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ABBREVIATIONS AND ACRONYMS

| | | | |
|-----------|--|--------|---|
| AAGDS | Accelerated Agricultural Growth and Development Strategy | CFC | Community Forestry Committee |
| AEZ | Agro-Ecological Zone | CIDA | Canadian International Development Agency |
| AFD | Agence Française de Développement | CLA | Customary Land Administration |
| AFLEG | African Forest Law Enforcement and Governance | CLS | Customary Land Secretariat |
| AGDP | Agricultural Gross Domestic Product | CORMAC | Community Resource Management Committee |
| AgSSIP | Agriculture Sub-Sector Investment Program | CREMA | Community Resource Management Area |
| AgSWAP | Agriculture Sector-Wide Approach | CRMU | Collaborative Resource Management Unit |
| AMA | Accra Metropolitan Assembly | CSIR | Council for Science and Industrial Research |
| APRM | African Peer Review Mechanism | CSR | Corporate Social Responsibility |
| ASM | Artisanal and Small-Scale Mining | CWSA | Community Water and Sanitation Agency |
| BOD | Biological/Biochemical Oxygen Demand | DA | District Assembly |
| CBAG | Community Biodiversity Advisory Groups | DACF | District Assembly Common Fund |
| CBD | Convention on Biological Diversity | DEMC | District Environmental Management Committee |
| CBNRM | Community-Based Natural Resource Management | DF | Dedicated Forest |
| CBO | Community-Based Organization | DFID | Department For International Development |
| CD | Chief Director | DP | Development Partner |
| CDD-Ghana | Centre for Democratic Development—Ghana | EIA | Environmental Impact Assessment |
| CDM | Clean Development Mechanism | EITI | Extractive Industries Transparency Initiative |
| CE | Chief Executive | ENRM | Environmental and Natural Resource Management |
| CEA | Country Environmental Analysis | EPA | Environmental Protection Agency |
| CEPIL | Center for Public Interest Law | ERP | Economic Recovery Program |
| CEPS | Customs and Excise Preventative Service | ESP | Environmental Sanitation Policy |
| CF | Consolidated Fund | | |

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Abbreviations and Acronyms continued

| | | | |
|--------|--|--------|---|
| ESW | Economic and Sector Work | LAP | Land Administration Project |
| EU | European Union | LC | Lands Commission |
| FAO | Food and Agriculture Organization | M&E | Monitoring and Evaluation |
| FASDEP | Food and Agriculture Sector Development Policy | MAS | Metropolitan or Municipal Assemblies |
| FC | Forestry Commission | MC | Minerals Commission |
| FDI | Foreign Direct Investment | MDA | Ministry, Department or Agency |
| FIMP | Forest Inventory and Management Project | MDBS | Multi-Donor Budget Support |
| FLEGT | Forest Law Enforcement Governance, Trade | MDF | Mineral Development Fund |
| FO | Forest Ordinance | MDG | Millennium Development Goals |
| FOB | Free on Board | MES | Ministry of Environment and Science |
| FR | Forest Reserve | MEST | Ministry of Environment, Science and Technology |
| FSD | Forest Services Division | MLF | Ministry of Lands and Forestry |
| GDP | Gross Domestic Product | MLFM | Ministry of Land Forestry and Mining |
| GEF | Global Environmental Facility | MLGRD | Ministry of Local Government and Rural Development |
| GESS | Ghana Environment Sector Study | MLGRDE | Ministry of Local Government, Rural Development and Environment |
| GIS | Geographic Information System | MMA | Metropolitan or Municipal Assemblies |
| GLASOD | Global Assessment of Human-Induced Soil Degradation | MMDA | Metropolitan, Municipal and District Assemblies |
| GLFPSF | Ghana Land and Forestry Policy Support Facility | MoFA | Ministry of Food and Agriculture |
| GoG | Government of Ghana | MoFEP | Ministry of Finance and Economic Planning |
| GPRS | Growth and Poverty Reduction Strategy | MOU | Memorandum of Understanding |
| GPS | Ghana Partnership Strategy | MoWH | Ministry of Works and Housing |
| GSBA | Globally Significant Biodiversity Area | MSDEP | Mining Sector Development and Environment Program |
| GSD | Geological Survey Department | MTR | Mid -Term Review |
| GTZ | German Agency for Technical Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit) | NAP | National Action Program to Combat Drought and Desertification |
| GWCL | Ghana Water Company Limited | NEAP | National Environmental Action Plan |
| GWD | Ghana Wildlife Division | NEF | National Environment Fund |
| HIPC | Heavily Indebted Poor Countries | NESPCC | National Environmental Sanitation Policy Coordination Council |
| HQ | Headquarters | NGO | Non-Governmental Organization |
| HR | Human Resources | NLP | National Land Policy |
| IDA | International Development Association | NP | National Park |
| IFAD | International Fund for Agricultural Development | NR | Natural Resource |
| IFC | International Finance Corporation | NRM | Natural Resource Management |
| IGF | Internally Generated Funds | NSBCP | Northern Savanna Biodiversity Conservation Project |
| IRS | Internal Revenue Service | NSP | National Sanitary Program |
| ISODEC | Integrated Social Development Center | NTFP | Non-Timber Forest Product |
| ISRIC | International Soil Reference and Information Centre | NTFR | Non-Timber Forest Resources |
| IWLM | Integrated Watershed and Land Management | O&M | Operation and Maintenance |
| JSA | Joint Strategic Action | OASL | Office of the Administration of Stool Lands |
| KMA | Kumasi Metropolitan Assembly | ODI | Overseas Development Institute |
| L.I. | Legislative Instrument | OPR | Output to Purpose Review (DFID) |
| | | PA | Protected Area |

| | | | |
|----------|--|---------|---|
| PADP | Protected Areas Development Program | TREC | Timber Rights Evaluation Committee |
| PAMAB | Protected Areas Management Advisory Board | TRF | Timber Rights Fee |
| PAF | Performance Assessment Framework | TUC | Timber Use Contract |
| PAMWCP | Protected Areas Management and Wildlife Conservation Project | TUP | Timber Use Permit |
| PAYE | Pay As You Earn | TWN | Third World Network |
| PES | Payment for Environmental Service | TWU | Timber and Woodworkers Union |
| PM | Project Memorandum | UESP II | Urban Environmental Sanitation Project II |
| PPP | Public-Private Partnership | UNDP | United Nations Development Programme |
| PRODICAP | Promotion of District Capital Project | UNEP | United Nations Environment Programme |
| PSP | Private Sector Partnership | UNIDO | United Nations Industrial Development Organisation |
| PURC | Public Utilities Regulatory Commission | UWP | Urban Water Project |
| RNE | Royal Netherlands Embassy | VAT | Value-Added Tax |
| RR | Resource Reserve | VIP | Ventilated Improved Pit Latrine |
| SDI | Spatial Data Information | WACAM | Wassa Association of Communities Affected by Mining |
| SEA | Strategic Environmental Assessment | WB | World Bank |
| SLM | Sustainable Land Management | WC | Water Closet |
| SNR | Strict Nature Reserve | WD | Wildlife Division |
| SNV | Netherlands International Development Organization | WDI | World Development Indicators |
| SP | Salvage Permits | WDR | World Development Report |
| SRA | Social Responsibility Agreement | WDSP | Wildlife Division Support Project |
| SWC | Soil and Water Conservation | WMD | Waste Management Department |
| TIDD | Timber Industry Development Division | WRC | Water Resource Commission |

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Executive Summary

Introduction

1. Ghana's economy is expanding at a commendable growth rate, with an average annual GDP growth of about 6 percent. As a result, the country has made considerable progress in laying the foundations for sustainable growth and poverty reduction. The Government of Ghana is further committed to achieving faster poverty reduction: accelerated growth is set to play a key role, and Ghana's Growth and Poverty Reduction Strategies (GPRS II), driven by agriculture and private sector development, are focused on continued growth.

2. However, Ghana's natural resources, upon which so much of the country's economic activity and the population's livelihood depend, are being depleted at an alarming rate: more than 50 percent of the original forest area has been converted to agricultural land by clearance for perennial or annual cropping and slash-and-burn cultivation practices. Crop yields have stagnated, and productivity has declined because of rampant soil erosion. Fish, timber, and nontimber forest product stocks are decreasing rapidly. Coastal towns are facing severe water shortages during the dry season. Wildlife populations and biodiversity are in serious decline. Health-related pollution—indoor and outdoor air pollution, and water and sanitation issues—have emerged as serious health threats for the majority of the population.

3. All of these factors threaten to reduce Ghana's GDP growth in the near future. From a broader view, if we measure Ghana's productive base not simply as growth in GDP, but also in terms of human, natural, and social capital, Ghana's recent economic growth achievements look much less impressive and much less sustainable. Recent estimates of the cost of natural resource and environmental degradation suggest that the equivalent of 9.6 percent of GDP is lost annually through unsustainable management of the country's forests and land resources and through health costs related to water supply and sanitation, and indoor and outdoor air pollution. This has a significant impact on the capacity of the country to sustain its growth, as it substantially reduces the genuine savings rate (a measure of growth sustainability that takes environmental factors into account).

4. Considerable changes are also under way in the architecture of development assistance to support national priorities. There is a general shift toward budgetary support and sector-wide programs to align with country priorities, strengthen country systems, and reduce the transaction costs of dealing with multiple partners and projects. This shift has implications for addressing environmental issues that are integral to many different sectors. In light of this new approach, the Government of Ghana (GoG) and development partners have considered how best to deal with these issues and have jointly developed a natural resources and environmental governance budget support operation as a response to the findings in the CEA.

Scope and objectives

5. The Ghana Country Environment Analysis (CEA) has thus been formulated to assist the Government of Ghana and its development partners to: (a) assess the country's environmental priorities in key sectors, the environmental implications of key economic and sector policies, and the country's institutional capacity to address them; and (b) find practical management, institutional, and policy solutions to handle issues of natural resource management, environmental degradation, and sustainability of growth.

6. The CEA evolved in the context of the 2006 Ghana Joint Assistance Strategy, which marked a shift towards increasing harmonization and collaboration between development partners (DPs), which the CEA exemplifies. The CEA was also developed in a time period where the importance of cross-cutting NRE issues was emerging – in large part also due to the preliminary findings of the CEA – and where budget support as a means to address overarching policy issues was becoming a preferred funding modality. It should be noted that a substantial series of consultations and dialogues with development

partners, government institutions, and civil society organizations went into the development of the final document.

7. The CEA is not intended as a comprehensive “state of the environment” report and so does not address all possible environmental or natural resource aspects, but functions rather as a key input to stimulate the ongoing policy dialogue in the country. Although the CEA highlights the main environmental challenges, it does not identify Ghana’s environmental priorities but rather focuses on the priority issues in key environment and natural resource sectors that are critical for both growth and poverty reduction in Ghana: forestry and wildlife, mining, land resources, and the urban environment (water supply, sanitation, and waste management). The analysis focuses on the underlying policy, financial, and institutional causes of environmental degradation, rather than on its symptoms.

Outputs, value added, and results

8. The two main outputs of this CEA are (a) a comprehensive report that provides—for each sector/asset—an overview of the sector and its contribution to growth, an analysis of the underlying causes of degradation (with a specific focus on policy, regulatory, and institutional issues and applying public expenditure review as an analytical tool), and a set of implementable recommendations to address these issues; and (b) a set of policy/action matrices that provide—for each sector/asset—a road map for action in the short, medium, and long-term.

9. The CEA has already contributed to mobilizing, strengthening, and anchoring the Environment and Natural Resources Management (ENRM) dialogue between the government and development partners involved in the Multi-Donor Budgetary Support (MDBS) Group. The CEA has had an immediate impact on the ground in that it has provided concrete inputs to the MDBS and World Bank Poverty Reduction Support Credits (PRSC) IV and V. For instance, the trigger identified for the forestry sector in the MDBS/PRSC performance assessment frameworks (PAFs) was one of the measures in the CEA; the 2006 MDBS PAF also includes a second forestry target and a target related to environmental governance. The 2006 PRSC V uses this second forestry target as a trigger,

10. The creation of a multi-donor natural resources and environmental governance (NREG) sector budget support became a specific request of the Government of Ghana (GoG) after the results of the CEA and other analytical studies were publicized. Below we provide some of the key recommendations of the CEA, followed by some sector-specific findings and recommendations, and the way forward.

Main findings and key recommendations

11. Based on the results of the sectoral analysis, the key messages of the CEA can be summarized as follows:

- **Strengthening environmental governance is key to ensuring that natural resources contribute to greater wealth and sustainable growth.** Stronger environmental governance in the natural resource sectors is critical to ensure that (a) these sectors optimally contribute to future growth, and (b) economic growth does not come at the cost of environmental degradation. In rent-seeking sectors such as forestry and mining, more transparent and accountable fiscal management of relevant agencies, including the Forestry Commission and Minerals Commission, is of particular importance to avoid short-lived consumption of natural resources that will leave a country poorer than before. Getting the most from natural resources implies: better regulation and management, and less wasteful utilization, of natural resources; more effective capture of the economic value of the resource; better collection of revenues; and higher levels of reinvestment and savings.
- **Removing policy, regulatory, and institutional bottlenecks is crucial for reducing vulnerability of the poor in both rural and urban areas.** In the land resource and urban

environment sectors, cleaner and low-tech options are available to lessen environmental stress. These technologies may contribute significantly to reducing the vulnerability of the rural and urban poor. However, they are not widely adopted because of the existence of a number of obstacles and bottlenecks, including policy, regulatory, and institutional barriers. To remove these barriers, actions that can create an enabling environment for scaling up these technologies are urgently needed.

- **Reinforcing coordination and dialogue to mainstream ENRM is critical.** Environment is a cross-cutting issue that requires coordination at the highest level. Recognizing this, the Government of Ghana should consider the creation of an environmental oversight mechanism—perhaps at the cabinet subcommittee level—to examine environmental integration across the full range of GPRS interventions. Typically, government agencies both prepare and review/approve environmental policies that have an impact on local communities. Although local communities have the potential to play a pivotal role in improved management of Ghana’s natural resources, to date they have not been actively engaged in the decision-making processes. In order to create a comprehensive system for environmental management, it is important for all stakeholders to be actively engaged in the policy dialogue.
- **Ministries, departments, and agencies in all the natural resource and environment sectors face common challenges.** It has become clear that developing collaborative cross-sectoral approaches to address these common issues will be more useful and efficient than dealing with them separately in each sector.

Sector Specific Findings and Recommendations

Forestry and Wildlife

12. A common misconception regarding Ghana is its “abundant forest wealth.” In fact, publicly available satellite imagery shows southern Ghana as a mosaic of depleted reserves, surrounded by “off-reserve” agriculture. The policy to date has been to allow the conversion of the off-reserve high forests to agriculture, and these have been a major source of timber for the timber-processing industry.

13. In the wildlife sector, theoretically the state controls exploitation through licensing, but in practice it has not been able to effectively regulate at the local level. The state’s inability to properly manage forest reserves and guard Ghana’s protected areas has facilitated an open access system for wildlife hunting, with few benefits to communities. The wildlife resource effectively belongs to, and is managed by, no one. The “empty forest” syndrome and the loss of savanna wildlife populations, off reserve, are symptoms of poor management of common property.

14. The potential of the timber industry has not been realized. Industry has captured much of the value of forests, but in an inefficient way (average conversion rates for sawmilling are around 30–35 percent). Too little processing for high-value export markets occurs (furniture, parts, moldings), and estimates indicate that the primary processing would be value-subtracting if timber were priced at world market prices.

15. Over the last 15 years, the Government of Ghana’s policy on plantations has been in disarray. Initiatives that did not fully succeed include: an aborted effort to privatize plantations in 1995; Subri plantation, which converted high biodiversity natural forest to plantations for a never-realized pulp scheme; the ultimately underfunded Forest Plantation Development Fund; and the Heavily Indebted Poor Country plantation operation.

16. Unsustainable management of forests is a symptom sometimes misdiagnosed as a cause. The possible set of actions that the CEA recommends are:

17. *Strengthen financial arrangements for the Forestry Commission.* There is strong recognition of the challenges facing the forest and wildlife sector. In general the policy and legislative framework is

agreed to be adequate, and significant progress has been made in recent years in institutional development, but severe challenges remain relating to the implementation and enforcement of laws on forests, wildlife, protected areas and habitat management. All respondents – from within Government, development partners and civil society stressed the need for urgent attention to resolving the causes of forest degradation and habitat loss, and dealing with (i) underlying governance and institutional problems, and (ii) the insecure financial arrangements for the Forestry Commission, as sector regulator.

18. *Promote plantation development.* Plantation activities have recently been harmonized and the anomaly of ministry involvement in operational plantation afforestation through HIPC funding has now ended. There is an immediate need to confirm and clarify the rights of participants in the recent plantation programs, and work towards creating an enabling environment for commercial and small-scale private sector investment in forests.

19. *Maximize rent capture.* Government retains its espoused commitment to the use of competitive mechanisms for the allocation of rights to exploit timber and wildlife resources on reserves and in protected areas, in order to maximize the capture of the economic rent within these resources. However, private sector investors have been able to effectively evade the spirit and intent of GoG policies, through for example timber utilization contracts (TUCs) allocated through mechanisms other those promoted in GoG legislation, the illegal use of timber use permits (TUPs) and small scale permits, and non-transparent negotiations on some wildlife park concessions.

20. *Restructure the timber industry.* The policy goal of promoting tertiary and value-added processing is not being achieved. Players in the industry are undertaking concerted lobbying efforts to capture GoG policy-making in order to reduce their payments of forest taxes; the specter of job losses is still being used as a rationale to delay change. Industry itself needs to be encouraged to put forward proposals to deal with the over-capacity in the industry relative to a “dwindling” resource and the limited investment in value-added processing.

2. Mining

21. Ghana continues to have an important geological potential that goes beyond gold and diamonds, particularly in construction minerals and bauxite. Moreover, Ghana has recently adopted a new mining law. This situation creates opportunities for mining activities to promote economic growth and poverty reduction in a more environmentally and socially responsible manner. To fulfill this potential, the possible set of actions that the CEA recommends are:

22. **Modify the royalty regime to take advantage of market booms.** As mentioned above, in the current metals market, Ghana has missed some of the opportunity to significantly increase its revenues from royalties without affecting the competitiveness of the mining sector. Metal prices have risen greatly in the last two years, in several cases reaching levels that have not been seen since the 1970s. Gold prices more than doubled in the last three years. Royalty rates in Ghana can range between 3 and 6 percent. However, current calculation procedures fix rates prior to the start-up of the mine, and usually at a lower rate. As increases in metal prices mainly translate into benefits for the operations already established, it is recommended that royalty rates be allowed to vary along with metal prices. In this way, part of the windfall profits from price spikes could also be shared by the state and used to improve both environmental management and living conditions, as well as create wealth in the mining regions.

