bad	10	
Total	100	110[a]
Category 2: national roads		
Very good and good	5	
Acceptable	20	
Undetermined	75	
Total	100	
Category 3: communal roads, including feeder roads		
Very good and good	2	
Acceptable	8	
Undetermined	90	
Total	100	
Categories 2 and 3		
Good		10
Fair		40
Poor		50
Total		100

a. Total is as set out in AIPA 2002.

Source: AIPA 2002 and Scetauroute 2002.

charges are introduced, as recommended later in this report.

Maintenance carried out on unclassified roads has been concentrated on the paved road system and rural roads have suffered especially as a consequence. The effects have been exacerbated by Rwanda's terrain and the prevalence of narrow curves, steep gradients, and uneven surfaces, combined with heavy rainfall and poor soil conditions. As a result, the condition of all unpaved roads, and especially unclassified rural roads, has deteriorated to a relatively poor level. Rutting and potholes are common.

The state of the urban roads, especially in some densely populated, hilly areas of Kigali, is very poor owing to heavy traffic, inadequate maintenance, and lack of proper drainage. This poor condition has led to unacceptably high numbers of accidents in the capital. The situation in Kigali is aggravated by the fact that the utilities network is unmapped. A recent attempt to rehabilitate the roads in Kigali had to be suspended because of the damage and disruption to water and telephone networks it caused.

A direct effect of the generally poor condition of the road network in Rwanda is the level of vehicle operating costs (VOCs), which is high by comparison with neighboring African countries—and the associated reduction in the operational life of vehicles. These costs represent a significant burden on the national economy. The World Bank (2000, p. 9) found that the lack of maintenance on the road between Gitarama and Kibuye raised VOCs from a 1989 level of US$1.00 per kilometer to almost US$3.40 per kilometer in 1996.

In summary, the condition of the entire road network has deteriorated substantially in the past decade. This deterioration has been especially marked on unpaved classified roads and both urban and rural unclassified roads, resulting in a significant cost to the economy. As far as can be ascertained, the condition of bridges, viaducts, and culverts mirrors that of the roads of which they form part.

Impact of Poor Road Maintenance The current poor condition of the road network is damaging to Rwanda's economy because it restricts access to markets, raises VOCs (making exports uncompetitive and adding to the cost of imports), and reduces income from tourism. These direct effects on economic development inevitably also present obstacles to reducing poverty and improving the quality of life of a wide spectrum of the community, most especially the most disadvantaged in society.

Poor maintenance of the feeder roads, especially those in agricultural areas, has impaired market access and hence restricted farming income for the rural community. It thus represents an obstacle to effective reduction of poverty. In its recent review of the Transport Sector Project, the World Bank notes that rehabilitation of the road between Gitarama and Kibuye has resulted in VOCs being reduced by 50 percent, amounting to a reduction in overall transportation costs of about 40 percent. As a result, agricultural surpluses in the area can now be sold in markets throughout the country, and a general shift is taking place from subsistence agriculture to production for the market.

Opportunities for Private Sector Participation

The road rehabilitation, maintenance, and development program offers significant opportunities for PSP. PSP will need to be accomplished on a phased basis, to allow the private sector to gain confidence in operating in Rwanda. The first phase should be to pass responsibility for a significant proportion of road rehabilitation and maintenance to the private sector through 5- or 10-year concession contracts. Because it will probably take a 10-year program to bring the entire road network back to an acceptable standard, a 10-year contract would save rebidding costs at year 5. There would be contractual safeguards in the form of minimum performance standards, with penalties for nonperformance and the ultimate sanction of the cancellation of the concession. Where the cost of the rehabilitation is unusually high owing to the poor state of the road, it may be preferable to go to a 15-year contract to ease the strain on cash flow over the concession period.

The intention would be that all rehabilitation work be completed within the first 10 years. After year 10, concessions would be for maintenance only, to maintain the existing and rehabilitated road network at an acceptable minimum standard (monitored by the Directorate of Roads). The private contractor would charge a service fee on a monthly or quarterly basis, made up of the rehabilitation costs, maintenance costs, initial mobilization costs, and a profit margin, which might be partially taken as dividends through the local project concessionaire. The risks transferred to the private sector would in principle be the following:

- The design, construction, and cost of the rehabilitation work
- The cost—but not the inflation risk—and the quality of the annual maintenance work, against an agreed-upon scope of work and services over the concession period
- The completion date of rehabilitation work
- General commercial and legal risks.

The concession approach would start the development of a road rehabilitation and maintenance market in Rwanda. In parallel, it will be important to support the development of this market by stimulating the private sector—preferably the indigenous private sector—to set up companies owning and hiring road plant and equipment. After five years, the policy should be to move progressively to design, rehabilitate, finance, and operate (DRFO) concession contracts, under which the private sector would begin to invest in and take responsibility for financing concessions for all road maintenance projects. DRFO is a variation on the design, build, finance, and operate (DBFO) contracting model widely used to finance new road development. Under DRFO arrangements, the private sector takes over responsibility for an existing road. Whereas in the DBFO model the private partner funds initial road design and construction and meets ongoing maintenance costs, in the DRFO model the initial financial burden arises from the need for rehabilitation expenditure. As with DBFO, a long-term maintenance obligation falls on the private partners. The private partner derives some or all of its income from actual or shadow toll payments, thereby accepting a proportion of demand risk.

A credible and attractive scheme to incorporate PSP in road maintenance and development must necessarily focus in the first instance on the following four steps: (a) development of a prioritized list of activities, (b) design of measures to provide inputs into the RMF, (c) capacity building to establish contracting out capability within the government, and (d) introduction of a method of contracting that includes local participation. Other countries in Africa have attempted a similar approach, and lessons can be learned from their experiences. For example, Ethiopia, although it is a much bigger country than Rwanda, has had a similar background of internal strife and disruption. The process of transforming road maintenance (and rehabilitation and construction, including design and supervision activities) in that country has been conducted along the lines mentioned above. In Ethiopia, it has taken five years of concentrated effort to get to the stage where routine maintenance is entirely funded by road fund levies.

The problem of developing Rwandan private sector capabilities in road maintenance and construction, as well as in design and supervision, can be addressed by twinning local and international contractors and consultants. However, the time frame for achieving meaningful domestic participation in these areas will normally be long and will depend on the skill levels available in the country at the start of such a program.

The first step is therefore to attract foreign road contractors with the necessary expertise and experience in paved and unpaved roads—if possible, gained in

Rwanda or a similar African context—to bid for road rehabilitation and maintenance contracts, preferably on a 5- to 10-year concession basis. Attracting such contractors will require immediate review and reform of the law on foreign investment, the company law, and the tax and import duty laws. It will also require the preparation of a credible national and international publicity program built around a clear, properly specified and financed plan for road rehabilitation and maintenance. It is vital to ensure that there is more than one foreign road contractor available in Rwanda to bid for road projects.

The second step is to encourage suitable local contractors to diversify into the road infrastructure sector, to acquire the necessary expertise, and to purchase the necessary equipment. Rwanda has at least one medium-size local private building contractor capable of constructing buildings of reasonable size and to a good standard. Contractors with a proven track record in a sector such as building construction can be expected to perform well in the road sector. Apart from addressing the cross-cutting legal issues, attracting local contractors will again depend on a credible publicity program for the road rehabilitation and maintenance plan, backed by the World Bank and the donor community.

The third step is to attract local business people with the necessary funds to invest in new, local road contracting companies. The new companies will need to recruit a staff with the necessary expertise, although at first they may prefer to hire plant and equipment from other contractors. While building up their expertise, locally based enterprises are likely to bid only for the smaller rehabilitation and maintenance projects relating to unpaved roads, but this is an important beginning from which the indigenous road maintenance sector can develop. Local enterprises will bid only if the government publicity campaign, backed by the World Bank and the donor community, is convincing in promoting this opportunity. The ability of the private sector to react to opportunities where it is convinced that a viable new market is opening up has been widely demonstrated worldwide.

A further step would be to attract local business people to set up new companies to provide the necessary road plant and equipment for these new road contractor companies on a rental or lease basis. Again, these local investors will need to be convinced by government publicity that such investment is a new, viable market opportunity.

Given the size of the country, it is obviously not necessary to establish a large number of foreign and local road contracting companies or local plant and equipment hire companies. Two or three hire companies, three foreign contractors, and perhaps four or five local contractors would provide adequate supply-side capacity and competition. Apart from the obvious economic benefit of an improved road network, the establishment of such new companies would have the added economic benefit of increasing employment opportunities, particularly in urban areas, with a resultant boost to the poverty reduction program.

Involving local communities in maintaining the rural road network, with the right controls on quality, makes a great deal of sense. The promotion of labor-intensive public works is an important plank of broader government policy. In some areas, local communities, encouraged by the local prefects, have organized road maintenance gangs and have carried out road maintenance on unpaved roads in their area under the supervision of the Directorate of Roads. These local communities can be encouraged to set up proper commercial companies for maintaining rural roads. They will require assistance from the government and, in particular, the Directorate of Roads for training to establish the necessary level of expertise. Once again, in addition to its direct benefits, such a program would also bring indirect economic benefits in terms of increased rural employment opportunities and be a step toward reducing poverty.

Issues

Several issues need to be addressed to move forward with the road rehabilitation and maintenance program.

Maintenance of the Road Network The maintenance of the entire road network is currently inadequate and is constrained by the lack of road maintenance funds. In August 2002, the government of Rwanda adopted a document defining strategic prioritization for the roads. The document stated that resources should be distributed to national roads of international interest, national roads of national interest, roads of local (communal) usage, and the urban road network. However,

the implementation of this policy remains questionable. The government must still go some way if scarce resources are to be applied where they will generate the greatest contribution to achieving the government's broader economic and social objectives. There is no road management system in Rwanda and no systematic planned road maintenance program appears to be in place. Instead, maintenance is carried out ad hoc or in response to urgent needs for repairs to the paved road network. There is a clear need to develop a systematic, planned approach to rehabilitation and maintenance, particularly if the private sector is to be effectively involved in the execution of such a program. This road rehabilitation and maintenance plan will require the backing of the World Bank and the donor community, supported by their commitment in principle to provide appropriate financing.

A necessary first step toward developing a planned program is prioritization of roads in order of their importance to the economy. The following order is suggested:

1. Major export-import routes between the capital and the Tanzania and Uganda borders
2. Roads between Kigali, Ruhengeri, and Gisenyi
3. Roads between Kigali, Butare, Cyangugu, and Bugarama
4. Paved roads linking Rwanda to Burundi and the Democratic Republic of Congo
5. Feeder roads from major agricultural areas to the main export roads
6. All other unpaved main roads
7. All urban roads
8. Rural roads leading to important tourist sites such as national parks
9. All gravel roads
10. All other rural roads.

A further problem is the scarcity of experienced road contractors in the country. As of the date of this report, only one foreign-owned contractor was present in Rwanda, a Chinese company. A second contractor, Astaldi of Italy, had recently pulled out of the country, apparently in response to the low level of ongoing road construction and maintenance work. There were, furthermore, only four local contractors, two of which had only limited equipment and two of which had no equipment whatsoever. Equipment requirements were therefore largely met by the Chinese company. The four Rwandan contractors also lacked both expertise in and experience with tarmac surfaces.

A direct consequence of the current decentralization policy is likely to be that overall unpaved road maintenance activity—and quality—will become very difficult to control. The Directorate of Roads is trying to counteract this effect by providing training to local communities. The department is also considering hiring consultants directly to take responsibility for all road maintenance on a regional basis. Whether this approach will be approved and implemented is not yet clear. Nor is it evident how the approach will be funded or whether it will in fact lead to any improvement in the current level and quality of road maintenance.

As regards unpaved gravel roads, the AIPA report remarks that the 15 percent saving in construction cost for an unpaved road by comparison with the cost of an equivalent paved road is outweighed by the ongoing maintenance costs of unpaved roads, which may be up to 10 times those of paved roads. As a result of generally inadequate expenditure on road maintenance, these roads have deteriorated to such an extent that they are now in urgent need of rehabilitation.

It is clear that urgent steps need to be taken to improve the level and quality of road maintenance across the whole network. The objectives must be both to restore the network to an acceptable standard and to prevent further deterioration beyond a point that would entail vastly more extensive and costly repairs and reconstruction in the future.

It is not clear how environmental considerations are currently taken into account or will be taken into account in any future road rehabilitation or maintenance program.

Roads Maintenance Fund Although revenue collection has recently increased slightly owing probably to a higher level of penalties imposed or a greater number of foreign trucks in transit—no government contribution has been paid to the RMF throughout the fund's existence. The Revenue Authority and the Traffic Police, who are responsible for collecting some of the component charges, have also been very slow in turning over to the RMF the amounts they collect; both have been persistently in arrears. Combined with failure to enforce charges, these delays have resulted in an annual collection level that has fallen to about

US$4 million currently from about US$10 million before 1994, according to the AIPA report. Furthermore, charge levels were set 12 years ago and have not been increased in line with inflation over this period. The RMF has made a request to the government for an urgent increase, so far without result.

The overall outcome is that the RMF can provide funding for only 16 percent of the FRw 12 billion (approximately US$24 million) of annual maintenance spending requests, although this level is itself an inadequate reflection of actual spending needs. As a result, the total maintenance backlog is growing year by year, and the road network continues to deteriorate. Urgent steps are therefore required to make the operation of the RMF effective.

Estimated Cost of Road and Bridge Rehabilitation and Maintenance An indication of the potential cost of a road rehabilitation program can be found in the Scetauroute and AIPA reports. The principal relevant findings of these studies are set out in appendix C of the CFR. In summary, the AIPA study suggests rehabilitation and maintenance costs over 10 years of US$186 million for the paved road network, US$253 million for the unpaved main road network, and US$395 million for the unpaved secondary road network—US$834 million in total. The Scetauroute report suggests figures ranging very approximately from US$130 million to US$180 million in total over a 10-year period, covering only the paved and unpaved classified roads system. Although the Scetauroute report covers a smaller proportion of the total road network, the equivalent cost identified is clearly much lower than in the AIPA study. There is no basis on which it is possible to judge the reliability of the different cost estimates.

Financing of Road Rehabilitation and Maintenance The generally adopted approach is for rehabilitation and maintenance to be financed by road users. This approach can be difficult to apply in developing countries with low traffic levels and low income levels, although car and commercial vehicle owners are usually in the higher income brackets. Those with lower incomes—who will normally travel on foot or by bus, animal-drawn cart, or bicycle—will either face no road user charges whatsoever or benefit from the dilution of charges among a group of passengers. Nevertheless, direct road-user charging (through tolls) is usually unpopular with both politicians and the general public. The cost of providing road infrastructure is therefore normally financed from annual vehicle registration charges, with the balance met from fuel taxes and general taxation.

In any case, until the private sector gains experience and confidence in operating road rehabilitation and maintenance concessions in Rwanda, it will necessarily fall to the government to raise the required financing. The following approaches to financing would thus appear possible for a 10-year program:

- Increase RMF charges and penalties to a level that would finance the fully costed plan on an annual basis over the 10-year time frame—with charges and penalties subsequently to be increased annually in line with inflation. If the government view is that those charges would be excessive, then a smaller acceptable increase in charges might be introduced (although penalties might still be increased by the full amount), again indexed to inflation, with the shortfall to be financed from general taxation or borrowing.
- Impose direct road-user charges in the form of road vehicle tolls, which would be charged and collected by the government on the paved road network only or, alternatively, on paved roads being rehabilitated or maintained by the private sector on a concession basis (with the private sector responsible for the toll collection). In view of concerns regarding low traffic flow and affordability, the initial level of tolls could be low. The level would gradually increase as road traffic increased and users became accustomed to the tolls. Tolls would have the short-term disadvantage of increasing VOCs, although this effect would diminish as the paved roads were brought back to an acceptable standard. The initial cost of constructing the toll barriers and ongoing costs of toll collection would also be a drawback of this approach.[3] Potential private sector participants could also well perceive a significant risk that the income from affordable tolls would fall short of the amount required to meet the concessionaire's service charge, given the current, relatively low traffic flow on many Rwandan roads. The private sector may be prepared to become involved only if there is a clear

and credible commitment by the government to make up any shortfall from taxation or borrowing.

- Impose indirect road-user charges through "shadow tolls" using roadside meters, which would count the passing traffic, broken down by vehicle length, and then calculate the total shadow revenue at the agreed-upon shadow tolls for the different vehicle lengths. Payment of charges would be made by the government from general taxation and borrowing because there is no direct monetary payment by road users. Again, these tolls could be applied to the paved road network as a whole or to paved roads being rehabilitated or maintained by the private sector under concession agreements. Shadow tolls are generally popular with politicians because they avoid publicly unpopular, directly collected tolls.
- After year 5—when the private sector has gained experience and, it is to be hoped, confidence in operating concessions in Rwanda—it may be possible to introduce a rehabilitation-focused variant of the DBFO concession contract model. Such concessions would transfer the risk of raising the financing for these contracts from the government to the private sector. It may be necessary to increase the maturity of the DBFO contract to 15 years, to ease the strain on the cash flow in the early years.
- Use a combination of the above options, so that each option is seen neither as too severe or excessive nor as premature in the context of a newly developing market. In combination, these options are sufficient to raise the level of financing required, as well as being acceptable to the government and road users. The financing of a road rehabilitation and maintenance program will require strong, coordinated support from the World Bank and the donor community, particularly in regard to contributing toward the financing costs to be borne by the government.

Financing of Essential New Road Development The existing rehabilitation and maintenance program should take clear precedence over new road construction throughout the next 10 years, in terms of allocation of financing and other scarce resources. The question then is how essential new roads or bridges should be financed over this period. A vital first step will be a clear assessment of what limited construction is necessary over the period, taking into account the rehabilitation program. Any study of the need for new roads should be driven and constrained by a requirement for consistency with the new transport sector policy, which was being prepared with the assistance of the World Bank's Sub-Saharan African Transport Policy Programme at the time this report was written.

Again, there are several financing options:

- Impose a five-year general moratorium on all new road construction, after which new projects would be advanced only through public procurement, assuming the necessary capital financing can be raised. Exceptions would be allowed only in special circumstances (for example, to meet road infrastructure needs for the resettlement of returning refugees).
- After the same five-year moratorium, proceed with new schemes only on the basis of private procurement on a DBFO concession basis, under which the private sector would have responsibility for raising financing.
- Proceed with a construction program for essential new roads—as identified by the Directorate of Roads in the new roads study—by public procurement only for the next five years. This approach will give the private sector time to gain confidence in the government's rehabilitation and maintenance program, in the new market for road rehabilitation and maintenance, and in operating in Rwanda under concessions. After year 5, switch to a private DBFO concession basis. The feasibility of this approach would depend on the government's ability to raise the capital financing necessary to build new roads during the initial five-year period, on top of the financing for the rehabilitation and maintenance program.

Institutional Capacity The ability of the Ministry of Infrastructure to bear the burden of addressing the wide range of issues arising in the roads sector is potentially a matter of some significance. The question of overall institutional capacity is considered elsewhere in this report. It is clear, however, that addressing these issues will require considerable effort, involving hiring experienced personnel; reviewing current departmental wage scales in order to attract and retain the necessary personnel; and carrying out a continuing in-house

training program, together with donor technical assistance programs. Such a training program is, however, essential if the government's objective of attracting private sector involvement in the provision of public infrastructure services is to succeed. Such a program will also need the full support of the World Bank and the donor community.

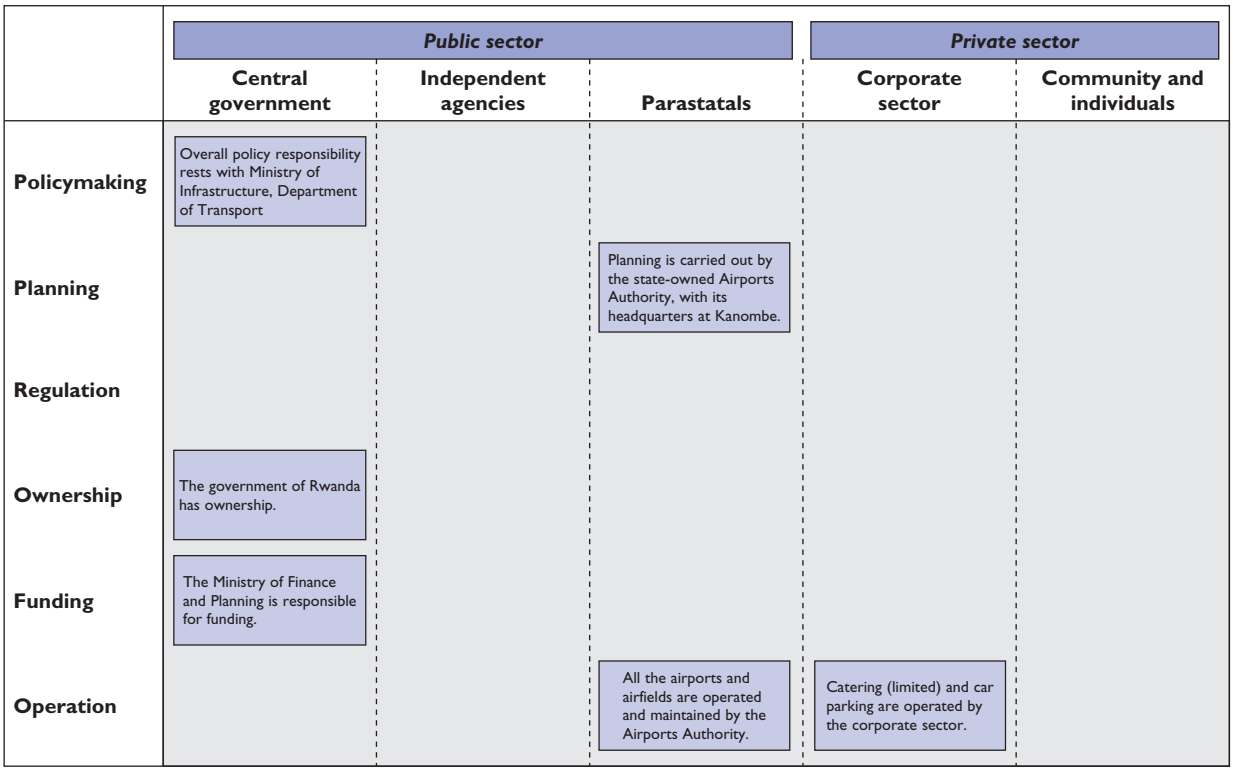
An approach that has been used in a number of countries is to transfer responsibility for the execution of roads policy to a roads agency operating at arm's length from the government, which continues to be responsible for policy development. The benefits of such an approach in Rwanda would be to transfer to the new agency, the responsibility for performing all road rehabilitation, maintenance, and construction, together with the responsibility for establishing and enforcing design and maintenance standards. It would also free the Directorate of Roads from ministry bureaucracy and allow it to concentrate on improving the efficiency and performance of road rehabilitation, maintenance, and construction. The new agency would also take over responsibility for all dealings with the private sector related to participation in providing road infrastructure services, within the policies set by the Ministry of Infrastructure.

Recommendations

The following are the CFR recommendations:

- Steps should be taken, in cooperation with the provincial governments, to return responsibility for all road and bridge maintenance to the Directorate of Roads of the Ministry of Infrastructure in order to reestablish capacity to undertake road maintenance and to improve quality.
- The Directorate of Roads should quickly prepare a minimum set of design and maintenance standards for paved, gravel, and unpaved roads, as well as for bridges, viaducts, and culverts. The department should subsequently be held responsible for maintaining these standards at all times.
- The Directorate of Roads should draw up a set of environmental guidelines to be applied to all road and bridge construction, rehabilitation, and maintenance programs and should be held responsible for enforcement of these guidelines.
- The Directorate of Roads should prioritize roads in order of their importance to the economy and should give rehabilitation and maintenance precedence over new road construction, unless there is a very strong economic case for the new road.
- Based on the road priority list, the Directorate of Roads should establish a fully costed plan of road and bridge rehabilitation and maintenance covering a 10-year period, with a scope that embraces the entire road network.
- As a matter of urgency, axle-load restrictions should be enforced against overloaded vehicles to prevent further damage, in particular to the paved road network. This task may well require additional resources being made available to the enforcement authorities.
- Serious consideration should be given to introducing penalties for vehicles that cause environmental damage to the road network and its rights of way, as a consequence of accidents or technical failures. In addition, the law should be strengthened to protect and enforce rights of way.
- There should be an immediate increase in all RMF charges to take account of inflation over the past 12 years. The charges should then be further reviewed in light of their adequacy to meet the required level of annual maintenance funding.
- The government should make up any shortfall each year in the RMF against the level of funding required to bring the road network back to an acceptable level over an agreed-on timescale.
- The collection authorities for certain charges (namely, the Revenue Authority and the Traffic Police) should be held responsible for passing on these collected charges within three months of receipt or paying penalty interest.
- Immediate action should be taken to address institutional capacity problems within the Directorate of Roads:
  - To prepare it to handle its increased responsibilities in controlling all road and bridge maintenance
  - To enable it to establish and manage the increased participation of the private sector in the road infrastructure sector and to meet the associated contract monitoring requirements
- The government should give serious consideration to establishing the Directorate of Roads as an independent roads or highways agency, reporting to the

Figure 2.2 Airports: Roles and Responsibilities



Source: Adam Smith Institute research.

Ministry of Infrastructure, with the Ministry of Infrastructure retaining responsibility for roads policy.

- To attract the private sector to participate in road rehabilitation and to establish a road maintenance market, with participation by both foreign and local private sector entities, including the local communities, the government should move all rehabilitation and maintenance contracts to a 10-year concession basis. There will be contractual safeguards for the government through minimum performance standards with penalties for nonperformance and the ultimate sanction of cancellation of the concession.
- A financing plan should be agreed on with donors for the 10-year road rehabilitation plan. It should include consideration of the following options:
  - The RMF
  - Government borrowing with the support of the donor community
  - Road tolls—direct or indirect (shadow) on a staged basis within affordability levels
  - In five years, the possibility of moving the concession contracts onto an appropriate variant of DBFO.

Airports

Key roles and responsibilities within the airport sector are summarized in figure 2.2.

Policymaking, Planning, and Regulation

The government's objectives for airports are

- To assist the development of air transport
- To enhance Rwanda's integration into the regional economy
- To make Kanombe Airport a regional transport hub and part of a proposed export-processing zone

A number of measures have been taken to implement the policies and objectives:

- Kanombe Airport in Kigali is shortly to be upgraded with a repaved and slightly extended runway, a new taxiway, an increased aircraft parking

area, new navigational aids, new fire-fighting equipment, and a renovated lighting system.
- Kamembe Airport, near Cyangugu, is being rehabilitated with a new aircraft parking area and the renovation of the existing buildings.

Sector Performance

There are two airports and five airfields in Rwanda. The one international airport is Kanombe Airport in Kigali, which has a paved runway of 3.5 kilometers and handles about 140,000 passengers annually, plus about 6,500 tons of cargo (as of 2001). The relatively new terminal is designed to handle up to 500,000 passengers annually, so it has ample spare capacity at present. The second airport is the domestic airport at Kamembe near the port of Cyangugu on Lake Kivu in the southwest. It has a paved runway of 1.5 kilometers and handles some passenger and cargo traffic emanating from the Democratic Republic of Congo. The only other airfields with paved runways are at Gisenyi (1 kilometer), which is also on Lake Kivu but in the northwest, and at Butare (less than 1 kilometer), which is in the south. The other three airfields are at Ruhengeri in the north, Nemba in the south, and Gabiro (a military field) in the east. All the airports and airfields are operated and maintained by the state-owned Airports Authority, with its headquarters at Kanombe Airport.

Kigali is served by one European airline (SN Brussels), four African airlines, and one local airline. There is also one local and one regional regular cargo airline service and occasional general cargo flights, including occasional Russian cargo planes to Kanombe and Kamembe. In addition, there are two small domestic charter plane companies. Kamembe receives two regular DHL courier planes a month. The other airfields are used infrequently.

As with road transport, the cost of air transport is high, owing to lack of competition and the small size of the market. Air cargo rates for general cargo from Kigali to Brussels and London are set out in table 2.3 as a benchmark.

Table 2.3 Air Cargo Rates for General Cargo

SN Brussels		Kenya Airways	
Size (kg)	Rate (US$ per kg)	Size (kg)	Rate (US$ per kg)
0–44	6.95	0–99	2.70
45–99	5.50	100–499	2.55
100–499	2.45	500–1,000	2.25
500–1,000	2.35		

Sources: Data from SN Brussels and Kenya Airways.

Issues

Development Priorities The following issues emerged during the development of the CFR:

- The need at Kanombe for increased export-import capacity, with bigger refrigeration storage and a larger general storage area
- The requirement for a new taxiway at Kanombe and an extension to the apron for parking cargo planes
- The requirement for a new emergency paved airstrip for Kigali, in case Kanombe is closed (a site has been identified at Bugasera in the Ngenda region)
- The need for rehabilitation of the runway and apron at Kamembe Airport
- The need for rehabilitation of Gisenyi and Ruhengeri airstrips should tourism increase to pre–civil war levels
- The need to consider a future international airport location, such as the site at Bugasera, given that Kanombe cannot be developed further owing to the difficulties of the site.

The need for a new emergency paved airstrip for Kigali and the potential need at some time in the future for a new international airport to replace Kanombe lie beyond the scope of the CFR and will require extended technical and economic analysis.

Opportunities for Private Sector Participation

There seems little potential for the private sector to participate in this sector in the short term. A number of options should be considered in the medium term, including the introduction of a private sector contract to manage airports. The contract would be monitored by the Airports Authority, which could itself be privatized if the economy develops and passenger numbers grow. In the short term, it may also be worth considering the use of PSP options on a smaller scale—for

example, contracting out airport car parking to the local private sector.

Recommendations

The following are the CFR recommendations:

- Investigate the need for an increase in the refrigeration and general storage facilities, the case for a new taxiway, and the case for extension of the apron in the context of the upgrading project for Kanombe Airport. If justified, these project components should be included in the project investment program. The prime objective would be to ensure no constraint on the growth of passenger and cargo traffic, which is important because of its potential for generating increased foreign exchange revenue.
- Rehabilitate the runway and apron at Kamembe Airport.
- At the appropriate time, conduct a proper study of the rehabilitation of Gisenyi and Ruhengeri airfields. This study is unlikely to be justifiable in the short term. It should be initiated only if tourism returns to pre–civil war levels and small air charters can compete against road transport on an improved road network.
- Give serious consideration to establishing the Airports Authority as a civil aviation authority, which—in addition to its current responsibilities—would take over responsibility for all civil aircraft movements within Rwandan air space. This change would bring responsibility for all airports, air safety, and civil aircraft movements within Rwanda under one agency.

Rail

Policymaking, Planning, and Regulation

The government's key policy objective for rail is to investigate the feasibility of establishing a railway to connect through one of the other regional railway systems to the port of Dar es Salaam or Mombasa. This link could bring a number of benefits:

- A reduction in the transport costs of exports and imports because of the ability of railways to carry goods in bulk
- Lower wear and tear on Rwanda's road network and reduced maintenance and life-cycle costs
- Reduced dependence on the road networks of Kenya, Tanzania, and Uganda—which are not in good condition or are unpaved.

Given the prospects of increased trade, the government is also keen to consider the possibility of establishing a southern transport corridor linking the countries of the Great Lakes Region with South Africa, as part of the Great Lakes Railway Project. This project uses a combination of rail and lake transport. A discussion document was prepared by Protekem and the Common Market of Eastern and Southern Africa in 2000 to explore the available options.