23. **Conduct a trilateral policy dialogue to incorporate environmental and social considerations into legal instruments and mining policy.** The concerns and needs of stakeholders involved in and affected by mining, especially artisanal and small-scale mining (ASM), and those related to land compensation and postclosure restoration must be addressed. To this end, conducting a participatory trilateral policy dialogue is recommended. The dialogue would focus on mining policy, institutions, and governance to address priority environmental and social concerns of domestic players as local

communities and ASM. Results of this dialogue should be incorporated into sector policies and into the implementation of the New Mining Law.

24. **Increase support to domestic miners.** ASM not only is a major source of employment, but also has a large environmental impact on Ghana. Thus, sound management of this segment offers opportunities for economic growth and poverty reduction in an environmentally and socially responsible manner. A comprehensive program dealing with issues of mining rights, access to appropriate technologies and funding, and human and natural resource management for ASM is needed to address the seemingly intractable environmental and social problems related to this group of miners.

25. **Redistribute revenues to strengthen institutional capacities and regional development.** Institutional capacity needs to be strengthened through additional funding to improve environmental management. The purpose of these funds would be to (a) augment those already available in the Mineral Development Fund (MDF) and (b) allocate funds for local and regional development in addition to those already earmarked in the MDF for local authorities. To guarantee the best use of these resources and leverage additional monies, the creation of a separate development fund is recommended. The proposed fund may receive a portion of mining royalties and contributions from donors that would be spent according to a plan approved and monitored by mine-adjacent communities through a participatory and transparent process.

3. Land Resources

26. Sustainable utilization of the country's land resources is a necessary precondition to achieving and maintaining the economic growth rate necessary for Ghana to attain the status of a middle-income country. Several low-input, site-specific technologies and conservation practices that substantively reduce land degradation while enhancing productivity (sustainable land management) are currently applied in Ghana. However, large-scale adoption of these practices continues to be elusive. Several factors (including policy, regulatory, institutional, and incentive barriers) prevent a wider adoption of sustainable land management (SLM) practices. A number of actions are proposed here to remove these barriers. Jointly, these actions would contribute to the development of a strong framework for sustainable land management. The possible set of actions that the CEA recommends are:

27. **Harmonize and strengthen policy, regulatory and incentive framework.** Land degradation and sustainable land management elements are still weakly integrated into the key development and sectoral policies, strategies and action plans. The existing regulatory framework is characterized by a plurality of land tenure and land management systems (i.e. statutory and customary) and by a multitude of laws and regulations, often outdated or in contradiction with each other. In addition, the existing incentive framework - characterized by weak tenure security, inadequate access to credit, inappropriate pricing of resources, and poorly functioning markets - does not provide the adequate incentives to farmers for long-term investments in land management.

28. **Strengthen SLM governance.** The existing institutional framework - characterized by duplication of roles and responsibilities among the institutions with a mandate for land management and administration - does not provide a clear direction for land utilization and management. In addition, weak cross-sectoral coordination results in incoherent and un-harmonized policy development, inefficient or sub-optimal allocation of resources, and does not favor a comprehensive approach to address land degradation. Finally, weak institutional capacity for SLM has been identified as one of the main constraints to enforcement of policies and regulations.

29. **Improve knowledge management and dissemination.** Generally limited knowledge on the extent, impacts, costs of land degradation and economic benefits of sustainable land management and limited use of Spatial Data Information and Geographic Information Systems limit on the one hand the attention to the problem by key decision-makers, and on the other hand the capacity to understand and comprehensively address the problem of land degradation. In addition, limited and unorganized

information on the specific characteristics and requirements of sustainable land management practices, and limited information on the contextual factors that determine the sustainability and replicability of sustainable land management, limit the capacity to promote and scale-up sustainable land management in the country.

4. Urban Environment

Water Supply

30. Inadequate water supply, sanitation, and hygiene have a very strong negative impact on human health and mortality rates. More than 8,000 people die every year from diseases related to poor water supply, sanitation, and hygiene conditions. Seventy percent of the morbidity in Ghana is attributed to the same shortcomings.

31. The supply of piped water is inadequate—both the extension and quality of the services. A low proportion of the poor urban population has access to potable water, and the supply to those who are connected suffers from frequent interruptions because of leaks and the like. Sale of water through unregulated secondary vendors and improper storage of the water in households frequently result in serious health-related problems. A general upgrade of the water supply sector is crucial. New water sources are also needed, especially in Accra, as is better protection for the existing sources. Improving the urban water supply will require strengthening the operations of the Ghana Water Company Ltd. (GWCL) through the newly signed management contract with a foreign operator, providing funding for further expansion of the piped system, and improving the quality of the water supplied by secondary vendors.

32. Most of the necessary framework for implementing a sustainable water supply system for the urban areas is in place. The legislation regarding the various parts of the system has been adopted, and the institutions needed to run the system are established and their roles clearly defined. Establishing the Public Utilities Regulatory Commission (PURC) has been particularly important to facilitate the regulation of tariffs and quality of supply. However, PURC enforcement is still weak.

33. *The possible set of actions that the CEA recommends are:* (i) strengthening the capacity of the GWCL to efficiently manage its contract with the private operator (including improving its planning and monitoring functions), (ii) strengthening PURC to improve its monitoring and enforcement capacity, (iii) to continue an upgrading of the infrastructure, and (iv) building the capacity to better monitor the quality of water provisions by secondary providers across the distribution chain.

Sanitation and Solid Waste Management

34. The number of sanitation facilities in Ghana continues to be quite low. Estimates suggest that 30 percent of the population in the largest cities have household latrines, and 30 percent use public toilets. In some poor communities, less than 10 percent of households have latrines. Moreover, the quality of sanitation facilities in urban areas remains far from satisfactory. Almost all parts of the various systems are malfunctioning, and in several poorer urban areas these services are almost nonexistent. At the household level, poor hygienic practices by individuals and communities are compounded by insufficient and ineffective hygiene education. Consequently, various health problems have arisen among the population. Vector-borne diseases such as malaria and bilharzia are rife because of the virtual absence of vector control programs for pests and disease. All of these factors have serious health impacts; indeed, more than half of all reported diseases are related to poor environmental sanitation and the attendant social and economic costs. In addition, flooding from broken pipes causes major damage to public infrastructure and private property.

35. The situation in solid waste management is worse. Ninety-one percent of the population faced unsafe methods of solid waste disposal. Moreover, less than 40 percent of urban residents are served by solid waste collection services. Less than a third of the daily refuse generated is decently disposed of, and

the rest is abandoned to pollute the environment. Even the existing disposal sites and landfills are poorly managed; some of them are leaking polluted water into the surroundings and becoming a breeding ground for mosquitoes, parasites, and the like.

36. The possible set of actions that the CEA recommends are: (i) increasing the capacity of District Assemblies, Municipal and Metropolitan Authorities to better regulate and monitor waste management and collection, sanitation services, management of landfills and waste disposal sites; and the enforcement of building codes; (ii) more effective enforcement by local government agencies of urban plans and layouts, in cooperation with the Town Country Planning Department; (iii) greater coordination and clarification of responsibilities (mandates) is needed on the environmental side of Municipal and Metropolitan Authorities, the District Assemblies, the Town and Country Planning Department and Environmental Protection Agency and (iv) awareness raising on the health impacts, which was much highlighted among all stakeholders.

The way forward

37. Institutional capacity and low access to accurate data and financial information pose fundamental challenges to the allocation and use of resources and implementation of public policy. The CEA indicates that greater attention needs to be paid to the implications of environmental factors for economic growth and the trade-offs that may be required across sectors. Policy, regulatory, and incentive frameworks relating to environmental management are complex, often with overlapping institutional mandates and outdated legislative measures that can lead to anomalies in interpretation and program implementation. An immediate need exists for strengthening the intersectoral coordination mechanisms to foster sustainable growth.

38. Officials and civil society increasingly recognize that the environmental and social impacts of broader economic and development policies need to be considered up front. Given the expanding mandate and increasing responsibility placed upon country systems and institutions, and with the analytical foundation provided by the CEA, the Ministry of Finance and Economic Planning recognizes the need to develop an environmental management oversight and governance mechanism across the full range of GPRS II interventions.

39. By highlighting cross-cutting issues and providing a road map for reforms and investments in key sectors in the medium and long-term, the CEA should also be a useful tool in providing inputs during the reviewing and renegotiation of future development strategies. These include the next MDDBS/PRSC VI, the design of the next Government of Ghana Growth and Poverty Reduction Strategy (GPRS), and the upcoming multidonor Natural Resources and Environmental Governance (NREG) sector budget support Program. In fact, the CEA did not just provide inputs to the NREG Program but was actually the main catalyst for its creation.

40. There exists relatively significant donor aid for all four sectors in the form of investment projects, though many of these programs are on the verge of completion. Despite the substantial amount of donor assistance allocated to the some of these sectors, the CEA analysis has shown that this is still inadequate given the serious shortcomings of the sectors. Thus, more support is needed.

41. Faced with the large number of donors to the four sectors and the relatively low total DP support (with respect to the needs of each sector as identified by the CEA), and in line with the new trends in development assistance and the emerging emphasis on cross-sectoral, holistic programs, the GoG explored possibilities for further financing; this has resulted in the development of the NREG Program. The multi-donor Program will provide harmonized budget support to encourage institutional and policy reform – as well as assistance to the artisanal sector and support to civil society– in the forestry and wildlife, mining, and environmental protection sectors. Tentative approximations of DP commitments to the program are estimated at US\$20 million per year.

1 Introduction

Background and context

1. **Ghana's economy is expanding at the commendable GDP growth rate of about 6 percent**, while fiscal deficit, debt, and inflation have all been reduced. As a result, Ghana has made considerable progress in laying the foundation for achieving poverty reduction and attaining the status of a middle-income country within a reasonable period of time. The Growth and Poverty Reduction Strategy (GPRS II) currently under implementation focuses on creating a setting conducive to accelerating the present growth rate from 6 to 8 percent. Under certain conditions (GoG 2005 [GPRS II], xix-xx) this would allow Ghana to achieve the status of middle-income country by 2015.

2. **Environmental and natural resource depletion could present a major obstacle to fulfilling Ghana's growth potential.** Environmental and natural resources are the major wealth assets for Ghana. Economic growth has been concentrated in a few natural resource-dependent sectors; most of the population's livelihoods depend on the country's natural resource base. However, natural resources are diminishing at an alarming rate. Recent estimates of the cost of degradation suggest that an equivalent of 9.6 percent of GDP is lost annually through unsustainable management of the country's natural wealth (forests and land resources), as well as from health costs related to urban environmental problems (water supply and sanitation, and indoor and outdoor air pollution).¹ Environmental accounting analyses (World Bank 2006) estimate that the per capita current genuine savings rate² for Ghana is in fact negative, thus compromising the capacity of the country to fulfill and sustain its full potential for growth. Under reasonable assumptions,³ the estimated costs of environmental and natural resource degradation are reducing by approximately 1 percentage point the potential for economic growth in the country.⁴

3. **A pressing need exists to *rethink* the modalities to support the environment and natural resource management (ENRM) sector in Ghana.** ENRM has been inconsistently considered in country priorities and policy reforms in the recent past. In addition, considerable changes are under way in the architecture of development assistance to support national priorities. A shift is occurring toward budgetary support and sector-wide programs to align with country priorities, strengthen country systems, and reduce the transaction costs of dealing with multiple partners and projects. This shift has implications for addressing environmental issues as, historically, environmental issues were addressed primarily through projects. In light of this new approach, the Government of Ghana and development partners have considered how best to deal with these issues and have jointly developed a joint natural resources and environmental governance budget support operation as a response to the findings in the CEA..

4. **Analytical work to assess the costs of natural resource depletion in Ghana has renewed interest in ENRM issues.** During the presentation of the results of the Economic and Sector Work (ESW) on Natural Resource Management and Growth, the GoG, represented by the Minister of Finance, expressed the need for concrete proposals to address environmental degradation. The Country Environmental Analysis (CEA) has been formulated in response to that request. The CEA builds on the existing ESW to fill information gaps, analyzing previously unaddressed issues such as sustainable land management or mineral revenues.

¹ See Appendix 1 for how this figure was reached.

² Genuine savings is an indicator that measures the true savings rate in an economy by taking into account investment in human capital as well as depletion of natural resources. If the savings rate for a country is negative, then the future level of economic welfare will decline. If it is positive, the country's management of a growing portfolio of assets will produce new wealth (World Bank et al. 2006).

³ Real return on investment equivalent to 7percent, and resource sectors making up 30percent of output.

⁴ See Chapter 2 for more details.

Objectives and scope

5. **The main objective of the Ghana CEA is to assist the GoG and the DPs** in finding practical management, institutional, and policy solutions to address the issues of natural resource management, environmental degradation and sustainability of growth. More specifically, the CEA aims to (a) analyze the *underlying causes* of environmental degradation in the sectors that underpin economic growth in Ghana, (b) propose a comprehensive set of *policy, institutional, and management recommendations* to address the causes of degradation, and (c) identify *appropriate financing instruments* (e.g. projects, sector programs, direct budgetary support) for the implementation of the recommended actions.

6. **The CEA seeks to:**

- Better understand the dynamics of the environmental and natural resource challenges;
- Highlight institutional and implementation failures that are contributing to environmental degradation;
- Help identify the gaps in country policies, programs, and institutions; and
- Develop practical measures to address the challenges.

7. **The CEA focuses on four key sectors/natural assets that are critical for both growth and poverty reduction in Ghana: forestry and wildlife, mining, land resources, and the urban environment** (water supply, and sanitation and waste management). The four selected sectors are the major engines of economic growth in Ghana but also the sectors most seriously affected by environmental degradation and those with the most severe social and poverty implications. Other sectors/assets (such as fisheries or water resources) and other environmental considerations (such as the role of energy or transport in growth, the impact of future foreign private sector investment—e.g. “China effect,” or the implications of climate change) are not addressed by this study, as these have been addressed in the 2006 ESW or may constitute areas for further analytical work in the future. The CEA is in fact not conceived as a comprehensive “state of the environment” report and so does not address all possible environmental or natural resource aspects. Rather, the CEA identifies priority issues in specific, high-growth sectors that are illustrative of issues faced by other NRE sectors. For these reasons, the CEA did not specifically address the issues of wetlands and freshwater, coastal, and marine resources.

8. **The context in which the CEA was developed has changed since its inception.** The chapters of the CEA concerning the four different sectors were initially written separately from one another, with little consideration of the overarching natural resources and environment (NRE) issues common to all four sectors. During the later stages of the CEA, there came to be increased attention to the importance of cross-cutting NRE governance, greater recognition of the need to harmonize across DPs and align with Government priorities (as marked by the Ghana Partnership Strategy and the resultant Ghana Joint Assistance Strategy), and a move towards budget support. Despite this later shift in context – part of which the CEA helped engineer – the CEA’s contents in large part reflect the circumstances at the time the analysis was started. The CEA was largely written before September 2006 but has been updated since to reflect more recent developments, such as the preparation of a multi-donor natural resources and environmental governance sector budget support.

9. **The CEA has been revised and updated when possible to reflect these contextual changes.** The need for a more integrated cross-sectoral approach to NRE governance emerged from the CEA and other analytical works such as the Ghana Environment Sector Study (GESS). In line with this view, the seventh and final chapter to the CEA clearly brings out the linkages between the different sectors and summarizes the cross-cutting recommendations for policy and institutional reforms, including increased cross-sectoral coordination and cooperation. An initial version of the CEA was reviewed by the concerned MDAs of the GoG. As best as possible, their feedback is reflected in the body of the CEA.

10. **The GESS is a complement to the CEA, assessing the institutional capacities for inter-sectoral NRE management where the CEA leaves off.** The objective of the GESS was specifically to review the existing processes for inter-sectoral environmental mainstreaming, going above and beyond the institutional analysis provided by the CEA. Specifically, the study consists of an organizational and institutional analysis of the EPA, an assessment of environmental governance and management capacities at decentralized levels, and an examination of environmental monitoring and information management systems. The findings of the GESS included recommendations for the establishment of environmental governance and management authority within the Ministry for Local Government, Rural Development and Environment (MLGRDE), establishing inter-ministerial committees for cross-sectoral coordination on NRE issues, and strengthening decentralized environmental committees.

11. **The CEA provides the analytical foundations for further actions related to NRE governance.** The CEA has been a key instrument for helping to carry out the due diligence requirements of Development Policy Lending (DPL) operations, including the Poverty Reduction Strategy Credit (PRSC) as required in the World Bank's Operational Policy OP 8.60. Most notably, the CEA and the GESS have served as a springboard for the upcoming Natural Resources and Environmental Governance (NREG) sector budget support, which was formulated in response to these two analyses.

Impacts and linkages with ongoing initiatives

12. **The CEA strengthens the policy dialogue and decision-making processes between the government and DPs on environmental and natural resource management issues.** It has strengthened the interest of the Ministry of Finance and Economic Planning (MoFEP) in NRE management, and has led MoFEP to accept the cost estimates of environmental degradation and the impact on future growth. Environment has thus been brought to the Government's agenda as an essential issue to address. The CEA further mobilized the ENRM dialogue between DPs involved in the Multi-Donor Budgetary Support (MDBS) Group and the Government by providing concrete inputs to the MDBS/PRSC discussion. The CEA was prepared in parallel to the MDBS group's preparation of a new Joint Assistance Strategy to Ghana (G-JAS), and provided input to the Consultative Group meeting in June 2006 – and thus to the discussions on the G-JAS and to the Performance Assessment Framework for the implementation of the budget support. The G-JAS has a substantial chapter on environment reflecting the findings of the CEA: the environment as a key priority for development is as such accepted at the highest level of the donor community.

13. The direct and immediate impact of the CEA can be recognized by the fact that the MDBS/PRSC matrix for PRSC IV has incorporated one of the measures recommended in the CEA as its trigger for the forestry sector. The MDBS PAF 2006 and the PRSC V have also drawn from the findings of the CEA: they both include a target to develop a financial and policy framework for the Forestry Commission (in PRSC V, this is also a trigger). The CEA will continue to provide inputs during the reviewing and renegotiation of future development strategies, such as the next MDBS/PRSC and GoG GPRS.

14. **The CEA complements and supports a number of ongoing governmental and DP initiatives** by providing inputs to the implementation of the new Mining Law, and informing the discussion on the minerals policy, the National EIA & SEA Project of the Environmental Protection Agency (EPA), the Mining Sector Support Program, forest sector reforms, public sector reforms, and land reforms. Potential synergies exist with other initiatives such as the aforementioned RNE/High Commission of Canada/UNDP-supported GESS, the USAID work on Environmental Threats and Opportunities Assessment (ETOA) on Biodiversity and Forestry, and the DFID/CIDA work on land.

15. **The upcoming Natural Resources and Environmental Governance (NREG) Program is a direct outgrowth of the CEA.** The CEA has played the important role of demonstrating the economic significance of engaging in NRE governance issues and the need for greater dialogue within and across the NRE sectors. In doing so, the CEA generated interest in developing an umbrella program focused on

good governance – the joint NREG Program – rather than developing multiple sectoral projects. The Program will focus on regulatory agencies, public financial management, artisanal activities related to mining, forestry, and wildlife, strengthening civil society capacities, and linking with global governance initiatives to which Ghana is committed. The analysis provided by the CEA has guided the development of the policy matrices of the NREG Program related to mining, forestry and wildlife, and environmental protection, and has provided a starting point for the fourth cross-sectoral policy matrix.

16. **Finally, the CEA, and particularly the chapter on land, supports the approach and the objectives of TerrAfrica**, a regional multipartner initiative aimed at enabling the scaling up of sustainable land management (SLM) in Sub-Saharan Africa. In line with the objectives of TerrAfrica, the CEA will help to identify, generate, and disseminate targeted knowledge that supports decision making, informs policy making, and guides investment decisions in SLM.

Methodology and Approach

17. The CEA has been prepared under the umbrella of and in collaboration with the ENRM Sector Group (the group of donors that coordinate the development partners' support to the environment and natural resource sector in Ghana), with the financial support of the Agence Française de Développement (AFD) and the Royal Netherlands Embassy (RNE).

18. The analytical framework for this CEA is based on three types of analyses using both primary and secondary data sources:

- **Policy, legislative, and regulatory analysis.** This includes taking stock of existing laws, policies, and regulations as well as assessing their effectiveness and relevance.
- **Assessment of institutional capacity and constraints.** Included is an assessment of the environmental management capacity of public agencies at national, subnational, and district levels. This is based on the review of existing capacity in terms of plans, processes, and personnel for environmental management in key institutions.
- **Public Environmental Expenditures Review.** This review includes a thorough analysis of expenditures that support environment and natural resource conservation objectives, as well as trends in environmental expenditures and ratios over time, and tax and non-tax revenues of key natural resource/environmental ministries, departments, and agencies.

19. For each sector, the CEA provides (a) a general overview of the sector, its contribution to growth, and the scope and causes of degradation, (b) an analysis of the policy, legislative, and institutional framework, highlighting how the deficiencies in these frameworks contribute to the degradation of the asset, and (c) a set of prioritized recommendations (jointly agreed upon with the government, the DPs, and other stakeholders). Recommendations for each sector are organized along four categories: (a) policy and regulatory improvements (to create an enabling environment for implementation), (b) institutional capacity building (building sufficient capacity and providing the proper institutional arrangements to perform well), (c) investment (to fill financing gaps in infrastructure, technology, or key outputs), and (d) knowledge management, monitoring, and evaluation (to inform policy and regulatory decision making, and to monitor performance). The CEA recommendations will be tailored to address both short-term and longer term strategic directions.

20. The CEA also presents an overview of the existing and future DP financing of the NRE sectors in an initial attempt to identify the alignment of donor assistance with the CEA findings. This includes the upcoming NREG budget support Program.

21. The preparation of the CEA involved a series of consultations with Government representatives, DPs, and civil society representatives. A first fact-finding mission occurred in October 2005 to receive the endorsement of the Government for the CEA. The mission met with various ministries and agencies,

including the Environment Protection Agency (EPA), the Minister of Food and Agriculture, the Minister of Land, Forestry, and Mines, as well as with a number of civil society organizations. A further consultation mission occurred in March 2006 to present and discuss the first set of findings and recommendations of the draft CEA with GoG and civil society. During this time, an NGO workshop was held to review the draft matrices for each sector and to establish a dialogue between stakeholders regarding the CEA. NGOs present at this workshop include CARE International, the Africa Economic Journalists Forum, the Wassa West Association of Communities Affected by Mining, Land for Life, and Conservation International, among many others. Finally, a third mission took place in May 2006 to present the draft CEA report and further discuss the preliminary results with GoG and civil society. Workshops were held throughout the month of May with all relevant stakeholders. All of these meetings and workshops reveal a serious commitment to consulting systematically with all stakeholders during the stages of CEA preparation.

22. The GoG is strongly committed to the CEA through the Minister of Finance, who is both a champion of the CEA and the former Minister of Environment and Science (MES).⁵

Structure of the CEA Report

23. The report is divided into seven chapters, including the introduction. Chapter 2 highlights the linkage between economic growth and its implications for natural resource management in Ghana.

24. Chapters 3 to 6 present the analysis for the four sectors:

- **Forests and wildlife**, which addresses management of forest reserves and wildlife protected areas, and the “off reserve” areas (Chapter 3).
- **Mining**, which analyzes the environmental consequences arising from both large-scale mining and small-scale artisanal miners, and the prospects for institutional strengthening of environmental regulation (Chapter 4).
- **Land resources**, which analyzes the policy, institutional, and incentive barriers that prevent sustainable solutions from being adopted, and considers how to improve policy coherence and cooperation mechanisms in an area that demands cross-sectoral collaboration (Chapter 5).
- **Urban environment**. This section deals with two subsectors that are important for environmental health in urban areas: water and sanitation and waste management (Chapter 6).

At the end of each chapter, key recommendations as well as more detailed recommendations are provided.

25. Chapter 7 presents key cross-cutting recommendations relevant to improving environmental policy management in general, the inclusion of which is a reflection of the changing institutional context in which the CEA was written. At the beginning of the analysis, the sectors were looked at separately, a fact that may be apparent when examining Chapters 3 – 6. As recognition of the need for broader NRE governance emerged during the course of the CEA, Chapter 7 was added to address cross-cutting issues.

⁵ On April 27, 2006 the President John Agyekum Kufour announced a restructured government list, which realigned and re-designated ministerial portfolios. In this restructured government list, the ministerial portfolio of Environment has been attached to the Ministry of Local Government and Rural Development, now Ministry of Local Government, Rural Development and Environment (MLGRDE). Most of the institutional analysis of the present CEA has been conducted before this institutional restructuring. Therefore, the various chapters often refer to the former Ministry of Environment.

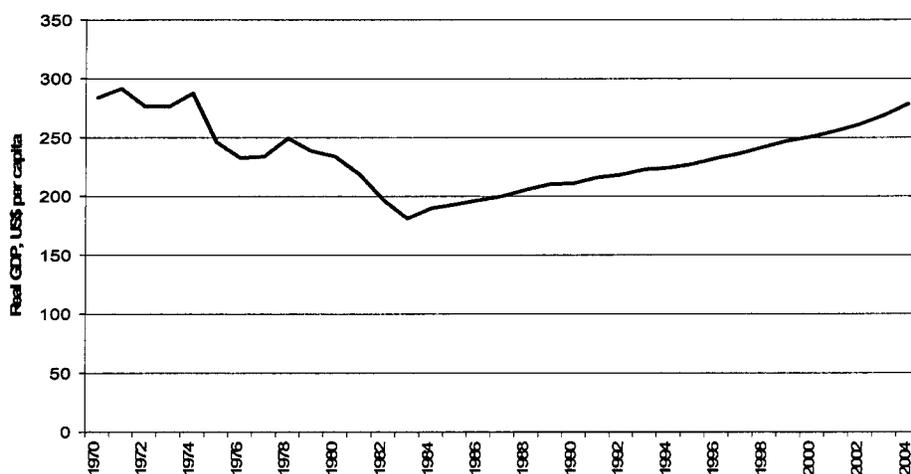
The chapter concludes by discussing existing and projected donor assistance in each sector, including the upcoming NREG Program.

2 Natural Resources and Growth in Ghana

Background

1. Since embarking on economic reforms in the mid-1980s, Ghana has made considerable progress in laying the foundations for sustainable growth and poverty reduction. In fact, Ghana's growth performance over the past two decades has been modest but relatively good compared with that of other West African countries (see Figure 2-1 and Table 2-1 below). Growth rates in recent years have been particularly strong, reaching the 6-7% range in 2006. In order to demonstrate its strong commitment to sustainable growth and poverty reduction, the Government of Ghana (GoG) has included the growth agenda in a number of initiatives. For example, accelerated growth is an important objective of Ghana's Vision 2020 Plans and in its moving toward achieving the Millennium Development Goals targets. In addition, in its Poverty Reduction Strategies (GPRS I and II) the GoG is further committed to achieving faster poverty reduction, and accelerated growth is set to play a key role.

Figure 2-1: Ghana, Real GDP per capita (1970-2004)



Source: Aryeetey and Kanbur(2006)

Table 2-1: Comparison of Average annualized per capita growth rates of West African countries (1980-2002)

| | 1980-89 | 1990-99 | 2000-02 | 1980-2002 |
|-----------------------|-------------|------------|------------|------------|
| Benin | 0.0 | 1.6 | 2.9 | 1.1 |
| Burkina Faso | 1.1 | 1.3 | 1.1 | 1.2 |
| Cameroon | 1.1 | -2.2 | 2.4 | -0.2 |
| Cape Verde | 4.6 | 2.8 | 2.3 | 3.4 |
| Cote d'Ivoire | -3.8 | -0.5 | -3.4 | -2.3 |
| Equatorial Guinea | -1.9 | 17.2 | 20.9 | 13.4 |
| Gambia, The | 0.3 | -0.4 | -0.3 | -0.1 |
| Ghana | -1.3 | 1.6 | 2.4 | 0.5 |
| Guinea | 1.6 | 1.5 | 1.1 | 1.4 |
| Guinea-Bissau | 0.2 | -0.9 | -2.6 | -0.6 |
| Liberia | -7.1 | -1.3 | 6.7 | -2.8 |
| Mali | -1.9 | 1.0 | 2.3 | -0.1 |
| Mauritania | -0.2 | 1.0 | 1.4 | 0.5 |
| Niger | -3.0 | -1.5 | -0.3 | -2.0 |
| Nigeria | -2.1 | 0.2 | -0.3 | -0.9 |
| São Tomé and Príncipe | -1.0 | -0.8 | 1.6 | -0.4 |
| Senegal | -0.4 | 0.6 | 1.5 | 0.3 |
| Sierra Leone | -1.0 | -6.4 | 3.1 | -2.8 |
| Togo | -0.6 | -1.0 | -1.9 | -0.9 |

Source: World Development Indicators 2004

2. In light of the requirements of the Millennium Development Goals, the Ghana Poverty Reduction Strategy (GPRS I), and the Growth and Poverty Reduction Strategy (GPRS II), the need for the Ghanaian economy to grow faster than it has ever done cannot be overstated. But at the same time, for this growth to be sustainable in the long run, it has to be accompanied by constant efforts to improve productivity and strengthen the management of natural resources.

3. The sustainability of continued economic growth and expansion in Ghana hinges on key actions aimed at enhancing the efficiency of investment and raising productivity throughout the economy. At present, growth is being driven primarily by factor accumulation, as reflected in a rising investment to GDP ratio; increases in productivity are having a negligible effect (World Bank 2006c [Ghana PRSC IV]). This trend cannot be sustained, particularly because growth driven exclusively by capital accumulation loses momentum due to the declining marginal productivity of capital.

4. This is just one side of the story. Some 50 percent of GDP in Ghana is derived from the exploitation of renewable natural resources in the agriculture, fisheries, and forestry sectors. The output of these sectors is further dependent on the productivity of key natural resources including land, soils, water, and forests combined with associated human, capital, and technical inputs.

5. In Ghana, as more capital was commandeered for achieving growth, the need arose to utilize the country's rich natural resources. Growth therefore led to larger export volumes of cocoa, timber, and minerals. This was done in an unsustainable manner, which not only reduces current output from these sectors (including revenues), but also jeopardizes future growth and human development potential. Sustainable growth in resource-based economies requires that living resources be exploited at a sustainable rate, when rents from exhaustible resources are invested in other assets—as just noted; however, it is important that any new investments be productive.

6. It is within this context that the Country Environmental Analysis presents one of the first attempts in Ghana to quantify and monetize the environmental cost of economic growth across a wide range of environmental issues. Despite the difficulties involved in assigning monetary costs to environmental

degradation, these estimates can be a powerful means of raising awareness about environmental issues and facilitating progress toward sustainable development. It is far easier for decision makers to incorporate and prioritize the environment when issues can be cast in clear economic terms. The aim therefore is to create a baseline against which the government can measure the environmental consequences of its growth strategies and take policy decisions that are likely to have implications for achieving sustainable growth.

Where is the Natural Wealth of Ghana?

7. The economic literature has traditionally focused on produced capital such as buildings, machinery, equipment, and infrastructure. Over the years, recognition has increased about the importance of extending these measures to account for exhaustible resources, renewable resources, and agricultural land. Added to the list more recently is intangible capital, which encompasses raw labor, human capital (the stock of human skills and know-how), social capital, and the quality of institutions. Increasingly emphasized is the strong link between changes in wealth and the sustainability of development—if a country (or a household, for that matter) is running down its assets, it is not on a sustainable path (see Box 2-1; World Bank 2006a). Therefore, for the link to hold, the notion of wealth must be truly comprehensive.

8. The prospects for economic development, sustainable rural livelihoods, and poverty reduction in Ghana are highly dependent on natural resources. Rural households rely on soil and other natural resources for their livelihoods; fisheries and wildlife provide important sources of protein in the Ghanaian diets; urban economic activities depend on reliable hydroelectric power and fuel; the wood-processing industry (the main manufacturing sector in Ghana) depends on timber; and the emerging tourism sector relies on cultural and natural assets.

9. Natural resources are also indispensable for most of the economic sectors of the country. In particular, more than half of Ghana's GDP is derived from the following sectors that are closely related to the natural resource base: agriculture and livestock (29 percent), forestry and wood processing (7 percent), fisheries (4 percent), electricity and water (3 percent), mining (5 percent), and tourism (5 percent). Therefore, Ghana's natural resource base accounts for a vast portion of the country's economy and provides goods and services fundamental to rural and urban livelihoods.

10. Despite their social and economic roles, Ghana's natural resources are overexploited and continue to decline in both quantity and quality. Inappropriate crop production practices, mining, and wood processing are adversely affecting forests and savanna woodlands. Ongoing soil erosion and a decline in soil fertility undermine food and agricultural production. Human activities such as salt winning are degrading wetlands. Silt accumulation and alien species threaten goods and services provided by Lake Volta and other hydrological systems.

11. Further compounding the situation in recent years is the rapid urbanization of the economy without related improvements in infrastructure. This has contributed to additional depletion of the environmental services that nature provides. Inadequate housing, water supply, and sanitation; rising congestion and air pollution from automobiles, especially in large cities; and indoor pollution in rural areas are serious environmental concerns that are having a negative impact on both the quality of life and the quality of growth.

Box 2-1: Where is the Wealth of Nations?

Natural capital constitutes a quarter of total wealth in low-income countries, greater than the share of produced capital. This suggests that better management of ecosystems and natural resources will be important to sustaining development while these countries build their infrastructure and human and institutional capital. Particularly noteworthy is the share of cropland and pastureland in the natural wealth of poor countries—at nearly 70 percent, this argues for a strong focus on efforts to sustain soil quality.

This new approach to capital suggests that the key role of the management of wealth is through savings and investments. It also provides a comprehensive measure of changes in wealth, a key indicator of sustainability. There are important examples of resource-dependent countries, such as Botswana, that have used their natural resources to underpin impressive rates of growth. In addition, the research finds that the value of natural capital per person actually tends to rise with income when we look across countries—this contradicts the received wisdom that development necessarily entails the depletion of the environment.

However, the figures suggest that, per capita, most low-income countries have experienced declines in both total and natural capital. This is bad news not only from an environmental point of view, but also from a broader development perspective.

Growth is essential if developing countries are to meet the Millennium Development Goals by 2015. Growth, however, will be illusory if it is based on mining soils and depleting fisheries and forests.

Source: World Bank 2006a.

Value of Depletion and Degradation

12. Ghana's natural resources, upon which so much of the country's economic activity and the population's livelihood depend, are disappearing at an alarming rate. More than 50 percent of the original forest area has been converted to agricultural land by slash-and-burn clearing practices. Despite cocoa land expansion, productivity has declined because of rampant soil erosion. Fish, timber, and nontimber forest product stocks are decreasing. Coastal towns are facing severe water shortages during the dry season, hydropower capacity is dropping, and bilharzias have spread around the Volta Lake region. Wildlife populations and biodiversity are in serious decline, and many species face extinction. Health-related pollution issues—both indoor and outdoor air pollution, water, and sanitation—have serious implications for the well-being of the majority of the population and in the long run may affect their contribution to economic growth. All of these consequences might lower Ghana's GDP growth in the near future. From a broader view, a measure of Ghana's productive base in terms of wealth that includes not only growth in GDP, but also human, natural, and social capital, makes Ghana's recent economic growth achievements look much less impressive and much less sustainable.