Issues

The case for the proposed rail development requires careful assessment, based on a full feasibility study and a proper environmental impact assessment (EIA). The Chinese government has apparently made an offer to finance such a feasibility study, with obvious interest in the prospects of building such a railway if it goes ahead (Economist Intelligence Unit 2000).

The main concern relates to traffic potential. It is almost an axiom that a new railway line is financially feasible or economically viable only if it has guaranteed throughput of 1 million metric tons of paying freight traffic on the length of track constructed and if the terrain is easy and rolling, does not involve steep gradients, and does not require a large amount of bridging and tunneling. Where the terrain and soil present difficulties, as is the case in Rwanda, one can easily expect the threshold of viability to rise dramatically—perhaps to twice the usual rule of thumb. Considering the short distances within Rwanda, an internal railway line would not be expected to be viable at all, in comparison with a road, unless large amounts of minerals will need to be moved from mining areas or refineries.

There is a significant question about whether such a large investment could be justified, given the current and projected volume of Rwanda's exports and imports. These doubts might be mitigated if the railway could be connected to Burundi and the Democratic Republic of Congo—in particular, to the mineral-rich Kivu provinces of the eastern Democratic Republic of Congo, which have no outlet to the East African coast except by a long road route. A regional concept should also be more interesting and acceptable to the

donor community, if the economics can be made to work.

The difficult topography of Rwanda—with its mountains, hills, and valleys—would make a railway very expensive to construct. This expense might be alleviated to some extent by routing the railway from Isaka in Tanzania, where it would connect to the Tanzanian Railways line from Dar es Salaam to Mwanza, through Burundi to the south of Rwanda, approaching Kigali from the south in the Ngenda and Gashora region. This routing might also support a regional railway solution, but it would not resolve the need for a link by road or rail to Lake Kivu to complete the connection with the Democratic Republic of Congo. Another option would be to extend the railway through Burundi around the south of Rwanda to connect with the Butare road at Akanyaru Haut on the border. Trade would then come by road through Cyangugu and Butare to transfer to the railway.

An alternative to connecting to the Tanzanian Railways at Isaka (as investigated by Austria Rail Engineering in 1984 in the "Kagera Basin Railway Study," the executive study of which was published in 1991) would be to build a new railway from Kemondo Bay in Tanzania, a port on the west shore of Lake Victoria. This line would run through Tanzania to the east of Rwanda, entering Rwanda at Rusumo in the southeast for a distance of 4 kilometers, and then to Burundi to a terminus at Kabanga. Rwandan trade goods would have to be carried by road to the rail terminus at Rusumo. The advantage of this approach was identified by its shorter track length—about 270 kilometers—associated with a connection by boat to the port of Mwanza and the railway to Dar es Salaam, a connection by boat to the port of Kisumu in Kenya and the railway to Mombasa, and a connection by boat to the port of Jinga in Uganda and an alternative rail connection to Mombasa. The port of Kemondo Bay would require upgrading to handle the increased trade.

All these routes would rely on the infrastructure and operating efficiency of Tanzanian, Ugandan, and Kenyan Railways. The infrastructure of these railways is considered to be of variable quality and reliability, with their operating management less than efficient. In addition, the track capacity of these systems might have to be increased to handle the increased flow of goods—and this improvement also would have to be financed.

Although the potential project to establish a southern transport corridor linking the countries of the Great Lakes Region with Southern African railway systems incorporates the necessary regional approach, it will be a very expensive project. Its economic and financial feasibility will need to be very thoroughly tested before it can be regarded as a project for serious consideration.

Recommendations

The government is committed to pursuing the implementation of a railway project and to seeking donor community support for what will be a major enterprise. It will therefore be necessary to approach the donor community for support in updating the 1991 Kagera Basin Railway Study. This exercise will need to extend the scope of the original study to include the Democratic Republic of Congo, in addition to Rwanda and Burundi. It is likely that only a regional approach will be acceptable to donors and, moreover, that the project will not be economically viable unless it includes the considerable mineral trade and transport of the Kivu provinces of the Democratic Republic of Congo.

Should such a study be carried out and the project prove to be economically viable, an EIA would also be necessary before financing could be considered. Because the government also wishes to pursue the alternative of the southern transport corridor project, it will again be necessary to approach donors and the other governments involved and to carry out the necessary feasibility study and EIA to establish whether the project might be viable and which project of the two is the most economically and financially viable.

Water Transport

At the request of the Working Group, the CFR exercise was to include a review of three studies on the subject of water transport:

1. A study for the development of transport on Lake Kivu, dated November 1986, prepared for the Economic Commission for Africa (ECA) of the United Nations

2. A preliminary study on the navigability of the River Kagera, dated December 1986, also prepared for the ECA
3. A study of the need for a boatyard on Lake Kivu by the Bureau National d'Études de Projet (BUNEP), dated July 1986.

However, it did not prove possible to obtain access to the River Kagera study, and this topic has been excluded from the CFR.

Sector Performance

Table 2.4 through table 2.6, together with the supporting text summarize key relevant data extracted from the reports concerning water transport on Lake Kivu.

Table 2.4 Commercial Traffic

Travel route	Weight
Gisenyi to Kibuye	13,500 tons
Kibuye to Cyangugu	11,860 tons
Total	25,360 tons
Kibuye to Gisenyi	11,380 tons
Cyangugu to Kibuye	6,200 tons
Total	17,580 tons
Lake fleet:	
2 motor launches carrying 50 passengers each	
2 motor launches carrying 15 passengers each	
13 barges with capacities from 10 to 110 tons	
30 tugs of various sizes	

Source: ECA 1986.

Table 2.5 Annual Traffic from Gisenyi to Cyangugu, 1985

Type of traffic	By lake	By road
Passengers	24,000	132,000
Goods	33,600 tons	7,100 tons
Goods including Congo, Dem. Rep. of	58,953 tons	—

— Not available.

Note: Goods comprise raw materials, cement, beer, and agricultural produce.

Source: BUNEP 1986.

Table 2.6 Estimated Traffic, Gisenyi to Cyangugu, 1990

Type of traffic	By lake	By road
Passengers	55/65,000	230/235,000
Goods	80,000 tons	15/30,000 tons

Note: Goods comprise raw materials, cement, beer, and agricultural produce.

Source: BUNEP 1986

The BUNEP report also refers to the existence of 2 passenger boats (motor launches) that can carry up to 50 passengers each and 11 barges with a total carrying capacity of 800 tons. It has not been possible to confirm the existence of either the passenger boats or the barges. Both cement and beer are still transported on the lake, which indicates that some barges have survived, although no passenger transport appears to be available.

Opportunities for Private Sector Participation

There appears to be the potential for the transport of goods on Lake Kivu on an economically viable basis. Examples would be the distribution of beer from the brewery at Gisenyi to the port of Kibuye, where it could be transferred to road transport for national distribution, and to the port of Cyangugu for local distribution and possibly export to Burundi and the Democratic Republic of Congo. Another example—in the opposite direction—would be the distribution of cement from the manufacturing plant at Cyangugu to the ports of Kibuye and Gisenyi, where it could be transferred to road transport for national distribution and possible export. Another example could be the transportation of tea, which is grown near both Cyangugu and Gisenyi, to Kibuye for road transportation to Kigali and for export. These possibilities would potentially maximize the efficiencies of both water and road transport.

Another potential economically viable use of water transport is to provide market access to the small-scale coffee growers of Nyamyumba and Kayove districts of Gisenyi province. These districts front on Lake Kivu and have very poor rural road connections to the unpaved road between Gisenyi and Kibuye. In addition, a number of coffee-washing plants are located adjacent to the lake. There is potential for the coffee to be collected by water transport from the coffee-washing plants and then transferred to road transport at either Kibuye or Gisenyi. The same opportunity is likely to arise in the coffee-growing districts south of Kibuye toward Cyangugu.

Issues

A major constraint on the potential to develop water transport on Lake Kivu is the absence of a boatyard on

the Rwandan side of the lake with facilities either for boat and barge maintenance and repair or for new construction. Any new boats, tugs, or barges would have to be imported overland from Mombasa or Dar es Salaam, which would be difficult and expensive. It is difficult to see how water transport on Lake Kivu can be further developed or, indeed, maintained at current levels over the medium term without at least one boatyard available for boat, tug, and barge maintenance and repair. Furthermore, at least one boatyard needs to have the capacity to build new boats, tugs, and barges, without which it will not be economically viable to use water transport on Lake Kivu because of the high cost of importing such boats.

Recommendations

The CFR recommends that the study for the development of transport on Lake Kivu be updated and augmented to include an update of the BUNEP report on the construction of a boatyard on Lake Kivu.

Notes

1. The department still holds some maintenance equipment, but the equipment is no longer being replaced.
2. The classifications are as follows: category 1—international or cross-border roads, category 2—national roads, and category 3—communal roads including feeder roads.
3. Note that in the alternative case these costs would be included in the private sector's costs to be recovered from the tolls.

3 The Energy Sector

This chapter describes the current structure of the energy sector and provides a synopsis of existing government policy with respect to energy services in general, rural electrification in particular, and other key policy elements such as sector regulation and environmental strategy.[1] It further summarizes sector performance in terms of the character and quality of service delivery to customers, the financial state of the industry, and the nature and condition of existing assets. Opportunities for private sector participation (PSP) in Rwanda's electricity and natural gas subsectors are identified along with key sectoral issues. The section concludes with recommendations for improving the environment for PSP in the energy sector.

Sector Structure, Roles, and Responsibilities

Figure 3.1 illustrates how the various elements and institutions involved in energy sector policy and service delivery are expected to evolve over the coming years. The provision of electricity (and water services) in the urban districts of Rwanda is the responsibility of Electrogaz (ELG). The key features illustrated in figure 3.1 concern the transfer of ELG's operations to a management contractor in March 2003 (depending on negotiations), the potential for ELG subsequently to be put on a concession contract or even fully privatized, the likely introduction of independent power producers into the sector, and the transfer of some elements of industry supervision to a Multisector Regulatory Agency (MSR).

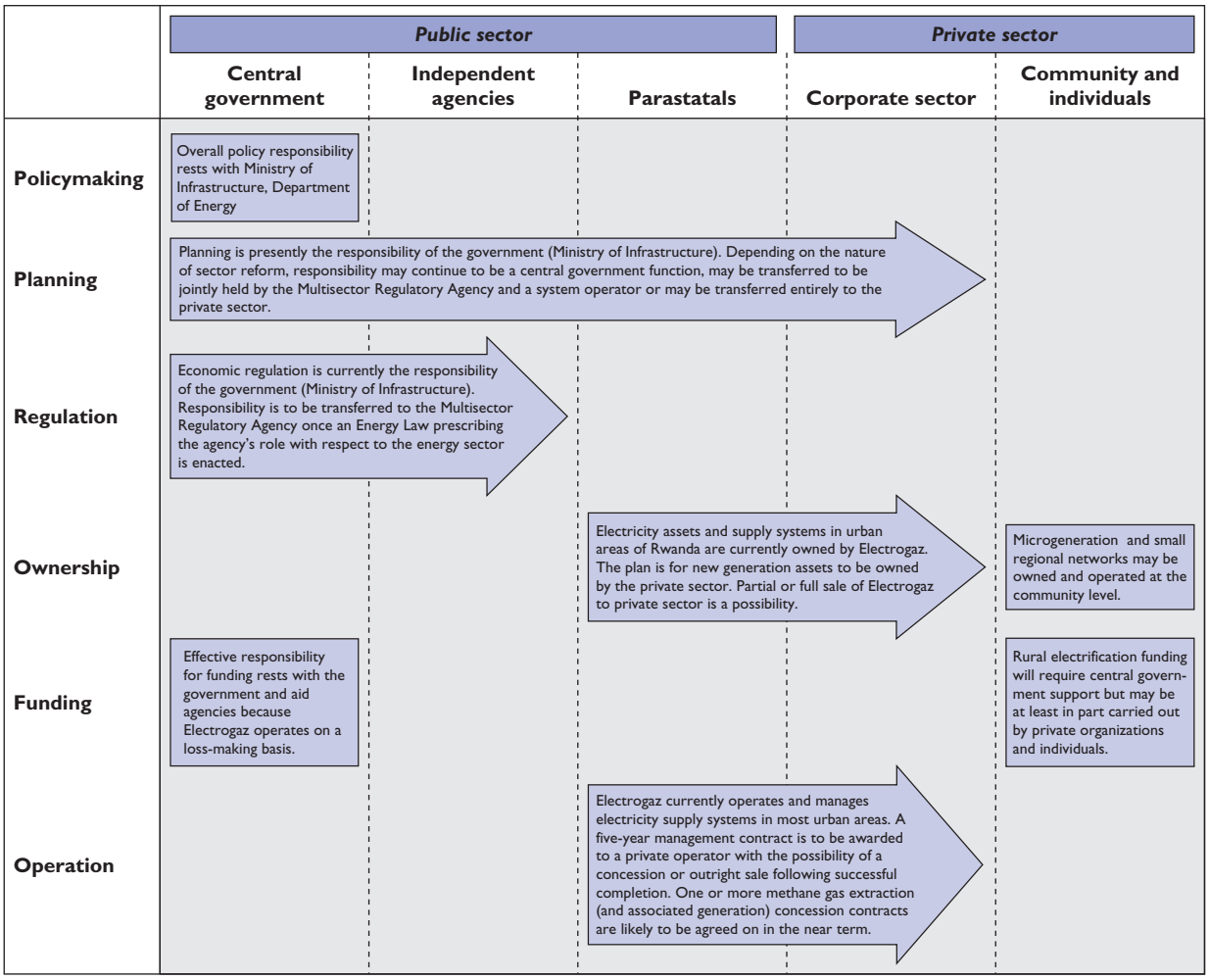
Policymaking, Planning, and Regulation

The government of Rwanda—particularly the Ministry of Infrastructure's Energy Division (MIED)—has not developed and published a single comprehensive, coordinated policy statement and program for the energy sector. It has, however, prepared a general strategy for reforming and developing the sector, both within the context of the ongoing PSP initiative with respect to ELG and as part of its poverty reduction strategy policy (PRSP). This policy statement needs to be published as soon as possible to help shape the development of the sector.

The government recognizes that to promote economic development, it must increase access to energy in rural areas. Doing so can add to off-farm employment opportunities in, for example, agroprocessing and other small-scale manufacturing enterprises that can have a direct effect on the reduction of poverty. Clearly, the quality of life for rural residents will also be improved through domestic access to, and use of, electricity with consequent effects on health, education, and productivity.

To help address these issues, the focus of the government's energy policy is to promote activities that will increase access to electricity and provide a good quality, cost-effective service while assuring the financial viability of the economic agents engaged in providing energy services and protecting the environment. To implement this strategy, the government plans to

Figure 3.1 | **Energy: Existing and Future Key Roles and Responsibilities**



Source: Adam Smith Institute research.

carry out the following six key activities:

1. Transfer the management and development of ELG to a private operator and investor under a contractual framework that provides incentives to improve the operational and financial performance of ELG.
2. Revise the regulatory framework for the provision of energy services in Rwanda.
3. Promote competition and support investment by the private sector to increase production of electricity.
4. Undertake to rehabilitate and expand infrastructure to meet national demand for electricity, keep costs to a minimum, and improve quality of service.
5. Encourage energy conservation through the rational use of energy and promote necessary measures to protect the environment.
6. Promote rural electrification through both network extension into rural areas and local power generation. As a goal, the government's 2020 Vision calls for 36 percent of the population to be connected to the grid by 2020.

Gas sector policy is the responsibility of Unité de Promotion et d'Exploitation du Gaz du Lac Kivu (Department of Promotion and Exploitation of Methane Gas from Lake Kivu, or UPEG), which used to be part of the former Ministry of Energy. UPEG reports to the Ministry of Infrastructure. UPEG is charged with developing the methane resource by introducing PSP into the sector, ensuring any such development is undertaken in a safe and sustainable fashion, and supervising the establishment and use of gas-related assets, such

as pipelines and storage infrastructure. There is some preliminary consideration of turning UPEG into a private company, but no definitive plans have been announced.

Electricity

Generation

Table 3.1 summarizes the nature, capacity, and output performance of Rwanda's generation electricity portfolio, as well as its import and export transactions in 2002. The key conclusions to be drawn from the table are as follows:

- Rwanda's capacity portfolio is dominated by hydroelectric plants, meaning that the country is vulnerable to both climatic and environmental fluctuations. A small diesel plant, Gatsata, which is located in Kigali, is rarely used because of the prohibitive cost of imported fuel.
- A significant proportion (about 55 percent) of Rwanda's electricity needs are met either through imports or through Rwanda purchasing Burundi's share of the output of the Sinelac operation (owned in equal shares by Burundi, the Democratic Republic of Congo, and Rwanda).
- The total installed capacity for electricity generation in Rwanda (28.55 megawatts) is not sufficient to meet peak demand, which is estimated to be 40 megawatts.
- The output efficiency of the four hydroelectric plants is on average 38 percent. This low number partly reflects the fact that the effective capacity of the plants is considerably below installed capacity. It is low primarily because Ntaruka is used principally at peak periods, owing to low lake levels (arising from historic mismanagement of the reservoir) and because Mukungwa needs rehabilitation.

Inspections by the independent consultants Deutsche Energie-Consult Ingenieurgesellschaft mbh (DECON) in 1999 indicated that the generating plant was in reasonable working condition, although a lack of preventive maintenance and unavailability of spare parts has meant that the plant has operated at less than full capacity. However, at the time this Country Framework Report was written, almost four years had passed since DECON's report was prepared, so the situation may have deteriorated in the meantime.

Transmission and Distribution

The transmission network consists of some 285 kilometers of 110 kilovolt lines and 64 kilometers of 70 kilovolt lines. A study conducted by Berocan in 1998 indicated that the assets were in reasonable condition, requiring only some relatively minor conductor and insulator maintenance. The lack of spare transformer capacity was, however, considered to make the network vulnerable to outages.

The distribution system consists of both medium-voltage (30 kilovolt, 15 kilovolt, and 6.6 kilovolt) and low-voltage (380 volt three-phase and 220 volt single-phase) networks, with a significant proportion being located in Kigali and much of that sited underground.

Table 3.1 Electricity Provision in Rwanda

Plant name	Plant type	Installed capacity (MW)	Output (GWh)	Percentage of total	Output efficiency (percent)
Mukungwa	Hydroelectric	12.5	56.691	25.8	45
Ntaruka	Hydroelectric	11.25	28.691	13.07	25
Gihira	Hydroelectric	1.6	6.912	3.15	64
Gisenyi	Hydroelectric	1.2	5.670	2.58	62
Subtotal (hydroelectric)		26.55	97.964	44.6	38
Gatsata	Diesel	2.0	0	0.0	0
Subtotal (all domestic sources)		28.55	97.964	44.6	36
Imports			(1.43)	(0.7)	
Rusizi II (Sinelac)	Hydroelectric	9	99.5	45.4	
Rusizi I (Snel)	Hydroelectric	3.5	19.35	8.8	
Uganda Electricity Board			2.66	1.2	
Subtotal			121.51	55.4	
Total			219.474	100.0	

Source: Adam Smith Institute research.

The Berocan study indicated that the distribution system was in a generally very poor state, with substations in dangerous conditions, distribution lines lacking protection from tripping, spare parts needed, and outdated and incomplete information on the whereabouts of underground cables in Kigali that has resulted in frequent accidental damage. All those factors produce a serious deleterious effect on supply quality and reliability.

System losses overall are estimated to be of the order of 32 percent, with technical losses contributing something like 15 percent and commercial losses 17 percent. This rate of system losses is very high by both international and African standards.

Supply

At its last official count, ELG had 43,177 electricity customers. Assuming this figure is an underestimate—which is a reasonable assumption, given the lack of information ELG presently possesses concerning its customer base—the real number is somewhere in the region of 50,000 customers. With an average household size of six persons, this figure translates into a total of just 300,000 persons receiving electricity—some 3.8 percent of the national population.[2] The MIED uses a higher estimate than six persons per family to take account of large consumers of power, thereby giving a higher figure for national coverage. Furthermore, these persons are principally urban residents; ELG is not responsible for providing rural electricity service.

As a consequence, the vast majority of the energy needs of Rwanda's population are met through the use of other fuels, principal among them wood. This fact has important consequences both for the productive potential and health of individuals and for the environmental condition of the country. The environmental issue is addressed further below and in appendix A.

Little organized effort has been made to serve the electricity needs of rural communities. There have been a number of studies on the use of off-grid electricity solutions (including micro-hydro, solar, and biomass), and solar power is used by some hospitals and other bodies. ELG has also undertaken some limited rural electrification projects, at the request and on behalf of the government. The overall effect of these projects appears to have been negligible.

A single flat rate tariff of FRw 42 (approximately US$0.082) per kilowatt-hour was set by the Ministry of Infrastructure in 1998 and has not changed since. This tariff does not reflect actual costs. A single tariff structure means both that there is no "life-line tariff" for the poorest customers and that there is little incentive to encourage energy conservation (such as might be achieved by means of a rising block tariff structure).

Obtaining comprehensive, up-to-date, and reliable data is relatively difficult. Nonetheless, figure 3.2 presents some basic benchmarking data concerning various technical and service parameters. The data indicate that Rwanda falls short of many of its African neighbors in terms of level and quality of service.

Financial and Human Resource Performance

Chapter 5 comments on the financial performance of ELG and its weaknesses with respect to billing and collection. The chapter also contains a summary of ELG's management and human resource capability, as well as some comments on the structure and content of the management contract that is currently under negotiation.

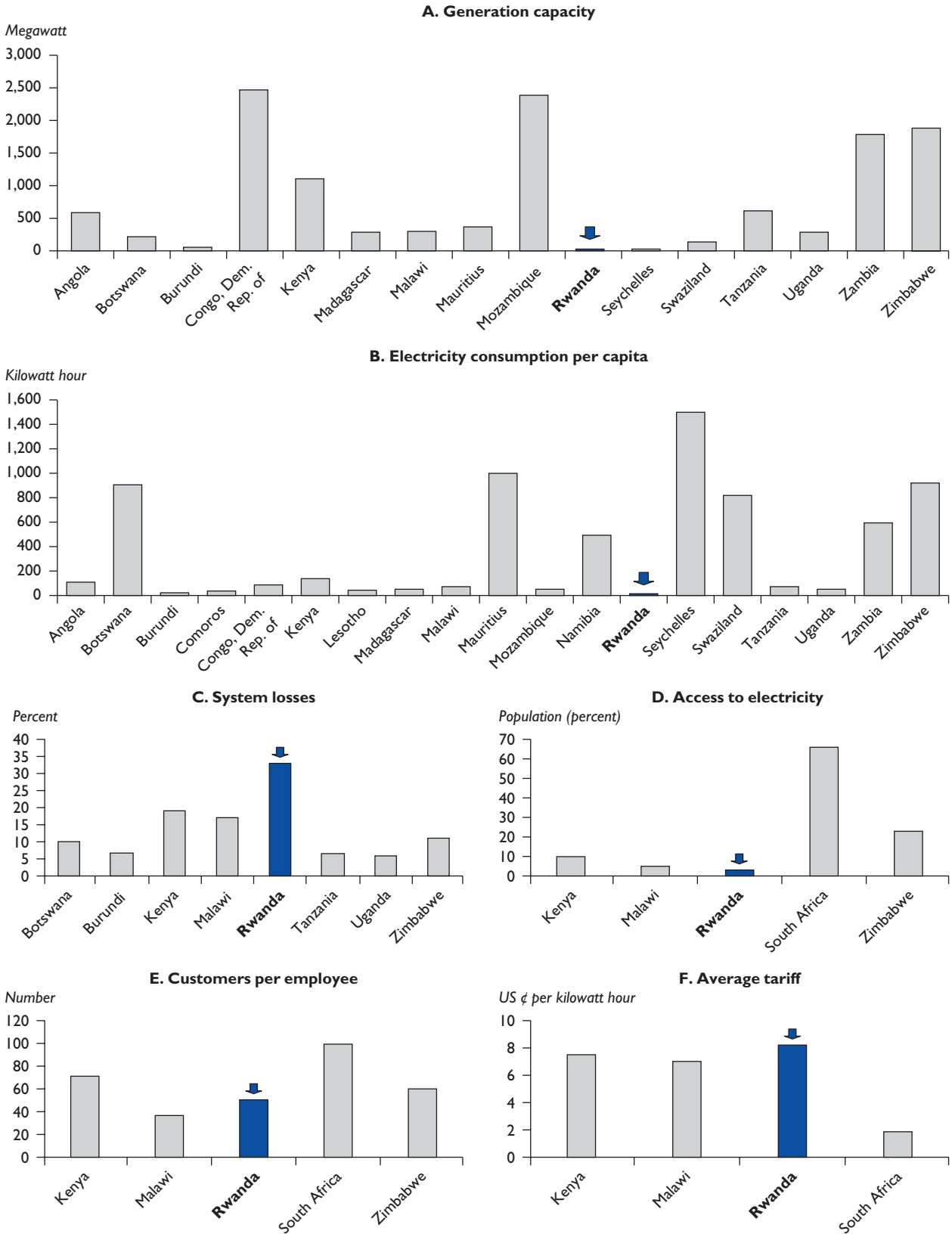
The Gas Sector

Operational assets in Rwanda's gas sector are currently limited to a single, small-scale, methane gas extraction facility on Lake Kivu. This plant was constructed in 1963 as an experimental facility but has for some considerable time constituted no more than an energy source to fire the boilers of a local brewery.

A number of feasibility studies have been undertaken with respect to large-scale extraction of methane gas from the lake and its subsequent use for power generation purposes. An estimated 50 billion to 56 billion cubic meters of methane are thought to be available for exploitation—a resource of enormous potential significance for Rwanda. At the time we prepared this report, two consortia had expressed interest in project development, and one was in the early stage of concession negotiations with the government. One proposal entails constructing a single methane extraction facility with an associated 25 to 30 megawatt generation plant. The other envisages multiple extraction facilities along the lake, with associated 8 to 10 megawatt generators.

The lake's potential for power generation would benefit mainly urban residents who are hooked up to the ELG distribution system. The exploitation of Lake Kivu gas, however, also offers the prospect of providing liquefied natural gas supplies to the wider rural

Figure 3.2 **Benchmarking Data in Electricity**



Source: Adam Smith Institute research.

population for whom, if economical, its use would represent a much healthier and more environmentally friendly alternative to burning wood.

Investment Needs and Priorities

Several needs and priorities have been identified with respect to the energy sector.

Rehabilitation

The DECON study provides a detailed and comprehensive, although now somewhat outdated, assessment of the state of each of the generating plants owned and operated by ELG. It contains a number of proposals as to where the replacement, upgrading, and maintenance of specific aspects of the plant would increase operating efficiency and reduce outages. Table 3.2 contains summary estimates of base rehabilitation costs for three generators. Berocan undertook similar work to assess and cost the rehabilitation and maintenance requirements for transmission and distribution networks in five urban areas. As is evident from table 3.2, the majority of the rehabilitation funding is targeted at the networks and the low-voltage networks in particular.

Table 3.2 Rehabilitation of Assets in the Energy Sector

Asset requiring rehabilitation	Total cost (US$)
Mukungwa hydroelectric generating station	1,950,000
Gihira hydroelectric generating station	1,465,000
Gisenyi hydroelectric generating station	1,477,000
Generation total	4,892,000
High-voltage lines and substations	13,214,000
Medium-voltage lines (over and underground) and substations	5,698,000
Reinforcement of medium- and high-voltage substations and switchboxes	5,300,000
Low-voltage lines and substations	13,829,000
Transmission and distribution total	38,041,000
Overall total	42,933,000

Note: Total cost includes various types of costs, including direct and indirect costs as well as costs for improvements, materials, and installation, depending on the type of expenditure involved.

Source: Adam Smith Institute research.

New Generation Investment No new generating plant has been constructed in Rwanda since 1982, and given the current supply shortage, new investment in electricity generation is evidently needed. A number of proposals have been put forward and are under consideration by the government, as summarized in table 3.3. Lake Kivu is regarded as the best alternative for a number of reasons, including its relatively low construction cost and short lead time, its relatively low estimated operating costs (estimates of US$0.05 per kilowatt-hour compare favorably with hydroelectric power), its potential for serial development in response to Rwanda's changing needs, its limited environmental effect, and finally its diversification away from hydroelectric power.

New Network Investment A number of proposals have been put forward to extend the high- and low-voltage networks. The priority, however, should be to connect any new generation facility (a 20 to 30 kilometer line would be required to connect a single Lake Kivu station to the grid) and to connect as many large industrial customers—such as the tea estates—as possible to help reduce wood fuel consumption. It should be noted that Rwanda's challenging topography means that network construction costs are relatively high and can reach up to US$80,000 per kilometer.

Table 3.3 Proposals for New Generation Investment

Plant	Relative priority	Rwanda share (percent)	Fuel	Capacity (MW)	Lead time (years)	Approximate project cost (US$)	Capacity cost (US$/MW)
Lake Kivu	1	100.0	Gas	25.0	2	25,000,000	1,000,000
Rusomo Falls	2	33.3	Hydroelectric	61.5	5	170,000,000	1,500,000
Nyabarongo	3	100.0	Hydroelectric	28.0	4	77,000,000	1,500,000
Rusizi III	4	33.3	Hydroelectric	82.0	5	170,000,000	2,100,000

Source: Adam Smith Institute research.

Potential Sources of Investment Financing

Several sources of investment financing have been identified, or secured, to pay for the various rehabilitation work and new capital works discussed above, as summarized in table 3.4. With respect to urban electricity supply, the World Bank's short-term loan is already in place, while the loan from the African Development Bank, the loan from the Arab Bank for Economic Development in Africa and Organization of Petroleum Exporting Countries, and longer-term World Bank loans have all been approved and now await the investment plan to be prepared by ELG's future management contractor. Consequently, considerable funding appears to be available. Even if it is assumed that rehabilitation cost estimates will need to be increased significantly because of the time that has elapsed since their preparation, the amount of donor funds available appears sufficient. In terms of private investment for the Lake Kivu generation project, the existence of two consortia interested in the project also bodes well.

Opportunities for Private Sector Participation

There appear to be five main opportunities for engaging the private sector in owning, operating, and enhancing the use of assets in Rwanda:

1. The five-year management contract for running ELG is clearly the most immediately significant and important form of PSP affecting the energy sector. In principle, after the contractor has improved ELG's operational and financial performance, it should be possible to establish deeper forms of PSP involving a significant funding commitment by the private sector, most probably in the form of a long-term concession contract, although an outright sale is also possible. It is not yet clear whether such a transaction might best involve the whole of ELG or separate electricity and water functions.
2. The serious need for additional generation capacity represents the next most immediate priority for PSP. The granting of a concession for a methane gas extraction plant and an associated generation facility represents the best, and most likely, prospect for introducing a private sector operator into the industry.
3. PSP will certainly be required if a far-reaching rural electrification program is going to be implemented. In particular, the development of microgeneration and regional networks is most likely to require private sector initiatives, with financial support from the government or donors. National grid extension could also involve PSP.
4. The potential exists to contract certain service elements out to the private sector. Clearly, proper procurement rules will need to be put in place first, but such a program would have the added benefit of encouraging the development of local skills and capability.
5. In principle, some form of private sector involvement in running the emerging MSR might also be possible. The MSR faces an uphill task in terms of the volume of work it already faces while simultaneously trying to build capacity.