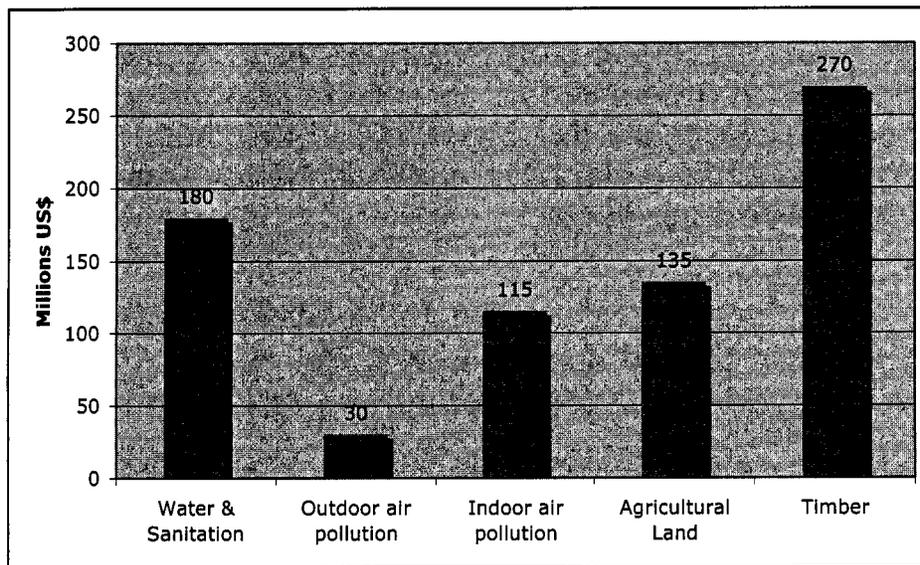
New Estimates of Cost of Natural Resource and Environmental Degradation

13. The CEA extended the earlier estimates of costs of natural resource degradation to also cover costs of environmental health effects. The mean estimated annual cost of natural resource and environmental degradation is nearly US \$730 million or 9.6 percent of GDP in 2003. This cost represents almost one half of Ghana's US\$1.5 billion annual Overseas Development Assistance (ODA). The degradation of agricultural soils and forests and savanna woodlands costs at least US\$405 million annually (5.3 percent of Ghana's annual GDP).

14. Environmental health effects account for nearly US \$325 million (or about 4 percent of GDP) from (a) urban air pollution (US\$ 30 million), (b) inadequate potable water supply, sanitation, and hygiene (US\$ 180 million), and (c) indoor air pollution (US\$115 million). While health effects from mining pollution and vector-borne diseases, such as malaria, are a concern and might be severe in some locations, they are often difficult to estimate. The estimated health costs are therefore understating the total magnitude of cost.

15. The costs of environmental damage are distributed unevenly across the population. The estimated cost of urban air pollution (PM10) of US\$9 per year (80,000 cedis) is for cities with more than 90 thousand inhabitants. Hygienic practices, and to some extent inadequate potable water supply and sanitation, are affecting most of the population and causing unnecessary diarrheal illness and child mortality; their annual cost is nearly 80,000 cedis (US\$ 9) per person per year. Indoor air pollution from solid fuels is a burden on the urban and rural population, and costs an estimated 55,000 cedis (US\$ 6) per person per year. So while the total annual cost of urban air pollution is substantially less than the cost of the other two major environmental health risks, the cost per person exposed is as high as for water, sanitation, and hygiene.

Figure 2-2: Annual Cost of Degradation (millions US\$)



Source: World Bank (2005a) and World Bank 2006

16. In this new calculation, the magnitude of depletion is almost three times the level calculated in the National Environmental Action Plan (NEAP) 10 years ago. In addition, the majority of the cost, 3.5 percent of GDP, is now seen as coming from forest depletion. Ironically, much of the forest depletion has occurred inside reserves that were established for preservation purposes 50 years ago. The next biggest cost is that of inadequate water supply, sanitation, and hygiene, followed by damage to agricultural lands.

17. The depletion of these natural assets is interrelated and self-perpetuating. For example, a scarcity of fish stocks usually results in increased pressure on wildlife. Similarly, the loss of soil fertility often leads farmers to clear forests and savanna woodlands in search of productive land. A growing population can further exacerbate the ongoing depletion of natural resources and the associated economic losses.

How Much is Ghana Saving Per Capita?

18. Two of the most important issues for developing countries are how to stimulate investment, and how to bring about an increase in the level of savings to fund increased investment. Savings are thus a core aspect of economic growth and development. Economic theory predicts that increased total savings (from domestic or foreign savers) will lead to higher investment and higher growth. Without the creation of a surplus for investment, there is no way countries can escape a state of low-level subsistence. The situation is further complicated by the fact that poor countries are dependent on resources, and depletion of natural resources is often not accounted for in the standard measurement of savings. It should,

however, be emphasized that it is not only the quantity of investment that is important, but also the quality of investment.

19. The standard national accounts measure the change in a country's wealth by focusing solely on produced assets. A country's provision for the future is measured by its gross national savings, which represents the total amount of produced output that is not consumed. Gross national savings, however, can say little about sustainable development, since assets depreciate over time (World Bank 2006a). Net national savings (gross national savings minus depreciation of fixed capital) takes us one step closer to measuring sustainability. But a more comprehensive way of measuring sustainability is to adjust net saving for the accumulation/depletion of other assets—human capital, the environment, and natural resources—that underpin development. The “adjusted” or “genuine” savings indicator provides a much broader indicator of sustainability by valuing changes in natural resources, environmental quality, and human capital, in addition to the traditional measure of changes in produced assets provided by net savings. It measures the true rate of savings in an economy after taking into account investments in human capital, depletion of natural resources, and damage caused by pollution.

Box 2-2: Calculation of Genuine Savings

Gross national saving is calculated as the difference between the gross national income (GNI) and public and private consumption and net current transfers. From this the consumption of fixed capital is subtracted, giving the traditional measure of net national saving. Consumption of fixed capital represents the replacement value of capital used up in the process of production.

In the traditional measure of net national saving only that portion of total expenditure on education that goes toward fixed capital (such as school buildings) is included as a part of saving; the rest is treated as consumption. From the perspective of broadening the measure of wealth this is clearly unsatisfactory. Therefore, as an approximation, current operating expenditures on education, including wages and salaries and excluding capital investments in buildings and equipment, are added to net national saving.

Natural resource depletion is then subtracted. The value of resource depletion is calculated as the total rents on resource extraction and harvest, where rents are estimated as the difference between the value of production at world prices and total costs of production, including depreciation of fixed capital and return on capital. The energy resources include oil, natural gas, and coal, while metals and minerals include bauxite, copper, gold, iron ore, lead, nickel, phosphate, silver, tin, and zinc.

Next is the adjustment for damages from carbon dioxide, using a figure for marginal global damages of \$20 (1995 prices) per metric ton of carbon emitted. This represents the present value of marginal damages to crops, infrastructure, and human health over the time that emitted carbon dioxide resides in the atmosphere—over 100 years.

The genuine saving calculation also includes the value of damages from air pollution. Pollution damages can enter the national accounts in several ways. While, in theory, pollution damage to produced assets is included in depreciation figures, in practice, most statistical systems are not detailed enough to capture this. For example, acid rain damages to building materials are rarely fully accounted. The effects of pollution on output—damage to crops, for example—are already included in the standard national accounts, although not explicitly.

Finally, the value of health damages arising from particulate matter pollution is deducted. Particulate air pollution is capable of penetrating deep into the respiratory tract and causing damage, including premature mortality. The population-weighted average level of PM10 (particulate matter less than 10 microns in diameter) is estimated for all cities in each country with a population in excess of 100,000. Particulate emission damage is calculated as the willingness to pay to reduce the risk of mortality attributable to PM10. The net result of all these adjustments is genuine saving.

Source: World Bank, 2006a

20. Using a more comprehensive assessment of only natural resource depletion, the recent Economic and Sector Work (ESW), “Natural Resources Management and Growth Sustainability,” in conjunction

with the Costs of Environmental Degradation study that assessed health costs from pollution, leads to the conclusion that wealth accumulation is in fact closer to 12.3 percent of GDP.⁶

21. Table 2- provides an estimation of genuine savings for Ghana. It shows the detailed accounting of the change in wealth per capita in Ghana, accounting for a 1.7 percent population growth rate per year. The left-hand column shows the assets that compose tangible wealth, totaling tangible wealth per capita. The right-hand column breaks out the accounting of adjusted net saving. Gross national saving is added to education expenditures to yield total saving effort; consumption of fixed capital and natural resource depletion are then subtracted from this total to yield the net saving per Ghanaian, US\$16. The population growth rate is then multiplied by tangible wealth and the result subtracted from adjusted net saving to yield the net change in wealth, -US\$18 per capita or 18.8 percent of GDP. Even this negative “genuine” savings are somewhat overstated as it does not take into account the health damages from air pollution, especially particulate matter. The rate of change of total real wealth (US\$16/US\$2,022 = 0.8 percent) is less than the population growth rate.⁷ The Ghanaian example shows that it is indeed possible to have positive genuine savings in total, but declining wealth per person.

Table 2-2: Accounting for Changes in Wealth Per Capita in Ghana

| Tangible Wealth | US\$ per capita | Adjusted net saving | US\$ per capita | % GNI |
|------------------------|------------------------|-----------------------------|------------------------|--------------|
| Subsoil assets | 65 | Gross National Saving | 40 | 28.1 |
| Timber resources | 290 | Educational expenditure | 7 | 2.8 |
| | | Consumption fixed capital | 19 | 8.7 |
| NTFR | 76 | Energy depletion | 0 | 0.1 |
| Protected areas | 7 | Mineral depletion | 4 | 0.2 |
| Cropland | 855 | Net forest depletion | 8 | 2.3 |
| Pastureland | 43 | Particulate emission damage | | 0.3 |
| Produced capital | 686 | | | |
| Total tangible wealth | 2,022 | Genuine saving | 16 | 18.8 |
| Population growth | 1.70% | Change in wealth per capita | -18 | |

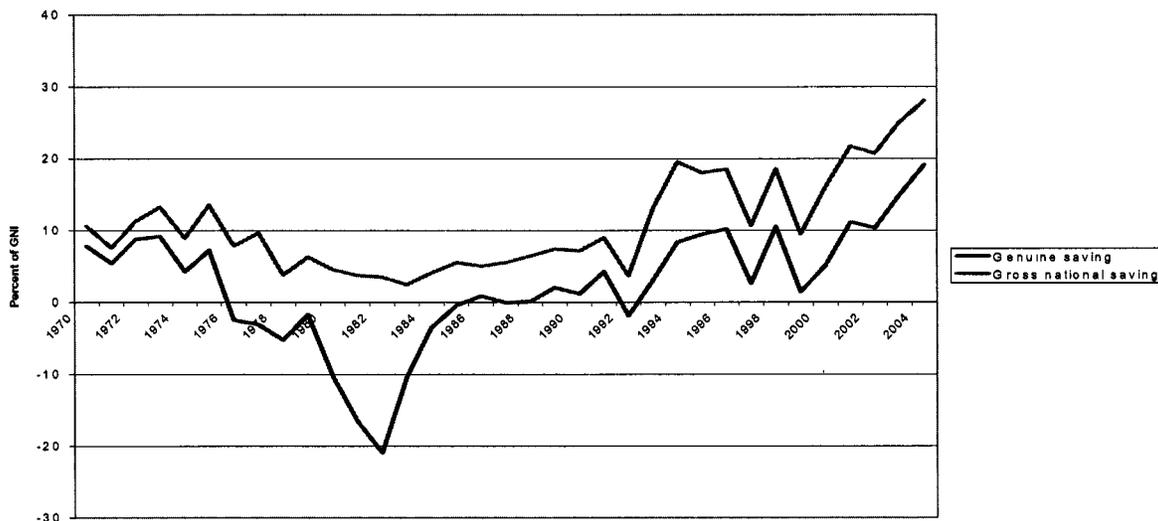
Source: World Bank (2006a, b).

Note: Tangible wealth estimates are for 2000; adjusted net savings numbers are for 2004

⁶ The study included degradation of five types of natural assets: agricultural soils, forests and savanna woodlands, coastal fisheries, wildlife resources, and Lake Volta’s environment (World Bank 2005). See Appendix 1 for an overview of how the costs of environmental and natural asset degradation were computed.

⁷ The rationale behind the adjustment for population growth is that the existing wealth per person declines because it is spread over the population increment.

Figure 2-3: Real Savings versus Genuine Savings in Ghana



22. In effect, summarizing the above analysis, one can say that growth sustainability is at risk because the country's total wealth is diminishing. Support for this also comes from both theoretical and empirical literature, which directly links savings to future welfare (Hamilton and Withagen 2004; World Bank 2006a). The striking reality of this analysis is especially important for developing countries like Ghana—the processes of accumulating produced assets and depleting natural resources is inextricably linked with the welfare of these countries.

Conclusion

23. Ghana is endowed with a rich, renewable natural resource base. This base has contributed significantly to driving economic growth in the past. Our analysis shows that the exploitation of Ghana's resources has been unsustainable. As a result, it is now estimated that the cost of natural resource and environmental degradation in Ghana today is on the order of about 9.6 percent of GDP. This is indeed alarming, and it is clear that current unsustainable management practices will continue to impede growth and erode Ghana's natural assets. At this rate, productivity is likely to fall even more dramatically because of poor natural resource management and governance. It is essential that key decision makers in Ghana respond to this challenge.

24. Current projections of sectoral contributions to GDP in Ghana's policy documents assume that natural assets will continue to play a significant part in its economic growth. The national accounting systems do not factor in the negative economic effects of natural resource degradation. Data from the Ministry of Finance suggest that wealth accumulation is 28 percent of GDP, which is rather misleading in the context of sustainable development. In other words, wealth accumulation is being overestimated in the country. As described above, the actual "genuine" savings in Ghana of 12.3 percent are well below the official savings estimates if resource depletion is taken into account.

25. Since natural resource depletion is a limiting factor for sustained economic growth, it follows that better natural resource management can contribute to growth in Ghana. More specifically, under reasonable assumptions,⁸ in an economy such as Ghana's, for each percentage point of genuine savings

⁸ If the real return on investment were 7 percent and resource sectors make up 30 percent of output, each 1 percent increase in genuine saving would boost the rate of growth of net income by 0.1 percent

loss, the rate of growth is decreased by 0.1 percent. In practical terms, this means that environmental and natural resource depletion in Ghana (which accounts for 9.6 percent of GDP) is reducing by roughly 1 percent the potential for economic growth in the country.

26. With a demographic growth rate of about 2 percent, future streams of depletion costs are likely to increase over time if nothing is done. Meanwhile, flows of benefits will decrease, and natural resources will be exhausted. Consequently, the government would be taking an extremely large risk if it did not shift policy to include natural resource depletion costs and, by extension, improve the rate of wealth accumulation.

27. There is an urgent need for Ghana's policy makers to take action and stem this trend. As will be discussed in the next chapters, better management of key natural resources can significantly contribute to future growth. In fact, our estimates suggest that Ghana's natural resources contribute twice as much to current social welfare as does produced capital. Policies, regulations, institutions, and incentives across sectors must be aligned to ensure sustainable development, or a "positive" genuine savings rate.

28. A clear policy rule links natural resources management with economic growth: targeting a constant positive rate of genuine savings will yield sustainable growth, even with exhaustible resources.

3 Forestry and Wildlife

Key Features of the Sector

1. **Ghana’s forest and wildlife sector is on the brink of major change.** Forest and wildlife resources have long been major contributors to Ghana’s economic development, formal and informal employment, livelihoods, and export earnings. The high forest zone in southern Ghana has been the main focus of attention: as a natural resource, as a source of fiscal revenues and—through elite capture of the economic rent—a political resource.

2. **Long-held assumptions about Ghana’s forest wealth are no longer valid. The off-reserve forest has largely gone; future timber supply will increasingly come from plantations; and constrained supply and changing international markets will encourage industry restructuring.** Satellite views of Ghana’s southwestern forest areas illustrate the results of the country’s historic forestry policies. These policies structure many of the challenges of environmental management today. The dark areas visible in the satellite image are forest reserves and protected areas, surrounded by “off-reserve” areas, where policy has led to conversion of the forests to agriculture. Estimates of the remaining closed-canopy, off-reserve forests in the 1990s varied from 100,000 to 350,000 ha (World Bank, 2006a); satellite imagery clearly shows that the lower estimates are more accurate—remaining off-reserve forests are fragmented and small. In the dryer transition zone above Kumasi, bushfires and overexploitation have all but eliminated several forest reserves; in the northern savanna regions, the distinction between reserve and off-reserve is less dramatic. In all cases, however, the boundary between reserve and off-reserve is an area of potential conflict over land use.

3. **Most forest reserves, and off-reserve areas, remain under a traditional form of land management;** around 85 percent of land in Ghana is administered in this way. Traditional authorities (paramountcies) hold the root (allodial) title to the land, and usufruct rights are held by subchiefs and families.⁹ Traditional authorities and stool¹⁰ chiefs have rights to a share of benefits from timber royalties and forest lands. Since 1947, forest policy has foreseen the exploitation of off-reserve areas for timber under a licensing regime. Around 45 percent of forest reserves are production forests (meaning they can be logged, using selective harvesting techniques, according to a management plan). However, in the last 15 years, most of the supply of the timber industry has come from off-reserve areas.

4. **The land in the national parks (NPs) is not under the allodial title and, in theory, compensation is paid to the relevant stools.** In reality, only two NPs, Mole and Nini-Suhien, are fully compensated. Ghana has a total of 15 wildlife-protected areas (6 national parks, 6 resource reserves, 2 wildlife sanctuaries, and 1 strict nature reserve), and 5 RAMSAR wetland sites. Compensation is not paid for resource reserves, as the stool (represented by local communities) has conditional access to the forest resources (except possibly timber; in most cases, it has conditional access to wildlife and to land for agriculture). In recent years, potential revenue from future “eco-tourism” and other benefits have been used to raise expectations of local communities. However, many of the resource reserves will struggle to generate significant income to justify these claims from tourism alone.

Table 3-1: Typology of Forest Areas

| Typology | Area | Comments |
|-------------------|-------------------------|--|
| Off-reserve areas | 201,000 km ² | Off-reserve areas are lands that are currently (or were) forests but where the policy presumption is that these lands would be converted to other use—in |

⁹ In the Volta Region, families control land; in the north, land management is undertaken through *tindama*.