Table 3.4 Sources of Investment Financing

Source of financing	Amount (US$)	Comment
African Development Bank	29,000,000	US$15 million of this loan is for rehabilitating Kigali's distribution network and national transmission lines.
Arab Bank for Economic Development in Africa and Organization of Petroleum Exporting Countries	10,500,000	Loan is for rehabilitating three hydroelectric plants.
World Bank	7,770,000	Loan consists of an ELG management contract and a short-term investment to improve operational and commercial capability of ELG.
World Bank	30,000,000–40,000,000	Loan represents a longer-term investment for rehabilitation of water and electricity assets.
Private	Not yet confirmed	This private sector investment is for the construction of a methane gas–fired independent power plant at Lake Kivu.

Source: Adam Smith Institute research.

Issues

Several issues must be addressed.

Success of ELG Management Contract

It is understood that agreement has been reached on the terms of the ELG management contract, although the contractor is not yet in place. Completion of this step represents a clearly positive development for the energy sector. The particular terms of the contract remained private between the parties at the time this report was drafted, however, and it is not therefore appropriate to comment on them here. In general terms, though, it is clear that, if the long-term objectives of the government are to be realized, the performance regime must provide a framework of incentives that strongly encourage the management contractor to improve revenues and to minimize costs while achieving satisfactory standards of service. A remuneration formula that relies as far as reasonably possible on variable payments linked to, among other things, collection rates, technical and commercial losses, and service levels will have significant advantages over an approach that incorporates a high proportion of fixed payments. For these incentives to be effective in practice, a strong and equitable mechanism for monitoring and compliance must also be in place.

It will also be important to make adequate investment funding available to the management contractor. In this respect, it will be most important that the major loan proposed by the World Bank for ELG asset rehabilitation be regarded as an absolutely firm and reliable commitment.

Other loans tied to asset rehabilitation identified above are, reportedly, secure. Pending the completion of negotiations, it is not yet fully clear what the management contractor's role will be in terms of utilizing these funds. The provision of funds is to some extent contingent on investment plans and proposals to be prepared by the management contractor during the initial contract period. The uncertainty that flows from this approach is unavoidable, given the impossibility of establishing a reliable assessment of investment needs and priorities before the management contractor is in place. The importance of ensuring that the management contractor is subject to strong and clear performance incentives cannot be overemphasized. However, this aspect of the contractual framework highlights the fact that the arrangements proposed over the next five years should also be seen as a collaborative partnership between the private sector, government, and donors.

Legal and Policy Framework

It is imperative that an energy law (or separate electricity and gas laws) be prepared as soon as possible.[3] The law (or laws) will have two principal purposes: first, to set out the role and responsibility of the MSR with respect to the energy sector, and second, to set out a policy framework for the sector. This framework should, at a minimum, incorporate the following key elements:

- A statement of overall government policy for the sector—that is, principles, objectives, and targets for sector development covering at least the next 10 years
- A roadmap setting out important milestones for industry development
- A vision for the structural and operational evolution of the electricity sector, including a clear and detailed description of the wholesale trading arrangements envisioned for the industry; of ELG and UPEG's structure, role, and ownership in this new environment; of the position of the private sector; and of how competition will be managed
- A vision for the structural and operational evolution of the gas sector and how its close interrelationship with the power sector will be managed
- Details concerning the nature and application of the government's subsidy policy.

This policy framework is necessary for the government and ELG to understand how the energy sector will evolve over time and what steps need to be taken and when the vision will be achieved. It is also important for private sector investors, who will wish to understand the potential for and nature of their prospective participation in the industry. Without such a framework, contract negotiations with any private investor (such as a potential methane gas concessionaire) will prove considerably more difficult: the government will not know what sort of flexibility will need to be built into the contract to accommodate sector evolution, and the private operator will want financial compensation for any additional perceived risk incurred from a lack of knowledge concerning industry development.

Multisector Regulatory Agency

It is also important that the function, responsibility, and jurisdiction of the MSR—as far as energy sector operation is concerned—be specified as soon as possible. For example, the following questions should be clearly addressed:

- Should the Ministry of Infrastructure, UPEG, or MSR be responsible for determining rules for access to, and pricing of, gas pipeline and storage facilities as and when they are constructed?
- How many licenses should ELG have?

The introduction of a regulatory framework will not in itself reassure potential investors. Rather, it is the creation of a truly independent, properly resourced, and effective regulatory body that investors will wish to see. The present constitution of the MSR leaves room for doubt concerning some of these important questions. For example, the MSR Board, which holds executive responsibility for delivering regulatory policy, is composed entirely of civil servants, which means the MSR appears not to be properly independent from the government. In addition, the MSR itself has not been granted appropriate powers—for example, in the telecommunications sector the MSR is not charged with licensing all companies. In the absence of an appropriate regulatory framework, investors may still appear, but their engagement will likely require a very inflexible contract or a potentially unaffordable financial premium.

Lake Kivu Gas

The successful conclusion of a concession agreement with one of the consortium seeking to develop the methane gas resource for power generation purposes is clearly a short-term priority given Rwanda's shortage of electricity supply. Two separate agreements with the two consortia are unlikely because there is insufficient demand in the short term for the gas extracted. Considerable care must be taken in executing this agreement because—as a long-term contract—it will affect both the potential for success in awarding a concession agreement for ELG in five years and the implementation of new wholesale trading arrangements for the industry.

Rural Electrification

The Ministry of Infrastructure needs to develop a rural electrification plan as soon as is feasible. This plan should complement the energy law described above but should specify in considerable detail how energy services will be extended to rural areas, including mechanisms for government support and subsidies to the private sector to enable the development of microgeneration and network development initiatives. Such financial support may be delivered by means of

- The creation of a rural fund
- Direct payments to operators
- Indirect assistance through tax or import duty incentives.

The plan should make use of the studies and initiatives that have been performed to date, such as the Mukurange electrification project, which, although not entirely successful, does provide important lessons in terms of what constitutes a commercially viable scheme. Further policy studies are also needed to aid understanding of what customers are willing and able to pay and to pinpoint development opportunities.

There may also be a case for promoting greater community and nongovernmental organization involvement in the development of rural electrification schemes. Such an approach would be likely to achieve the following:

- Better value for the potentially available subsidy because closer community involvement would encourage provision at an appropriate standard to those who will benefit most
- A higher level of long-term sustainability.

The essential features of a possible scheme focused on rural water service are set out in chapter 4.

Recommendations

The preceding discussion leads to the following recommendations for facilitating and making best use of PSP in the energy sector:

- Prepare an energy policy framework that clearly sets out how the sector will evolve with respect to its structure, ownership, and trading arrangements. This framework should set out unambiguous milestones for achieving this vision and should be used to assist with independent power producer negotiations.
- Draft and enact new electricity and gas laws—or a combined energy law—that incorporates the energy policy framework and sets out the role and responsibility of the MSR with regard to

supervising energy sector operations. The regulator should be granted sufficient power and resources to make it as independent from government as possible while still being required to conduct its activities in a transparent manner. Revision of the MSR law may also be necessary to ensure either that the executive responsibility for delivering regulatory policy rests with those actually creating policy or that the constitution of the board is altered so that it is no longer dominated by representatives from government. Private sector operators need to be convinced that the regulator will act impartially to protect their interests.

- Proceed with the methane gas concession agreement but preferably within the context of the energy policy framework and, if possible, following the passage of the gas and electricity (or combined energy) laws.
- Prepare a rural energy plan that sets out a strategy for implementing rural electrification, complete with measurable objectives, a clear funding policy, and a prioritized action plan that the private sector can potentially engage with.
- Carry out a feasibility study focused on the possibility of implementing a demand-led scheme for funding rural electrification.

Although sufficient donor funding appears to be in place for asset rehabilitation and maintenance, it is important that effective donor coordination takes place to ensure that other important elements underlying sector development, including the rural electrification and environmental policy initiatives, proceed.

Notes

1. The majority of the information here is derived from a report prepared for the Rwanda Investment Promotion Agency by the Africa Institute for Policy Analysis and Economic Integration (AIPA 2002) titled "The Rwandan Economy: A Strategy for Investment." The RIPA report summarizes much of the key content of Booz-Allen & Hamilton's 1999 "Rwanda Diagnostic Report" as well as a 1998 report by Deutsche Energie-Consult Ingenieurgesellschaft mbh (DECON) reviewing generation rehabilitation costs and Berocan's 1998 report reviewing network rehabilitation costs. Each of these documents may be referred to if further information is required.

2. The estimated penetration of electricity as a percentage of the total population depends on an estimated household size of six. Clearly, a higher percentage penetration will result as average household size increases or significant institutions are taken into account. The figure may, in a best-case scenario, be as high as 6 percent of the population receiving electricity, given this variation.

3. A draft gas law has been prepared, but it is not a law as such because it contains very little policy for the gas sector. Rather it is a draft contract for a service agreement, and this draft itself needs amendment in light of plans to award a concession contract, rather than a service contract, for Lake Kivu methane gas development.

4 The Water and Sanitation Sector

As recognized both in the United Nations Millennium Declaration and at the 2002 Johannesburg summit, the provision of adequate water supply and sanitation services has a more direct effect on human health and welfare than the provision of any other infrastructure service and contributes directly to the well-being of the poorest in society. Improved access to safe water supplies not only generates immediate benefits in terms of significant measurable reductions in morbidity and mortality rates, but also frees up a substantial proportion of the time of (especially) women and children for more productive use. Improved sanitation also brings immediate benefits in terms of both public health and the environment.

Despite their particularly direct effect on poverty alleviation, improvements in the provision of water and sanitation services generally have a more diffuse effect on economic growth and income generation than do improvements in the other infrastructure services considered in this report.

This chapter first considers the institutional framework for water and sanitation services in Rwanda. It then assesses the current performance of the sector in both urban and rural areas and recommends measures to improve this performance—in particular through the promotion of private sector participation (PSP).

Sector Structure, Roles, and Responsibilities

Overall responsibility for water resource management policy in Rwanda resides in the Ministry of Infrastructure. The allocation of key roles and responsibilities relating to the urban and rural water supply sectors as they are currently organized and managed in Rwanda is summarized in figures 4.1 and 4.2, respectively.

Water supply and sanitation policy in Rwanda is the general responsibility of the Department of Water and Sanitation in the Ministry of Infrastructure. In Kigali and 13 other urban areas, responsibility for the provision of potable water supplies resides with Electrogaz (ELG). The districts hold responsibility for water supply in rural areas, although this responsibility is generally delegated to a community level in practice. Urban areas served by ELG are as follows: Butare, Byumba, Cyangugu, Gikongoro, Gisenyi, Gitarama, Kibungo, Kibuye, Kigali, Nyagatare, Nyanza, Ruhango, Ruhengeri, and Rwamagana.

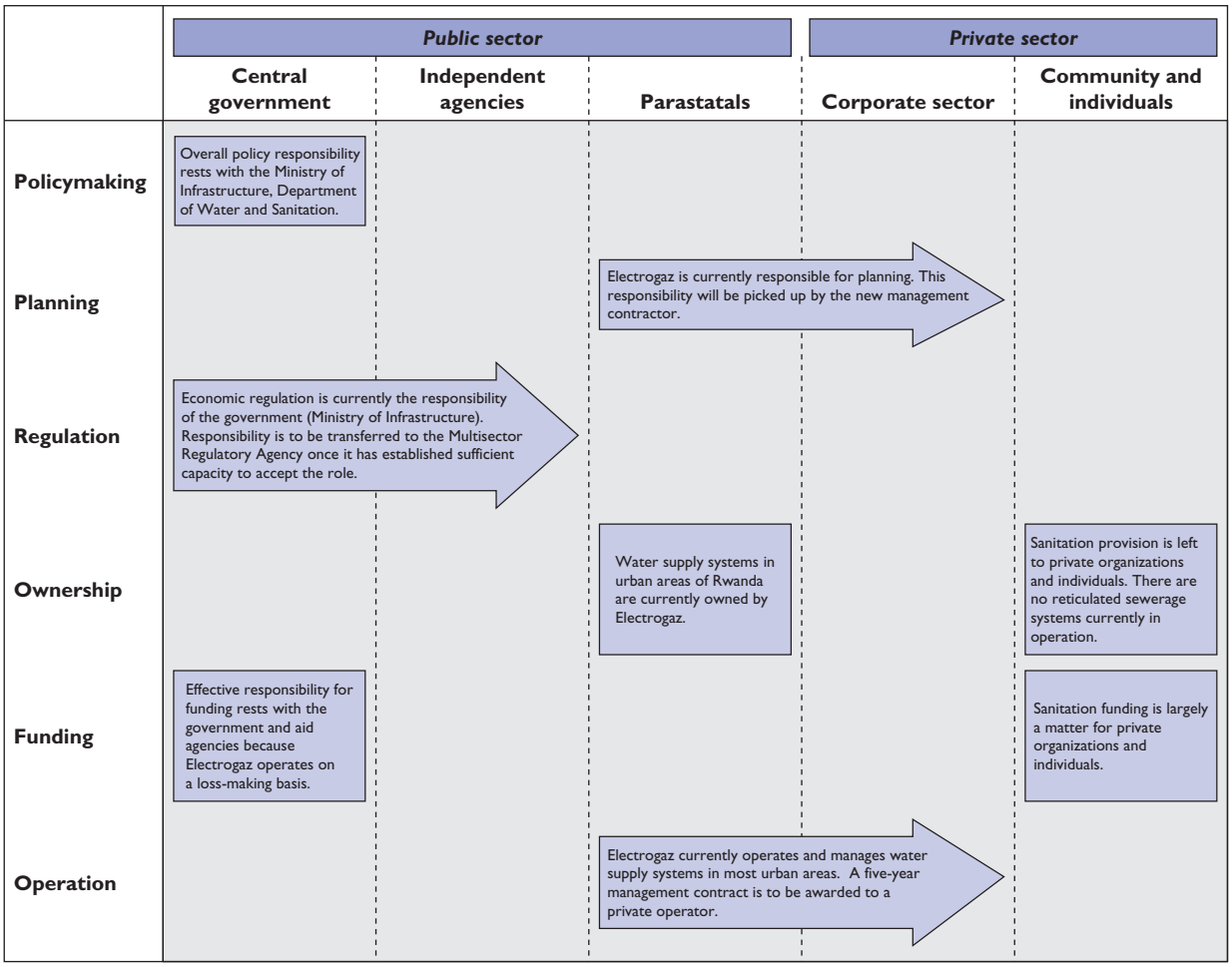
Responsibility for sanitation services resides at the district level in both urban and rural areas, although in practice almost no service is actually provided.

Policymaking, Planning, and Regulation

The core policy objectives for the water supply and sanitation sector are

- To improve the provision of water and to extend the water supply network
- To increase access to sanitation services
- To encourage community participation in the installation and management of water and sanitation infrastructure
- To promote technically and financially viable projects based on strong community participation
- To strengthen capacity at both the central government and the district level.

Figure 4.1 | **Urban Water Supply: Roles and Responsibilities**



Source: Adam Smith Institute research.

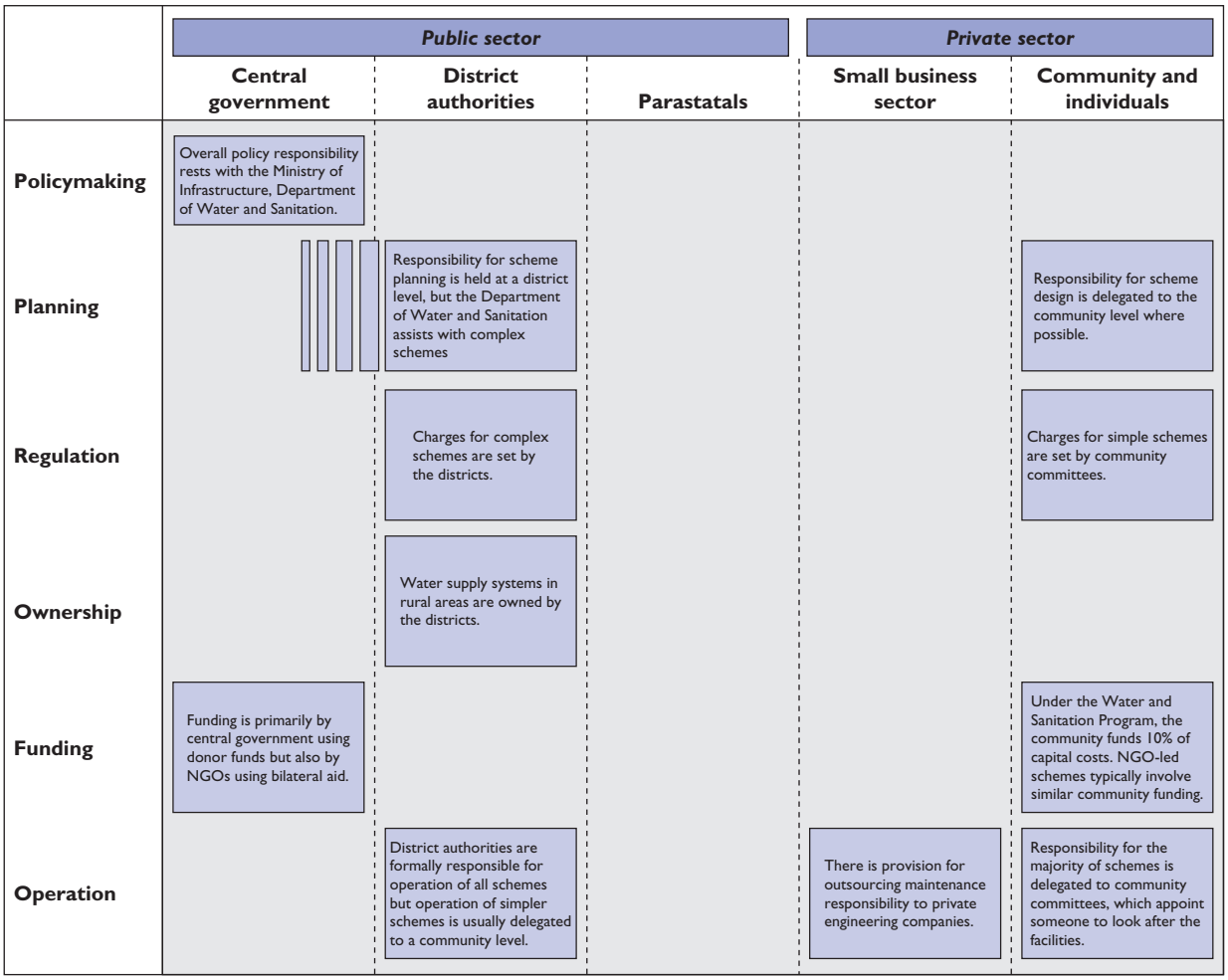
These policy objectives are not currently set out in any formal water and sanitation policy statement, although a policy document has been under preparation for some time, and a second draft was being considered by the government at the time this report was prepared.

Urban Water Supply

Within the city of Kigali and the other main urban centers in Rwanda, the principal means that the government is using to achieve the above objectives in the potable water subsector is the introduction of PSP. This effort will initially be achieved by the award of a five-year management contract for ELG. The process of designing and implementing this contract has been substantially completed. At the time this report was drafted, an agreement was reported to have been reached with a preferred bidder, although the contractor is not yet in place.

The PSP scheme about to be put in place does not entail any private sector contribution to funding the improvement and extension of ELG's water supply facilities. The intent is that over the period of the contract ELG's commercial and operational performance should improve to the point where deeper forms of PSP will become feasible in the longer term, thereby opening up the possibility that substantial private sector financing toward improved service provision and network extension might be obtained under a long-term concession, to be introduced subsequently.

Figure 4.2 Rural Water Supply: Roles and Responsibilities



Source: Adam Smith Institute research.

Funding for the rehabilitation of existing facilities during (approximately) the first two years of the management contract and funding for further development of the water supply system (projects identified in investment plans prepared by the management contractor) during the remaining years of the contract will therefore be externally provided using donor funds. Nevertheless, even within the term of the management contract, the approach that is being adopted allows for the possibility of raising additional private sector financing to support individual development projects under build, operate, and transfer (BOT) or similar arrangements.

Apart from the Kigali effort, a project is planned for the reinforcement of Butare's water supply system, and the government has requested donor funding for studies of the needs of other urban centers.

Urban Sanitation

In the sanitation subsector, specific policy measures focused on the urban areas are not currently in evidence. The Atelier Technique sur la Politique Sectorielle de l'Eau et de l'Assainissement (Workshop on Water Supply and Sewerage Sector Policy) held in September 1997 agreed on the following strategy:

- Establish an appropriate institutional and legal framework and finalize and formalize the Sanitation Code.
- Adopt the "polluter pays" principle.
- Protect natural resources and the environment.

The following action plans were also agreed on:

- Publish and disseminate the Sanitation Code.
- Work out a strategy for the most densely populated urban areas.
- Require the preparation of a collective or shared sanitation scheme for all new areas under construction.
- Promote the harmonization of the processing and management of waste by the most economic overall means available.
- Put in place or improve stormwater drainage systems.
- Develop a plan for removing and treating industrial wastewater.
- Carry out a pilot project to test the applicability, in the Rwandan context, of the demand-led sanitation strategies adopted in Kumasi, Ghana, and Ouagadougou, Burkina Faso, with the objective of adopting and applying a similar approach based on willingness to pay.
- Identify all participants in the subsector and define their roles, following the example of the national policy on housing.
- As soon as possible, run education, information, and sensitization campaigns on hygiene.
- Manage solid waste in a fashion that permits recycling and processing into useful products.

Rural Water Supply and Sanitation

Decentralization lies at the heart of the government's approach for water supply in rural areas. The objective of decentralization is to promote the development of demand-led schemes initiated at the community level. It is focused on ensuring that water infrastructure is developed in ways that meet the community's priorities at charges that are at the same time both affordable and sufficient to cover long-term operating and maintenance costs. A mobilization process designed to assist communities in establishing community water associations—and aid them in agreeing on their requirements and in planning—forms an essential early stage of the government's approach.

Under the decentralization model,

- Policy formulation is the responsibility of the government, which also provides the majority of initial funding for capital expenditure.
- Planning and maintenance and operations are the responsibility of the community, which must also make a contribution to initial capital costs.
- System ownership resides at the district level.

A number of specific initiatives have been established to improve water and sanitation infrastructure in rural areas:

- The Rural Potable Water and Sanitation Project, which entails a six-year program to support the development of water and sanitation services in 11 districts. The project is financed by a US$20 million International Development Association credit together with an intended US$1 million community contribution and US$500,000 of government financing. Three pilot projects are currently in progress.
- A project funded by Kreditanstalt für Wiederaufbau (KfW) to establish potable water supplies and sanitation services in eight districts in Kigali Rurale.
- The water and sanitation component (US$10 million) of the Umutara Community Infrastructure Development Project, which is directed toward the provision of services in all seven districts in the province (currently at the planning stage).
- Government-funded schemes for the provision of potable water in the districts of Mukingi and Bwisige (at a cost of FRw 214 million and FRw 152 million, respectively).
- The Murambi Potable Water Supply Project, which covers another Umutara district and is due for completion early in 2003. The project is receiving Japanese and German (KfW) funding of US$589,000 and US$300,000, respectively.
- A scheme for the possible integration of the Karenge water supply system with that of Ngenda to cover the entire Bugasera region. The project is funded by the European Union at an estimated cost €19.3 million. The Ngenda water supply system is currently operated by a private company (SHER Ingénieurs-Conseils) under a form of BOT but has excess capacity of treated water from Lake Cyohoha. Bid documents are being prepared and financing has been agreed on in principle.

Sector Performance

Overall access to potable water in Rwanda is low by African standards, with some 52 percent of the national population estimated as having access to safe water (defined in terms of the percentage of the population living within 500 meters of a safe water source).

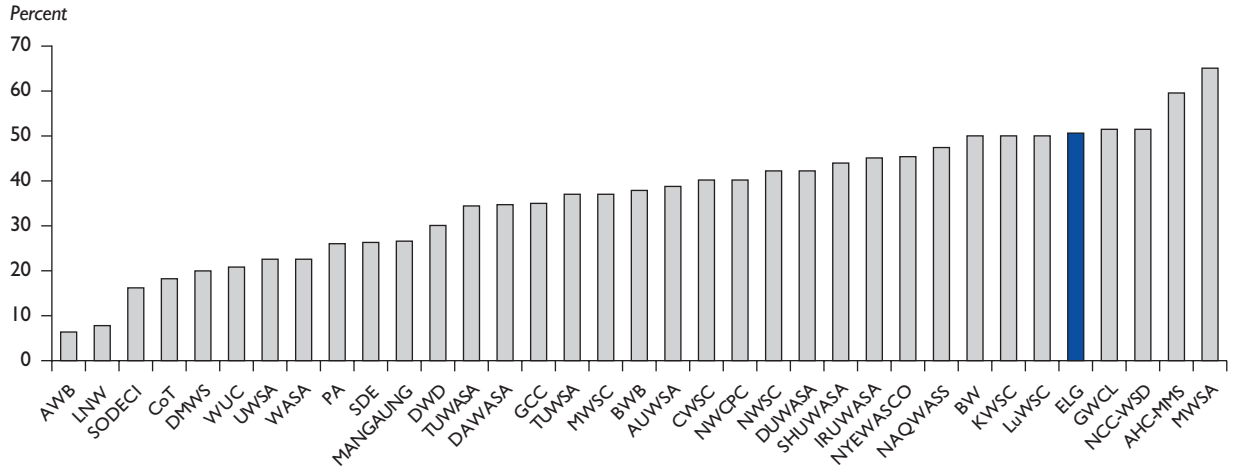
Sanitation services are largely limited to individual on-site provision and, taken as a whole, are poor.

Urban Water Supply

According to available statistical data, the performance of ELG in the urban water sector appears to be weak by comparison with that of a selection of other African water utilities.[1] ELG has one of the highest levels of unaccounted-for water in Africa, although it is not clear to what extent this statistic arises as a result of technical losses as opposed to administrative losses (that is, failure to meter or bill consumption because of illegal connections and poor information and commercial systems). ELG also achieves one of the lowest ratios of customers per employee among African utilities (although it should be noted that a high proportion of ELG connections take the form of shared standpipe connections). Figures 4.3 and 4.4 show the relevant numbers.

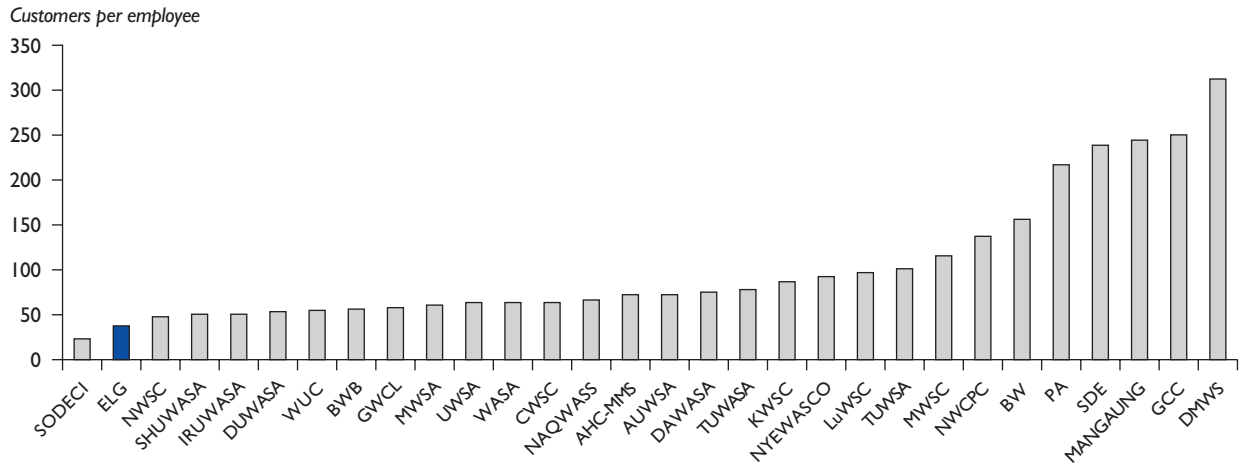
ELG's current tariff structure is shown in table 4.1. Establishing a reference value for tariff comparisons with other African utilities is made difficult by the fact that the Rwandan franc has depreciated substantially against the U.S. dollar in recent years. The dollar

Figure 4.3 **Unaccounted-for Water in African Water Utilities**



Source: Water Utility Partnership SBNet 2001.

Figure 4.4 **Number of Connections of African Water Utilities**



Source: Water Utility Partnership SBNet 2001.

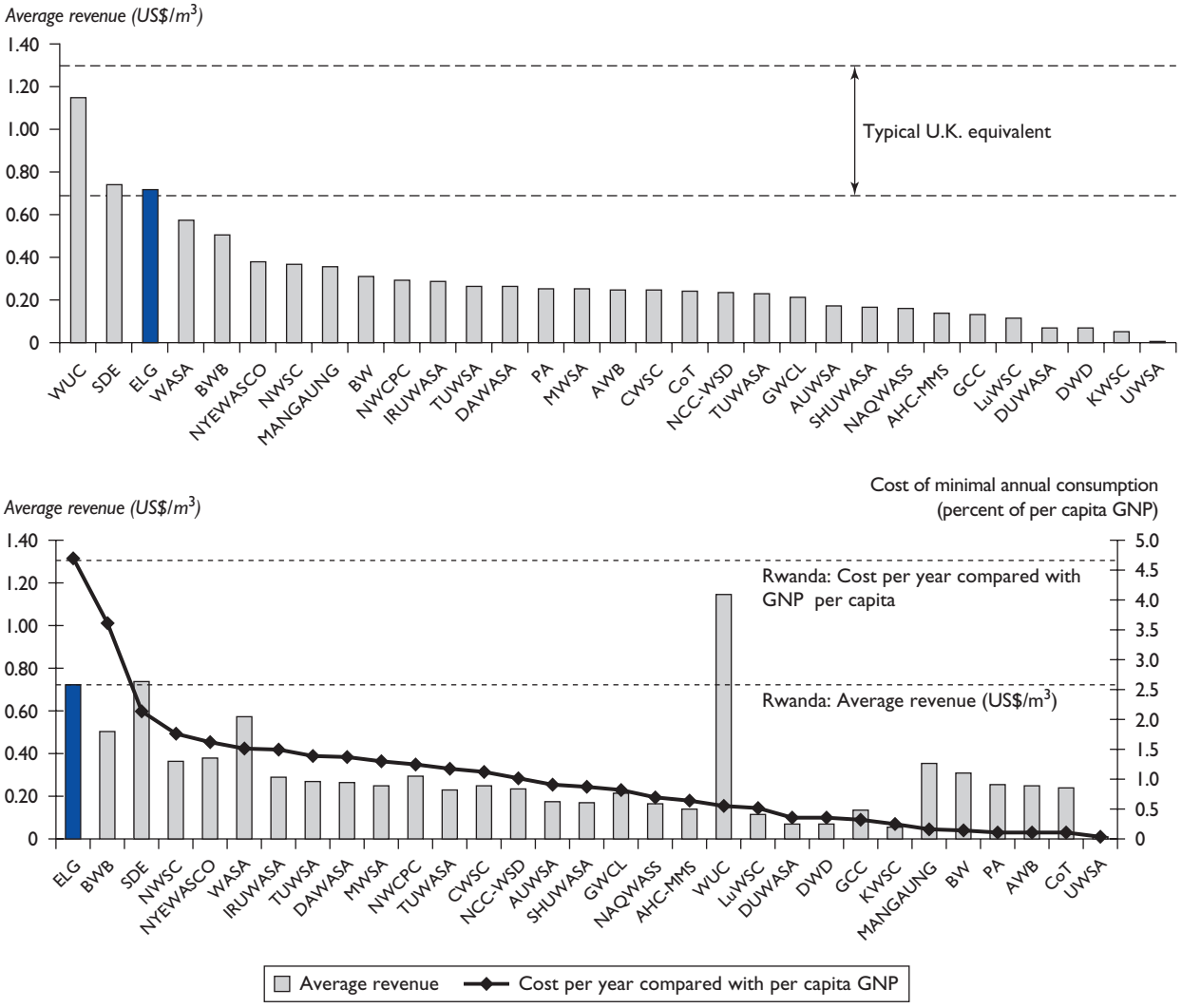
Table 4.1 Electrogaz Water Tariffs

Monthly consumption	1997–present FRW/m³	USD/m³	USD/m³
		1997	2003
0–25 m³	200	0.63	0.37
26–60 m³	300	0.94	0.56
61–100 m³	350	1.09	0.65
Over 100 m³	375	1.17	0.70
Standpipe concessions	200	0.63	0.37

Source: Electrogaz.

equivalent rate per cubic meter has slipped from 0.63 to 0.37 for the lowest consumption band since the tariff was introduced in 1997. At US$0.63 per cubic meter ELG's first block price is extremely high by African standards; at US$0.37 per cubic meter, the price is more in line with African norms. Overall average revenue for ELG water in 2001 was FRw 285 per cubic meter, or US$0.55–0.89 (at the current and 1997 exchange rates, respectively). A comparison with other African water utilities is given in figure 4.5.

Figure 4.5 Average Price of Water Supplied by African Water Utilities



Note: The top graph shows ELG's average revenue (midpoint value) in U.S. dollars compared with a selection of other African water utilities. The bottom graph again shows comparative average revenue and also provides an indication of how the total cost of typical per capita water consumption compares with average gross national product (GNP) per capita in the country in which each utility is based. This comparison is based on a nominal per capita consumption of 40 liters per day (equivalent to approximately 15 cubic meters per year). This shows particularly clearly how expensive ELG water supply is in relation to per capita income levels in Rwanda.

Source: Water Utility Partnership SBNet 2001, supported by GNP data obtained from the CIA World Factbook.

Key to Figures 4.4 and 4.5.

AHC-MMS	AHC Mining Municipal Services Ltd.	Zambia
AUWSA	Arusha Urban Water Supply and Sewerage Authority	Tanzania
AWB	Amatola Water Board	South Africa
BW	Bloem Water	South Africa
BWB	Blantyre Water Board	Malawi
CoT	City of Tygerberg	South Africa
CWSC	Chipata Water and Sewerage Company	Zambia
DAWASA	Dar es Salaam Water and Sewerage Authority	Tanzania
DMWS	Durban Metro Water Services	South Africa
DUWASA	Dodoma Water and Sewerage Company	Tanzania
DWD	Department of Water Development	Tanzania
ELG	Electrogaz	Rwanda
GCC	City of Gweru	Zimbabwe
GWCL	Ghana Water Company Ltd.	Ghana
IRUWASA	Iringa Urban Water Supply and Sewerage	Tanzania
KWSC	Kafubu Water and Sewerage Co. Ltd.	Zambia
LNW	Lepelle Northern Water	South Africa
LuWSC	Lusaka Water and Sewerage Co.	Zambia
MANGAUNG	Mangaung Local Municipality	South Africa
MWSA	Mwanza Water and Sewerage Authority	Tanzania
MWSC	Mulonga Water and Sewerage Company	Zambia
NAQWASS	Nakuru Water Company	Kenya
NCC-WSD	Nairobi City Council	Kenya
NWCPC	National Water Conservation and Pipeline Co.	Kenya
NWSC	National Water and Sewerage Company	Uganda
NYEWASCO	Nyeri Water and Sewerage Co. Ltd.	Kenya
PA	Drakenstein Municipality	South Africa
SDE	Senegalaise des Eaux	Senegal
SHUWASA	Shinyanga Urban Water and Sewerage Authority	Tanzania
SODECI	Societe de Distribution d'Eaux de Côte d'Ivoire	Côte d'Ivoire
TUWASA	Tabora Urban Water and Sewerage Authority	Tanzania
TUWSA	Tanga Urban Water Supply and Sewerage Authority	Tanzania
UW	Umgeni Water	South Africa
UWSA	Urban Water Supply and Sewerage Authority	Tanzania
WASA	Water and Sewerage Authority	Lesotho
WUC	Water Utilities Corporation	Botswana

In practice, the majority of the urban population pays substantially more for water than the ELG average rate. Water is currently sold to standpipe operators at a flat rate of FRw 200 per cubic meter and is then resold to final users. There is no control over the prices that standpipe operators charge, but the normal price charged in Kigali was about FRw 10 for a 20-liter jerry can at the time of preparing this report—or FRw 500 per cubic meter (that is, US$0.97–1.56). This price is exceptionally high. It is the poorest in society who are the most exposed to these high prices, because they have no safe alternative but to use standpipe water, paying almost three times the amount that wealthier households pay for water to meet essential needs. Figure 4.5 shows average revenue per cubic meter of water sold by each utility and does not take into account the supplementary amount paid to standpipe operators. It clearly demonstrates the exceptionally high price of ELG supplies.

Despite high tariff levels, ELG's financial performance remains extremely weak, although it is impossible to ascertain to what extent this weakness is attributable to water supply as opposed to electricity supply activities. In part, it reflects the company's weak financial systems, especially in relation to customer management. It is estimated that less than 70 percent of water service billed is collected, and unbilled consumption is likely to represent a significant proportion of unaccounted-for water. Inefficiency is also evident in operations, particularly in relation to overemployment.

In addition to the need to improve its overall operational and commercial performance—issues to be addressed within the framework of the management contract that is currently under negotiation—ELG faces a number of fundamental difficulties that will need to be addressed in the near future. Principal among these is the poor quality of the main water source for Kigali, the Yanze River. The extremely high levels of sediment carried by the river, especially at times of high flow, result in significant operational problems in filtration and treatment. During periods of low flow, ELG must take almost the entire flow to satisfy demand from the city and there is a significant overall supply deficit. Also, the five main springs on which Kigali also relies for a significant proportion of the balance of its water supply, especially during the dry season, are centrally located and have become enveloped as the city has expanded. They are accordingly highly vulnerable to pollution. Finally, growth in population—and hence in demand—has also put serious

pressure on the overall adequacy of the available water resources, although this problem may in part be due to the high level of estimated leakage from the distribution system.

The poor quality of existing resources for Kigali and the increasing supply deficit mean that there is a strong case for developing alternative sources of supply. The most promising potential new resource appears to be water piped under gravity from catchments in the areas of Rubindi, Mutobo, and Mpenge in the Virunga region. The project would involve a pipeline of at least 800 millimeters in diameter, running some 105 kilometers from Ruhengeri to Kigali, together with the possible installation of some hydroelectric capacity. The supply rate would average 520 liters per second (45,000 cubic meters per day), which would certainly satisfy the current demand for water in Kigali.

Piping water this way would represent a substantial project, with an estimated cost in the region of US$117 million (excluding power generation). Thus, it might provide a good opportunity for private financing and operation through a suitable BOT scheme. The prospects for the success of such a scheme are increased by the fact that the people of Kigali already pay a high price for water. Thus, it is likely that the scheme can be made financially attractive to a private operator without requiring an increase in the general level of tariffs.

If the Ruhengeri-to-Kigali pipeline scheme is taken forward, it should be done on an integrated basis as part of a broader basin master plan. It is in any case unlikely that Kigali will benefit from increased supplies from this source for about 8 to 10 years. There is, however, an urgent need to improve supplies to the city within a much shorter time span. In part, the security of supply to Kigali can be improved through a sustained program to reduce leakage from the distribution system—a key aim of the ELG management contract. Although necessarily a matter of speculation until a program to reduce unaccounted-for water is put in place, it seems likely that a high proportion of Kigali's unaccounted-for water is attributable to administrative rather than physical losses. Thus, even very substantial reductions in Kigali's unaccounted-for water will not significantly increase the effective supply of water to the city. If this proves to be the case, priority will need to be given to improving water availability in the short to medium term.

A pilot scheme to draw water from boreholes on the banks of the River Nyabarongo has been largely successful—although there are important lessons to be learned concerning future improvements to this type of resource development—and offers a model that could be replicated to provide additional water in the relatively short term.

Urban Sanitation

The density of housing development in Kigali, particularly in the spontaneous informal settlements that are growing in the city's periurban fringe, presents an immense challenge to the establishment of satisfactory domestic sanitation. The typically small plot size and the difficult topography mean that individual on-site sanitation is often infeasible. Facilities for the disposal of the contents of latrines and septic tanks are inadequate, and there is little provision for the safe removal of liquid waste or overflows. Basic night-soil removal services do not appear to be available. Similar circumstances apply in most other major urban centers, although to a lesser extent than in Kigali. A significant and growing proportion of the urban population, therefore, lacks access to adequate sanitation. Reticulated service is limited to a few well-off areas, and the extent of wastewater treatment is effectively negligible. An unacceptably high proportion of human waste returns untreated directly to the environment.

Rural Water Supply and Sanitation

The proportion of the rural population benefiting from a main household supply or yard tap is negligible, with virtually the entire rural population relying on communal water sources (wells, springs, and standpipes). In many parts of the country, water is relatively easily and freely available from unprotected and untested sources, including streams, lakes, and swamps. Hence, even where safe water has been provided, the local population will often use these alternative sources to meet at least some of their water needs. Clearly, the first priority is that rural inhabitants be encouraged and enabled to use safe sources of water for human consumption and culinary purposes. The source of water used for personal hygiene and washing clothes is of less concern. Nevertheless, the use of unsafe water even for these less important purposes can carry health risks, and the time costs for women and children engaged in

collecting and using water from more distant sources should also be considered.

A number of factors may dissuade the rural community from using potable water where it has been provided:

- The long distances that rural people have to travel to access safe water. In many cases, the distances are so great that they amount effectively to the complete unavailability of potable water.
- The lack of public awareness of the benefits of clean water supply, combined with a perception that water is not an economic good whose provision must be paid for. These factors continue to inhibit demand-led provision of service.
- The price that rural people have to pay. Currently charges at source appear to range from FRw 5 to FRw 15 for a 20-liter jerry can (of which, about FRw 3 will normally be retained as payment by the person engaged to look after the water supply point and to recover charges).

There are two distinct approaches adopted to payment for rural water service provision, in order to ensure that the community can continue to meet operating and maintenance costs. First, a flat rate charge may be collected by the community from all those considered to benefit from the water supply. The advantages of this approach—low collection costs and perceived fairness—need to be set against the disadvantages of the ease of evading payment and the difficulty of preventing (or unwillingness to prevent) those who have not paid from taking water. Second, user charges may be levied in accordance with the amount of water actually taken.

The highest prices are likely to arise where significant pumping is involved in the provision of water through more complex (and generally superior) systems. Lack of access to electricity means that rural schemes must generally rely on diesel pumps, and the rising price of fuel is a serious concern. Ability to pay is a significant issue for poorer rural communities and a price level of FRw 10 or more can be a serious disincentive to many to use clean water to meet even their most basic needs.

In addition to the price at source as noted above, people who live farther away from safe water sources or who are unable to carry water over the distances involved are likely to pay a premium for safe water that is distributed by bicycle carriers or other vendors. It may be noted that these water vendors, together with the individuals employed to take care of water sources and standpipes, are evidence of the existing low-level PSP that already exists in the rural water sector.

Experience in the Ngenda PSP scheme in the south of Rwanda has demonstrated the following:

- Willingness to pay for clean water may be very low in rural areas where (unsafe) alternatives are readily available.
- Only about 30 percent of potential consumers use Ngenda water (at FRw 14 per 20-liter jerry can), and average consumption is only about 4 to 5 liters per person per day—despite the fact that standpipes are located very conveniently for the vast majority of the local population.

These findings highlight two issues:

- The design standards that should be used in rural water schemes. Actual overall average per capita consumption at Ngenda is in the region of 1–2 liters per day, but the plant design was based on a consumption level of 10 liters per person per day (a general standard of 20 liters per person per day is frequently quoted).
- The importance of effective public awareness campaigns in order to build demand for safe water. Both the promotion of public health and the exploitation of the potential for PSP to make a contribution to rural water supply depend on building demand for safe water.

It is estimated that about 90 percent of rural residents have access to some form of toilet facility but that only a tiny proportion, about 10 percent, have access to an adequately hygienic facility. The majority of public places and buildings in rural areas, such as markets, schools, and prisons, also lack adequate sanitation facilities. The unplanned location of dwellings, often on the sides of steep slopes, typically makes the installation of shared sanitation facilities technically and financially infeasible.

Opportunities for Private Sector Participation

There are several opportunities for PSP in the water and sanitation sector.

Enhancing Standpipe Businesses

The price that the urban poor pay for water to meet their essential needs is high, and it would clearly be

desirable to find means to reduce the extra costs that they have to bear. While there is no control on the prices that standpipe operators charge, regulation would be difficult to implement, and it is uncertain whether regulation would bring any significant benefit to the urban poor. Particularly in urban areas, households are normally able to choose between a number of different standpipe locations (at different levels of convenience), and competition between operators should ensure that prices are kept in check. A more significant factor influencing the high premium is likely to be the fact that the operators must earn enough to provide them with an adequate livelihood. Standpipe operators in Kigali are earning a gross margin of about FRw 6 per jerry can and—in the absence of any ancillary source of income—will need to resell on the order of 400 20-liter jerry cans daily to generate a US$1 per capita per day income (for a family of five).

It follows that a more promising approach to reducing the extra cost of water to the poor may be to try to develop opportunities for standpipe operators to augment their incomes by providing additional services. A number of options have been suggested in this regard. For example, washstands, small-scale retail businesses, and even Internet cafés could be incorporated into extended kiosk premises. Although well intended, it is not clear that this type of development would be successful in most locations. Standpipe operators would not generally have a great deal of time to devote to additional activities, and extra security measures would be necessary if materials left on site are to be protected. Such measures are unlikely to result in a general reduction in the premium that standpipe operators charge, however, since there are relatively few locations where such operations are likely to be viable. Nevertheless, a pilot project would be worthwhile to test the feasibility of this approach and to refine it.

Developing a Networked Supply

A further longer-term concern is whether a path can be found by which the urban population in general can obtain access to piped household water supply. At present, lack of purchasing power combined with rapid urbanization and the unplanned spontaneous development of the periurban fringe presents a formidable barrier to the provision of conventional mains supplies to these communities. A possible approach would be to encourage very small business enterprises to establish small-scale local networks, using overground installations of plastic piping to provide low-cost and low-capacity distribution networks to households living within the neighborhood of an existing standpipe facility or other bulk off-take point established for this purpose. Such condominial systems are becoming increasingly common in Latin America and have also been introduced in Southeast Asia. Condominial systems may be developed by entrepreneurs acting on their own or through partnership initiatives involving the government, the private sector, and the community.

The fact that such systems would be established at standards that fall well below those to which ELG adheres is not a concern in this type of approach (especially in view of the fact that systems do not yet exist for the safe disposal of wastewater). Regulation of such schemes should be minimal, limited to occasional inspection of the installation to ensure that basic public health standards are being maintained. No economic regulation should be needed, because customers would be protected from monopoly exploitation by their continuing access to standpipe facilities.

Condominial schemes would not be feasible throughout all urban areas in Rwanda in the short term and, in particular, cannot be expected to work in districts where the poorest urban citizens are concentrated. Nevertheless, the approach offers the prospect of an evolutionary path toward the eventual development of a universal piped water supply in urban areas and, at the same time, should contribute to improved livelihoods for people involved directly in service provision.

Essential to the practicability of the condominial approach are these conditions:

- Absolute clarity that such local distribution schemes would not conflict with any exclusive rights granted to ELG. (There are doubts about this under the terms of the ELG management contract.)
- Absolute clarity that it is permissible under Rwandan law for private persons or companies to own water supply assets. (It is understood that this is in fact the case.)
- Confidence that rights-of-way issues could be managed, for example, by some form of licensing or indemnification provision.
- Development of regulated bulk supply arrangements to apply to ELG to ensure that condominial suppliers have access to adequate supplies.

- Availability of loan financing to enable condominial suppliers to invest in system development.
- Provision of technical assistance to assist in the planning and development of such schemes.

Given, on the one hand, the significant potential to improve water supplies in urban areas that the approach would appear to have in principle and, on the other, the range of issues to be addressed in its implementation, there would seem to be a very strong case for setting up a pilot project for the condominial approach.

Private Sector Participation in Rural Water Supply and Sanitation

The government's overall policy on rural water supply and sanitation is broadly in line with expert opinion on how these areas should be addressed, in particular with respect to its emphasis on decentralization and community participation in the design, development, and sustainable operation of demand-driven schemes. The budget currently available for the implementation of specific policy measures is, however, limited, and the rate of progress of the Rural Water and Sanitation Project is extremely slow in comparison with the scale of need. The current pilot projects being run by the Department of Water and Sanitation have indicated a marked reluctance on behalf of the community to contribute toward the capital costs of infrastructure provision in advance of the provision of services (10 percent of the initial capital cost is generally requested). The sanitation component of the project is currently limited to sensitization campaigns, with no direct help being provided for infrastructure development.

Although opportunities for PSP in rural water and sanitation are likely to be very limited in scale, there may be scope to increase the number of individuals earning a living (or, at least, supplementing their income) from the provision of water services or from ancillary services, and to enhance the level of incomes they are able to generate.

To date, a number of national nongovernmental organizations (NGOs) appear to have been more successful than the government in promoting community-led development of rural water services. Some national NGOs have also been directly involved in assisting householders in installing satisfactory basic latrine facilities. The relative success of the NGOs is almost certainly attributable to the fact that they operate close to local communities and are much better able to sensitize and mobilize the community than are government authorities. Although statistics are not available, it seems likely that the NGOs are also able to obtain a better return from scarce resources than is the government. It may be questioned whether the government's current approach takes sufficient advantage of the scope to cooperate with the NGOs in the process of community-led infrastructure provision.

The current policy approach is demand led only insofar as the design and planning of schemes is community driven. It remains top-down and supply driven, however, insofar as the selection of districts for inclusion within the scope of rural water and sanitation initiatives remains a matter for the government and aid agencies. A better outcome might be possible with a more highly demand-driven approach, under which community groups, in coordination with NGOs, might be empowered to take a greater role in the selection of projects.

A possible model for a more demand-driven approach is the approach developed in Mozambique for funding rural electrification schemes. This model has six main features:

1. Establishing a central rural water supply fund using government and donor contributions
2. Allowing bids for subsidy from the fund to be made—on a project-by-project basis—by any organization engaged in the development of rural water supply projects, including the private sector, NGOs, and community groups
3. Allocating available funds to water supply projects on the basis of the total capital subsidy required per additional person supplied (that is, favoring projects in which unit cost is low or community or private sector capital contributions are high)
4. Mandating that all projects be supported by plans and clear community commitments that confirm their long-term financial and operational sustainability
5. Establishing preset limits on the maximum proportion of annual funding that can be allotted to any individual project
6. Developing a closely collaborative approach with local NGOs in order to support their core role in sensitizing and mobilizing rural communities and in

helping communities identify their needs and develop and implement project plans.

A key feature of this type of approach is the need to develop a flexible stance on standards of provision. The poor will benefit from better water supplies only if the policy emphasis is on promoting their ability to achieve improvements that they can afford, rather than on establishing rigid minimum requirements that may be beyond their means.

Adopting a strongly demand-led approach to rural water supply—in close cooperation with donors and NGOs—should lead to a step change in the rate at which improved water supplies are made available to the rural poor and will maximize the benefit obtained from scarce government and donor resources.

Opportunities also exist to exploit the potential to supply some rural areas from ELG's network. In a number of areas, ELG's water mains run close by rural communities that lie outside ELG's defined sphere of operations but which it would be practicable for ELG to serve if an appropriate business, financial, and regulatory model could be developed. In terms of a general business model, partnership arrangements with a local private business or community association would seem to represent the most appropriate approach. ELG would enter into a bulk (that is, wholesale) supply agreement with the local operator, who would then be responsible for all infrastructure, services, and revenue recovery beyond the point of metered off-take from the ELG system. This model is, in fact, very similar to the approach discussed above in relation to extending reticulated water services in urban areas.

Issues

Several issues arise with respect to the water and sanitation sector.

Water Resource Management

The focus of this report is on infrastructure issues relating to the provision of water supply and sanitation services to the Rwandan public rather than on water resource management. Nevertheless, the way in which Rwanda manages its water resources has critical implications for water supply and sanitation and vice versa. The "National Water Resources Management Policy" of July 1998 notes the following main water resource problems:

- Insufficient technical professional staff
- Increasing industrial pollution and lack of adequate wastewater treatment facilities
- Incomplete inventory of water resources
- Lack of watercourse development and development of potentially navigable lakes
- Inadequate watershed management, high levels of soil erosion, and increasing instability of flow volumes
- Application of agricultural technologies that are unsuited to water resources management
- Lack of framework legislation and regulations governing water planning and management in the industrial sector
- Pollution of watercourses and lakes, especially by water hyacinth.

These issues will be addressed under the legal and institutional component of the newly awarded Japan Policy and Human Resources Development Fund grant aimed at preparing a new project related to national water resource management.

Some of these issues bear particularly directly on water supply provision. As noted in appendix A, the increasing turbidity of its existing water sources is causing considerable operational problems, as well as additional expense, for ELG. The lack of a satisfactory inventory of water resources is, likewise, a concern in extending the availability of potable water in rural areas. Although water resource management policies are clear, there is currently relatively little evidence of successful implementation, which is likely to rely on significant external support and cannot be expected to attract private funding.

Urban Water Supply

Two issues arise with respect to urban water supply: the ELG management contract and the role of the Multisector Regulatory Agency (MSR).

Management Contract The success of the ELG management contract will be of central importance to the future development of potable water supplies in Rwanda's urban areas. The future ability of the company to tap private sources of financing, whether

through the intended route of a long-term concession or through an alternative means such as bond financing, hangs critically on its ability to improve its operating and commercial performance and to generate cash surpluses to remunerate private investors.

It is understood that agreement has been reached on the terms of the ELG management contract, although the contractor is not yet in place. This agreement represents a clearly positive development for the urban water sector. The particular terms of the contract remained private at the time of drafting this report, so it is not appropriate to comment on them here. In general, however, it is clear that, if the long-term objectives of the government are to be realized, the performance regime must provide a framework of incentives that strongly encourages the management contractor to improve revenues and to minimize costs, while achieving satisfactory standards of service. For these incentives to be effective in practice, it will also be necessary to have a strong, equitable mechanism for monitoring and compliance in place.

Regulation The role of the MSR is critical in the latter regard. The regulator is required both to implement sector regulations and to serve as an impartial arbiter for dispute resolution, although it is proposed that the Board of Directors of ELG should undertake these responsibilities until the MSR is fully operational. The general enabling legal framework for the MSR has been established, and funding is in place. The MSR has made key senior appointments, including the managing director and a number of departmental heads. More junior staff members remain to be appointed, and attention will need to be given to training and provision of technical assistance before the MSR will be capable of performing its functions. The proposed water sector law has not yet received parliamentary approval, however, and is still in the drafting process. The new law is necessary to define the specific duties and powers of the MSR with respect to urban water services and is essential to complete the overall regulatory framework within which the management contract will be performed.

Urban Sanitation

Although the policy objectives of the government are sensible, the policy measures established to put them into effect are extremely limited and the overall approach can be regarded as, in essence, a statement of aspirations. The proposed Sanitation Code has not yet been finalized. Proposed legislation on sanitation is contained in both the draft Sanitation Act (emanating from the Ministry of Health) and in the draft Environmental Management and Protection Act, and there is a significant risk of inconsistency between the two laws. This issue will also be addressed under the legal and institutional component of the newly awarded Japan Policy and Human Resources Development Fund grant.

The environmental and health consequences of inadequate urban sanitation are extremely serious and are increasing with growth in the urban population. It is imperative that the government and the relevant city and town authorities address urban sanitation services as a matter of highest urgency, establishing clear, realistic, and measurable policy objectives and effective means for their achievement.

Sanitation provision does not typically represent a suitable target for large-scale PSP in low-income countries. Even in the capital, where average incomes are highest, it is unlikely that a significant proportion of the population would be willing to pay full cost-recovery charges for anything more than basic on-site sanitation provision. The sort of communal sanitation schemes that are likely to be required to provide adequate services to many urban communities in Rwanda are unlikely to represent a suitable vehicle for private financing, although a contribution by the community toward capital and operating costs may be both possible and desirable.

The private sector is, however, already active in the collection and disposal of sludge from septic tanks in Kigali, a service that is also provided by the Kigali City Authority. This activity is primarily focused on wealthier communities, where residents are both more likely to have septic tanks and more likely to be willing and able to pay the high prices charged for pumping out and disposing of sludge. It would be in the interests of customers if competition could be promoted in this type of activity.

In the long term, the prospects for developing proper urban sanitation services in Kigali and other urban areas appear to hang on the possibility of establishing a significant income stream from which to

support the development and operation of sanitation services. There appear to be two principal options:

1. Attaching an additional sanitation charge to existing water supply charges, an approach that will be both fair and practicable only when the majority of the urban population has access to piped household water supplies
2. Introducing a hypothecated property tax, necessarily associated with broader changes to the basis of local taxation and the introduction of a residential property tax system—again, an approach that is unlikely to be feasible in the short to medium term.

Rural Water Supply and Sanitation

Issues regarding rural water supply and sanitation include ELG participation in water supply and the need for public education.

ELG Participation in Rural Water Supply ELG is not currently able to participate in the provision of rural water supply even though its mains systems sometimes traverse rural areas that could benefit significantly from access to improved water supplies. A particular issue is how ELG might benefit from a share in the subsidies that are generally required to establish rural water service. Under the funding model for rural water supply outlined above, it should be relatively simple to find a way for ELG to benefit. As long as ELG is allowed to bid projects into the fund (separately or in association with private sector or community partners), it will be able to access subsidies on the same basis as any other party proposing to provide a new rural water supply. This approach would provide a framework that would promote achievement of the best value from available funding, adopting ELG rural solutions where they work best.

A clearly thought-out legal and regulatory framework would be required to support this approach. Issues to cover will include the following:

- Control of bulk supply charges
- The obligations and standards that ELG should fulfill in relation to bulk supplies or the requirement to establish a service-level agreement between ELG and local rural operators
- The right, if any, of local operators or communities to requisition bulk supplies from ELG and the corresponding limitations on ELG's obligations to provide wholesale supplies
- The monitoring and general procedures that should be applied.

Importance of Continuing Public Education and Communication It is widely recognized that a key requirement in relation to rural water supply and sanitation is to build public demand—and willingness to pay—for an improved standard of service. PSP in rural water supply and sanitation—for example, through the type of scheme outlined above—will be feasible only if backed up by an energetic and focused communications program aimed at sensitizing the rural population to the importance of clean water and the risks associated with using unsafe supplies.

Recommendations

This report recommends the following actions:

- Urgent attention should be given to developing a clear, long-term policy framework for both the water and the sanitation sectors, setting out in each case (and for both urban and rural areas) not only the objectives that the government proposes to pursue but also the specific methods that it intends to adopt in order to achieve those objectives. It is recommended that this policy be published in a policy statement and be widely disseminated.
- Following completion of the policy statement, a new water law should be drafted, as soon as practicably possible, to ensure that a proper enabling framework is put in place for the policy methods to be adopted. For the same reason, it is also recommended that other laws such as the Environmental Management and Protection Act and the Sanitation Code be amended as necessary (assuming that they have been enacted).
- A detailed feasibility and financial study should be undertaken of the scope for developing a PSP scheme (most probably a BOT scheme) for the Ruhengeri-Kigali water supply project. The terms of reference for this study should include
  - Completion of any further engineering studies and outline costings necessary to complete the project; for example, the costs of modifying

the existing network to cater to the new source of supply and the costs of disconnecting and decommissioning other water resources that would be made redundant by the project

— An economic and commercial appraisal of the project, including risk analyses from the standpoint of the BOT contractor, ELG, and customers.

An environmental impact assessment should also be commissioned. Assuming that the prospects for the scheme appear to be positive, based on a general assessment of these studies, a plan should be put in place to complete the PSP project. It should include a detailed commercial, regulatory, and contractual design, and the project should be bid out on an open and competitive basis.

- Following an initial assessment of the scope for providing additional effective supplies to Kigali by means of an effective leakage reduction program, if appropriate, a scheme should be created and evaluated to develop further boreholes on the banks of the Nyabarongo. The scheme should be developed on a PSP basis if possible, using a BOT (build, operate and transfer) or BOO (build, operate, and own) approach.
- A pilot project should be implemented to test the scope for urban standpipe operators to augment their incomes by providing additional services at water supply kiosks.
- A pilot project should be implemented by the Department of Water and Sanitation in conjunction with ELG to test the practicability of the condominial approach. Before carrying out the pilot project, the department should commission a full strategic and feasibility study to establish a provisional institutional, legal, technical, and commercial design for condominial schemes in Rwanda.
- A fully demand-led approach to rural water supply should be designed and implemented, incorporating competitive bidding for subsidies from a rural water supply fund. This project should be undertaken in close cooperation with donors and with both national and international NGOs.
- A specific component of the scheme should be the introduction of arrangements to ensure that ELG is able to participate in the provision of rural water services where doing so represents an efficient and effective solution.

Although water resource management is not directly concerned with the public service infrastructure required to deliver water and sanitation services to the general population, it is extremely important that effective policy means be identified and implemented to pursue better management of Rwanda's water resource endowment and to achieve the objectives set out in the National Water Resources Management Policy of 1998. Water resource management is not an activity that provides extensive opportunities for PSP, and in Rwanda, as elsewhere, a government department or agency would normally undertake this activity (although specific works may be contracted out to private contractors). Because river basin boundaries rarely, if ever, correspond with local government political boundaries, and because of the important international issues that arise where watercourses and lakes are shared across international boundaries, water resource management is very poorly suited to decentralized management. It is, therefore, important that the institutional approach adopted for water resource management in Rwanda be nationally based, although river basin subdivisions could be established within this broad framework.

Note

1. These statistical indicators, all of which are derived from data submitted by the utilities, should be treated with some caution. Nevertheless, the picture presented of ELG is consistently poor.

5 Common Issues in the Electricity and Water Sectors

This short chapter considers a number of Electrogaz (ELG) operational issues that have a bearing on both the electricity and the water parts of ELG's business.

Management and Human Resources

Skills development and knowledge transfer constitute an important element of the ELG management contract, as it is recognized that both management capacity and technical expertise are presently in short supply at ELG. Internal communication is also seriously deficient. To its credit, the senior management team at ELG is enthusiastic and is keen to embrace this capacity development.

Commercial and Financial Management

By ELG's own admission, accurate information concerning its financial state is in short supply. The latest annual report available when this Country Framework Report was prepared (the annual report for 1999) indicated that the company was not financially viable and had accumulated substantial debts. Its precarious financial state is a consequence of a number of factors:

- High operational costs. Costs are especially high at the distribution level.
- Extremely poor billing and collection performance. The billing rate stood at 66 percent and the collection rate stood at 63 percent in 1998. Performance has improved a little since then, but not much. This poor performance results from a lack of systems and technical skills, a shortage of human resources, theft, inaccurate meter reading (including corruption among meter-reading employees), and inadequate information concerning customer connections. The relatively recent introduction of local customer centers around Kigali (where the majority of ELG's customers reside) has improved matters.
- Inadequate accounting and customer management systems. Such systems make it very difficult to either understand or address the problem and also prevent the introduction of any kind of performance management program to help improve the situation.
- The single, flat-rate electricity tariff. A tariff of FRw 42 per kilowatt-hour was set by the Ministry of Infrastructure in 1998 and has not been changed since to reflect costs. A formal tariff study is needed to establish economical tariffs (including variable rates) that will promote the efficient use of electricity by customers.