¹⁰ The stool is both a symbol of a social unit and the unity itself. The term refers not only to the administrative structure but to the actual chair on which a chief sits. It represents the source of authority and legitimacy of the chief (or head of family).

| | | |
|---|------------------------|---|
| | | particular, agriculture. This includes 5,000 km ² of unreserved forests, 60,000 km ² of bush fallow, 71,000 km ² of bush fallow 36,000 km ² of unimproved pasture, and 29,000 km ² of tree and annual cropland. |
| Forest reserves | 26,000 km ² | These are areas that have been designated as forest reserves where no farming is allowed (except for in “admitted” farms, which were usually present at the time of reservation of the forest). |
| Dedicated forests | 4 km ² | Dedicated forests are designed to enable communities to manage their own forest “reserves” based on approved management plans. They take the form of patches of forests, sacred groves, and secondary forests in off-reserve areas. A dedicated forest management scheme was initiated in 1994. Under a pilot project, two communities were assisted in declaring Dedicated Forests (215 ha & 190 ha) in Fosu District to determine the scheme’s feasibility to communities. The results were positive, and draft legislation and a program to promote dedicated forests were formulated in 1997; however, no further action was taken. |
| Sacred groves | Unknown | Numerous sacred groves are found throughout Ghana. They are managed wholly by communities, but they have no legal status and are extremely small in most instances. |
| Protected areas (National Parks) | 10,500 km ² | A protected area is generally a large and relatively undisturbed area of outstanding natural value containing representative samples of major natural regions, features, or scenery and containing one or several entire ecosystems; it is an area not materially altered by man (or reflecting longstanding cultural land management practices). The areas should be accessible to the public, have high recreational, educational, inspirational, and cultural potential of clear benefit to the local people, the region, and the nation. |
| Resource reserves (game production reserve) | 1,664 km ² | The highest competent authority, i.e., the Ghana Wildlife Division administers and manages these areas to prevent or eliminate exploitation or intensive occupation in order to maintain them in perpetuity in a natural or near-natural state. These areas are of varying size. They contain habitats managed to guarantee the conditions essential to the well-being of selected species for the sustained production of wildlife products (meat, timber, pasture, fruits, honey, bamboos, rattans, medicinal plants, and other nontimber forest products [NTFPs]). The areas are used for cultural practices, tourism, and trophy hunting. Conservation priorities involve the manipulative management of species and their habitats to ensure the protection and propagation of the target species, including introduced indigenous and exotic species. Management is to be conducted in such a way as to preserve the areas’ natural aspect as far as possible. Other forms of land use compatible with these goals are allowed. These areas may be managed by a central authority or, through agreement, by other levels of government, special trusts, or local community institutions as appropriate under the overall supervision of GWD. |
| Forest reserves | 26,000 km ² | Areas designated as forest reserves allow no farming (except for in “admitted” farms, which were usually present at the time of reservation of the forest). |
| Wildlife sanctuaries | 66km ² | Wildlife sanctuaries can be created on state land or local land. A revenue-sharing mechanism is in place at Agumatsa Wildlife Sanctuary (community 57 percent, FC 23 percent, and Hohoe District Assembly 20 percent). |
| CREMAs | 30km ² | The Community Resources Management Area is a legally recognized unit of management capable of managing the wildlife resources within the defined area. Devolution of authority to the CREMA from the Executive Committee is conditional and confers the right to restrict access to the common property and extra-farm resources. This measure provides incentives for sustainable management of wildlife resources. So far only one CREMA (Amokwasuazo) has received the authority to manage its resources. |

| | | |
|--|-----------------------|---|
| Globally Significant Biodiversity Area (GSBAs) | 2,302 km ² | GSBAs are legally established areas identified within the existing forest reserve system. They form a potential network of 30 forest reserves that are proposed for either full (11 reserves) or partial (19 reserves) protection to provide global security for floristic diversity. Included in this group are Southern Dry Forests and the Provenance Protection Areas. |
| Strict nature reserve (SNR) | 385 km ² | Only one strict nature reserve, Kogyae, is in existence. Originally created from a forest reserve, it was taken over by the WD in 1971 and established as an IUCN Category I strict nature reserve. However, the WD has been unable to evict a number of farms and settlements within the reserve. |
| RAMSAR Sites | 1,784 km ² | Six RAMSAR sites are listed as wetland sites of international importance. Under the RAMSAR convention the contracting parties are generally obligated to include wetland conservation considerations in their national land-use planning. They have undertaken to formulate and implement this planning to promote, as far as possible, <i>"the wise use of wetlands in their territory."</i> |

* Dating from the 1948 Forest Policy.

Sources: World Bank (2006a); PADP (2000).

5. **The biological diversity of the forest region is high, of global significance, and rich in species endemic to the area** (Burgess et al. 2004; Hawthorne and Abu Juam, 1995). It is part of the Upper Guinea forest ecosystem from Guinea to Togo, which is categorized as one of the eight African biodiversity “hotspots” by Conservation International (Critical Ecosystem Partnership Fund 2000). Burgess et al. (2004) note that the “relatively well-managed” production forest reserves have considerable value in conservation of threatened species, and even small areas such as sacred groves can be effective in the conservation of rare plant species (Campbell 2005). This has important implications for the regulation of commercial logging in southwest Ghana in particular, where the best of the high forest remains.

A. Structure of the Forest and Wildlife Sector in Ghana

6. **The shape and structure of today’s industry is, in part, a consequence of liberal credit availability under the Economic Recovery Program (ERP) of the 1980s.** Initial ERP investments mainly went into logging and processing capacity. In the post-ERP era, timber-processing capacity increased dramatically, and timber exports peaked in 2000 at around 500,000 m³ of finished product (equivalent to around 1.3 million m³ of logs). In 2001, installed sawmilling capacity¹¹ in the wood industry was estimated at 3.4 million m³—around 10 times the level of probable sustainable yield level from forest reserves of about 350-400,000 m³/year (Birikorang 2001; Forestry Commission, internal data). The subsequent introduction of a log export ban, low and falling stumpage rates, and weaknesses in regulation resulted in the dramatic increase in timber-processing capacity. However, the milling machinery imported was often old and inefficient. This has left a legacy of overcapacity in the industry of four to six times sustainable yield and very low conversion rates in sawmills—just 36 percent on average, although the best firms achieve rates of around 70 percent (Birikorang, 2001; Bureau of Integrated Rural Development, 2005).

7. **As a result, substantial parts of the timber industry in Ghana are not merely inefficient, but actually value-subtracting.** Low log prices—a mix of the log export ban and failure to collect forest taxes—have distorted industry behavior, and have not created an incentive for the best operators to move to higher value-added processing. Although tertiary processing in Ghana (furniture parts, moldings) may demonstrate Ghanaian manufacturing capacity, policies have made it possible for inefficient operators to stay in place (Box 3-1).

¹¹ On the basis of two working shifts.

Box 3-1: Primary Timber Processing in Ghana: A Value-Subtracting Industry

Sawmilling of lumber is the most basic processing undertaken in Ghana. However, increases in industry capacity since the late 1990s are also from an expanded capacity in veneer production. Unfortunately, both sawmilling and veneer production in Ghana are value-subtracting, and only make money for the operators of the log export ban and because they pay substantially less than world market prices for timber. The data below are based on 2003 mill operating estimates; local and international prices have not altered substantially since then.

| | <u>At domestic log prices</u> | | <u>At international log prices</u> | |
|---|-------------------------------|---------------|------------------------------------|---------------|
| | Sliced veneer | Milled lumber | Sliced veneer | Milled lumber |
| Log price per m ³ | 50 | 40 | 155 | 120 |
| Cost of processing/m ³ | 260 | 50 | 259 | 50 |
| (Subtotal) total log-processing cost | 310 | 90 | 414 | 170 |
| Recovery percentage (30%) | | | | |
| Overhead cost | 12.4 | 2.7 | 12.4 | 2.7 |
| Transport cost | 1.6 | 1.6 | 1.6 | 1.6 |
| Port handling, bank | 9.1 | 3.6 | 9.1 | 3.6 |
| Total economic cost | 332.3 | 97.4 | 437.0 | 177.38 |
| Export value (FOB) US\$ m ³ of product | 302.50 | 97.38 | 302.50 | 119.11 |
| Net Gain / Loss | -29.8 | - 21.7 | -134.5 | -58.25 |

By comparison, Ghana could have earned a net value of US\$465 or US\$360 from export of the log equivalent (3m³), for the veneer and lumber grade logs, respectively.

Source: Derived from Birikorang (2001).

8. **Nontimber forest products (NTFPs) are also extremely important, but much of their value is not formally recorded, and remains inadequately represented in policy analysis.** This is in part attributable to “timberization” of all aspects of policy formulation and regulation. The NRM ESW study noted that NTFPs are so frequently collected, for both commercial and household purposes, that their economic value may locally outweigh that of timber. Their use is more than mere subsistence. Wild animal and wild plant exports were valued at US\$18 million in 2003 (World Bank 2006a). Recent bushmeat studies have shown that 72 to 82 percent is traded and 52 percent is consumed by urban dwellers (Cowlshaw, 2006). Hunters get 72 percent of the final sale price, suggesting high and sustained demand for bushmeat. Attempts to value the national annual trade in bushmeat have produced widely varying values: between US\$9 million (Hofmann et al. 1999) and US\$200-300 (Ntiamoa-Baidu 1998). No work has been carried out to determine the replacement costs of these resources. However, the dietary importance of bushmeat as a protein source in Ghana was illustrated by 30-year trend analyses where years of poor fish supply coincided with increased hunting and sharp declines in biomass of wildlife species (Brashares et al. 2004).

9. **Wildlife-based tourism in Ghana is minor and has revenues of around US\$2.5 million.** Nevertheless, significant opportunities exist for development as tourist numbers continue to grow. Moreover, these investments in themselves increase overall visits to Ghana and spread benefits as tourists travel to wildlife attractions. Opportunities include (a) adding value to the overall tourism package, as the aerial walkway at Kakum has done for the coastal tourism route, and (b) attracting visitors and associated economic activity to otherwise little-visited areas, such as Mole National Park (NP) or Shai Hills Resource Reserve (Johnson 1999).

10. **Forestry employs about 120,000 people in the timber industry and public institutions.** The principal trade union in the sector, the Timber and Wood Workers Union (TWU), has around 23,000 members and is the fifth-largest trade union in Ghana, representing 9 percent of unionized labor (Assens and Jenson 2003).

11. **In the informal sector, however, tens of thousands of people and many rural households depend on forest resources for their livelihoods,** whether it is timber from off-reserve areas, hunting of bushmeat, illegal chainsaw operations, fuelwood collection, or the gathering and commercialization of diverse nontimber forest products (NTFPs), including medicinal plants, bamboos and rattans. Around 11 million of Ghana's population live in forest areas; about two thirds of livelihoods are supported by forest activities (Birikorang and Rhein 2005). Estimates suggest that:

- *Small-scale carpenters* number approximately 41,000, in addition to around 25 *medium- to large-scale furniture and joinery companies* (Coleman, 2004 in Nketiah et al. 2004)
- *Illegal use of chainsaws to convert lumber into timber*, largely for the domestic market, provides income for about 50,000 and generates around 12 billion cedis (about US\$ 1.3 million) in income (Agyeman et al., 2003). Most chainsaw operators are gang workers, employed by small- and medium-sized businesses; anecdotal reports from the field suggest that only around one third of chainsaw operators are local individuals
- Although data on the number of people engaged in *bushmeat hunting* are scanty, surveys in 1998 suggested around 5,000 to 6,000 engaged in regular hunting around each of the Ankasa and Bia Protected Areas; average incomes from hunting were about US\$1,000 per year (Holbech 1998). Earlier estimates (Hofmann et al. 1999) indicate hunter populations of 4.4 hunters per km² in hunting areas in Ashanti. On the crude assumption that only half of Ghana might support hunting on that level, hunting for sale and consumption of bushmeat might provide significant contributions to the livelihoods of perhaps half a million people.

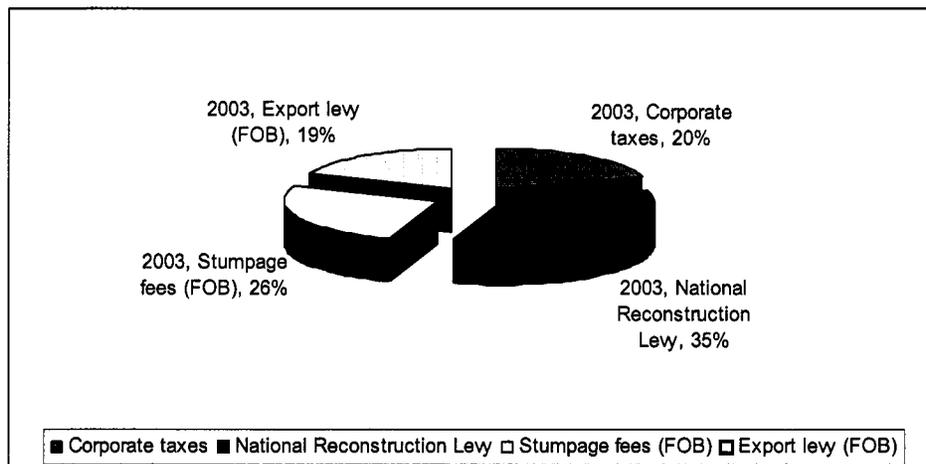
12. **Appropriate wildlife management policies can, however, ensure both conservation and managed exploitation in the off-reserve areas.** In southwest Ghana, Cowlshaw et al. (2006) found that, in areas where forests were already degraded, sustainable levels of harvest were possible from fast-reproducing bushmeat species.

B. Contribution to Government Revenues

13. **Trade level fees (export levies and national reconstruction levy) accounted for more than 50 percent of total charges, representing an important source of revenue for the FC and the MoFEP.** The National Reconstruction Levy was abolished in January because of its adverse impact on the profitability of the timber industry.¹² With the amendment of the Timber Rights Management Act (Act 617) in 2003, new fees were introduced such as the Timber Rights Fee (TRF).

¹² The Government of Ghana is in the process of gradually reducing the reconstruction levy in 2005 and 2006 and plans to eliminate it entirely in 2007 (see GoG—National Budget Statement 2005c).

Figure 3-1: Taxes and Charges Faced by the Timber Industry in 2003



Source: Birikorang and Rhein ((2005)

14. **Despite a variety of taxes and charges, successive studies have shown that the government does not capture high levels of timber values.** Average stumpage values of Ghanaian timber have been variously estimated at between US\$87 and US\$108 per meter (Grut et al. 1991; Richards 1995, and Awudi 1999). By comparison with mill gate prices and prices bid for timber in auctions, Birikorang and Rhein (2005) concluded that the residual forest rent not collected by government was US\$10 to \$45 million per year. This lost revenue arises from policies that allow inefficient mills to operate, or for the efficient operators to retain the residual rent as “super profits.”

15. **In 2004, the main charges to the industry (around US\$ 22 million) accounted for 4.5 percent of the industry’s turnover of US\$500 million.** Only 26 percent of the total charges were related to timber harvesting/throughput, while about 54 percent of the total charges were related to trade. Thus, forest revenues are mostly generated through taxes on the value added to forest resources by processing, not through the value (e.g., the economic rent) of the resources themselves (Birikorang and Rhein 2005).

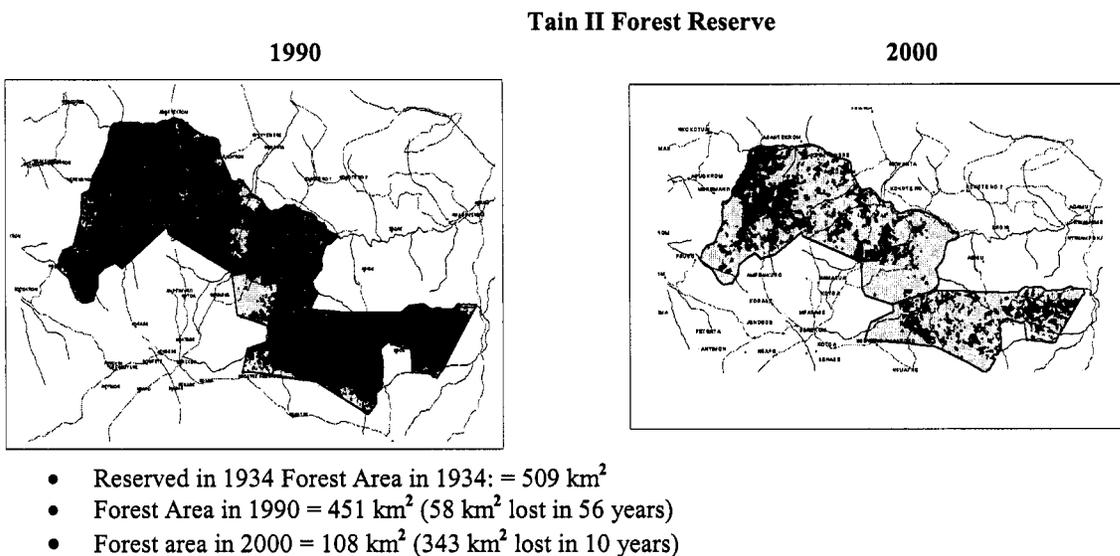
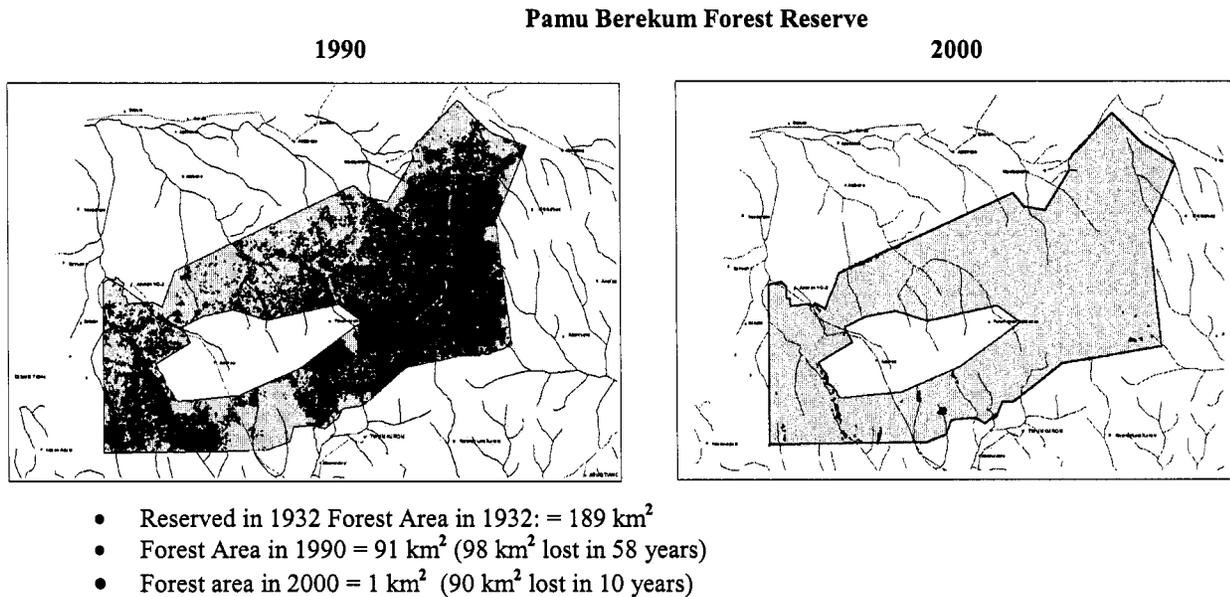
16. **Revenues captured by GoG from wildlife are almost insignificant.** Revenues in 2004 amounted to US\$155,039, half of this arising from park entry fees (World Bank 2006a), while sale of game and bushmeat trading licenses comprised US\$5,873. District Assemblies also issue “chop bar” licenses.