Management Contract

Without doubt, the impending management contract represents a positive and important step to help ELG improve its operational and financial performance. Contract agreement is also a necessary precondition for the short- and long-term donor funding that is vitally needed to introduce financial and management systems and to rehabilitate assets. Finally, the contract represents an important first step toward a deeper form of private sector participation.

Recommendations

Assuming the ELG management contract is successfully established, the following are recommended:

- In relation to the provision of further donor funding during the term of the management contract, consideration should be given to introducing a performance program that links the level of payment to the contractor to its success in implementing the investment program and in achieving the program's core objectives, in accordance with the principles of output-based aid.
- Following the success of the Cashpower prepayment program, sufficient funding should be allocated to this program to ensure that ELG's plans to extend the program through the acquisition of new meters can be realized.

6 The Telecommunications Sector

Telecommunications development plays a central role in the government's vision of economic development led by information and communication technology (ICT). Unless there is rapid and sustained expansion of Rwanda's telephone network, which is currently one of the least extensive in Africa, it is clear that this vision will be impossible to realize. Privatization and liberalization of telecommunications have been shown in numerous countries at a variety of stages of economic development to represent the core requirement for galvanizing rapid increases in access to modern telephony services and quick improvement in the range and quality of services offered to consumers.

Broadening access to telecommunications and extending the range of quality of available services can be expected to support economic development in a wide variety of ways. In urban districts, high-quality telecommunications networks offer the scope to develop information-intensive economic activities. In rural areas, better access to up-to-date market information and improved contact with suppliers and customers increase the ability of farmers to maximize the value of their output and avoid wastage resulting from extended periods of storage and inefficient harvesting of crops. More generally, improved telecommunications will improve the ability of the community to participate in civil society and in the political life of the country.

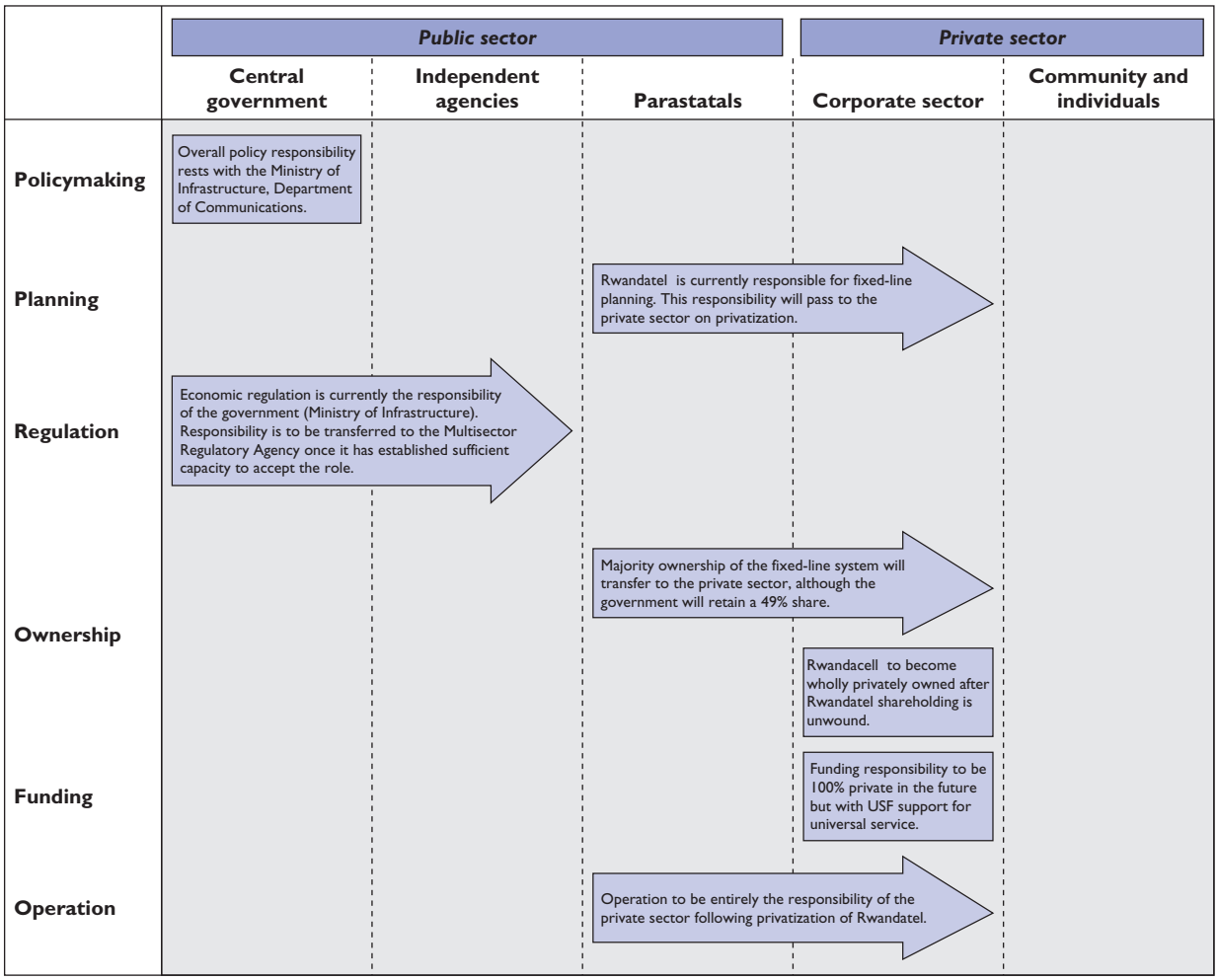
Sector Structure, Roles, and Responsibilities

Figure 6.1 summarizes key roles within the fixed and mobile telecommunications subsectors as they are currently organized and managed in Rwanda. It indicates the changes that will arise on completion of the planned sale of 51 percent of Rwandatel, the state-owned fixed-line operator, to a foreign strategic investor, 43 percent to local investors, and 5 percent to employees (the government will retain a 1 percent golden share in order to maintain the power to veto certain decisions).[1]

Figure 6.1 clearly shows the transition that is being implemented from an old-style state-monopoly telecommunications provider to a modern ownership and competition model. The first stage of this process was initiated in 1998 when MTN (Mobile Telephone Networks) Rwandacell was permitted to establish a mobile telephone business in (partial) competition with Rwandatel. Rwandacell's ownership structure involves a 46 percent holding by Tristar, a local investment vehicle; a 26 percent holding by MTN; and a 28 percent holding by Rwandatel. The proposed sale of Rwandatel, the latter's disinvestment in Rwandacell, and the opening up of the market to competition should complete this transitional process.

The government has set up an ICT Commission, headed by the president, and has adopted a national

Figure 6.1 | **Telecommunications: Roles and Responsibilities**



Source: Adam Smith Institute research.

ICT policy, committing it to transforming itself from an essentially agrarian economy to a knowledge-based society within 20 years. The Rwanda Information Technology Authority has been established to assist in the implementation of this strategy.

There are currently five Internet service providers in Rwanda, of which three—Rwandatel, the National University of Rwanda (NUR), and the Kigali Institute of Science and Technology (KIST)—are well established and two (Mediapost and DIN) are recent entrants. Both NUR and KIST obtain their international bandwidth through the use of very small aperture terminal (VSAT) dishes, installed as part of the U.S. Agency for International Development (USAID) Leland Initiative. About 60 Internet cafés are currently located throughout the country, of which most are in the Kigali and Butare areas. In the Maraba district, however, local farmers have been using the Internet to look up coffee prices and communicate with customers, demonstrating the potential that ICT has to contribute to economic growth and development in rural areas.

Policymaking, Planning, and Regulation

Core policy objectives for the telecommunications sector are as follows:

- To achieve a reduction in the waiting lists for the installation of fixed lines

- To extend telephone service to areas of Rwanda that are currently unserved or underserved
- To ensure better quality of service (fewer faults per line, quicker repair)
- To rebalance telephone tariffs so that prices are brought more closely into line with costs
- To provide a wider variety of services, including more widespread Internet access
- To ensure the availability, wherever possible, of a choice of supplier
- To ensure affordable access to telephone services for Rwandans in all regions
- To provide opportunities wherever possible for Rwandan entrepreneurs and investors.

Liberalization of the telecommunications sector and the privatization of Rwandatel lie at the heart of the government's approach to achieving its objectives. The enabling framework for this approach has been put in place by the Telecommunications Law (Law No. 44/2001) and Law No. 39/2001, which establishes the Multisector Regulatory Agency (MSR). The principal provisions of the Telecommunications Law include the following:

- Establishment of a licensing framework for telecommunications, covering both standard and individual licenses
- Issuance of individual licenses by a government minister on the advice of the regulator (applicable where operators are providing telecommunications services to the general public, where they require rights of access to land, where they are required to provide certain mandatory public services, or where defense and security issues arise)
- Issuance of standard licenses by the MSR
- Regulation of the sector by the MSR, including
  - Enforcement of licenses and imposition of penalties (which may be substantial)
  - Modification of licenses
  - Price and quality control
  - Establishment and enforcement of technical standards
- Provision for the courts to take an appellate role in the event of a regulatory decision being subject to dispute
- Provision for management of the radio spectrum and associated licensing by the MSR
- Establishment of competition in the markets for installation and maintenance of equipment on customer premises
- Provision for directory and inquiry services
- Provision for the establishment of a universal service fund to cover the additional costs to be met by certain operators with universal service responsibilities
- Provision for mandatory interconnection of telecommunications operators on regulated terms.

In addition, the MSR will be responsible for

- Ensuring that operators maintain a satisfactory system for dealing with customer complaints, including a compensation mechanism if stipulated standards are not met
- Ensuring that operators regularly publish, on a common basis, how well they have performed against stipulated standards
- Administering the national numbering plan.

The government is proceeding with the sale of a majority stake in Rwandatel, with advisers in place and due-diligence work now largely completed. Negotiations are under way to unwind the existing cross-shareholding between Rwandatel and Rwandacell.

Extent of Telecommunications Networks

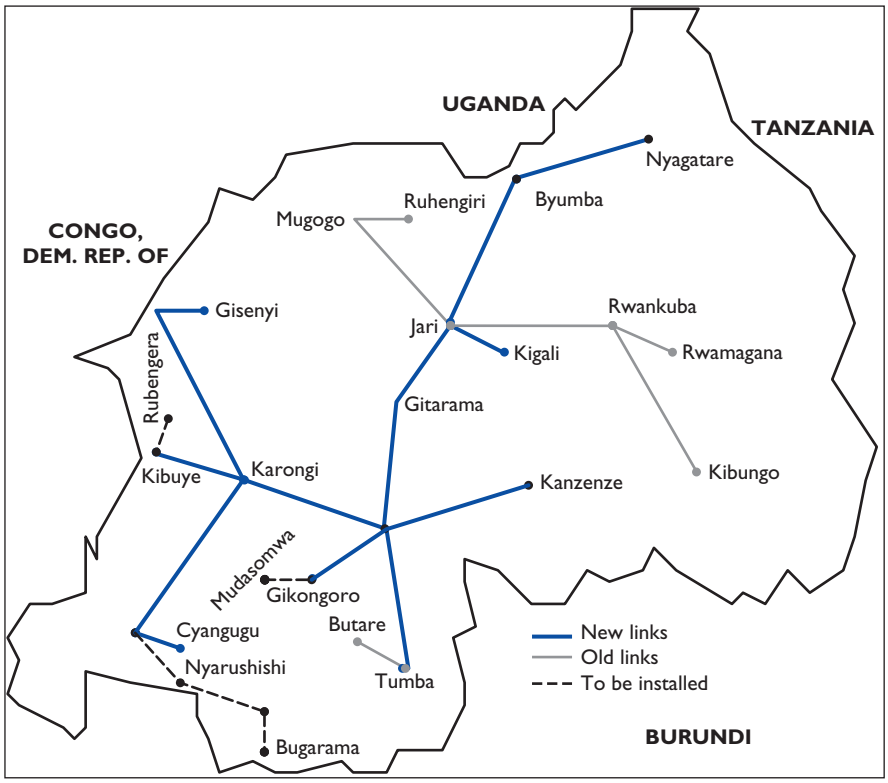
Figure 6.2 shows the extent and basic network architecture of Rwandatel and Rwandacell.

Rwandatel Rwanda's mountainous terrain makes it best suited to the construction of telecommunications networks based on radio and cellular technology. The existing microwave transmission network is based essentially on the layout that existed before the genocide. The same towers are used, but radio equipment has been replaced with modern units from Lucent, Harris, and Nortel. The transmission network has a mixture of SDH (synchronous digital hierarchy) links (at 155 Mbps) and PDH (plesiochronous digital hierarchy) links (at 34 Mbps). Most high-speed multiplexed links in Rwandatel's network use digital microwave, because copper cabling and optical fiber installations require a greater number of installation personnel in a country where personnel are scarce and the terrain is difficult.

At the moment, Rwandatel is equipped with two main digital exchanges, both located in Kigali: one

Figure 6.2 Telecommunications Networks in Rwanda

A. Rwandatel network



B. Rwandacell network

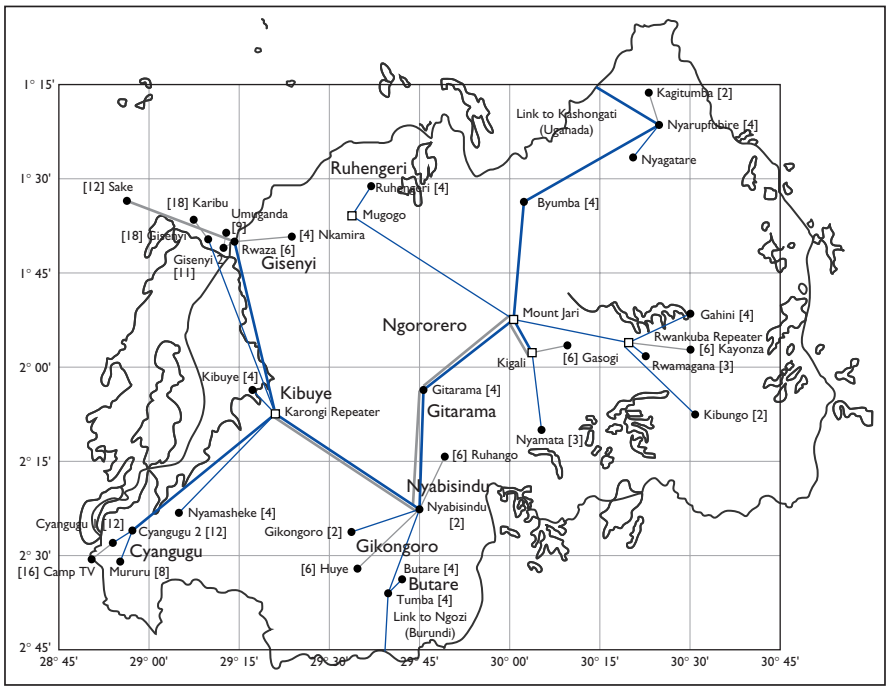
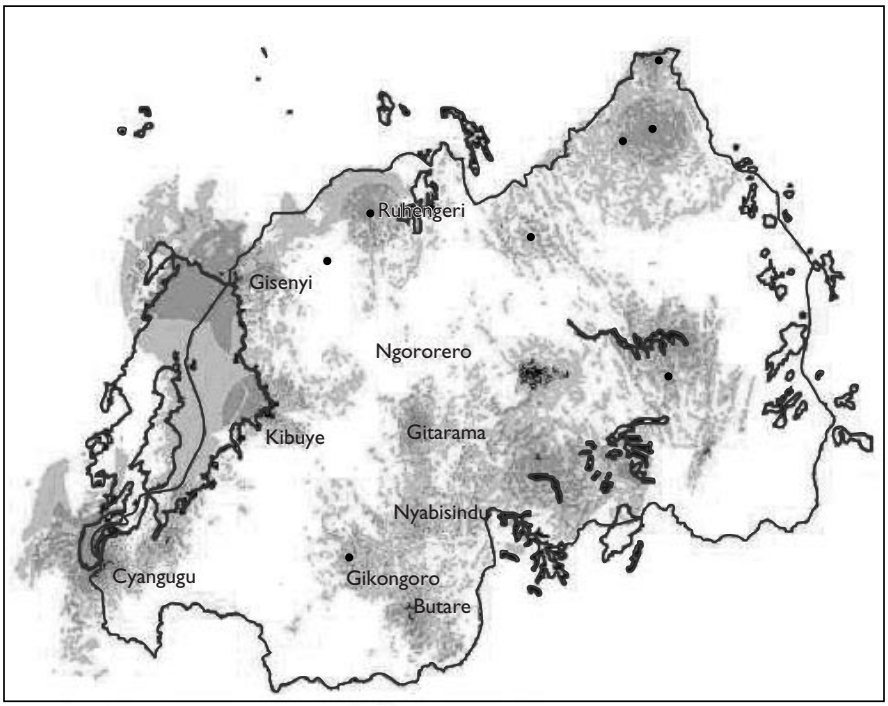


Figure 6.2 (*Continued*)

C. Rwandacell coverage



Source: Rwandatel and Rwandacell.

Alcatel E10B with a capacity of 10,000 lines and one Nortel DMS100 with a capacity of 100,000 lines. Traffic from the regions is switched by means of remote concentrators, meaning that all switching is done in Kigali. As and when satisfied demand builds up, there will be a case for installing local switches in locations such as Butare, Gisenyi, Ruhengeri, and Gitarama. System expansion is currently taking place using wireless local loop (WLL) technology. Each WLL radio subsystem allows for 16 E1 trunks or 480 PCM (pulse code modulation) lines.

Rwandacell The transmission network layout of Rwandacell is similar to that of Rwandatel, with most microwave antenna towers being shared by the two companies. In Kigali, Butare, and other highly populated areas, Rwandacell is building additional base stations in order to meet the rapidly growing demand for cellular service. The topology of Rwandacell's switching network also follows that of Rwandatel. One main mobile switching center, an Ericsson AXE-10, is located in Kigali and colocated with Rwandatel's central switching facilities.

Rwandacell is investing in network expansion and in strengthening and support systems. Its coverage extends to about 15 percent of the country. By way of comparison, in Uganda mobile telephone network coverage is 15 to 20 percent.

Rural Telecommunications Rwandatel's rural network is mainly based on Alcatel's Rurtel equipment. An unusually large number of repeaters is required to reach the terminal stations, reflecting the difficulties caused by the terrain. It is expected that WLL technology will be used increasingly in the future to replace existing rural telephone systems. As yet Rwandatel has not, however, programmed the installation of any WLL systems in rural areas.

Rwandatel has entered into an agreement with Artel Communications, under which the latter is engaged in installing solar-powered VSAT stations at 400 rural locations. Each of these units will support a

PC–local area network connection and up to six telephone channels, which will provide public access to basic voice and data services using a prepaid (scratch card) system. With the completion of this project during 2003, Rwanda has one of the highest densities of public satellite telephone lines per square kilometer in the world (one public telephone per 30 square kilometers).

Sector Performance

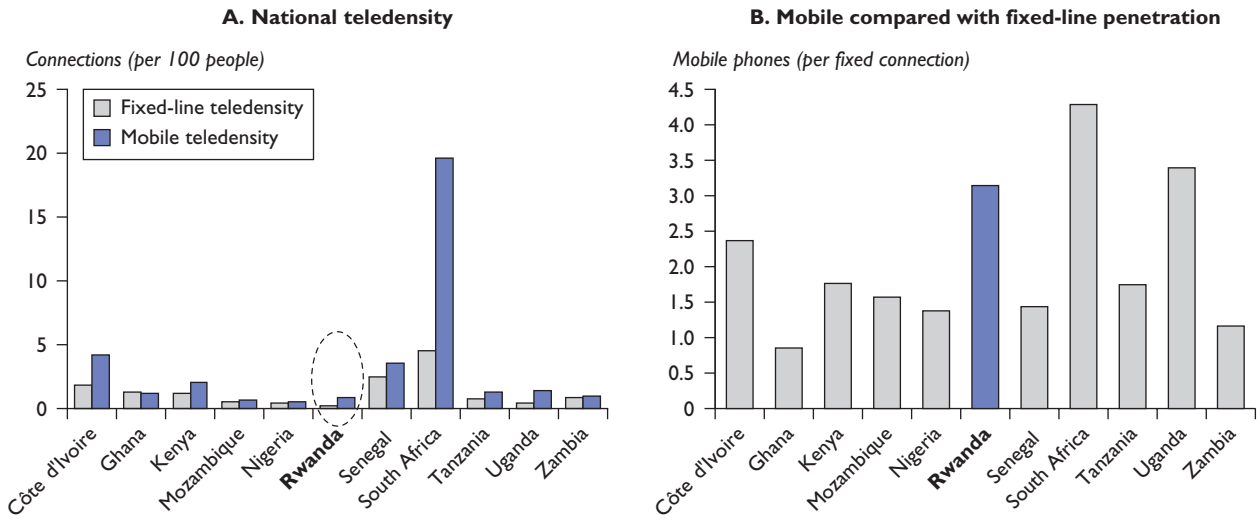
Rwandatel's performance has been poor, considered across a wide range of service attributes. Compared with other African telecommunications service providers, Rwandatel's market penetration is exceptionally low, with only 0.27 fixed lines installed per 100 people. As figure 6.3 shows, this number is among the lowest in Africa. It is also clear that mobile penetration relative to fixed-line penetration is among the highest on the continent. The waiting list for a fixed-line connection is currently the highest in Africa when measured as a proportion of fixed lines installed, while as a percentage of population it is the highest in Africa with the exception of Kenya (see figure 6.4). The overall picture presented is one of an underperforming fixed-line operator that is failing to provide adequate access to telecommunications services—with the high level of unserved demand being reflected in an unusually high level of mobile penetration.

The relatively high level of mobile penetration means that Rwanda's overall combined teledensity—at 1.1 connections per 100 people—compares a little more favorably with the experience of other African countries, although overall teledensity remains extremely low by any measure. The increasingly important role of wireless telecommunications (both fixed and mobile) services in providing voice telephony services in Rwanda, as elsewhere in Africa, calls into question whether it is any longer appropriate to draw a distinction between conventional fixed-network service provision and wireless service provision in framing policy and regulatory requirements. A more relevant distinction than whether the network technology uses wired or wireless connection is probably whether the system that is in place supports the provision to customers of voice services, data services, or both.

Figure 6.5 shows that Rwandatel's tariffs are generally modest in comparison with those of other African fixed-line operators, with both line rental and charges per national call minute being among the lowest. Connection charges are, however, higher than the African norm.

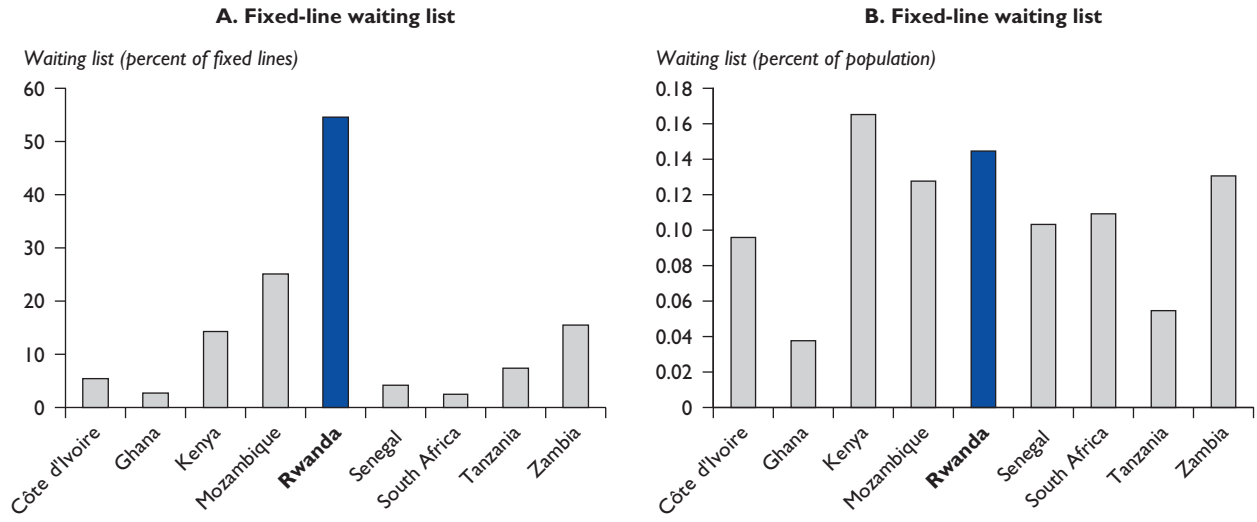
Low disposable incomes are clearly one reason why teledensity is relatively low in Rwanda, but they are not enough on their own to explain Rwandatel's poor performance. As previously noted, waiting lists are unusually long and, as figure 6.6 shows, low gross domestic product (GDP) per capita does not appear to

Figure 6.3 National Teledensity



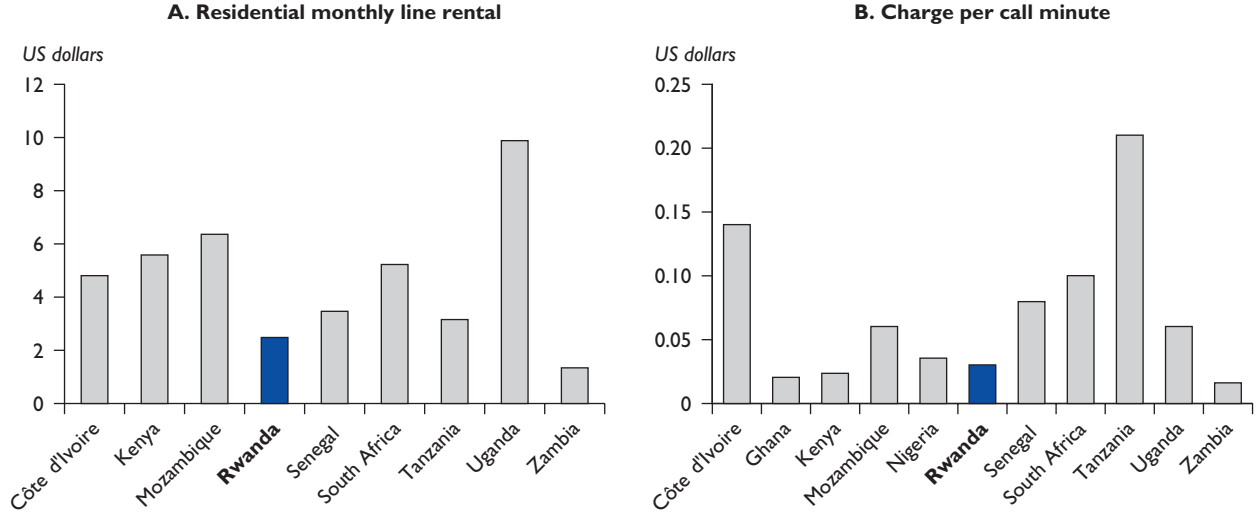
Sources: BMI-Techknowledge 2002; International Telecommunications Union.

Figure 6.4 Fixed-Line Waiting Lists



Sources: BMI-Techknowledge 2002; International Telecommunications Union.

Figure 6.5 Fixed-Line Tariffs



Sources: BMI-Techknowledge 2002; International Telecommunications Union.

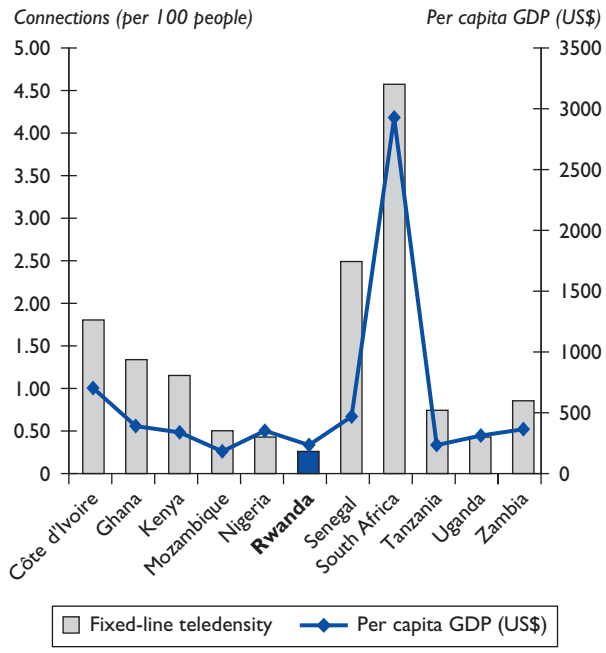
have held back fixed-line penetration to the same extent in other African countries.

Factors Underlying Rwandatel's Poor Performance

A number of factors explain Rwandatel's poor performance:

- The genocide resulted in a very serious attrition of senior managerial and technical staff and completely undermined the company's knowledge base, including information regarding the location of its own network.
- Of the company's approximately 320 employees, only about 4 percent have higher-level education. The total number of employees is itself low by African standards, when compared with the number of lines provided. Rather than indicating a high level of efficiency, this low level of employment probably reflects Rwandatel's inability to recruit and retain appropriately qualified personnel. As a result, Rwandatel lacks adequate capacity to manage the business effectively and is forced to concentrate on "fighting fires" rather than on improving

Figure 6.6 **Teledensity and Per Capita Gross Domestic Product**



Sources: BMI-Techknowledge 2002; International Telecommunications Union.

the quality of operations and management planning and reporting.

- The very high rate of unplanned housing development since 1994, combined with the lack of knowledge about the location of network assets, has meant that Rwandatel is often unable to obtain access to its core assets.
- The company is failing to develop plans for medium- and long-term development and has been operating on a six-month to one-year planning horizon—probably reflecting concerns that any investment now may conflict with the plans of a new strategic shareholder. Rather than take the initiative in planning, the company has been excessively swayed by proposals generated by potential suppliers.

Demand Growth

A forecasting exercise carried out by the International Telecommunications Union in collaboration with Rwandatel in 2001 predicted that if demand were to be fully satisfied there would be a need to move from a combined teledensity of 0.3 lines per 100 people in 2001 to 1.4 in 2006 (representing 112,000 fixed-line and 13,000 mobile connections for a population of 8,907,000). In fact, by the end of 2001, there were already some 69,000 mobile subscribers—as compared with about 22,000 fixed-line subscribers—representing a combined teledensity of 1.1. As previously noted, take-up of mobile connections has been unexpectedly rapid, leaving growth in fixed-line subscriptions well behind.

Opportunities for Private Sector Participation

Opportunities for private sector participation (PSP) exist in both telecommunications and ICT.

Telecommunications

The most significant opportunities for PSP in telecommunications are those that emerge directly from the liberalization of the sector and the partial privatization of Rwandatel, namely for strategic investment in Rwandatel itself and for the entry of more privately owned operators into the telecommunications market. It can be expected that new entrants will focus on the provision of wireless services, providing both fixed and mobile services through wireless technologies.

Information and Communication Technology

There are further opportunities for PSP in ICT, particularly in the context of Rwanda's strategy of ICT-led development. Most of these opportunities are relatively small in scale and particularly well suited to exploitation by the country's indigenous businesses. Examples of such opportunities include the following:

- The provision and operation of Internet cafés and rural and urban telecenters (or public data processing centers), where the community can access computer facilities and the Internet
- The provision of computer and computing support, training, and related services to the government.

The extent to which these opportunities can be realized will depend in part on the development of improved telecommunications facilities—the bandwidth available to Internet cafés is currently limited, for example—and on public awareness and education programs that will generate demand for ICT service provision.

In the case of telecenters, there are also a number of different PSP models that may be adopted, potentially

operating alongside one another:

- Phone shops, probably offering only basic telephony and facsimile services and generally operated as individually owned microenterprises or as part of a national telecommunications provider franchise
- Basic telecenters offering telephony, fax, basic computing, and Internet access services and owned or franchised by small and medium-size private enterprises
- Multipurpose telecenters providing access to higher-end technologies and additional training and specialized services. These centers will generally require full-time expert staffing and PSP is likely to require the involvement of larger and more sophisticated businesses with significant financial capacity.

Issues

The most important issue in relation to the telecommunications sector is whether the government's policies and the effectiveness with which they are implemented will be sufficient to stimulate the development of effective competition in the market and promote the extension of services to a significantly greater proportion of the community. It is generally accepted, on the basis of extensive international experience, that effective competition provides by far the most potent stimulus available to accelerate improvements in service coverage and quality of service.

Telecommunications Law

A number of decrees required to make the Telecommunications Law and the related terms of the law establishing the MSR fully effective have not yet been drafted. These decrees include the following:

- A decree or decrees covering the amount and the basis of fees to be paid by license holders in order to support the funding of the MSR
- An interconnection decree, setting out the terms and the pricing principles to be incorporated in the interconnection agreement
- A licensing decree or decrees, setting out the scope of activities for which a license is required, the nature of the license to apply to different network and service activities, and the conditions and principles that will be incorporated in different licenses
- A decree setting out establishing a universal access fund and determining the basis on which contributions will be made to this fund.

These decrees must be addressed as a matter of urgency, because the regulatory regime cannot function effectively without them. Equally important, in the absence of these decrees the prospects of a successful privatization of Rwandatel will be significantly reduced.

Interconnection

Even if the issue of the interconnection decree is resolved, considerable additional work is likely to be required, in particular by the MSR, before it is ready to decide on the specific issues raised in any interconnection dispute regarding terms and pricing. The terms on which mobile operators terminate calls that originate on competitors' networks will be of considerable importance to how competition develops, as will be the interconnection terms set by Rwandatel.

Establishing a framework that allows free and fair competition in the market for international calls will be especially important. Particular attention must be given to

- The terms on which operators terminate incoming calls that originate on competing operators' international networks
- The provisions made to allow subscribers on particular networks to select a preferred international carrier to complete outgoing international calls.

Setting appropriate interconnection terms and prices is a complex task, raising difficult theoretical and practical issues. Tackling this task will represent a major challenge for the MSR, at a time when it is also engaged in many other important tasks necessary to establish the regulatory regime and has had relatively little opportunity to build up its experience and expertise. That said, the issue of interconnection is one that has now been addressed in many countries and the (publicly available) interconnection agreements that have been established in other developing countries provide an excellent starting point for the preparation of a suitable agreement in Rwanda.

Issuance of Licenses

A further important concern is the potential for extended delay in the issuance of licenses to applicants

wishing to enter the market. Under the Telecommunications Law it is the responsibility of the MSR to advise ministers on whether the government should issue individual licenses to telecommunications operators. At the time this report was prepared, there was a queue of three applicants for mobile licenses. Neither the MSR nor the Ministry of Infrastructure is at present in a position to issue the requested licenses. There is a serious risk that, by the time a new license or licenses are issued, Rwandacell's penetration of the mobile market will have reached the point where it will be very difficult for a new entrant to compete on fair and equal terms.

The MSR is preparing to commission a consultancy study concerning the number of mobile operators that the Rwandan market can sustain, and World Bank funding has been allocated for this purpose. It is important that this study progress as quickly as possible and that it does not further delay the licensing of new entrants.

There is a lack of clarity about how the government and the MSR intend to proceed if the market is considered to be too small to accommodate all the current and potential entrants. The generally accepted approach is to auction the available licenses. The Telecommunications Law makes provision for the use of tendering approaches, however, only where the grant of an individual license involves the use of a scarce resource (for example, the frequency spectrum). It does not appear to provide for a tendering process in circumstances where the government is seeking to limit the number of licenses to be issued for commercial or economic reasons.

Moreover, any such auction would deplete the resources of the successful bidders and would further restrict their ability to compete on equal terms with Rwandacell. It is further understood that Rwandacell itself was not required to make any payment in return for the 10-year mobile telephony concession that it holds, and it is expected that Rwandatel will (in line with usual practice) be issued a mobile license to improve the prospects for its successful privatization. Obviously these two factors complicate the process of designing a fair, efficient, and lawful means of selecting licensees.

The current policy is to issue separate and distinct fixed-line and mobile licenses. As already noted, technological and market developments mean that it is now highly questionable whether it is appropriate to maintain this separation. A preferable approach would be to issue standard licenses that would not place any requirement on licensees in terms of the particular technology that they should use, although they might still impose obligations (where appropriate) on the services to be provided and incorporate rollout targets for service coverage.

Independence of the Multisector Regulatory Agency

The Telecommunications Law reserves important powers to the government, in particular with respect to the issuance of individual licenses. Although the government is required to seek guidance from the MSR on such matters, there is a clear reduction in the independence of the regulator and a risk that political considerations might interfere with the process of issuing licenses. Broader concerns regarding the independence of the MSR are discussed in chapter 7 in relation to cross-cutting issues.

Rural Telecommunications

Access to telecommunications can bring substantial benefits to the rural population. It offers farmers the opportunity to market their crops more effectively and aids participation in civil society. Where rural communities fall within the scope of mobile telephone networks, simple kiosk facilities or shared prepaid mobile telephones can give relatively poor individuals some access to telecommunications.

Very low incomes and relatively low population density, combined with the unavailability or unreliability of local electricity supplies and Rwanda's mountainous terrain, mean that for the foreseeable future it will remain uneconomical to install either fixed-line or mobile telecommunications infrastructure in many rural districts. Artel is working under the terms of Rwandatel's license and has not itself been issued a license. Hence, it is unable to set up VSAT installations in, for example, private business premises. Because of the particular nature of the market in which Artel is seeking to operate, the issuance of a license to Artel is unlikely, other things being equal, to result in a substantial diminution of the market available to other operators.

There are, however, concerns that the close contractual relationship between Rwandatel and Artel may prejudice the opportunity for free and fair competition to develop in telecommunications, because other operators will be unable to obtain access to Rwandatel's network on equal terms. Although there is, in general, a strong case for issuing a standard license to Artel without delay, doing so should be associated with the establishment of an interconnection regime applicable to all operators on an equal basis and corresponding adjustments to the contractual arrangements between the company and Rwandatel.

Recommendations

The overall policy that is being pursued in relation to the telecommunications sector is well founded. The main recommendations in relation to the sector are therefore concerned with improving the effectiveness with which this policy can be implemented.

The recommendations are as follows:

- Urgent attention should be given to drafting the important decrees that are required to put the Telecommunications Law into effect and that are essential both to the privatization of Rwandatel and to the development of the regulation and competition regime.
- Technical assistance should be procured as a matter of urgency for the head of the telecommunications department in the MSR in order to increase the pace at which key regulatory rules and mechanisms can be developed. At the same time, such expertise will help the department head build his knowledge about complex aspects of telecommunications regulations, notably interconnection.
- Documents should be drafted as soon as possible that define the way that the government intends to exercise its functions under the Telecommunications Law. The aim of the documents should be both to define and to confine the circumstances in which the government might consider acting other than as specifically advised by the MSR.
- The study to assess the appropriate number of participants in the Rwandan telecommunications market should proceed as quickly as possible, and license documents should be drafted in parallel with this process (and in advance of the issue of the licensing decree). It is suggested that a model based on the issue of standard (technology-independent) licenses be adopted.
- Urgent attention should be given to the development of a fair, efficient, and legally permissible means of allocating available licenses to applicants.

Note

1. Rwandatel SA was created as a separate company from Rwanda's postal services in January 1993, with a 99 percent government shareholding. The remaining 1 percent is held by six other Rwandan companies and organizations.

7 Cross-Cutting Issues

Some of the biggest constraints in the development of Rwanda's infrastructure—and, in particular, on the use of private sector participation (PSP) to improve infrastructure services—are not specific to the individual infrastructure sectors but act across a range of sectors. These cross-cutting issues may also have an important effect on private sector development in the wider economy. This section explores the main cross-cutting issues identified in the course of the Country Framework Report (CFR) exercise and, where possible, proposes possible actions to remediate them.

Institutional Capacity

The institutional capacity of both government and parastatal entities is a core issue that must be addressed.

Government

The ability of Rwanda's government institutions to meet the challenge of reforming and extending the country's key infrastructure sectors and to promote the role of PSP in contributing to this process is threatened by a number of factors impinging on the institutional capacity of the government. Some of these factors are among those normally to be expected in a developing country where resources are scarce, government is faced on all sides by pressing needs for action, and minimal indigenous experience exists in relation to designing and implementing reform policies for infrastructure.

The government's institutional capacity is also threatened by a number of factors that are specific to Rwanda, including the legacy of the genocide, and the need to adjust to the changes brought about by decentralization.

The capacity of government institutions at both the national and local levels was seriously damaged by the genocide. The loss of key experienced staff members, in particular, but also the destruction of records and the interruption of programs and projects established before 1994 have diminished the ability of the government to perform as effectively as would otherwise be the case. While there are many highly competent government officers, there remains a lack of strength in depth. In addition, some of the senior staff members do not have a continuous track record of experience in government that might have been expected were it not for the disruption caused by the genocide. Institutional memories may be shorter than would normally be the case. These direct effects of the genocide are compounded by indirect effects, including the need to divert scarce resources toward national rehabilitation, resettlement, and reconciliation efforts.

In the long term, Rwanda's policy of decentralizing key government activities, initiated in 2001, should strengthen the government's ability to deliver infrastructure sector reform and infrastructure development projects at the local level. It should, in particular, lead to a closer focus on the least well-served groups, which will often constitute the poorest and most vulnerable

in society. In the short term, however, the transfer of functions and resources to district levels has inevitably been disruptive in the following ways:

- The district authorities need to build their capacity to deliver on the government's infrastructure policies but may lack the technical skills necessary to manage larger, more complex projects, such as the development and operation of local electricity and water networks.
- The central government has also lost the ability to carry out some of its responsibilities through the transfer of budgets, staff, and equipment to the districts. Within the Ministry of Infrastructure, for example, the Department of Water and Sanitation is currently unable to monitor water resource availability and quality.

Among the more general institutional capacity issues that the government faces are the need to establish a commission to monitor and combat corruption; and the need to improve financial systems and accountability within the government. Key priorities include the rationalization of the functions of the Auditor General's Office and the Inspectorate of Finance and Audit, the establishment of a legal framework for the National Tender Board, and the wider dissemination of budgetary and financial performance information.

Parastatal Organizations

Many of the effects of the genocide on government institutional capacity are mirrored in Electrogaz and Rwandatel, two important utility organizations. Both organizations not only suffered serious damage to their infrastructure and records but also lost numerous key managers and the knowledge and skills that they possessed. A high proportion of the current senior management of these parastatal organizations was recruited after 1994 and accordingly does not have the depth of experience and understanding that would usually be found in long-established utilities. Although much has been achieved in terms of rebuilding the capacity of both Rwandatel and Electrogaz since 1994, much work still remains. In both organizations, however, there are capable and dedicated managers who are aware of the weaknesses in their company's performance and who have worked unceasingly to offer the best service they can to the community.

In addition to management issues, several other factors have an important bearing on the capacity of the parastatals. These include an exceptionally high proportion of temporary staff, poor training facilities, inadequate accounting systems, and poor commercial and customer management capabilities.

Recommendations

Institutional capacity issues cannot be resolved overnight, and simply importing expertise from outside Rwanda will not on its own generate a sustainable improvement in institutional capability. Imported expertise may also result in the development of approaches that are out of tune with the underlying culture and customs of the country. The following approaches are recommended for supporting a program to develop PSP in the infrastructure sectors:

- Survey the resources that are available in each of the key departmental units that have core responsibility for infrastructure development and operations, focusing in particular on the availability of skilled and experienced personnel in key positions.
- If the CFR recommendations are accepted in each infrastructure sector, have each key departmental unit carry out a survey of additional resources, personnel, and equipment needed to carry out those recommendations. Combine the estimates from each key departmental unit into an estimate for the ministry or parastatal concerned.
- Develop and execute a training plan, with priority given to areas of departmental operation that are central to the design and implementation of infrastructure development programs and PSP in infrastructure.
- Ensure that a core element of the training provided is in the form of technical assistance programs and that such programs include clear, measurable targets in terms of the knowledge transfer to be achieved.

Alongside capacity building focused on training and staff development, it is recommended that administrative load be made a key criterion in evaluating, prioritizing, and developing infrastructure projects, including PSP. Lack of capacity in depth means that a heavy administrative burden falls on a narrow spectrum of staff members in both the government and the parastatals. Therefore, it is vital to avoid unnecessary

complexity in areas such as PSP scheme design in order to ensure that available resources are exploited effectively.

Local Financial Markets

The following issues arise in relation to the capacity and operation of local financial markets:

- Lack of a local, in-depth, medium- and long-term bank debt market to finance private sector infrastructure projects. The current level of bank interest rates is far too high and needs to be reduced to an economic level.
- Lack of a local capital market to provide opportunities for raising private equity by floating the equity of private companies investing in or operating public infrastructure services.
- Lack of sufficient local microfinance facilities to assist local entrepreneurs in establishing small-scale infrastructure facilities, such as small water treatment and supply facilities or small rural hydro irrigation and power generation facilities.
- Lack of local bank expertise, knowledge, and experience in project finance techniques and security structures based on project cash flows.

The CFR recommends that the government of Rwanda focus on the following areas to enhance local financial markets:

- Encourage and support the local banks in providing medium- and long-term bank debt and financing for company start-ups. This effort will require the development of a medium- to long-term bank deposit market, initially created in the corporate sector, particularly by insurance companies, which are seeking additional outlets for investing insurance premiums. The government should assist the process by establishing a national pension program with tax incentives for pension savings and with pension savings partially invested in the medium- and long-term deposit market.
- Use technical assistance and training programs to train bank staff in medium- and long-term lending practices, project finance techniques, and provision of financing for start-up companies.
- With donor assistance, provide additional microfinance facilities through local banks.
- With donor assistance, consider establishing a small informal equity trading market, in addition to the present underused commercial paper market, possibly similar to the Alternative Investment Market (AIM) in London, using donor assistance.

Regulation

An effective and well-designed regulatory framework will be critical to achieving pro-poor private sector participation in infrastructure in Rwanda. The design of this regulatory framework should include the following:

- An appropriate framework of controls and incentives that promotes quality and efficiency improvements that extend coverage to unserved communities (generally the poorest citizens)
- Protection for service users from exploitation by monopoly infrastructure service providers
- Conditions in which competition among infrastructure service providers and the extension of choices for consumers can flourish, where both feasible and economically efficient
- The ability for private sector participants to earn a fair return that reflects the risks they are accepting and the quality of their performance.

For such a framework to function effectively, it is vital not only that the key rules, mechanisms, and procedures associated with the regulatory framework be in place, but also that they be put into effect in a competent, clear, and fair—but firm—manner by a strong regulatory institution.

The role of the regulator is effectively to "hold the ring" among government, private owners and operators, service users, and the unserved community. Balancing the often conflicting interests of these different groups in a way that not only is fair but also can clearly be seen to be fair demands that the regulatory body have the highest achievable degree of independence. At the same time, the complexity of the issues that will arise requires that the technical capacity and resources available to the regulator be sufficient to match the difficult challenges that will be encountered.

Considerable attention has been devoted to getting the regulatory approach right in Rwanda. As a result, both a well-considered regulatory law and a properly

funded regulatory institution are now in place. There are, nevertheless, some important regulatory issues to be addressed.

Urgency of Developing Regulatory Capacity

First, the Multisector Regulatory Agency (MSR) has been established only very recently (November 2002). As of the date of this CFR, the managing director and three sector department heads have been appointed, together with some administrative personnel. Funding is in place for the appointment of further technical staff members, and the MSR is pursuing the tasks of staff planning and recruitment as a matter of urgency. No matter how speedily additional staff members are appointed, however, the MSR will not be fully functional until training is complete. This task will be considerable given the lack of previous experience in Rwanda in the area of independent economic regulation, and, therefore, it will not be completed quickly.

At the same time, a number of vital regulatory tasks must be carried out very soon. These include drafting key license documents, developing an interconnection regime in telecommunications, and developing monitoring systems and regulatory controls for Electrogaz (without which the proposed management contract cannot function properly). There is also an urgent need for an enhanced energy law (or separate electricity and gas acts), as well as a transport, water, and sanitation law if the MSR is to regulate effectively.

Indeed, unless sector-specific technical assistance—in addition to the general regulatory assistance already to be provided to the managing director—is provided right away to assist and guide MSR staff members through these difficult tasks, the job facing them will prove overwhelming, and serious delays and mistakes are likely to be made.

Independence of the MSR

Second, under the approach set out in the regulatory law, executive regulatory authority rests with the Regulatory Board and not with the MSR. The MSR has an advisory and secretariat role and is not responsible for final regulatory decisions. This approach is not unusual and has been adopted in many other countries, including the United Kingdom, where it is used for postal sector regulation. The seven individuals who have been appointed to the Regulatory Board by presidential decree are, however, all members of government ministries or closely related bodies, such as the Kigali Mayor's Office. All have clear policy responsibility for, or a direct interest in, one or more infrastructure sectors.

The individuals who have been appointed are all of high standing and are well placed to understand the regulatory issues that will arise in the infrastructure sectors and the reasons underlying the chosen approach. There are, however, two serious drawbacks. The most important of these is that the approach seriously compromises the independence of the MSR: the Regulatory Board would appear, in effect, to be an extended arm of the government. This fact will inevitably impair the prospect for successful PSP in Rwanda or, at least, add to the risks perceived by potential investors, consequently increasing the rate of return that they will require.

Furthermore, because the board members have been appointed on the basis of the official positions they hold in government organizations with infrastructure interests, senior staff movements between ministries are likely to force changes in the composition of the board relatively frequently. The Regulatory Board will hence be less able to build a strong common understanding of regulatory principles and issues, and it will be less effective as a consequence.

Both of the issues noted above concerning board members could be avoided if membership on the board were drawn from civil society rather than from governmental bodies. Ideally, legal provisions should mandate such an approach. In addition, the selection process for board members should, if possible, be less influenced by the government. For example, at least some of the members might be selected through public selection committees.

These concerns regarding the lack of independence of the regulator are increased by the particular approach that has been adopted by the Telecommunications Law, which is the only sector-specific law currently in place. As noted in chapter 6, the Telecommunications Law gives the key regulatory functions to the government. The State Ministry of Telecommunications under the Ministry of Infrastructure retains responsibility for many of the most important elements of regulation, including issuing individual licenses to key operators, deciding who does and who does not

require a license, setting quality of service parameters and associated compensation levels, and determining interconnection pricing principles.

Development of an Appellate Body

An additional cross-cutting issue regarding infrastructure regulation in Rwanda concerns the process for appeals against regulator decisions. The current law makes the courts responsible for adjudicating disputes. As yet, however, no commercial court exists in Rwanda, although it is understood that there are proposals to establish one. Even then, however, the nature of the disputes that are most likely to arise in relation to regulatory decisions will often require considerable special expertise in both technical and economic matters if the disputes are to be satisfactorily resolved. There is also a significant risk of substantial delay and a real danger that dominant operators will be able to take advantage of this delay. For example, by disputing interconnection terms in the courts, a dominant telecommunications operator could easily prevent a competitor from entering the market. By the time the courts have adjudicated, the opportunity for profitably entering the market may no longer exist, and competition may have been stifled right from the beginning.

Recommendations

To address the issues discussed above, the CFR recommends the following actions:

- Reconsider the composition of the Regulatory Board to ensure that at least the majority of members are from civil society rather than the government and that a public selection committee or equivalent arrangement be introduced to broaden the basis on which appointments are made. Enact legislative amendments to make this composition a formal and permanent requirement of the regulatory system.
- Amend the regulatory law, changing the role of the Regulatory Board to a general supervisory one, with executive authority for the majority of regulatory decisions transferred to the MSR managing director.
- Provide technical assistance to each of the department heads over a one- to two-year period to enable them to deal effectively with the heavily front-loaded work that they face and to enable them to build their level of knowledge and expertise as quickly as possible. Measurable targets for knowledge transfer should be incorporated within the technical assistance contracts.
- Evaluate and implement effective institutional and procedural arrangements for appeals against regulatory decisions to ensure that the appeals process is accessible but that it discourages frivolous challenges and delaying tactics.

The question of the need for transport sector regulation has also been raised; however, it is fairly evident that the primary area that regulation must address is that of compliance with technical specifications and safety standards. The need for economic regulation of the transport sector should, thus, be of secondary concern to the need for technical regulation. The only possible exception to this rule remains with the need for enhanced economic regulatory control in the airports sector.

Accounting System

Rwanda's accounting system lacks a national accounting standards system. In addition, the lending institutions lack confidence in the corporate accounting information provided to them to support loan requests. The Revenue Authority also encounters problems with tax payments, often disputing corporate tax and profit calculations.

The CFR recommends the following actions to alleviate accounting system issues:

- Require that all corporate bodies over a certain size prepare their accounts to minimum international accounting standards.
- Ensure that all local practicing accountants have minimum accounting qualifications.
- Set up a national accounting standards board or committee to regulate national accounting standards.

Taxation System

The following issues arise in relation to Rwanda's taxation system:

- No tax holidays exist to attract private sector investors.
- The carryforward period for tax losses is only three years.

- Private sector investors consider Rwanda's tax collection procedures to be harsh and arbitrary; hence, they are a constraint on increasing private sector investment.
- The private sector considers importation procedures to be cumbersome and slow, thus impeding private sector investment.

The CFR recommends the following changes to the current taxation system:

- The government should consider a tax holiday for investors of five years from the start of operations.
- The carryforward period for tax losses should be increased to five years.
- The tax collection procedures should be revised to make them more client friendly and less confrontational.
- The importation procedures should be revised to reduce delays.

Legal System

Both general issues and sectoral issues arise with respect to the legal system.

General Issues

Rwanda is a civil law country, and as such its entire legal structure may appear unfamiliar to those who are used to an Anglo-Saxon system of common law. This fact does not mean that the necessary structures and laws are not there. It simply means that the structures and laws may take a different form from those in countries with common law systems. Whether this civil law structure is helpful or acceptable in terms of encouraging outside investment is a matter for debate. The private sector within Rwanda can be assumed to be familiar with the system, as would be private investors from other civil law countries. Furthermore, some aspects of the Rwandan administrative structure may provide considerable support to the small-scale water and energy projects discussed elsewhere in this report.

Rwanda's civil laws are based on a Civil Code together with local customary laws. In particular, Rwanda has inherited the French system of public administrative law, in which there is a division of the Supreme Court that is devoted to constitutional and administrative matters. The existence of a system of public law means that *intérêt publique* has legal status and has a dramatic impact, for example, on the treatment of land ownership.

Legislation is made in the form of laws passed by the National Assembly, by presidential decree, and by ministerial decree. Presidential and ministerial decrees take the place of the secondary legislation known to common law systems.

A few recommendations should help foreign investors in their dealings with the legal system:

- One of the principal difficulties is that much of Rwandan law is written in Kinyarwandan and French. Under the terms of the Arusha Accords, English is now one of the official languages of the country. The more recent laws are published in English. It is recommended that, to assist access to outside investors, all laws relevant to the privatization process be made available in official translations into English.
- Another difficulty is that the applicable laws are not easily ascertainable to outsiders or even, in some cases, easily obtainable. This difficulty undoubtedly arises in part because of the problems that Rwanda has experienced in the recent past. To make it easier for the private sector to access applicable laws, a central library with good cataloguing facilities, or a one-stop government publication office that can provide information about the existing laws for particular areas would be invaluable and would assist outside investors in carrying out due-diligence exercises.

Sectoral Issues

As far as the sectors under consideration in this report are concerned, the principal legal issues appear as follows:

- *Roads.* Ownership of and liability for maintaining roads differ according to whether they are in the public or private domain. This basic civil law concept informs all of Rwandan land laws.
- *Water and sanitation.* Rights to run pipes over the land of others, rights relating to sources of water at the district level, and the legal status of local authorities are all important issues.
- *Energy and telecommunications.* In legal terms, energy and telecommunications are both affected by rights in contracts, the legal status of parastatals, and regulatory structures.

More generally, any outside private sector operator will want to see a transparent disputes resolution system in place, preferably both domestic and foreign; a favorable tax regime both for operation in Rwanda and for repatriation of profits; and a company law system that enables private sector operators to control any jointly formed companies in which they may be investing.

Land Law Certainty of land ownership will be essential for any large-scale private participation in infrastructure. The basic premise governing Rwandan land law is that all land belongs to the state and can be transferred only under certain conditions. A distinction is made between *domaine publique* and *domaine privé* in land tenure, as in every other facet of civil law society. Land in the *domaine publique* can only be sold or transferred to a private individual or company if it is first transferred into the *domaine privé*. Such transfers must be done by legislation.

A new initiative is under way to deal with registration of title to land as part of a reform of the land law in general and to address the problem of customary rights to the use of land, which are widely found in Rwanda (see appendix B for details).

The main problem with Rwanda's land law concerns the public-private ownership rules, which appear to restrict alienation of any kind—including concession contracts—to land held in the private domain, even by the state. It has already been necessary in one particular private sector project to legislate for the transfer of land held by a parastatal to the private sector. It seems likely that this need will arise in other projects. Whether it is efficient in terms of legislative and government time to legislate such matters piecemeal is questionable, to say nothing of the delay that the process causes.

A further problem is that Rwanda's land law provides for *droit de reprendre*—the right of the state to literally take back land that is not being properly exploited. In addition, problems with encroachment appear to affect road building and maintenance. These problems may be a result of customary law and may be dealt with by the proposed land law reforms.

Given the complexities of Rwanda's land law and the fact that reform is currently under consideration, it is recommended that a further study be made with a view to including in the proposed new law provisions that resolve these problems so that land used in PSP schemes is not subjected to what are—to an investor from a non-civil law country—quite serious disadvantages and constraints.

Water Rights Water rights are significant in two ways:

- The water supply responsibilities of Electrogaz and its proposed transfer to the private sector
- The rights of small private suppliers to access and pipe water over the land of others.

The water supply responsibilities are affected by the provisions of administrative law and *intérêt publique;* the rights to access and pipe water are affected by the specific legislation on water rights and the provisions of Rwanda's land law.

The Civil Code deals with water rights in the section on *propriété,* or property and ownership. The water in streams and lakes and underground watercourses can be owned by no one. Subject to the laws or regulations that govern the use of such water and concessions that may be awarded by the public authorities, the right to use such water is common to all. If the land in question is in the *domaine privé,* the right to pipe water over the land of another is dealt with by means of a *droit de servitude*—a type of way leave—and appears not to present a problem, except that a fee might be payable.

There is, however, a law (of July 23, 1979) providing for expropriation of property for public use that might be useful in this context. The law details a procedure for confiscation of private property by decree (either presidential or ministerial, depending on whether the project is local or regional) and for the payment of compensation.

There may be a need for minor amendments to the laws relating to water rights, or possibly a licensing scheme, to overcome delays in making available rights of way for private sector pipelines.

Administrative Structure An area of civil law practice that may prove extremely valuable in light of recommendations in chapter 4 relating to small-scale water projects is the legal and administrative rights and responsibilities given to the districts. These form the administrative backbone of the state; they own land—in both public and private domains—and generate and manage their own local projects for roads, water, health, education, and so forth. The new law on local authorities, passed in 2001 following the postwar decentralization process,

gives districts the power specifically to work with government and private entrepreneurs in matters concerning the welfare of the population, with particular reference to policies that help protect and improve the living conditions of the poor. The district can also acquire shares in associations or nongovernmental organizations (NGOs) where it has interests and can appoint its own representatives in such organizations.

The central government authority is represented by the préfet, or governor, of the province in which the relevant district is situated. The governor is assisted by a regional committee, which has statutory responsibility for, among other things, coordinating projects being carried out in partnership with the private sector. There is, therefore, in Rwanda the legal and administrative foundation for local-level projects involving public and private participation and for a monitoring role for central government, which will need to enforce common standards.

Contract Law The law governing contracts generally does not differ greatly from that found in common law systems. Some technical rules governing formation differ, but these rules are unlikely to significantly affect either an outside investor of the kind contemplated here or the small-scale nonprofit schemes recommended in the water and energy sectors.

The Civil Code precisely details the law relating to the different forms of contracts that govern normal commercial life. It reflects civil law systems in defining a contract, the terms used in the contract, and participants in the contract. In addition, the Civil Code deals specifically with several matters of significance to this CFR, including the status of foreigners. Foreigners have the same rights under Rwandan law as a Rwandan national. Contracts entered into by foreigners are subject to specified conflict-of-laws rules, which state that the status and capacity of the foreigner are to be assessed according to the laws of his or her own country, unless the rules of that country are unknown.

The concept of the concession contract was developed under French law, apparently as a result of the restrictions relating to alienation of public property (discussed above). The Civil Code of Rwanda contains a chapter setting out the law relating to concessions, or *bail emphytéotique*.

Apart from the basic provisions of the Civil Code, no laws deal specifically with concession contracts; build, operate, and transfer projects; and so forth. There is provision for laws (or decrees) to be passed for specific projects, but because of the need for transparency—and on the basis of discussion in this report about the road system and the need for maintenance and improvements by the private sector—consideration also should be given to upgrading existing laws on concession contracts. If changes were made in contract laws, then the problem noted in the section on company law below regarding the liabilities of a manager might be able to be addressed at the same time.

Legal Status of Parastatals Public enterprises in Rwanda are governed by the Organic Law of November 7, 1975 (as amended). The law provides that a public enterprise (*établissement publique*) is a public service created by law and endowed with *personnalité civile* and administrative and financial autonomy. The enterprises governed by the Organic Law include Electrogaz, as well as OCIR-Café and OCIR-Thé—the parastatals set up to run the coffee and tea sectors.

Privatization of public enterprises is governed by the Privatization Law of March 11, 1996. A presidential decree on May 3, 1996, set up a Privatization Commission, which is charged with directing the work of privatization. The Privatization Law provides wide powers for the method of transfer—partial or total liquidation, leasing out, or restructuring—but the means adopted are to be the means used to set up the enterprise in the first place (usually legislation). In addition, the process is restricted to situations in which (a) the management of the entity is considered unprofitable, (b) the state wishes to withdraw from a commercial or industrial concern, or (c) the purpose for which the entity was created has been attained. There is also an overriding provision that the state retain a shareholding when national sovereignty or security is concerned. These provisions obviously affect the proposed establishment of a management contract for Electrogaz, described in detail in previous chapters. They will also have to be taken into account in privatizing the telecommunications sector.