C. Environmental Challenges

17. **The nature of environmental degradation in the forest and wildlife sectors is well documented in the ESW (World Bank 2006a).** Deforestation is estimated at around 65,000 ha/year, and results in an annual cost of degradation of about 3.5 percent of Ghana’s GDP, together with habitat loss and species extirpation. Degradation of the forest resource is taking place:

- Off-reserve, where loss has arisen from the combined expansion of farming (especially cocoa) and demand for timber from the timber industry following the ERP period.
- On-reserve, where degradation has also accelerated dramatically in the last decade from overlogging, encroachment, illegal logging, and bushfires that the FC has been unable to prevent (see Figure 3- for two of the most stark examples from Brong Ahafo Region).

Figure 3-2: Degradation of Pamu Berekum and Tain II Forest Reserves



Source: Forestry Commission

18. **The most recent inventory analysis of the natural forest found alarming results.** Using data from permanent sample plots across 46 forest reserves and comparisons with inventories in the 1950s, 1974, and 1990, Wong (2003) found that the forest was degrading with a negative basal area of -0.13m²/ha/year; damage from logging was greater than new growth. The report concluded that whatever the policy goals:

Sustainable yield and hence the AAC are therefore going to be small...these facts need to be assimilated at a policy level by both the Forestry Commission and the timber industry if the continued pressure for timber is not to completely liquidate the resource (p 3.)

19. **Accompanying the loss of forest habitat, wildlife resources are also under severe threat** from opportunistic and sometimes excessive levels of hunting, illegal hunting in protected areas, unsustainable collection, mining (see Box 3-2), and habitat conversion. There exists clear evidence that the population

of many species habitually hunted for their meat has declined over the years. A number of threatened or endangered species are at risk from illegal hunting (particularly in protected areas). Consequently, a significant threat of species destruction is present (and in one case, extinction); moreover, wildlife resources are not contributing sufficiently to economic development.

Box 3-2: Mining in Forest Reserves

Significant debate has occurred on the issue of mining within forest reserves. Mining in forest reserves contravenes various national policies and the principles underlining the initial establishment of forest reserves in Ghana as protection reserves:

Section 4.4 Subsection (b) of the National Land Policy 1999 states “All lands declared as forest reserves, strict nature reserves, national parks, wildlife sanctuaries and similar land categories constitute Ghana’s permanent forest and wildlife estates, and are “fully protected” for ecosystem maintenance, biodiversity conservation and sustainable timber production.”

Subsection 4.5 (a) of the policy further states that “To ensure the conservation of environmental quality, no land with a primary forest cover will be cleared for the purpose of establishing a forest or tree crop plantation or mining activity.

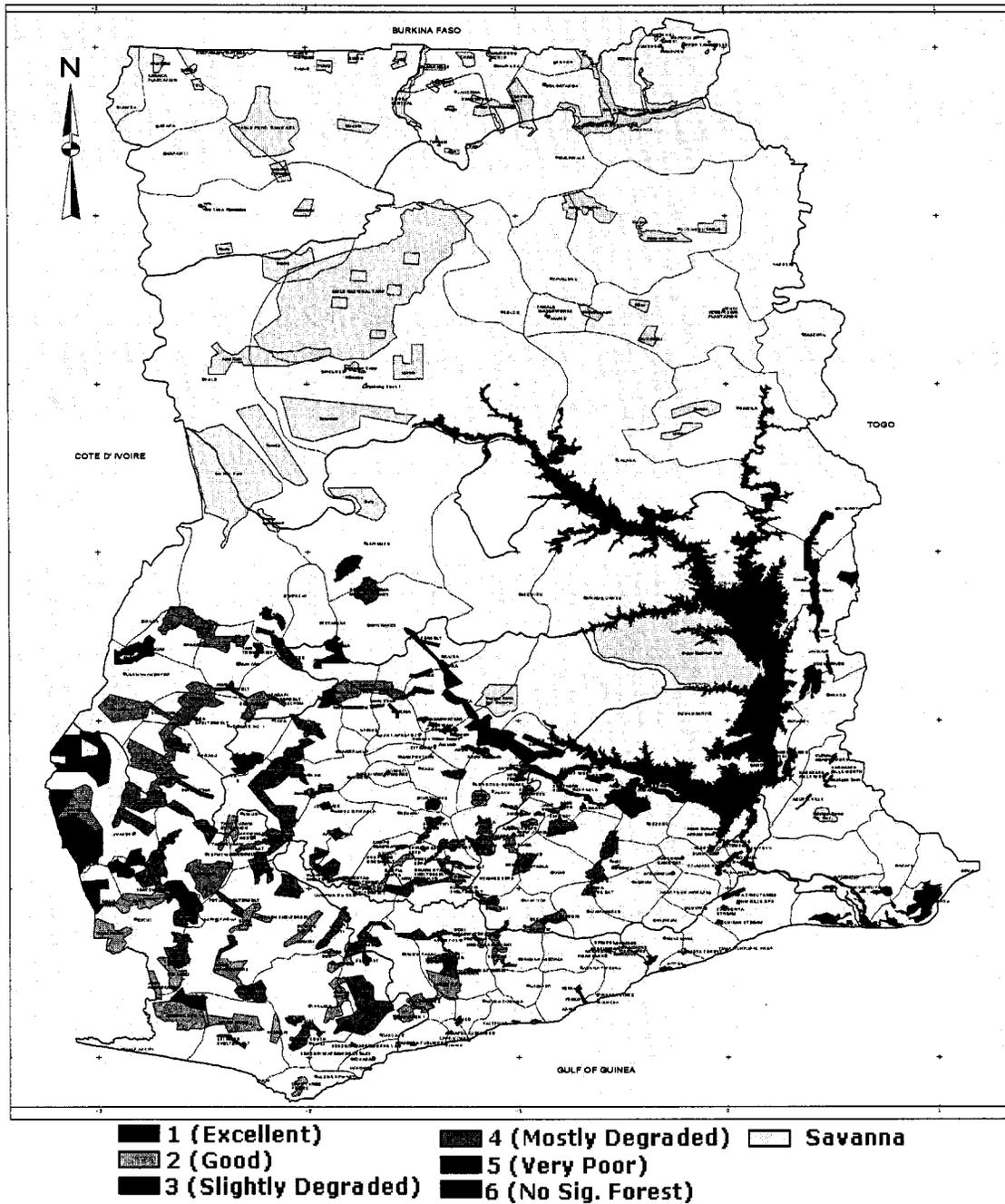
The 1994 Forest and Wildlife Policy states as its primary aim the “conservation and sustainable development of the nation’s forest and wildlife resources for the maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society.”

There remains, however, significant concern that new mining will be allowed within forest reserves. In 1996, a ban was placed on mining in forest reserves. This was lifted in September 1997 because of the amounts invested by firms up to that point; 27 mining companies were subsequently granted rights to continue operations within forest reserves.

20. *The principal environmental policy challenges fall into five broad categories*

- *Finding new ways to halt, and reverse, the pace of deforestation*, which is currently around 65,000 ha per year, and which has left only 16 (6 percent) of the 266 designated forest reserves in a healthy state (see Figure 3-4).
- *Dealing with the paradigm shift from abundance to scarcity of timber*. As the off-reserve forests have been converted to agriculture, established assumptions regarding the level of timber milling that can be maintained, as well as approaches to the management of off-reserve timber, bushmeat, and other NTFPs need revision.
- *Coping with continued chronic underinvestment in dry land forestry and agro-forestry*, a result of the policy bias on high forest zone timber (Select Committee on Lands and Forestry 2004). Wildfires in periods of prolonged dry years—from the early 1980s to 1994—contributed significantly to the loss of forest areas in the transition zone.
- *Ensuring the effective management and protection of the remaining permanent estate of forest reserves and wildlife reserves*. With the loss of the off-reserve buffer, those reserves and PAs are now more vulnerable to legal and illegal encroachment. Investment in capacity building of the FC and WD and increased usage of SDI and GIS to monitor changes in forest reserve boundaries could be key actions to ensure efficient protection.
- *Moving to an African model of wildlife management* that incorporates both the nonutilitarian and utilitarian values of wildlife and more accurately reflects the social, cultural, and economic values of modern Ghana. A more community-based wildlife management approach is recommended.

Figure 3-3: Map of Ghana Showing Condition of Forest Reserves



Source: Hall & Swaine (1981).

Principal Policy Issues

A. Rationale for Government Intervention

21. The principal rationale for government intervention remains the need to deal with market failure, i.e., the market may not always allocate scarce resources efficiently in a way that achieves the

highest total social welfare. This rationale is consistent with the aim of the Government Forest and Wildlife Policy, namely:

“Conservation and sustainable development of the nation’s forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society” [our emphasis] (GoG 1994, p. 8).

22. Unfortunately, the policy makers and regulators in the ministry and the Forestry Commission have been unable to either address the market failure mandate or realize this espoused policy. In practice, policy decisions have been driven by concerns for narrow segments of society (timber supply for loggers and millers, formalized workers) at the expense of sustainable development and the environment.

23. **For most of the last century, the role of government in the forest sector has been interventionist and centralized.** The early justifications in the 1920s and 1930s for the transfer of land management from traditional authorities and chiefs to the newly formed Forestry Department rested on concerns about loss of valuable resources, but were linked to arguments for environmental and watershed protection. In the war years, however, the colonial authorities were able to cite military prerogatives for accelerated timber production. More recently, the policy instruments of the 1983-88 ERP were similarly interventionist and driven by the need for urgent structural reform. Successive forestry officials over the course of 70 years have opposed decentralization and—in particular—proposals to cede *authority* over forest resources, especially timber (de Grassi 2003). Little attention was paid to the role forests played in livelihoods or diversified farming systems.

24. **Early wildlife policies were based upon similar approaches.** For the most part, these approaches failed to recognize the social, cultural, and utilitarian values that Ghanaian societies placed upon the resources. Policy was therefore developed around “protecting” wildlife from rural people (see Adams and McShane, 1996). Post independence, the appropriation of wildlife resources by the state was carried over, further usurping existing common property regimes. The legal framework for PAs was developed in the 1960s “at a time when consideration of the sustainable use of wildlife outside of protected areas was unheard of in Africa” (Murphree 2005).

25. **In any case, the assumption underlying these policy approaches—namely, the ability of the state to control the behavior of either market participants or rural populations—no longer holds.** There is limited evidence that the centralized agencies are now able to control access to, and exploitation of, forest and wildlife resources. Illegal logging, chainsaw logging, and bushmeat hunting are largely uncontrolled. The state, by assuming authority for these resources without the capacity to exercise its responsibilities, has created at best an open access system.

B. Forest and Wildlife Policies

26. **Government forest policies began to evolve during the colonial administration of the late 1880s as concerns arose over degradation of natural resources.** Most of Ghana’s forest reserves were established through negotiation with chiefs and traditional authorities in the 1930s. Reservation was enabled either through the 1927 Forest Ordinance or the Native Authorities Ordinance (which enabled authorities to constitute forest reserves under their bylaws). The rationale for reservation was one of protection, and hinged on the authorities’ role in the protection of watersheds and from drying winds. As Smith (1999) notes of the Ghana forest reserves:

As a system of protective forest reserves carefully arranged around rivers and headwaters, along scarps and across the drying savanna winds, it is possibly unique (p. 10)

27. **The first formal forest policy was prepared in 1948, and provided for conservation and protection of the forest reserve estate, but foresaw that the off-reserve areas would ultimately be liquidated.** The 1994 Forest and Wildlife Policy is the current policy document, and aims at conservation and sustainable development of the nation’s forest and wildlife resources for maintenance of

environmental quality and perpetual flow of optimum benefits to all segments of society. In 2001 a separate policy on CREMAs was issued, and in 2001 a Forestry Commission Service Charter was published, setting out public service performance standards that the FC's customers and clients could expect.

28. **The 1994 policy was well formulated and remains broadly relevant today.** It recognizes the need to balance forest and wildlife resources between users, and to maintain a renewable and lasting flow of benefits. The current operational objectives of the MLFM reflect similar areas of policy concern, and were outlined recently (Fobih 2005) as: (a) securing the resource; (b) restoring the resource; (c) generating optimum revenue from the resource; and (d) ensuring equitable sharing of forest benefits.

29. **Plantation development is a high priority, but GoG policy over the last 20 years has been in some disarray.** In the mid-1990s, considerable effort was invested in developing proposals for the privatization of the state's plantation assets. The reasoning was to help enable the proposed Forest Service (which later became the new Forestry Commission) to focus on its regulatory, community forestry and protection functions. These efforts foundered because of concerns over valuations, and a reluctance to cede authority to the private sector. Subsequently, the Forest Plantation Development Fund Act was established to support the much-needed investments in planted forests.

30. Currently three separate schemes are in operation, namely:

- *The Forestry Commission's modified taungya system*, which is being implemented by the Plantation Department of the FSD.
- *A program financed by the Forest Plantation Development Fund.* Act 583 of 2000 as amended by the Forest Plantation Development Fund (Amendment), Act 623, 2002 states (section 4[1]) that sources for the fund must be derived from "(a) the proceeds of the timber export levy imposed under the Trees and Timber Decree 1974 (NRCD 273) as amended by the Trees and Timber (Amendment) Act, 1994 (Act 493); (b) grants and loans for encouraging investment in plantation forestry; (c) grants provided by international environmental and other institutions to support forest plantation development projects for social and environmental benefits; (d) moneys to support forest plantation development provided by Parliament from the Consolidated Fund and from any other source approved by the Minister of Finance."
- *The Ministry of Lands and Forestry (MLF) HIPC scheme*, which initiated a forest plantation development program in 2003, funded from the HIPC savings.

Box 3-3: Securing the Resource

The MLFM has in place, or has proposed, a range of measures to secure the resource (Fobih 2005).

These fall into four broad categories:

Initiating fiscal measures, market mechanisms, and tax incentives, including:

- measures to assist in rationalization of the timber industry
- competitive bidding in order to capture the economic value of the resource

Strengthening of control mechanisms and protection:

- introduction of a log-tracking and wood legality assurance scheme
- institutional strengthening of the WD to facilitate effective control of poaching in PAs
- designating specific areas as biodiversity reserves

Encouraging investment in new enterprises:

- small-scale alternative livelihood schemes to wean fringe communities off forest reserves, through community investment funds and similar support for economic activities (oil palm processing, piggery, soap making, grasscutter rearing, etc.)
- promotion of savanna medicinal plants and other potential crops

Involvement of forest fringe communities organized in CREMAs, CBAGs, CFCs, and CORMACs, to act as a “sort of ‘social fencing’” to protect the resource.

These are a good set of actions, although the rationalization of the timber industry is clearly a tough challenge to implement, and additional approaches to community forestry and wildlife management have recently been recognized from success stories in other countries (such as Zimbabwe and Namibia).

31. **New approaches will be needed to fill the cash flow gap that occurs in the early years of plantation and reforestation efforts.** A number of opportunities are: (a) the modified taungya system, which provides incentives for farmers through intercropping in the early years of plantation establishment; (b) securing carbon values, and (c) using bushmeat resources—key bushmeat species are, under favorable conditions, so prolific that a reasonable return can be expected from even small areas of land.

32. **For the natural forests, the steps outlined in securing the resource are key steps for allowing recovery of the forests.** Past overlogging means that some forests simply need decades of “convalescence.”

C. Revenue Generation from the Resource

33. **Since November 2003, the Forestry Commission has introduced market-based concession bidding in both on-reserve and off-reserve areas to increase transparency and revenue collection from Timber Utilization Contracts.** The annual timber rights fees (TRFs) are determined through the competitive bidding and aim to capture a larger share of the forest rent where stumpage fees have failed.

34. **Despite a good start and high expectations from competitive bidding, severe revenue shortfalls remain.** The FC has to date conducted four competitive biddings for the allocation of timber rights (area charge with harvesting limit). Despite high expectations in terms of revenues generation from the logging concessions (potential annual revenues have been estimated at US\$14 million), the government failed to collect the outstanding payment (mainly comprising the annual TRFs). The bidding process came to a halt entirely in 2005 when some timber companies began to sue the government regarding the transparency of the process and the eligibility of applications. This resulted in cancellations to the four planned competitive biddings in 2005 and severe revenue shortfalls for the government in 2005. The most recent auction (April 2006) for competitive bidding has attempted to plug loopholes in procedures for payment, and has recorded total bids of US\$9 million.

35. **Tax exemptions and avoidance further erode the government’s revenue receipts from forestry.** The timber industry benefits from tax exemptions that are applicable to all other companies in

the manufacturing industries. These exemptions include: (a) exemptions on import duties, (b) tax rebates for manufacturing companies located in rural areas, and (c) a Tax Free Zone (see Box 3-4 below). The Tax Free Zone was originally created to provide tax incentives for newly established manufacturing industry, exempting it from the payment of corporate taxes. However, over the past years, long-established companies have succeeded in entering the Tax Free Zone. Estimates suggest a revenue loss of US\$4 million (Birikorang and Rhein 2005).

Box 3-4: Tax Exemptions of Benefit to the Industry

Export taxes

- Since 2004, no export duty on lumber, veneer, and plywood products has been in effect.
- While export duties of 3 percent of the price are levied on several wood products, the export of round and square logs remains completely banned since the nineties.

Taxes

Manufacturing industry

- Tax rebates between 25 and 50 percent are granted to manufacturing industry located outside Accra (regional capitals 25 percent, elsewhere in Ghana 50 percent).
- A research and development expenditure by a manufacturing company is fully deductible.
- Companies that export nontraditional products (such as wood products) only pay an income tax of 8 percent.
- The number of new industries has increased significantly in the past years, and the free tax zone has created revenue losses for the government from the local economy.
- Corporate income taxes this year went from 32.5 (2005) to 28 percent.
- Companies enjoy special rates of capital allowances. (The rate varies according to the classification of the asset.)
- Losses can be carried forward for the next 5 years of assessment following the years in which the loss was incurred.

Trade taxes

- Timber industry benefits by a zero rate on import duties, which applied to all industrial machinery. (A 5 percent rate is applied on specific materials for the manufacture.)

36. **Tax policies favor the wood-processing industry but discourage the high value-added tertiary processing.** Within Ghana's Forestry Development Plan (1996-2020), the government committed to increasing the share of high value-added products made from lesser-used tree species. However, the current tax policies support wood processing, a second-level lower value-added industry, instead of tertiary processing. This is done by maintaining (a) a low level of charges on timber harvesting and throughput (because of the low stumpage fees), and (b) low export taxes on intermediate wood products. Efforts to increase the volume by the tertiary subsector through a backward integration of secondary processing has been hampered in the past, following (a) the high share of export of commercially valuable species in primary and secondary form; (b) the limited supply that is controlled mainly by operators in the secondary large-scale wood-processing industry (they produce and export more than 80 percent of processed wood and molding); and (c) high charges at the trade level (tax on FOB priced export product) that discourages the investment in higher value-added tertiary processing (Birikorang and Rhein 2005).

37. **Recent tax reform measures.** Over the past two years, the government has approved a number of policy measures that aim to rationalize and consolidate forest industry taxation without further sacrificing national revenue objectives. These include: (a) exports of all unfinished products (which include veneers, boules, etc.) will be taxed at the full corporate tax rate of 35 percent, instead of the non-traditional export rate of 8 percent (the latter will be applied only for income from export of finished products); (b) abolition of the National Reconstruction Levy; (c) review of locational tax exemptions and rebates enjoyed by timber-processing and logging companies located in southern Ghana; henceforth only companies situated outside the timber-producing zone (Volta, Northern, Upper East, and Upper West

regions), are to enjoy location incentives; (World Bank 2005) and (d) a review of the Tax Free Zone, initiated in 2005, to attain more transparency and reduce the tax evasion.

D. Distributional Aspects

38. **The distribution of forest revenues is also highly contested.** Until recently the FC took a first charge on all forest revenues of 60 percent, in order to cover management, operational, and investment costs. In 2002 this was reduced to 40 percent in the case of off-reserve timber. The remaining 40 or 60 percent after deduction of FC charges is delivered to the Office of the Administrator of Stool Lands (OASL).¹³ In accordance with Section 8(1) of the Office of the Administrator of Stool Lands Act, 1994, the OASL first retains 10 percent to cover its administrative costs, and then allocates remaining revenues to “stakeholders” according to the following constitutional formula.

- 25 percent to the stool “for the maintenance of the stool in keeping with its status”;
- 20 percent to the traditional authority (generally the paramount chief and his council);
- 55 percent to the District Assembly (Constitution 1992 Article 267 [6]).

39. The above revenue-sharing formula represents a split of revenues negotiated between the customary state (stools, paramountcies) and the state government at the time of the formulation of the 1992 constitution. There are several points of contention, however:

- The chieftaincy institutions challenge the basis for the first charge taken by the FC for management of forests. They consider 60 percent and 40 percent to be excessive since the FC has not managed to protect many forest reserves—particularly those in the transition zone—from destruction, and off-reserve areas are not managed but merely licensed for liquidation.
- The construction of the formula and its constitutional wording conflict with other constitutional provisions that land is held in trust by chiefs on behalf of the people (the implication that the stool is the chief). As a result there are no obligations on stool chiefs or traditional authorities to allocate their share of funds to forest-adjacent communities. Some do, some don’t, and essentially any benefits to the chiefs’ subjects are at the discretion of chiefs and traditional authorities.
- The revenues to the District Assembly are not earmarked for forest communities and so may be spent in district centers rather than rural areas. Chiefs can, however, argue that they have no need to disburse portions of their funds to communities, as this is the purpose of the allocation to DAs.

40. **Social Responsibility Agreements (SRA) are one mechanism to direct benefits to communities.** The Timber Resource Management Act (Act 547) enabled these agreements, and they have most recently been set at a fixed amount of 5 percent of stumpage values in L.I. 1721. Payments are made directly by timber firms to communities, often in the form of public services, school buildings or roads.

Legal Framework

41. **The legal framework for the forest sector comprises a mix of old and new legislation.** Old laws still in force include the 1927 Forest Ordinance, which operates alongside recent primary legislation (Acts) and regulations (Legislative Instruments, L.I.s), as shown in Table 3-2. In 1996, proposals were

¹³ Section 2 (a) and (b) of the Office of the Administrator of Stool Lands Act provides that the Office of the Administrator of Stool Lands is responsible for “the establishment of a stool land account for each stool into which shall be paid rents, dues, royalties, revenue or other payments whether in the nature of income or capital from the stool lands, (b) the collection of all such rents, dues, royalties, revenues or other payments whether in the nature of income or capital and to account for them to the beneficiaries stipulated in the Act and (c) the disbursement of revenues in accordance with the Act.”

submitted to the Minister MLF by a committee for a consolidated forest act (Committee for the Review of Laws in the Forestry Sector 1996). Draft legislation was prepared that brought together forestry and wildlife and included proposals for the devolution of authority for forest management to local communities through dedicated forests. A consolidated act never emerged from the ministry, however, and the more narrow Timber Resources Management Act became the main new piece of forest legislation.

Table 3-2: Principal Forest Legislation Currently in Force

| | |
|------|--|
| 1927 | The Forest Ordinance (Cap 157) |
| 1994 | Trees and Timber Amendment Act , Act 493 |
| 1997 | Timber Resources Management Act- Act 547 |
| 1998 | L.I. 1649—Timber Resource Management Regulation |
| 1999 | Forestry Commission Act 571 |
| 2000 | Forest Plantation Development Fund, Act 583 |
| 2002 | Forest Plantation Development Fund (Amendment), Act 623 |
| 2002 | Forest Protection Amendment Act, Act 624 |
| 2002 | Timber Resources Management Act 617 (Amendment) Act [Amends Act 547 of 1997] |
| 2003 | L.I. 1721 —Timber Resources Management Regulations [Amends L.I. 1649 of 1998] |

Table 3-3: Principal Wildlife Legislation Currently in Force[PLEASE PROV. SOURCE]

| Year | Name of law | Amendments (mainly gazetting PAs and RRs) |
|-------------|--|---|
| 1961 | Wild Animals Preservation Act | |
| 1971 | Wildlife Reserves Regulations: L.I. 710 | 1974, L.I. 881; 1975, L.I. 1022; 1976, L.I. 1085; 1977, L.I. 1105; 1983 L.I. 1283, 1991, L.I. 1525 |
| 1971 | Wildlife Conservation Regulations: L.I. 685 | 1983, L.I. 1284; 1988, L.I. 1357; 1989, L.I. 1452. |

42. **The legal framework for wildlife governance is also dated, reflects the legacy of the colonial administration, and does not fully support current policy.** The Wild Animals Preservation Act of 1961 regulates the use and exploitation of wildlife in Ghana and establishes the Government’s right to establish protected areas. Detailed management organization is provided for in both the Wildlife Reserves Regulations: 1971, L.I. 710, and the Wildlife Conservation Regulations: 1971, L.I. 685. Some of the laws are perceived as being fundamentally unfair, at odds with local values, or impossible to implement. New legislation is currently being drafted with technical assistance from IUCN, which will enable (a) recognition of the common property issues associated with managing the off-reserve wildlife estate, and (b) devolution of authority to an appropriate level for management.

43. **Other gaps in the legal framework must be filled in the short term, for example:** (i) improving the *Forest Plantation Development Fund Act*, which is designed to enable financial assistance for the development of forest plantations, yet does not specify important issues such as the restrictions and obligations of grantees of the fund; (ii) enabling legislation to provide for voluntary establishment of dedicated forests off-reserve; (iii) dealing with timber rights fees when TUCs are not allocated through mechanisms such as conversion; (iv) treating unsolicited bids (e.g., for wild life lodges or facilities); (v) creating a better definition and better processes for implementation of social responsibility agreements (SRAs); and (vi) harmonizing the fiscal incentives and mechanisms for private-sector plantation investments, including treatment of carbon values and other environmental services.

44. **Although the efforts to produce a consolidated law in the 1990s foundered, in the medium term, a comprehensive revision of the law will be needed.** This is unlikely to be an easy job, as it will open up challenges to benefit sharing and other arrangements, and will require a well-managed, consultative process. However, a new law can itself be a signal of the shifts in thinking that are needed, given the limited amount of commercial timber left off reserve.

45. **As with many country's forest laws, the major problem remains capacity to implement.** Solutions to this problem lie in three areas:

(i) "Capacity building and institutional strengthening." In particular, the staff of the FC and WD would benefit from enhanced capacity building. This is the usual response, however, but the lesson from the past is that this will only work well in conjunction with measures that tackle the loss of institutional revenue from rent-seeking behavior. In some activities, such as log tracking, more investment is definitely needed.

(ii) Withdrawal of the state from areas where the private sector is better placed. Plantations remain the obvious opportunity here.

(iii) Further strategic review of the costs of forest regulation. For example, if off-reserve management is transferred to local communities, then the costs of licensing can be cut back.

Institutions

46. **The Ministry of Lands, Forests and Mines (MLEM) has overall sector responsibility, and lead responsibility on policy.** Over the last decade, however, the ministry has exhibited a lack of capacity for evidence-based policy. A range of options have been tried, including: (i) drawing on external projects (such as the DFID-funded FIMP project based in the former FD Planning Branch in Kumasi, 1993-1996); (ii) posting expatriate forest policy advisers within the Ministry; (iii) commissioning policy reports (e.g., the Wood Industry and Log Study); (iv) forming special policy committees (such as that convened by Minister Kasanga); (v) creating policy-funding facilities (e.g., the DFID-funded pilot GLFPSF); (vi) obtaining policy inputs from the Forestry Commission.

47. None of these has proven to be an enduring success, and today's ministry remains relatively weak in both policy analysis and policy-monitoring capacity; moreover, it is overreliant on a few key individuals. Like most ministries, the PPMED function is also not very effective. At times the Ministry's intervention in operational areas (e.g., the HIPC plantations program) threatens to distract its attention from core policy functions.

48. **The Forestry Commission is the principal regulator and implementation agency in the forest and wildlife sectors.** Today's commission was formed by Act 571 of 1999 from the merger of five organizations—the Forestry Department of the Ministry of Lands and Forestry, the Timber Export Development Board, the Forest Products Inspection Bureau and the Department of Game and Wildlife of the Ministry of Lands and Forestry, and the former Forestry Commission. Total staffing in today's FC is 3,733 (as of January 2006) compared to 88 in corporate HQ, and the remainder is split between the three divisions of the FC as follows: the Forest Services Division (FSD), which includes the Resource Management Center at Kumasi, and the Plantation Department, has 2,509 staff in total, the Wildlife Division has a staff of 963 (although a significant "right sizing" exercise is foreseen to rebalance staff numbers from the lowest to professional levels), and the Timber Industry Development Division has a staff of 173 staff.

49. **Cultural differences remain between the divisions, in particular between the Wildlife Division (WD) and the FSD.** WD staff have been suspicious that closer integration will lead to timber

interests being exerted on the commission, leading to commercial exploitation of the Protected Areas (this indeed happened in Bia PA). It has been recommended that the WD undergo restructuring and further human resource development in order to be able to operate more efficiently.

50. **The FC has not decentralized its operations, as was once envisaged in the local government act.** Forest “districts” are not the same as administrative districts, and the FC maintains control over the assets and staff in the district offices. However, some innovations have occurred, including the establishment of Community Forestry Committees (CFCs) and the introduction of Customer Service Officers. Community Forest Committees were established by the Forestry Commission as a mechanism to engage forest fringe communities in local forest management planning, although authority for the forest remains with the FC. While sometimes seen as an appendage of the FC, some CFCs are now becoming local advocates in their own right and are holding the FC more accountable.

51. **Since 2005, the FC’s operational funding in district has been severely constrained by a mix of legal challenges, policy decisions, and campaigns of nonpayment of royalties.** Table 3-4 below shows the agency’s struggle to operate with inadequate funding. Over the years 2003 and 2004, the execution rate of the FC budget came on average to 67 percent. This rate is mainly related to (a) a low collection of IGFs, and (b) limited disbursements of donor aid.¹⁴ It is also noteworthy that the MoFEP retained a share of the revenues accruing from IGFs until 2005, thus further limiting the funding base of the FC. The overall underfunding of the agency has weakened the commission in several key areas: although salaries have been paid, operational funds for districts were almost nonexistent in 2006. This has created a vicious circle, crippling the FC’s ability to regulate logging operations and enforce collection of forestry fees and royalties.

**Table 3-4: Forestry Commission—Budgetary Allocations and Actual Spending
2002-2005 (in millions of US\$)**

| Dept/Agencies | 2002 | | 2003 | | | 2004 | | | 2005 |
|------------------|--------------|----------------------|-------------|-------------|---------------------------|-------------|-------------|---------------------------|--------------|
| | Budget | Release ^a | Budget | Release | Execut. rate (in percent) | Budget | Release | Execut. rate (in percent) | Budget |
| TOTAL | 17.32 | 0.0 | 23.4 | 15.6 | 66.5 | 30.5 | 19.2 | 63.0 | 30.63 |
| CF | 1.775 | 0.0 | 5.26 | 3.65 | 69.3 | 2.66 | 2.64 | 99.2 | 6.92 |
| IGF | 13.37 | 0.0 | 10.6 | 6.97 | 65.6 | 22.2 | 12.77 | 57.4 | 15.74 |
| Donor assistance | 2.185 | 0.0 | 7.54 | 4.97 | 65.9 | 5.60 | 3.80 | 67.9 | 7.97 |

a. Budget data on the implementation of the FC budget could not be provided by the FC.

Source: FC data.

52. **Budget allocations and releases to the FC are subject to high fluctuations of budgetary allocations provided by the CF budget and the IGF.** Allocations have increased by an annual average of 33 percent over the period 2002-2004. The CF and IGFs finance mainly the commission salaries and nonsalary recurrent expenditures (see statistical appendix); the oscillations hamper the commission’s ability to plan and finance its operating expenditures. Stagnation in budgetary allocations between 2004 and 2005 primarily reflects the commission’s difficulty in implementing the timber auction; as a result, the 2005 allocations include a revised, more realistic revenue forecasting.

¹⁴ See also Forestry Commission (2004) Annual Report.

53. The Ministry of Environment and Science was abolished in April 2006, and the environment portfolio now rests with the Ministry of Local Government, Rural Development and Environment. The former MES was seen as a relatively weak ministry, and lacked cabinet status.

54. The Environmental Protection Agency has relatively little engagement on forest, wildlife, or biodiversity issues. The main points of interaction relate to EIAs within forest reserves, and, previously, the intersectoral cooperation groups. Despite the relative importance of the sector, there is little engagement by either the Ministry of Trade or the newer Ministry of Private Sector Development.

55. The 1992 Constitution placed a specific role for Parliament in regard to the regulation of natural resources, by providing for parliamentary ratification of contracts relating to the exploitation of natural resources. Most recently, this authority has been used to ratify Timber Utilization Contracts, which had been subject to replacement. (Objections to these contracts had arisen from civil society, both before and after their ratification.) The Parliamentary Select Committee on Lands and Forestry is relatively well informed on policy matters within government, having received DFID-funded project support.

Table 3-5: Sector Institutions: Indicative Impacts of Policy Execution

| Agency | Impact on policy outcomes | Notes |
|---|---------------------------|--|
| 1. Central Government MDAs (Ministries, Departments, & Agencies) | | |
| Parliament | ●●● | Select Committee is well-informed, ratifies TUCs. |
| MoFEP | ●●● | Involved, because of concerns about revenue losses. |
| Revenue Board | ● | May be agent for stemming revenue losses. |
| CEPS (Customs) | ●● | Collects export taxes from timber. |
| MEST | ○ | Little involvement in the sector. |
| EPA | ○ | Almost invisible in the sector. |
| OASL | ●● | Allocates stool revenues from forests. |
| MLFM | ●●●● | Lead ministry for forest policy; HIPC plantations. |
| Forestry Commission | ●●●●● | Regulatory agency for GoG forest & wildlife policy |
| Police | ●● | Enforcement / Illegal logging task force. |
| NADMO | ● | Reforestation and HIPC plantations. |
| Fire Service | ● | Bush fire control in northern regions |
| Army | ○ | Involved in illegal logging task forces. |
| 2. Local and Customary Government | | |
| National House of Chiefs | ●● | Strong critic of management fees retained by the Forestry Commission. |
| Stools and Skins | ●●● | Hold forest land in custody for people; recipients of forest revenues from OASL. |
| Municipalities | ○ | Virtually no involvement. |
| District Assemblies / MLGRD | ● | Recipients of forest revenues from OASL but otherwise generally passive; District Environmental Management Committees could be strengthened. |
| 3. Private Sector | | |
| Trade Associations (GTMO, GTA, GhaTEX) | ●●●● | Represent factions of the industry. |
| Large integrated processors | ●●●● | Harvest, process, and export timber; might be the future of a sustainable industry. |
| Large millers | ●●●●● | Limited processing—the “old” industry relying on an unsustainable consumption of timber. |
| Local millers | ●●●● | Mainly for domestic use. |
| Local chainsaw loggers | ●●●●● | Profound impact. |
| Commercial farmers | ● | Locally important if plantations (oil palm) & large |

| | | |
|--|------|--|
| Small farmers | ●●●● | farms. |
| Tourism investors | ● | Conversion of forest to agriculture. |
| Nomadic herdsman | ● | Little impact so far. |
| Canoe fishermen | ● | Followers of land use shift— forest to grassland. |
| Hunters | ●●●● | Users of logs for keels of ocean canoes. |
| Chop bar owners | ●●●● | Mainly commercial. |
| Bushmeat traders | ●●●● | End users of bushmeat. |
| NTFP users | ●●●● | Supply users. |
| 4. Civil Society—Policy Think Tanks & Academic Institutions | | Wide range. |
| University of Legon | ● | Few individuals with strong interest in forestry |
| KNUST / CRNR | ● | Limited interest and capacity |
| Univ Cape Coast | ● | Limited interest and capacity |
| ISSER | ● | Broader interest in land rights |
| UDS (Tamale) | ● | Limited interest and capacity |
| CSIR / FORIG | ● | Limited capacity |
| 5. Civil Society—NGOs, CSOs, CBOs | | |
| Forest Watch | ●● | Main coalition on forest advocacy and community rights |
| Internationally-affiliated NGOs (FoE, CARE, CI) | ●● | Active in local services, channeling advocacy work through Forest Watch; some strong differences of approach |
| Internationally-affiliated NGOs (WWF, GW) | ●● | Work with GoG and industry to encourage a legal, sustainable industry |
| National NGOs | ● | Diverse, and varied interest in forest issues. Some strongly influenced by internationally affiliated NGOs |
| Community Forest CBOs | ● | Locally important, but still too few, too weak. CFCs and CREMAs have significant potential however to increase accountability pressure on Government |
| Trade Unions | ● | Concerned over job losses in timber industry |

Impact on realized policy outcomes:

- = very high
- = high
- = medium
- = low
- = none

56. Public finance management and revenue agencies have been closely involved with the forest sector:

- MoFEP has a particular interest in nontax revenues collected by the FC.
- The IRS is responsible for the assessment, collection, and recovery of corporate taxes and PAYE.
- Customs Excises and Preventive Services (CEPS) is in charge of collecting import duties.
- The FC is responsible for collecting stumpage fees, TRFs, SRAs fees, and export levies. The stumpage fees are shared with other stakeholders. The species-specific air-dried lumber export levies are paid into the FC plantation development fund, and the across-the-board 3 percent ad valorem export levy is paid to the Forestry Commission.