The restrictive nature of the Privatization Law may make it difficult to achieve the private participation needed in national parastatals. It is recommended that the law be amended to provide that, when private participation is in question, rather than a wholesale

disposal to the private sector, a more liberal regime be adopted, particularly with regard to the parastatals that can be selected for privatization.

Dispute Resolution The court system in Rwanda is based on the French model. It is headed by a Supreme Court, which has five sections: the Department of Courts and Tribunals, the Court of Appeals, the Constitutional Court, the Council of State, and the Revenue Court. The Supreme Court ensures the constitutionality of laws and statutory orders before promulgation into law and makes decisions on appeals from decisions of lower courts and administrative authorities. While the existing methods of dispute resolution may be adequate to regulate local commercial activity, even the new Arbitration Act—which contains provisions for public announcement of decisions and allows appeals to the court in certain cases (including possibly *intérêt public*)—will probably not prove an acceptable tool for outside investors.

The law applied by the courts in civil and commercial matters is based partly on those sections of the Civil Code dealing with commercial matters (and the so-called Commercial Code, which is composed of a number of different statutes) and partly on local custom, as required by article 98 of the Rwandan constitution. Otherwise, the courts apply the general principles of law and equity. A system of criminal courts also exists, which was renovated and strengthened after the genocide.

Civil law countries generally rely heavily on the settlement of disputes, particularly commercial disputes, amicably or by negotiation. This reliance is evidenced by the 1998 law establishing the Rwanda Investment Promotion Agency (RIPA). That law provides for the amicable, if possible, settlement of disputes between a foreign investor (as defined in the law) and RIPA or the government. If an amicable settlement is not possible, there can be reference by agreement to any international body to which both the country of the investor and government of Rwanda subscribe. Alternatively, the March 1965 International Convention on Settlement of Disputes between States and Nationals of other States of March 1965 can be referenced.

Rwanda has a comparatively new arbitration law, which is largely intended to resolve local disputes. The country has established an arbitration center under the terms of a World Bank project designed to assist the development of the private sector.

However, the system of dispute resolution is somewhat lacking in transparency for an outside investor. The statutory disputes resolution methods laid out in the 1998 law establishing RIPA need amending to accord with international practice. In addition, the new local authority laws contain provisions for dispute resolution when districts are involved in a dispute that involves reference to a minister and, therefore, to the Rwandan courts. These laws may also need amendment if the local authority structures are to be used for large-scale PSP projects.

Company Law There is no Commercial Code in terms of a single piece of legislation. The law relating to companies, however, is set out in the Companies Act of 1988. This act provides for the types of commercial organizations that may be established in Rwanda. The act is based on the French model and provides for these forms of business organization: the public company (*société anonyme*), the private company (*société à responsabilité limité*), and two main forms of partnerships. There is also provision for temporary associations for specific projects and profit-sharing associations, but these entities do not have legal personality. The main models are also found in Anglo-Saxon systems and do not in themselves present a particular problem to an outside investor. There are the usual requirements for local registration, representation, and so on. Detailed provisions of the Companies Act, however, have been found to conflict with requirements for the privatization process, as discussed later in this chapter.

In addition to the Companies Act, separate legislation exists for cooperatives, which have a considerable role in Rwanda, particularly in the agricultural sector.

Two problem areas arise concerning company law. First, one way for a non-Rwandan private investor to participate in privatization is to form a joint company with one or more local commercial organizations. Usually the investors would form a private company, which would effectively be a partnership between the parties. The outside investor would retain management and legal control of its investment by keeping a majority of the shareholding and, either by means of a management agreement or by the appointment of a manager, would also retain decisionmaking control.

A private company is usually chosen because that form of business organization affords the parties more confidentiality and restricts the transfer of shares to third parties. The Privatization Act, as reflected in the manual issued by the Privatization Agency (set up under the Privatization Commission), however, requires shares in state-owned bodies being privatized to be sold by tender. This requirement appears to conflict with the rules relating to private companies and the transfer of their shares.

Second, the Companies Act provides for the manager of a private company to have statutory liability for his actions, both to the shareholders and to the creditors. As mentioned above, this requirement would appear to place at risk the management arrangements adopted by many outside investors, particularly small- to medium-size investors.

There must be a structure by which an investor can protect its need to manage its investment. It is in the interest of the government to create a legal climate that encourages investment. The alternatives are either to let the investor fend for itself and choose corporate structures other than the private company, since other forms of business organizations do not have the problems highlighted above, or to include in legislation some sort of provision whereby a private company set up to participate in a PSP project is not bound by these provisions of the Companies Act. Neither alternative is satisfactory, and further examination of this problem is needed.

Bid Evaluation Process

One issue arises in relation to the bid evaluation process. Although there has been some improvement lately, the current system through the National Tender Board is still considered by the private sector to be cumbersome and cause delay, which unnecessarily increases both bidding costs and the cost of the particular project. It is therefore recommended that the current system be reviewed and procedures be developed to remove any unnecessary delays and reduce project costs.

Project Selection, Prioritization, and Planning

A basic procedure is in place for all public sector infrastructure projects: the Public Investment Program (PIP). Normally, all public sector projects would need to be accepted by the ministry governing the particular sector for inclusion in the PIP. These ministries meet annually with the Ministry of Finance and Economic Planning to agree on the PIP for the year ahead. A National Investment Strategy prioritizes sectors by various criteria, including, for example, what the expected social impact would be, what budget resources are available, whether the project will be financed by a grant or loan, and whether government counterpart funds are required. Projects, especially large infrastructure projects, would also normally require a feasibility study, in many cases carried out by an independent consultant selected in competition through the National Tender Board. The project then goes to the Investment Council. If approved and if funds are available, the project then goes to implementation by the line ministry. The Central Public Investments and External Finance Bureau (CEPEX) is responsible for monitoring and coordinating the full project cycle, including monitoring the identification of projects, coordination, and resource mobilization; monitoring the bid evaluation; and monitoring the project implementation.

The procedure is, however, flexible. If the projects are emergencies or self-evident—for example, an urgent road rehabilitation—they are derogated from the normal process and go straight to the Investment Council. The approval by the council is a formality. If a donor offers funds for a certain project, it will be included in the PIP and be referred to the Investment Council for approval, which also will be a formality.

The Ministry of Infrastructure is responsible for the priority of infrastructure projects. At the end of the day, however, the Ministry of Finance and Economic Planning controls the available financial resources and the coordination of the planning process.

An issue identified in the course of this CFR exercise is whether the flexibility in the procedure needs tightening, with additional checks and balances to reduce the possibility for misuse through, for example, undue ministerial influence, lack of donor and project coordination, or overriding national investment priorities. The government should therefore review the current procedure to ascertain whether any additional checks are necessary to ensure that the procedure is not misused in any way and that the right balance is

maintained between needs and resources. The objective is to ensure that all projects that go forward to implementation meet the criteria of the National Investment Strategy through the PIP.

Government Policy Communication with the General Public

A need exists for an improved presentation of government policies to the general public and greater public sensitization to the reasons for—and benefits of—PSP in infrastructure. It is recommended that the government consider making the Ministry of Infrastructure responsible for publicizing government policy on PSP in public infrastructure service provision. To do so, the Ministry of Infrastructure will need in-house public relations expertise. Alternatively, the Privatization Agency could be made responsible, or a new government public relations department could be established that would be responsible for publicizing all government policies.

Environmental Issues

Environmental concerns act as constraints to the development of certain forms of infrastructure, and the CFR takes this into account. A more detailed analysis of the environmental situation in Rwanda and the importance of environmental issues in the development of infrastructure nationally is provided in appendix A to this report. This section provides only a brief review of the key environmental issues.

Environmental Policy and Legislation

Rwanda's environmental policy and legislation are currently in a limited state of development. The key framework legislation on the environment, the Environmental Management and Protection Act (EMPA), is still in draft form. The EMPA requires further attention to avoid duplication with other draft legislation (particularly the draft Sanitation Act, which addresses both wastewater and solid waste). Of importance, the draft EMPA does not match international requirements for the completion of environmental impact assessments (EIAs). This is particularly relevant to the future development of infrastructure in Rwanda, because EIAs will be a fundamental component of the process to be followed and will ensure that environmental protection concerns are addressed in all major projects. Rwanda needs guidelines for the EIA process that reflect international best practice, as espoused, for example, by European Commission Directive 97/11/EC. In addition, the EMPA will require detailed regulations for its implementation, and priority must be given to the production and finalization of these regulations.

Strategic environmental assessments (SEAs) will also be of use in Rwanda, especially to clarify the environmental effects of major government policies and programs. SEAs are best formulated using European Commission Directive 2001/42/EC. The EMPA will require amendments to include SEAs within its scope.

Sectoral Environmental Concerns

Each of the sectors analyzed in this report has accompanying environmental concerns.

Transport A range of environmental concerns should be taken into account in the development of the transport infrastructure in Rwanda. The development of roads, airports, and railways all carry significant potential for generating adverse environmental impacts (for example, dust emissions, noise, impacts on land use, and impacts on biodiversity). The EIA process should be used to minimize such adverse effects. European Commission Directive 97/11/EC (and similar international legislation from elsewhere) can help identify projects that should be subjected to the EIA procedure.

Energy—Power Generation and Distribution The fact that Rwanda relies mainly on hydroelectric power implies that the environmental impacts from power generation are limited once the schemes have been constructed. The construction of new hydroelectric generating facilities, however, will have significant environmental impacts, and the proposed plan at Nyabarongo (involving a 41-meter high dam, a reservoir of 320 hectares, and the displacement of some 2,150 inhabitants) will need to be prefaced by a full-scale EIA. Micro-hydro plans are likely to be of some relevance to rural populations, although solar power and biogas will also be important in some circumstances. The environmental impacts associated with the distribution of electricity (including visual intrusion, exposure to electromagnetic fields, and polychlorinated biphenyls

in transformers and capacitors) should be identified and addressed.

Energy—Methane Gas The Lake Kivu methane resource is of great importance to the energy sector in Rwanda, and its development is a high priority. The relationship between this resource and hydroelectric power generation (as well as the importation of power) should be clarified through the completion of an SEA. The SEA would also serve to consolidate the government's policy on energy generation as a whole. A full-scale EIA will be needed on any plan that includes the exploitation of the Lake Kivu methane resource; in addition, the existing pilot plant will need to be replaced. An EIA also should extend to the uses of the methane downstream, which will involve significant environmental benefits (because of the replacement of fossil fuel and wood fuel use and the reduction in greenhouse gas emissions).

Water and Sanitation—Water Supply The current cost for potable water in Rwanda is very high, reflecting the difficulties in abstracting and treating (mainly) surface waters. The per capita water consumption in both urban and rural areas is low, but demand will certainly increase as the economy develops and the population expands. The potable water supply in Kigali is inadequate in relation to both quantity and quality; therefore, the realization of the proposed Ruhengeri-Kigali water supply plan should be given high priority. Smaller water supply plans in the rural areas should be capable of attracting private investment, although the government should maintain control over the standards achieved in such projects.

Water and Sanitation—Sanitation Currently, there is almost no treatment of wastewaters in Rwanda in either urban or rural areas. Without a doubt, this lack of water treatment is a major driver of human health problems, particularly because the topography of the country implies that watercourses will be subject to multiple uses in their various locations. The introduction of twinned charging for water supply and sanitation appears to have some long-term potential, but it will only be possible when individual household connections, rather than shared supplies, predominate. In rural areas, the use of low-technology sanitation plans is preferable. The disposal of various types of sludge should receive particular attention, because it can create significant adverse environmental impacts.

Telecommunications Only two minor environmental concerns relate to the telecommunications sector: the visual intrusion of overhead fixed lines (especially in areas of elevated protection status) and the possible effects of electromagnetic fields on human and animal health. Neither of these concerns is considered particularly important to the development of the telecommunications infrastructure in Rwanda.

Recommendations

A number if recommendations can be made with respect to environmental issues:

- *Policy development*. The government should expend additional effort to clarify its environmental policies, including updating the National Environmental Action Plan.
- *Development of legislation and guidelines*. The EMPA should be updated and improved, and duplication with other draft laws (for example, the Sanitation Act) should be eliminated. The procedures relating to EIAs in the EMPA should be amended to reflect international best practice, as exemplified by European Commission Directive 97/11/EC. In addition, SEA procedures should be cited in the EMPA. Guidelines for both EIAs and SEAs should be produced. Detailed regulations under the EMPA should be developed as a matter of priority.
- *Use of EIA procedures*. EIAs should be used as the key tool in identifying and mitigating any environmental impacts arising from specific forms of infrastructure development. The completion of EIAs will be important for all major transport-related infrastructure development (roads, railways, and airports). European Commission Directive 97/11/EC provides guidance that should be reflected by the Rwandan procedures.
- *Energy sector projects*. The current government policy in the energy sector is unclear, and the completion of an SEA on energy generation in Rwanda is recommended. Any new hydroelectric projects of significant scale should be prefaced by a full EIA. Certainly an EIA is needed for the proposed project at Nyabarongo (with the EIA updating and extending

the previous work by Sogreah). The development of the methane gas resource at Lake Kivu should be a high priority. All environmental constraints, however, should be clarified through the completion of a full EIA, and any mitigating measures should be scrupulously followed.

- *Water and sanitation projects—water supply*. The water supply sector offers considerable opportunities for PSP. In urban areas, the proposed Ruhengeri-Kigali water supply project should be pursued with vigor. Smaller water supply projects involving PSP should also be possible in the rural areas. The government should specify a range of basic requirements for such projects, especially in relation to the required quality of potable waters.
- *Water and sanitation projects—sanitation*. The current treatment of wastewaters is inadequate and should be improved countrywide. The population's ability to pay for upgraded wastewater treatment is questionable, especially in rural communities. Twinned charging for water supply and sanitation should be considered, at least in urban areas. Using the Nyanza site for the disposal of sewage sludge should be discontinued, and an alternative disposal method should be identified. In rural communities, the introduction of improved forms of sanitation based on low technologies (ventilation-improved latrines and so forth) should be the primary objective. In addition, education on the importance of adequate sanitation should be improved.

Other Cross-Cutting Issues

Some other cross-cutting issues bear comment.

Communication between Ministries and Parastatals

A general lack of communication between ministries and parastatals is evident.

It is recommended that communication between ministries and parastatals be considerably improved. If this recommendation is to be successfully implemented, it will probably be necessary for a senior manager in each ministry and parastatal to be responsible for communications between his or her ministry or parastatal and other ministries and parastatals.

Corruption

Corruption in government or within elements of the private sector is a major constraint on the participation of the legitimate private sector in providing public infrastructure services and in investing in infrastructure assets. Many constraints exist in this area. Unfair and nontransparent bids, unfair and nontransparent evaluation and award of infrastructure project bids, unfair taxation, unfair and unreasonable application of tax laws, difficulty in obtaining any necessary approvals to proceed with project implementation, difficulties in obtaining land titles or the use of land under lease arrangements, difficulty in obtaining import or export licenses, and difficulty in obtaining foreign exchange and remitting lawfully earned dividends on equity investments are just some of the problems that can arise as a direct result of corruption. If corruption occurs or is even rumored to occur, then the legitimate private sector, both local and foreign, will be reluctant or will refuse to provide services or invest in Rwanda. The foreign investment market is a worldwide market. Foreign private investors, in particular, will go where these problems do not occur or occur to a much lesser degree.

Rwanda does not appear in the *Corruption Perceptions Index 2002* (Transparency International 2002), so it is not possible to compare the country with the levels of perceived corruption in other regional countries.

The local private sector business community believes that corruption in Rwanda is minimal compared with other African countries. At most, it affects 15 percent of the business transacted in a given period of time. Where it does occur, it is against the overall policy of the government. The local private sector business community also believes that the government is slowly and surely fighting corruption and that, in time, corruption will be eliminated. Government actions taken include setting up the National Tender Board to handle all public procurement bids on a transparent basis and establishing the Office of the Auditor General, specifically to fight corruption. The performance of these institutions is good, although slow, but it will improve once their capacities have improved.

Proposed Implementation Schedule for the Recommendations

The government of Rwanda, in association with the World Bank, conducted a number of workshops that were funded by the Public-Private Infrastructure Advisory Facility and included key stakeholders, such as civil society organizations, NGOs, donor organizations,

Table 7.1 Implementation Schedule for Action Plan

Action/project	Responsibility	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Sector-specific action/project											
Increase in all road maintenance fund charges/penalties	National Roads Fund										
Strictly enforce axle-load restrictions and penalize overloaded vehicles	Directorate of Roads										
Prioritize roads in order of their importance to the economy	Directorate of Roads										
Give urgent attention to drafting decrees required to put the Telecommunications Law into effect	Department of Telecommunications										
Expedite study of appropriate number of participants in the Rwandan telecommunications market; draft provisional license documents in parallel	Multisector Regulatory Agency										
Make collecting agencies responsible for passing revenue to the National Roads Fund as quickly as possible	Ministry of Finance										
Allocate funding for extension of "Cashpower" plan	Ministry of Finance										
Issue provisional licenses to Artel without delay to enable it to install VSAT equipment at private premises	Multisector Regulatory Agency										
Develop long-term policy for transport	Ministry of Infrastructure										
Return control of all road maintenance to Directorate of Roads	Ministry of Local Government, Ministry of Infrastructure										
Prepare fully costed comprehensive 10-year road rehabilitation and maintenance plan	Directorate of Roads										
Agree on financing plan for 10-year road rehabilitation plan with donors	Ministry of Finance, Ministry of Infrastructure, donors										
Develop long-term policy for energy	Department of Energy										
Develop new sector law for energy	Department of Energy										
Develop long-term policy for water supply	Department of Water and Sanitation										
Develop long-term policy for sanitation	Department of Water and Sanitation										
Develop new sector law for water supply	Department of Water and Sanitation										
Develop new sector law for sanitation	Department of Water and Sanitation										

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Table 7.1 (*Continued*)

Action/project	Responsibility	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Sector-specific action/project											
Conduct feasibility studies for Ruhengiri-Kigali water transmission project	Department of Water and Sanitation, Electrogaz										
Develop further boreholes on the banks of the River Nyabarongo, if possible, as build, operate, and transfer (BOT) projects	Department of Water and Sanitation, Electrogaz										
Conduct feasibility study to develop plan for demand-led rural water service provision	Ministry of Finance, Ministry of Infrastructure, donors										
Introduce arrangements to ensure Electrogaz is able to participate in provision of rural water services	Department of Water and Sanitation, Electrogaz										
Introduce output-based aid incentives in connection with funding of Electrogaz investment plan	Ministry of Infrastructure, donors										
Procure technical assistance for the head of the Telecommunications Department in the Multisector Regulatory Agency	Multisector Regulatory Agency, donors										
Develop a fair, efficient, and legal means of allocating available telecommunications licenses to applicants	Department of Telecommunications, Multisector Regulatory Agency										
Establish 10-year concession basis for all road rehabilitation and maintenance contracts	Directorate of Roads										
Establish Directorate of Roads	Ministry of Infrastructure										
Consider developing a project for new taxiway and increase in refrigeration and general storage facilities at Kanombe Airport	Ministry of Infrastructure										
Rehabilitate runway and apron at Kamembe Airport	Ministry of Infrastructure										
Establish Airports Authority as an independent Civil Aviation Authority											
Conduct feasibility study to develop scheme for demand-led rural electricity supply	Ministry of Finance, Ministry of Infrastructure, donors										
Prepare a rural energy plan, setting out a strategy for implementing rural electrification	Department of Energy										
Document the way that the government intends to exercise its functions under the Telecommunications Law	Department of Telecommunications										
Develop information, communications, and technology systems, resources, and capability with maximum possible private sector involvement											
Conduct a pilot project to test the scope for urban standpipe operators to augment their incomes by providing additional services at water supply kiosks	Department of Water and Sanitation, Electrogaz										
Contract Lake Kivu methane gas extraction and related power generation as BOT	Ministry of Infrastructure										

Action/project	Responsibility	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Update and extend the Kagera Basin Railway Study with associated environmental impact assessments (EIAs)	Ministry of Infrastructure, donors										
Approach the governments of the Dem. Rep. of Congo and Burundi regarding support for and interest in the Kagera Basin Railway Study											
Pilot low-cost condominial water distribution scheme	Department of Water and Sanitation, Electrogaz										
Cross-cutting action/project											
Make administrative load a key criterion in the evaluation, prioritization, and development of infrastructure projects	Ministry of Finance										
Make available all laws relevant to the privatization process in official translations into English	Ministry of Justice										
Establish primary version of all laws published in more than one language	Ministry of Justice										
Conduct survey of availability of skilled and experienced staff in key positions in each of the key departmental units	Ministry of Finance, Ministry of Infrastructure										
Develop policy to encourage banks to set up a medium- to long-term debt market	Ministry of Finance, National Bank of Rwanda										
Provide technical assistance and training programs for bank staff in medium- and long-term lending, project finance techniques, and provision of financing	Ministry of Finance, donors										
Develop policy to encourage banks to set up a medium- to long-term deposit market	Ministry of Finance, National Bank of Rwanda										
Reconsider composition of the Regulatory Board and amend the Regulatory Law accordingly	Ministry of Infrastructure										
Amend the Regulatory Law to give executive authority to the Multisector Regulatory Agency managing director	Ministry of Infrastructure										
Provide technical assistance to each of the Multisector Regulatory Agency department heads over a period of one to two years	Multisectory Regulatory Agency, donors										
Have all corporate bodies over a certain size prepare their accounts to minimum international accounting standards	Ministry of Finance										
Set up a national accounting standards board or committee to regulate national accounting standards	Ministry of Finance										
Require all local practicing accountants to have minimum accounting qualifications	Ministry of Finance										
Consider a tax holiday for investors of five years from the start of operation	Ministry of Finance, Revenue Authority										

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Table 7.1 (*Continued*)

Action/project	Responsibility	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Increase the carryforward period for tax losses to five years	Ministry of Finance, Revenue Authority										
Consider how investors in private sector participation (PSP) schemes can be given greater security of tenure over land	Ministry of Justice										
Amend laws relating to rights of way, or implement a licensing scheme, to overcome delays in providing rights of way for the private sector	Ministry of Justice										
Consider upgrading the existing laws on concession contracts	Ministry of Justice										
Provide a way to ensure that investors are not exposed to statutory liability for seeking to safeguard its powers of management	Ministry of Justice										
Consider ways to make dispute resolution more transparent; amend statutory dispute resolution methods to accord with international standards	Ministry of Justice, Rwanda Investment Promotion Agency										
Address provisions for dispute resolution in local authority laws, if local authority structures are to be used for large-scale PSP projects	Ministry of Local Government, Ministry of Justice										
Clarify the government's environmental policies and update the National Environmental Action Plan	Ministry of Agriculture, Ministry of Environment										
Update and improve the framework of environmental legislation and key guidelines, and eliminate duplication with other draft laws	Ministry of Agriculture, Ministry of Environment										
Use EIAs to identify and mitigate environmental impacts arising from infrastructure development	Ministry of Finance, Ministry of Infrastructure										
Develop and execute training plan in areas that are central to the design and implementation of infrastructure development programs	Ministry of Finance, Ministry of Infrastructure, donors										
Set policy for national pension plan with tax incentives for savers	Ministry of Finance, National Bank of Rwanda										
Consider the establishment of a small informal equity trading market	Ministry of Finance, donors										
Revise tax collection procedures to make them more client friendly and less confrontational	Ministry of Finance, Revenue Authority										
Revise importation procedures to reduce delays	Ministry of Finance, Revenue Authority										
Review the current bid evaluation system and accelerate procedures to remove unnecessary delays and reduce project costs	Ministry of Finance, National Tender Board										
Consider making a single agency or department responsible for publicizing government policy on PSP in infrastructure services	Ministry of Finance										
Support the provision of additional microfinance facilities through the local banks	Ministry of Finance, donors										

Action/project	Responsibility	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Ensure that public and private sector corruption are kept under control											
Establish a central facility to provide information about the law	Ministry of Justice										
Amend Privatization Law to provide a more liberal regime, particularly with regard to the parastatals that can be selected for PSP (as opposed to sale)	Ministry of Justice										
Review the current project selection, prioritization, and planning procedure	Ministry of Finance, Ministry of Infrastructure										
Consider making a senior manager in each ministry be responsible for communication between ministries and parastatals											

Note: BOT = build, operate, and transfer; EIAs = environmental impact assessments; PSP = private sector participation; VSAT = very small aperture terminal.

parastatals, and core government institutions. As part of the review process, stakeholders worked to distill consensual action plans for the key recommendations arising from this CFR. The resultant implementation schedule is provided in table 7.1.

No order of importance is implied in the way the recommended actions are presented; instead the Gantt chart methodology is used to draw attention to the urgency with which recommendations must be implemented if Rwanda is to continue to grow and develop as an attractive locale for domestic and international investment.

The action planning charts list sector-specific action and projects, noting the allocation of responsibility within the government, thus presenting clear implementation priorities for the government and for donor organizations.

The effective implementation of the key recommendations arising from the CFR exercise will require clear prioritization by both the government and the donor community to ensure that the issues identified are addressed in a timely and effective fashion. Undoubtedly, the allocation and acceptance of responsibility for the implementation of recommendations will require a great deal of coordination between the government and the donor community. The relationships and momentum built in the course of this study must be harnessed if substantive change is to occur. Indeed, such coordination is likely to prove vital if pressing issues, such as weaknesses in the institutional capacity of core government institutions, are to be tackled.

The action plan in table 7.1 provides clear orientation as to where resources may most profitably be deployed to create an effective enabling environment for private sector participation in Rwanda. Follow-up and review of progress made by the government and the donor community in the coming months and years is vital if political will is to remain firmly focused on the necessary steps to be taken to realize the Vision 2020 goals.

Appendix A
The Environment

This appendix to the Country Framework Report (CFR) discusses cross-cutting environmental issues and provides additional information on environmental matters of importance in Rwanda. The existing environmental regulations, policies, and legislation in Rwanda are discussed initially to place the comments on sectoral issues in context. Thereafter, environmental issues relating to the specific infrastructure sectors covered by the current project are discussed.

The generic importance of environmental issues differs among the various infrastructure sectors addressed by this project in the following ways:

- Few environmental elements of significance exist for the telecommunications sector.
- Environmental aspects pertaining to the transport sector are of some importance, but they are only covered generally here because of the paucity of specific information on the precise infrastructure development likely to occur in this sector in Rwanda.
- Significant environmental elements of relevance exist for both the energy and the water and sanitation sector.

Private sector participation in the development of infrastructure is the key focus of the CFR. However, infrastructure development can occur in a rational and controlled fashion (with or without such participation) only if key environmental impacts are addressed directly before the construction of infrastructure projects begin. It will be critical for Rwanda to address environmental issues specifically and in detail before and during any attempts to upgrade the quality of the infrastructure in the country.

Existing Environmental Institutions, Policies, and Legislation

Institutional Issues

The institutional structure in Rwanda has not been specifically reviewed in this report, but comments are provided here that are relevant to the development of coherent environmental controls in Rwanda.

It is important to note that the development of any institutional capability addressing environmental issues in Rwanda is relatively recent. The Department of Environmental Protection within the Ministry of Lands, Human Resettlement, and Environmental Protection is staffed mainly by personnel who are relatively inexperienced in drafting legislation and establishing coherent systems of permitting and monitoring. Capacity building will therefore be required in the future. This is an important issue for the international financial institutions (IFIs) and the donor community to consider, because their financial assistance in developing infrastructure (or completing many other projects) in Rwanda will be at risk if the environmental aspects are not adequately addressed.

It is also notable that environmental concerns have not yet been integrated into the government of Rwanda as a whole. It is not sufficient for governments to simply delegate environmental protection to a single ministry. Rather, high-quality environmental

protection relies on the assumption of responsibilities of various entities across governments as a whole. The interface at the policy-strategy level for environmental issues and other elements of the governmental machinery in Rwanda is inadequately defined to date, with opacity in the precise division of responsibilities. This lack of clarity partly reflects the duplication of provisions in draft legislation referred to in the section on environmental legislation that follows, but it also points to the need for improved interministerial dialogue and planning.

In addition, while formation of an Environmental Protection Agency has been discussed—such an agency would be needed to implement any new framework legislation—there has been little substantive progress in this regard. This lack of progress is a concern because the establishment of an executive body charged with implementing environmental legislative requirements is an urgent requirement in Rwanda.

The countrywide capability in the area of environmental protection is also relatively sparse at present. Thus, external assistance will be needed during the initial period when environmental controls are established. However, it is very important that the in-country capability on environmental protection issues be developed as rapidly as possible. Work in this area has implications for the need for training and other forms of capacity building. Experience elsewhere has shown that capability in the consulting area and among the main governmental bodies can be built within five years or fewer, if sufficient funding is available. Rwanda will have to go through this process if environmental controls of the required depth and quality are to be established in the near future.

International Agreements

Thus far, the development of environmental policy and legislation in Rwanda is minimal. Until recently, the environmental authorities have tended to rely heavily on international agreements to provide a basic platform for developing the national approach to environmental controls. Rwanda has acceded to or ratified a number of international agreements, including the following:

- The Vienna Convention of 1988 and the Montreal Protocol, relating to the protection of the ozone layer
- The United Nations Convention to Combat Desertification of 1991
- The 1992 Convention on Biological Diversity
- The United Nations Framework Convention on Climate Change of 1992
- The Stockholm Convention on Persistent Organic Pollutants of 2002.

While this action is to some extent laudable (many of these international agreements essentially reflect best international practice, at least to some degree), it also introduces certain problems. First, Rwanda has been selective in acceding to these international agreements, creating a lopsided approach to environmental protection. For example, as can be seen from the list of agreements above, Rwanda has concentrated mainly on those that address air pollution issues and biological diversity. In contrast, the United Nations Convention of 1991 that relates to desertification is of particular importance in the Rwandan context, because there is great concern nationally over the impacts of deforestation. In Rwanda, deforestation has been caused mainly by agricultural development (often on significant slopes, with insufficient terracing), and high rates of soil erosion have resulted. As noted in a later section, soil erosion is relevant to at least two of the infrastructure sectors covered by the CFR.

International agreements almost always provide merely a basic framework of controls, with insufficient detail. It is therefore not sufficient for Rwanda to rely on international agreements as a basis for its approach to environmental protection. Robust national legislation on all environmental issues of consequence must be developed, enacted, and enforced. The next section discusses the current situation in this respect.

Policies and Legislation on the Environment

Environmental Policies Specific environmental policies have not yet been formulated at the national level. Draft policies currently exist, but they remain under review by the Department of Environmental Protection and are likely to be changed in the future. The authorities have stated that environmental policies cannot be promulgated until the key framework legislation is published. This viewpoint is flawed: the legislation should be based specifically on the policies, rather than the reverse.

A National Environmental Action Plan was produced before 1994, but the Department of Environmental Protection considers it to be outdated and in need of revision. There is currently no agreed timetable for a revision to be completed. Hence, there is currently a policy void on environmental issues in Rwanda. This lack of policy is of great concern if infrastructure development is to proceed (or indeed, if the environment is to be adequately protected in any fashion). The absence of coherent and detailed policies in most areas is a key feature of the government that must be addressed if significant economic development is to occur in the future, especially if external investment is to be a key feature of such development. This situation has a number of important implications for the IFIs and the donor community.

Environmental Legislation While a few preexisting laws and decrees relating to environmental matters exist in Rwanda, the key framework legislation, the Environment Management and Protection Act (EMPA), remains in draft. The authorities estimate that it may be passed in Parliament during 2003.

The draft version of the EMPA contains a number of significant provisions including the following:

- The right to a healthy environment is provided for.
- The inclusion of the precautionary principle and the polluter pays principle is particularly notable, because they lay a basic (and robust) platform for the general approach to environmental protection nationally.
- The need for sustainable development is included, which is important in providing a general framework for future environmental controls.
- Provisions are included on the quality of soil, water, and air; noise impacts; and waste management (although these provisions are all only of a generic nature).
- The need to maintain (and, it is hoped, increase) biodiversity is covered.
- Provisions are included that attempt to decentralize the executive responsibility for environmental issues.
- The link is made between land-use planning and environmental protection.
- A section is provided on environmental impact assessments (EIAs), which are of particular importance to the development of infrastructure in Rwanda (with or without private sector participation).

The EMPA constitutes framework legislation only. Even when enacted, this framework law requires detailed regulations of various types for its full implementation. Such regulations will take considerable time to develop, and there has been little progress in this regard. Hence, many of the real environmental protection controls are unlikely to be fully implemented for a considerable time.

Certain other draft legislation overlaps with the EMPA, and this issue has not yet been resolved. The best example of such overlap is the inclusion of provisions relating to solid waste in both the EMPA and the draft Sanitation Act. A comprehensive review is needed of all proposed legislation in the environmental arena to eliminate inconsistencies and duplication and to ensure that all required aspects of a coherent environmental protection regime have been included. This review should certainly be completed before the enactment of any of the current draft laws pertaining to the environment.

Land-Use Planning, Environmental Impact Assessment, and Strategic Environmental Assessment Although the EMPA attempts to create a link between land-use planning and environmental protection, the current interface between environmental controls and planning or building controls in Rwanda is opaque. The planning and building controls are inadequate as a whole, with wide-scale illegal construction activity (especially in and around the urban centers). As a result, present government practices continue to create future environmental problems because of the inappropriate juxtaposition of distinct forms of land use. It will be very important for Rwanda to introduce strong controls on land use; this effort should be given a high priority.

With respect to the use of EIAs in controlling development, Rwanda has relied to date on statements from the Rio and the Johannesburg world summits, which propose that EIAs should be completed for all development that may have a significant environmental impact. Rwanda has not acceded to any international agreements regarding EIAs, despite the existence of several such agreements (the Espoo Convention of 1992, in particular, addresses transboundary issues). The EMPA currently contains somewhat general provisions

regarding the need for EIAs, and there is no list of projects or activities that would be subject to EIAs.

The Department of Environmental Protection has stated that EIAs are currently being completed on almost all projects. This practice, however, is not an efficient use of sparse resources. Rather, Rwanda should extend the legislation on EIA requirements to reflect best international practice. Thus, lists of specific projects requiring EIAs should be added to the EMPA before its passage through Parliament. It is recommended that the European Commission Directive 97/11/EC be used as the basis for best international practice and that the Rwandan legislation reflect a similar approach. In that case, three annexes should be added to the EMPA to cover the following areas:

- Projects for which an EIA is mandatory
- Projects for which an EIA may be required
- Relevant aspects for determining whether an EIA is needed.

Rwanda currently has no national requirement for the completion of strategic environmental assessments (SEAs). SEAs are covered by recent European Union legislation (European Commission Directive 2001/42/EC) and are of particular use in determining the environmental impacts of government plans and programs. SEAs are quite relevant for Rwanda, given the current immaturity of policy development. In at least two sectors (see sector descriptions that follow), SEAs could be very useful in driving the development of robust and coherent government policies in Rwanda.

Environmental Issues in the Transport Sector

Specific proposals with respect to infrastructure development in the transport sector in Rwanda are not yet available. As noted in box A.1, European Commission Directive 97/11/EC cites several categories of transport-related infrastructure for which the production of an EIA is mandatory before development begins. The same directive includes additional types of transport-related projects for which EIAs may be required, depending on a number of circumstances discussed in Annex III of the European Commission Directive.

The European Union legislation is widely considered to approximate best international practice.

Box A.1 Requirements under European Commission Directive 97/11/EC for the Completion of Environmental Impact Assessments for Transport-Related Infrastructure Projects

Annex I, clause 7, of European Commission Directive 97/11/EC states that environmental impact assessments (EIAs) are mandatory in the following situations:

- Construction of lines for long-distance railway traffic and of airports with a basic runway length of 2,100 meters or more
- Construction of motorways and express roads
- Construction of a new road of four or more lanes—or realignment or widening of an existing road of two lanes or fewer so as to provide four or more lanes—if the new road—or the realigned or widened section of road—would be 10 kilometers or more in a continuous length

In addition, according to annex II, EIAs may be required in the following uses:

- Construction of railways, intermodal transhipment facilities, and intermodal terminals
- Construction of airfields
- Construction of roads, harbors, and port installations, including fishing harbors
- Construction of tramways, elevated and underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport.

Source: European Commission Directive 97/11/EC.

Rwanda should therefore adopt the requirements described in box A.1. In any event, international financial institutions frequently require the completion of EIAs before they will provide grants or loans for infrastructure development projects.

The topography of Rwanda implies that certain environmental impacts arising from transport-related infrastructure projects may be unusually severe. For example, the construction of roads and railways of significant length would generate large volumes of material from the cut faces of hillsides. In such scenarios, the attainment of a zero net balance of cut and fill materials is advisable but could be difficult in certain projects in Rwanda.

Environmental Issues in the Energy Sector

Electrical Power

Box A.2 shows the requirements for EIAs under European Commission Directive 97/11/EC for the energy sector. No large thermal power stations exist in

Box A.2 **Requirements under European Commission Directive 97/11/EC for the Completion of Environmental Impact Assessments with Respect to Infrastructure Projects in the Energy Sector**

Annex I, clause 20, of European Commission Directive 97/11/EC states that environmental impact assessments (EIAs) are mandatory for the following projects:

- Thermal power stations and other combustion installations with a heat output of 300 megawatts or more
- Extraction of petroleum and natural gas for commercial purposes where the amount extracted exceeds 500 metric tons per day in the case of petroleum and 500,000 cubic meters per day in the case of gas
- Pipelines for the transport of gas, oil, or chemicals with a diameter of more than 800 millimeters and a length of more than 40 kilometers
- Construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometers

Under annex II, EIAs may also be required for the following:

- Industrial installations for the production of electricity, steam, and hot water
- Industrial installations for carrying gas, steam, and hot water and transmission of electrical energy by overhead cables
- Surface storage of natural gas
- Underground storage of combustible gases
- Surface storage of fossil fuels
- Installations for hydroelectric energy production
- Installations for the harnessing of wind power for energy production (wind farms).

Source: European Commission Directive 97/11/EC.

Rwanda, where hydroelectric power generation is the main source of electricity. The country has only 28.6 megawatts of installed capacity (as compared with an estimated demand of 40 megawatts nationally). Some electrical power, however, is imported, and plans exist to develop the extensive natural gas resource in Lake Kivu (see the next section).

The proposed hydroelectric facility at Nyabarongo would undoubtedly require the completion of a full EIA before construction begins. This project would provide a further 28 megawatts of generation capacity but would involve a dam 41 meters in height and a reservoir some 320 hectares in area. The associated displacement of more than 2,100 inhabitants and the loss of significant agricultural land (about 80 hectares) are also notable. A preliminary environmental report for this was prepared by Sogreah in 1998, but this report would need to be updated and extended to meet a full EIA requirement.

In the rural areas, the paucity of electrical supplies is a key driver of deforestation in Rwanda. Deforestation has a number of consequences, and figure A.1 shows a link between deforestation, water resources, and power generation. The extremely high rate of deforestation in Rwanda in the past (mainly to generate agricultural land) has led to elevated rates of soil erosion, causing significant turbidity in local rivers and streams, even in low-flow periods. This situation not only gives rise to poor-quality surface waters—many of which are used as a potable resource (see the following section on water)—but also threatens the turbines of hydroelectric power facilities such as the Gisengi and Gihera facilities. In the absence of sufficient generating capacity, deforestation would in turn increase. What is required is an effort to break the vicious cycle shown in figure A.1 and to establish the virtuous circle. If this effort can be achieved, net benefits will be seen in all parts of the country in several sectors.

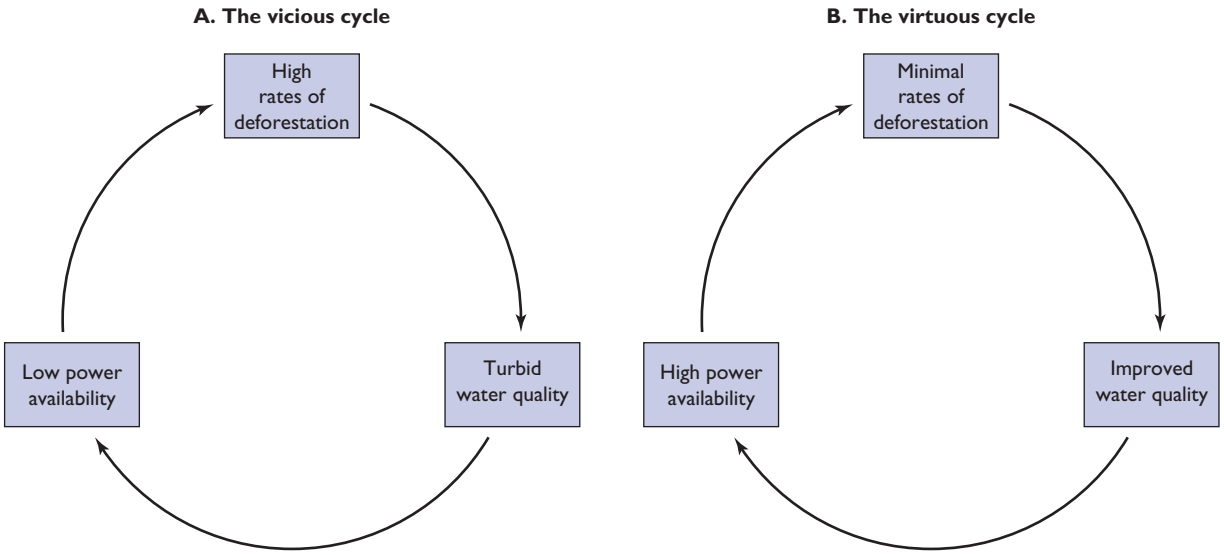
It is clear that rural electrification projects in Rwanda will largely involve power sources such as solar energy, micro-hydro power, and possibly biogas. These sources all possess net environmental benefits, at least if their introduction and maintenance is adequately managed. The recent introduction of solar power projects in rural areas in many parts of Africa is particularly notable and reflects the advances made in the past decade in solar technology. Rwanda could certainly benefit from such projects.

The Lake Kivu Methane Resource

The Lake Kivu methane resource is considered a critical element of the future development of Rwanda. Current estimates of the volume of methane available suggest that at least 55 billion cubic meters is present. A bilateral agreement is already in place between Rwanda and the Democratic Republic of Congo with respect to the future development of Lake Kivu.

As demonstrated by the incidents in Lakes Monoun and Nios in Cameroon in the mid-1980s, significant risks are associated with the exploitation of methane resources in lake environments. Technical studies completed in late 2000 on the Lake Kivu resource, however, have suggested that the risks associated with exploitation

Figure A.1 The Vicious and Virtuous Cycles Relating Deforestation to the Quality of Water



Source: Adam Smith Institute research.

are much lower at Lake Kivu than at the sites in Cameroon, because of a more stable stratification.

Currently, two major proposals are competing for the exploitation of the methane at Lake Kivu, and no decision has been made on the preferred development option. The scale of the existing resource, however, certainly indicates the need for very careful planning in its development. Any exploitation of the Lake Kivu methane should undoubtedly be prefaced by the completion of a full-scale EIA that should address not only the specific technology and plan to be used, but also the replacement of the existing pilot plant and the downstream uses of the methane.

The Lake Kivu methane resource is particularly attractive from a global environmental viewpoint, because the replacement of fossil fuels by methane would lead to reductions in greenhouse gas emissions. Methane could possibly be used in the future as a fuel source in various industries (for example, the tea estates and possibly the cement industry) and also as an automotive fuel. Such uses would have a positive environmental effect. Certain of the downstream uses of methane from Lake Kivu would reduce pressure on the forestry resource, which is of particular importance to Rwanda.

There could well be scope for completion of an SEA on the entire energy sector in Rwanda: the exploitation of the Lake Kivu resource and the further development of hydroelectric power appear to a large degree to be competing possibilities, and each has distinct environmental consequences. As noted in chapter 3, it is also vital that the government produce a coherent national energy policy for the future. The completion of an SEA would assist in the formulation of such a policy.

Polychlorinated Biphenyls

PCBs are industrial chemicals used largely in the electrical industry (mainly as dielectric fluids in transformers and capacitors), and they are of very considerable environmental importance. International legislation on PCBs has strengthened in the past decade, because of increasing concerns worldwide over the extreme toxicity and persistence of these chemicals.

There is no evidence currently available concerning the abundance of PCBs in electrical equipment in Rwanda, but because of the geographic and temporal origins of much of the equipment, PCBs are likely to be present in at least some transformers and capacitors. Hence, there is a need for particularly careful attention to the disposal of such equipment at the end of its useful life. There are no acceptable disposal facilities for such equipment in Rwanda (or, indeed, in most of Africa) and the costs for appropriate disposal will be

high. The completion of an investigation on the abundance of PCBs in electrical and other equipment in Rwanda is recommended.

Environmental Issues in the Water Supply and Sanitation Sector

Water Supply

It is well documented that inadequate water quality and sanitation are responsible for widespread human health problems in Africa and elsewhere in the world. Rwanda is certainly no exception to this general pattern. International data sources suggest that Rwanda faces particular problems with respect to water supply, as evidenced by the difficulties the country has experienced in providing water of acceptable quantity and quality not only to rural populations, but also to the main urban centers. The heavy reliance on surface waters for providing potable supplies (in Kigali and in much of the rest of the country) exacerbates the difficulties, particularly because the levels of water treatment are often inadequate. The monitoring of potable water supplies also does not meet international requirements, with far too few microbiological tests being completed.

The proposal to supply potable water to Kigali from the areas of Rubindi, Mutobo, and Mpenge in the Virunga region is of particular note. The project would involve a pipeline at least 800 millimeters in diameter, running some 105 kilometers from Ruhengeri to Kigali. The vertical gradient is from 2,300 meters at Ruhengeri to 1,850 meters at Mount Kigali, and no pumping would be required. The supply rate would average 520 liters per second (45,000 cubic meters per day), which would certainly satisfy the current demand for water in Kigali. A hydroelectric element to the project is also envisaged, yielding additional minor amounts of power.

Given the poor quality of the surface water currently available as a potable resource for Kigali, this project is of considerable interest. If managed correctly, it would essentially solve Kigali's present water supply problems at a stroke and would significantly improve the quantity and quality of water available in the capital. However, such a project would certainly need to be prefaced by a full-scale EIA. (See box A.3 in relation to the specifications of European Commission Directive 97/11/EC regarding water supply and sanitation projects.)

Box A.3 Requirements under European Commission Directive 97/11/EC for the Completion of Environmental Impact Assessments with Respect to Infrastructure Projects in the Water and Sanitation Sectors

According to annex I, clauses 11–13, and 15, of the European Commission Directive 97/11/EC, the following situations mandate an environmental impact assessment (EIA):

- Groundwater abstraction or artificial groundwater recharge schemes where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic meters
- Works for the transfer of water resources between river basins where this transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic meters per year (transfers of piped drinking water are excluded)
- In all other cases, works for the transfer of water resources between river basins where the multiannual average flow of the basin of abstraction exceeds 2 billion cubic meters per year and where the amount of water transferred exceeds 5 percent of this flow (transfers of piped drinking water are excluded)
- Wastewater treatment plants with a capacity exceeding 150,000 population equivalent as specifically defined
- Dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic meters

Annex II states that an EIA may be required for these projects:

- Water management projects for agriculture, including irrigation and land drainage projects
- Deep drillings—in particularly drilling for water supplies
- Inland-waterway construction, canalization, and flood relief works
- Dams and other installations designed to hold water or store it on a long-term basis
- Installations of long-distance aqueducts
- Groundwater abstraction and artificial groundwater recharge schemes
- Works for the transfer of water resources between river basins
- Installations for the disposal of waste
- Wastewater treatment plants
- Sludge-deposition sites.

Source: European Commission Directive 97/11/EC.

The availability of potable water of adequate quality is a problem in almost all rural areas in Rwanda. Groundwater systems are not commonly used, and reliance on surface water implies significant threats from upstream users. The ability of urban communities to

pay for higher-quality water is questionable, and at least one pilot project (in Njenda) has encountered difficulties in persuading rural communities to pay for high-quality potable supplies rather than using water of lower quality collected directly from nearby sources. It is clear that education about public health issues is a significant requirement in such scenarios.

Sanitation

Sanitation is perhaps the least developed of all the infrastructure elements addressed by the current project. Even the major urban areas of Kigali and Butare have effectively no wastewater treatment infrastructure, as is also the case in all rural areas. The widespread disposal of untreated wastewater to surface waters and to subsoils gives rise to serious effects on the subsoil recipients, and the health of downstream users of the surface waters is threatened. The collection of sludge from septic tanks in the capital city (which in some cases involves private contractors) is intermittent, and the disposal of the sludge occurs at the Nyanza waste disposal site on the southern outskirts of Kigali. The disposal location is altogether improperly designed and managed, amounting to an open dumping site with no adequate controls on environmental impacts. There are significant problems with respect to introducing cost recovery in the waste disposal infrastructure in Rwanda, but environmental protection in this area is especially critical.

As previously discussed regarding environmental policies, none of these areas of concern is addressed effectively by the existing national environmental policies or by the current legislation. No standards of relevance to environmental protection have been developed for Rwanda (for example, there are no requirements for the quality of potable waters, surface waters, base river flows, or wastewater effluents). However, the charges for water supply are currently high in Rwanda compared with other developing nations. Hence, there is scope for PSP, at least in the water supply sector.

Sanitation in rural areas is generally inadequate, countrywide. Efforts to upgrade latrines to so-called ventilation-improved latrines have not always met with success. Inadequate sanitation, however, is a major factor driving human health problems in rural areas. Solutions must involve low-cost technologies, because the ability to pay for adequate sanitation is deeply suspect in rural communities.

Some of the historical projects as well as some of the currently proposed projects in the water and sanitation sector in Rwanda have separated water supply from sanitation. This division is contrary to the principles of many of the IFIs, which generally demand that these elements be linked within infrastructure development projects. There is a particularly good rationale for this requirement in Rwanda, because many of the watercourses are subjected to multiple uses and are therefore degraded in quality as water flows downstream. Current government policies do not address this issue, and there is no attempt at whole-catchment management in river basins, which is a fundamental feature of water quality protection in western nations.

Finally, the problems related to cost recovery in the sanitation sector could be addressed by the introduction of a single payment for water supply and wastewater disposal, at least for some end-users. This twinning of the charges is related to the linking of the project conception and construction noted above and could imply that a single authority would be responsible for both elements of the sector. Further studies on this possibility in Rwanda are recommended.

Environmental Issues in the Telecommunications Sector

Only the following two relatively minor environmental issues are relevant to the telecommunications sector and neither has particular policy-related implications:

- Visual intrusion from land lines extending across the countryside
- The possible presence of polychlorinated naphthalenes (PCNs) in telecommunications equipment.

The first of these issues is self-explanatory; it is clear that above-ground land lines servicing the telecommunications sector should not be used, at least in areas with a protected conservation status. Above-ground lines are currently in certain areas of the Akagera National Park, resulting in high visual intrusion.

PCNs are highly persistent chemicals that have been found in telecommunications equipment in certain parts of the world. U.K. authorities have been particularly vigilant regarding PCNs and have classified PCNs in telecommunications equipment with the

even more toxic polychlorinated biphenyls (PCBs). (See the discussion below on PCBs in the energy section.) Hence, ascertaining whether PCNs are present in telecommunications equipment in Rwanda would have merit.

Ecotourism in Rwanda

The current CFR is not intended to address the tourism sector in Rwanda; the CFR is restricted to the four main vertical sectors (transport, energy, water and sanitation, and telecommunications). Ecotourism, however, is of growing importance in Rwanda, and protecting the environment is intimately linked to conserving key natural resources. This final note is, therefore, included here, in part because of the relevance of PSP to ecotourism.

Rwanda is a beautiful country in general terms, but it also includes three key protected areas of exceptional quality:

- The Virunga National Park, home to about half of the world's population of the mountain gorilla
- The Akagera National Park, with very significant habitat diversity and a number of endangered and threatened species
- The Nyungwe Forest, which has one of the highest concentrations of primates and monkeys in the world.

Authorities have noted that for ecotourism to be successful in terms of foreign currency income, at least three key tourist resources should be present in any one country. Each of the above resources in Rwanda is therefore important, not only in its own right, but also because it contributes to generating a critical mass of such sites in Rwanda so that the country can attract tourism from a worldwide audience. While it could be argued that the mountain gorillas of the Virunga region, habituated originally by George Schaller, are the key resources for ecotourism, the constraints placed on the level of visits to each gorilla group (which are altogether appropriate and should not be changed) restrict the total income from such visits to only about US$2.5 million annually. To optimize tourism revenues, Rwanda needs to further develop the facilities at Virunga, as well as the other two sites noted, to broaden the spectrum of tourism options. Facilities are currently being developed for tourists at the Virunga National Park, with golden monkeys currently being habituated and with walking trails and kayaking planned for imminent introduction. By comparison, the tourist facilities available at Akagera are very poor, and those at the Nyungwe Forest are not much better.

Given the present state of the Rwandan economy, these facilities should be developed further, to optimize foreign income. With the exception of the fees for visiting the mountain gorillas (which are already quite high and should remain so), the charges for entry to the protected areas can (and should) be raised considerably once the tourism facilities have been improved. It is critical, however, that any further development of the key conservation areas in Rwanda be completed in an environmentally acceptable fashion. Otherwise, ecotourists will not visit the degraded environments that would result. It is also vital that physical encroachment on the three key protected areas be halted immediately and that the levels of conservation be stepped up. Poaching remains a threat in all three areas, although the situation at the Virunga National Park has been controlled admirably in recent years under challenging circumstances. It is also of fundamental importance that the local communities become more closely involved in the conservation efforts and that some of the revenue from tourism remain in the local region to improve both the infrastructure and the economy as a whole.

The use of PSP to hurdle the initial barriers of investment and expertise in the development of ecotourism facilities has been demonstrated in many parts of Africa and elsewhere in the world. It is clear that PSP should be a favored option for Rwanda, albeit within the constraints of a highly developed monitoring and inspection regime designed to conserve the key natural resources at all costs.

Appendix B
The Legal System

This appendix describes some of the relevant legislation in Rwanda.

Rwandan Land Law

Rwandan land law is a combination of civil law norms and local customary law. The latter is particularly important as far as rural projects such as water and road projects are concerned.

Customary Law

The characteristics of customary law are that it is unwritten; it gives the right to deal with the product of the land (*usufruct* or *superficie*); it can be given up by its owner with prior written consent of the state, given after inquiry and indemnity to the owner of the rights under customary law; and there is no security of tenure, because the state can confiscate the right at any time in the public interest. The indemnity referred to above is again given.

The authority for the application of customary law is article 98 of the Rwandan constitution, which requires that customs meeting the following conditions be applied:

- The custom has not been modified by existing law.
- It does not contradict the constitution or other law or regulation.
- It is not against public order and public morality.

Land Law Reform

The proposed reform of the land law would do the following, if it took its current form:

- Confirm the powers of the state to confiscate land for public purposes.
- Allow foreigners—who are currently limited to rights of *bail emphytéotique,* or concession contracts, of 99 years maximum—to transfer land in the *domaine privé* of the state for, among other things, industrial or commercial use. Such transfers would be achieved by ministerial or, in the case of large-scale projects, presidential decree.
- Define the land held in public ownership (both *domaine publique* and *domaine privé*).
- Define land that can be held in private ownership—that is, land held by customary or written rights that forms neither part of the *domaine publique* nor the *domaine privé* of the state or commune.
- Give the proprietors of customary land rights the ability to register them.
- Extend the existing system of land registration.

The *domaine publique* of the state is defined as all land subject to public use, as well as that forming part of the *domaine environnemental* of the state, which include the beds of all lakes and rivers and the shores of all lakes and river banks, as determined by Ministerial decree, and *abreuvoirs* (waterholes) and the *emprises* (banks) of main trunk roads. Surface and groundwater belong to no one.

The *domaine privé* of the state is composed of all land that does not form part of its *domaine publique,* of the *domaine foncier* (real estate) of the commune or district, or of the *domaine privé* of private persons.

In other words, all ownership of land other than that in the *domaine publique* is a derogation from the basic principle that land is the property of the state, which has the right (and duty) on behalf of the citizens to monitor its use; to see that where it has been alienated it is *mise en valeur* (properly used); and, if it is not properly used, to take it back into public ownership. The *domaine foncier* of the district also comprises a *domaine publique* and a *domaine privé.*

Rights of Ownership

Ownership is defined in the Civil Code as "the right to dispose of something in an absolute and exclusive manner, subject to any restrictions imposed by law and any rights of third parties." Ownership of land includes the ownership of the space above and below the land. However if something is done at a height or depth that will have no effect on the owner, the owner cannot prevent it.

The owner of the land has no rights over water on the land, nor over any minerals that may be the subject of licenses under mining legislation. The bed of every lake and navigable watercourse, whether *flottable ou non,* forms part of the public property of the state. When a watercourse forms a new bed by abandoning the old one, the state acquires the new bed but must compensate the proprietors of the new land.

The shores of all lakes and banks of rivers and streams are property of the state for 10 meters from the highest watermark. If an owner has a water source on the land that is merely a feeder stream to a watercourse, the owner may use it as he or she wishes. If such a source forms the head of a stream whose bed is distinct from neighboring land, the owner may only use it according to the rules laid down in the Law of 6.5.52.

No one may own the water in streams and lakes and underground watercourses. Subject to the laws or regulations that govern the use of such water and subject to concessions awarded by the public authorities, the right to use such water is common to all.

Clearly, these land and water rights have a considerable influence on the way in which projects involving the private sector can be structured. If reform of the land law is to take place, it should include provisions making it more user friendly to outside investors.

Appendix C
Road Maintenance, Rehabilitation, and Reconstruction Costs

Table C.1 **Expenditure and Investments Associated with Road Building, Rehabilitation, and Maintenance of Various Types of Roads in Rwanda**

Road type and action	Approximate expenditure intervals (years)	Lower cost limit (US$/km)	Upper cost limit (US$/km)	Approximate average cost (US$/km)
Paved				
Annual maintenance	1	2,300	2,600	2,500
Periodic maintenance	5	100,000	120,000	110,000
Rehabilitation		450,000	560,000	500,000
Reconstruction		560,000	700,000	600,000
Unpaved main road				
Annual maintenance	1	1,600	2,400	40,000
Periodic maintenance	5	20,000	30,000	25,000
Rehabilitation		30,000	80,000	80,000
Reconstruction		80,000	150,000	90,000
Unpaved secondary roads				
Annual maintenance	1	1,500	2,000	1,750
Periodic maintenance	5	20,000	30,000	25,000
Rehabilitation		30,000	40,000	35,000
Reconstruction		40,000	80,000	120,000

Sources: Road Maintenance Fund 2002; World Bank 2002; MINITRACO 2002.

Table C.2 Expenditure and Investment Required to Rehabilitate the Paved Road Network in Rwanda

	Road condition			
Paved main roads	Good	Fair	Poor	Total
10 years' percentage	45%	30%	25%	100%
Length (kilometers)	418.5	279	232.5	930
Expenditure per kilometer over 10 years of rehabilitation (US$)	0	250,000	500,000	
Total investment and expenditure required over 10 years of rehabilitation (US$)	0	69,750,000	116,250,000	186,000,000
Total cost over 10 years (US$)	0	69,750,000	116,250,000	186,000,000
Annual cost (US$)	0	6,975,000	11,625,000	18,600,000

Sources: Road Maintenance Fund 2002; World Bank 2002; MINITRACO 2002.

Table C.3 Expenditure and Investment Required to Rehabilitate the Unpaved Main Road Network in Rwanda

	Road condition			
Unpaved main roads	Good	Fair	Poor	Total
10 years' percentage	10%	40%	50%	100%
Length (kilometers)	443.6	1,774.4	2,218	4,436
Expenditure per kilometer over 10 years of rehabilitation (every 10 years) (US$)	0	30,000	90,000	
Total investment and expenditure required over 10 years of rehabilitation (US$)	0	53,232,000	199,620,000	252,852,000
Total cost over 10 years (US$)	0	53,232,000	199,620,000	252,852,000
Annual cost (US$)	0	5,323,200	19,962,000	25,285,200

Sources: Road Maintenance Fund 2002; World Bank 2002; MINITRACO 2002.

Table C.4 Expenditure and Investment Required to Rehabilitate the Unpaved Secondary Road Network in Rwanda

	Road condition			
Unpaved secondary roads	Good	Fair	Poor	Total
10 years' percentage	10%	40%	50%	100%
Length (kilometers)	760	3,040	3,800	7,600
Expenditure per kilometer over 10 years of rehabilitation (every 10 years) (US$)	0	30,000	80,000	
Total investment and expenditure required over 10 years of rehabilitation (US$)	0	91,200,000	304,000,000	395,200,000
Total cost over 10 years (US$)	0	91,200,000	304,000,000	395,200,000
Annual cost (US$)	0	9,120,000	30,400,000	39,520,000

Sources: Road Maintenance Fund 2002; World Bank 2002; MINITRACO 2002.

Table C.5 Investment Projects: Base Scenario

Project number	Project	Cost (FRw million)	Rentability (percent)
IR01	Rehabilitation of the Kigali-Kayonza road	10,560	25
IR02	Rehabilitation of the Kigali-Gatuna road	4,470	24
IR03	Rehabilitation of the Kayonza-Kagitumba road	3,020	23
IR04	Rehabilitation of the Kayonza-Rusumo road	2,470	21
IR05	Rehabilitation of the Butare-Cyangugu-Rusizi 2 road	16,410	20
IR06	Rehabilitation of the Ruhengiri-Gisenyi road	9,270	18
IR07	Rehabilitation of the Ruhengiri-Cyanika road	810	17
IR08	Rehabilitation of the Kigali-Ruhengiri road	11,370	12
IR09	Rehabilitation of the Bugarama-Ruhwa road	210	10

Table C.6 Investment Projects: Alternative Scenario

Project number	Project	Cost (FRw million)	Rentability (percent)
IR01	Rehabilitation of the Kigali-Kayonza road	10,560	25
IR02	Rehabilitation of the Gatuna road	5,480	24
IR03	Rehabilitation of the Kayonza-Kagitumba road	3,680	23
IR04	Rehabilitation of the Kayonza-Rusumo road	3,020	21
TC03	Conservation works for the Butare-Rusizi 2 road	4,860	19
TC02	Conservation works for the Ruhengiri-Gisenyi road	2,260	19
IR07	Rehabilitation of the Ruhengiri-Cyanika road	810	17
TC01	Conservation works for the Kigali-Ruhengiri road	1,860	15
IR09	Rehabilitation of the Bugarama-Ruhwa road	210	10

Table C.7 Annual Road Maintenance Projects: Cost Summary

		Cost (FRw million)		
Project number	Project	2002	2005	2008
EC01	Annual maintenance of paved roads	1,185	1,296	1,322
EC02	Annual maintenance of unpaved classified roads	1,284	1,781	2,346
EC00	Total annual maintenance	2,469	3,077	3,668

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