Impediments and Incentives for Change

A. Translating Policy into Practice

57. **The 1994 policy is Ghana’s espoused policy. The NRMP program was designed to assist the government to deliver on those policy goals. Translating the policy into practice has been very different.** The main areas of difficulty outlined in this section include:

- Underestimation of the power of patronage-based and vested interests.
- The scale of reforms.
- The fact that centralized control systems over localized resources haven’t worked.
- Lack of knowledge and transparency over the state of the forests.
- Institutional role confusion.

B. Governance Issues

58. **Designers of forest sector reforms over the last two decades—both from within government and within DPs—have consistently underestimated the degree of governance problems in the sector.** This underpins all other areas of difficulty.

59. **It is important to recognize the special governance challenges that resource sectors pose, because of the value of the resource itself.** If appreciation of the political economy of reform is needed anywhere, it is in the natural resource sectors. The phenomena of the “resource curse” and the “rentier state” are widely recognized at a macroeconomic level, but these play out in the day-to-day institutional economics of ENRM sectors. As long as the timber industry is able to avoid or delay payments of forest royalties and taxes, it has large incentives to: (i) maximize short-term returns and capture available timber rents, (ii) avoid taxes, (iii) attempt regulatory capture of the principal regulator, the Forestry Commission, both at the center (the FC Board, senior officers in corporate headquarters and FSD) and in the districts (district and regional managers, field staff), as well as other influencers, and (iv) influence legislators and policy makers at all levels.

60. **Although the ERP enabled economic recovery, it contained the seeds of a major governance challenge, unrecognized at the time.** The soft loans available for the industry introduced graft and corruption on a new level, which was widely reported at the time. Expansion of processing capacity was encouraged, but without any thought as to exit mechanisms. Since then the industry has lobbied hard and consistently to keep the input (log) prices low, so as to continue to operate mills. Purchase of illegal timber (including timber taken from timber use permits [TUPs]) is one mechanism to avoid forest taxes. Other industry-led campaigns to avoid timber charges include:

- Delayed or nonindexed stumpage rates. During years of high inflation, this delivered high windfall gains to the industry. At their lowest, stumpage rates fell to US\$3 in 2002—less than 3 percent of average export values.
- Nonpayment of interest on arrears of stumpage, and outstanding debts.
- Challenges to the legality of export levies and, most recently, TRF.

61. Industry actors have also used court-based injunctions to prevent or delay payment, and registered new companies when existing firms became blacklisted for debts. Another sign of avoidance is the registration of new property marks at the same time as the timber resource is dwindling.

62. **The neopatrimonial nature of public sector and public-private relationships is recognized, well known, and well-documented** (see, e.g., Levy 2004). In Ghana, Booth et al. (2005) describe “an enduring neopatrimonialism of a peculiar Ghanaian sort in which ‘horizontal’ interest groups are subordinated to ‘vertical’ patronage relationships. This weakens issue-based pressures and the demand for improved performance.”

C. The Scale of Reforms

63. **Administrators of the 1994 government were engaged simultaneously on policy reform, new legislation, design of new processes, major institutional reform (the creation of the new Forestry Commission), and tackling issues such as mining in forest areas.** Although the government was then able to identify the best areas and packages of TUCs, reform overload led to (i) the inability, in the face of concerted industry opposition, to introduce subsidiary legislative instruments for enabling competitive bidding, (ii) failure to convert concessions and leases into the new TUCs within the six months specified in the new laws, leading to a situation where all logging was illegal, (iii) too little attention to dealing with the overcapacity of the industry, whether encouraging adjustment (decommissioning of inefficient mills) or investment (e.g., in tertiary processing, and improved milling efficiency), and (iv) insufficient capacity to address other key aspects of policy and legislative consolidation.

64. The NRMP Implementation Completion Report noted:

Project design failed to identify as a risk, that it would be very difficult to complete the myriad of policy reforms in a complex sector such as Forestry in 2 years. Thus, the project was overly ambitious given the number of activities in each sub-component, the number of co-financiers and the weak human capacity at the MLF (World Bank 2003).

65. **The partial completion of reforms had unintended consequences.** It encouraged individual operators to accelerate the harvesting of assets (through TUPs) and compete with other timber operators in a “race to exploit” remaining forest reserves before competitive bidding was introduced. This resulted in a further increase in the milling capacity after 1994, as well as collusion between operators and those who could grant access to timber. Administrative allocation of resources persisted after the introduction of the Timber Resources Management Act of 1997. Ineffective regulation of off-reserve timber exploitation was facilitated by several factors. One was the lack of community benefit from legitimate timber logging. Another factor was the temporary policy of chainsaw permits being regulated by cash-strapped District Assemblies. Still another was industry noncompliance with directives that 20 percent of timber milled should be available on local markets. In addition were the complaints by farmers of lack of compensation from crop damage arising from loggers entering their farmland to fell and haul logs. Farmers came to view trees on their farms as a nuisance rather than a useful part of a diversified farming system, and preferred to see trees felled illegally but with at least some compensation to themselves.

D. Overcentralization of Management Functions

66. **No consistent attempt has been made to devolve and decentralize responsibility for timber harvesting to local levels.** If there had been, some of the costs of regulation of the off-reserve areas might have been handled, as might the social problems of chainsaw logging. The center tries, but fails, to implement control. Examples follow:

- The Forest Sector Division attempts to control small-scale logging for use by communities by introducing small-scale permits — TUPs — for timber destined for community use. Yet in 2006, large logging companies were publicly admitting that up to 25 percent of their logs came from TUPs. The fact that licenses are given to small loggers, not communities, helped create the chainsaw “menace” that the neither the FC nor local communities seem able to control.

- The Wildlife Division attempts to manage a US\$200 million trade in bushmeat by issuing licenses. In practice, licensing is sporadic: for example, in the first six months of 1999, only 110 hunting licenses were issued (Symons 2000).

67. **The Ghana system for involving communities in wildlife management (the Community Resource Management Area, CREMA) goes further than any other system in Africa in devolving both the authority and responsibility for wildlife to the level of the individual farmer.** The importance of this approach has gone largely unnoticed despite its implications for off-reserve wildlife management as an extra-farm resource in high forest, transition, and savanna areas. The WD's CRMU, which has been instrumental in driving this reform, remains underresourced, however, perhaps a reflection of the difficulties involved in funding processes and programs rather than projects.

68. **The CREMA approach recognizes that the failure of modern government systems to incorporate common property regimes has often resulted in the institutional appropriation of forest resource values.** Therefore, forest-dependent communities are not poor because they depend on the forest resources; neither do they depend on forest resources because they are poor. They are poor because successive policies have denied them the option of using these resources for their livelihood. The situation then becomes one where high-value forest resources (timber, bushmeat, live animal sales, NTFPs, intellectual property, and possible future use values) are replaced by low-value conventional agricultural crops over which they have legal ownership.

Box 3-5: Does Community Management Work in Ghana?

Evidence from other countries shows that community management of forests and wildlife can work. In Namibia, wildlife numbers in community-managed reserves increased 30 fold (Williamson 2003); in Zimbabwe, the CAMPFIRE program of devolution of wildlife management to the district is now generally adjudged to be a success.

Genuine CBNRM has hardly been tried in Ghana. However, the evidence is that—given the chance—CBNRM can work in Ghana too:

the health of sacred groves throughout the country amply demonstrates that communities can exercise control over access to the forest and also support conservation efforts (Campbell 2005).

The Assin Fosu DF established in the mid-1990s remains in much better health than nearby reserves managed by the FC. Forest quality has improved, there is regular boundary maintenance, and illegal farming within the DF has stopped.

The Amokwaw CREMA—although only established in 2003—shows that the expected behavior change is emerging: clearing of lands within the CREMA for agriculture has decreased; poaching within the CREMA and the adjacent area of Ankasa PA has decreased; and less conflict exists between the WD managers of the PA and the community (Murphree 2005).

However, chiefs and NGOs have said that the more appropriate question is, “Does State Management Work?” The extensive degradation of forest reserves, and the increasing pace of degradation in the last decade, both challenge the assumption that central control can continue to work.

E. Knowledge and Transparency

69. **Although the problems are well-known to “insiders” within the sector, there is little public debate on the state of the forest sector:**

- The *supply* of information is poor, and asymmetric. The FC produces no annual reports monitoring the state of forests, or the loss of biodiversity. The FC website is bereft of information on the state of the resource, and publications and reports from the RMSC are difficult to come by. GIS and satellite imaging tools are not used to their full potential, when they could be used to survey and monitor forest reserve boundaries, for instance. The most plentiful and widely published data available are those on timber trade statistics, itself a reflection of priorities.

- However, the *demand* for better information—and performance—is also poor. Until recently, Parliament has not demanded that the MLFM comply with its legal obligations to table annual reports and accounts of the FC before Parliament. MoFEP has been reluctant to include tough triggers on forest *revenue* collection within its MDBS negotiations. For its part, civil society has been relatively weak; only in the last three years have coalitions of NGOs come together to demand better performance from the FC.

70. **The Ministry and the Forestry Commission could still become more transparent.** For instance, there is too little monitoring information available on the state of the forests in Ghana. In one case, the commission removed documents from the FC website that showed the rapid degradation of forest reserves in recent years. Furthermore, resource allocation processes are not fully transparent. The board of the commission and the TREC make critical—and sometimes controversial—decisions on the allocation of public resources, but the minutes of those meetings are not made public. There also do not exist measures to prevent personal conflicts of interest. For example, officers and board members should be asked to disclose potential conflicts of interest, to avoid circumstances where they or their family members undertake transactions with the FC (e.g., supplying of tools, tires, etc., or bidding on TUCs). A possible remedy would be to make the lists of concession and TUC holders public (even the terms of the concession). Another possible option to increased transparency would be to publicly list firms in default of payment or without a property mark (without a valid property mark, a contractor cannot operate a concession—reserve or off reserve). Property marks have to be renewed every six months at a fee of 400,000 cedis (about US\$ 44.4) per renewal. Although intended as a check to prevent the late payment of royalties and other fees, the number of property marks has increased recently to more than 1,000. FC officials believe that this is not happening because new entrants are chasing a dwindling timber resource, but because contractors are using them as a means to avoid payment yet still continue to extract timber.

71. **Nonetheless, there have again been positive changes, where the GoG has taken important steps to improve the monitoring and transparency in the forest sector.** The FC has introduced a measure to enhance the transparency in the disbursement of forest proceeds, namely, the quarterly (or half-yearly) publication of the disbursement of stumpage fees, published by the OASL and FC since 2003. The reports are printed and also placed on the FC website. There are cases where this has empowered communities to hold the stools and traditional authorities more accountable for the use of the transferred funds. Furthermore, MoFEP has instituted quarterly budget reviews beginning with the 2006 budget implementation to allow for monitoring and evaluation of projections and budget outcomes

72. **Past program support has paid too little attention to strengthening checks and balances in the natural resource sectors, including the roles for Parliament, civil society, and the boards of the natural resource commissions.** Given the inherent potential for rent-seeking behavior, it is particularly important that forestry and other extractive industries have institutional checks and balances. Only recently has this received attention, but on too limited a scale. The Parliamentary Select Committee on Lands and Forestry was supported by DFID (however, the engagement of Parliament was critical to the passage of competitive bidding legislation, reported to be the first time that a forestry motion was passed unanimously in Parliament). Civil society is emerging as a potential advocate for better accountability and transparency in the sector. The boards of all the natural resource commissions have considerable influence—good and bad—on the successful outcome of policies, but have been largely ignored. (This reflects a wider problem with public sector corporate governance in Ghana, which has been neglected both at sector level and in public sector reforms.) Support for all these areas must be broadened and sustained.

Box 3-6: Public Sector Corporate Governance in Ghana

Evidence abounds of poor corporate governance in Ghana. A review by Transparency International (TI), which concluded that there had been very little substantial change in anticorruption arrangements since 2000, also noted that corporate public governance remained a challenge: “There has also been a failure to devise and promulgate a credible code of conduct for public officials, to reform and improve the weak public official asset declaration regulations. Corporate governance and conflict of interest avoidance rules have also been neglected, which means that Ghana is pursuing anti-corruption without vital preventive components. Under present regulations, public office holder assets are infrequently declared once every four years, they are declared behind closed doors, they are not ordinarily accessible to the public, and they are lodged with agencies that are not adequately independent of the executive branch. Thus, the declarations fail the essential tests of ease of verifiability and monitoring.”

Source: Gyimah-Boadi 2004, p. 20.

F. Institutional Overlaps and Constraints

73. The relative roles of the Ministry, the Board of the Forestry Commission, and the Forestry Commission managers are not well defined in the Forestry Commission Act. There have been attempts to resolve ambiguities, and even a workshop leading to a signed tripartite memorandum of understanding. As a result there is competition between the FC and the board regarding policy matters; the Ministry engages in operations (e.g., HIPC plantations), and the Board itself meets frequently and becomes too involved in FC day-to-day management and operational decision-making.

74. In addition to being a regulator, the FC is a manager of state-owned forest assets, and collector of forest taxes; the inherent conflicts of interest generated by these multiple roles are also not recognized in the law that sets up the FC. Although many mills were privatized, the GoG still retains ownership of three mills albeit it unclearly: they fall under the tutelage of the FC, although they do not appear in the FC accounts. Large areas of teak, cedrella, and gmelina plantations created in the Busia years remain under direct management by the FC. Proposals in the mid-1990s to privatize or commercialize those plantations foundered upon concerns over low valuations, and after opposition from FD and ministry managers over the loss of assets. The sales of standing timber from these plantations are proving to be an important source of income for the FC in 2006 because of the collapse of normal revenue collection. Plantations directly established in 2003-2004 by the MLF, using HIPC funds, have also been transferred to the FC.

75. When Act 571 established the FC as a “corporate body” and enjoined it to operate in a more business-like manner, some came to believe that the commission should operate like a business. As a result, there has been no serious questioning of the FC’s role with respect to plantations; the commission is seen as being required to be in the plantation business in order to make money for itself. One symptom of this ethos: the FC’s website address announces to the world that the FC is a dot.com (the convention for profit-making companies) rather than a dot.org (the commonly used address for independent organizations).

76. Significant problems also exist in the ability of the GoG to deliver on program goals. For instance, the MDAs suffer from poor morale and low capabilities, in part attributable to the structure of the civil service. Salaries are low, benefits are not monetized, and (senior) staff rely on project allowances and top-ups. These structural problems are being tackled, but the political difficulty of reform means that the GoG can only move at a limited pace. There exists an inability — or reluctance — to hire good people within the public service. Senior-level financial staff are a key requirement, and a good example. The FC openly recruited for a finance director, found good candidates, but in the end was unwilling to pay commercial salaries (which would have been more than the salary of the chief executive). As a result, the FC’s financial capability is hobbled. Furthermore, the MDAs have weak financial management and

procurement skills. The skills of current staff are often overestimated, and the situation has not been helped by the legacy of past projects where consultants have performed these jobs. As a result, there are whole cadres of senior and middle management who lack practical experience in writing ToRs, tendering, and managing consultants, lawyers, and other service providers. In addition, progress has been disrupted when key “reformist” individuals within the forestry and wildlife sector have been lost through transfer, removal from office, or death. In the last decade, at least six such instances have occurred. Finally, there has been the problem of adoption of overly technocratic, consultant, or donor-led interventions, which have lacked political support. Such programs have not worked in Ghana (World Bank 2005).

G. Public Expenditures Review

77. **In preparing the public expenditure analysis within this CEA, we have found significant constraints to effective management and monitoring of public finances within the sector.** Neither the FC headquarters nor the MLFM nor MoFEP has a complete picture, and estimates conflict.

78. **Financial information captured by the FC is incomplete.** In particular, funds from some DP projects have continued to be channeled through separate accounts managed by project accountants, resulting in “enclave accounting” for those projects. FC finance staff have had difficulty obtaining complete and regular updates. Some staff on the payroll (notably those who were former civil service department staff) still have their personal emoluments directly paid.

79. **Budget information is inconsistent.** A comprehensive analysis of past public expenditure trends in the forestry and wildlife sector is difficult because the fragmented budget has created multiple data sources. The result is both inconsistency in and unreliability of data on executed expenditures.¹⁵ For example, budget information derived from the MLFM and the MoFEP is inconsistent. According to the MoFEP (Government of Ghana 2005a) the budget envelope for the MLFM amounts to 415 billion cedis (excluding HIPC assistance), or approximately US\$ 46 million. In contrast, the MLFM reports an allocated budget of 546 billion cedis (without HIPC assistance) in 2005, or US\$ 60.6 million. Information on past budget performance made available by the MLFM is often not complete, in particular regarding earlier years (2000-2003). The MoFEP also does not seem to fully capture all information about IGFs and external financing, especially grants and other expenditures made directly available to the sector.¹⁶

80. **The mix of revenues in the sector is relatively complex, a fact that MoFEP has not always understood well.** Over the last year, however, the Non-Tax Revenue Unit has become much more engaged, including participation in the Steering Committee of the Public Financial Management team in the FC (which is overseeing the roll-out of a decentralized financial management system).

81. **MoFEP’s data reconciliation at the level of the MLFM is problematic.** The ministry includes 11 departments involved in the land, forestry, and mining sector. Recently, the three mining agencies have been included following a merger with the Ministry of Mines in 2005. The Finance Department has struggled to collect and consolidate available budget data (allocation and execution data, recurrent and capital, by financing source for the period 2000-2005) across all departments. Most of the data collection for the CEA exercise has been manual; the MLFM does not have a comprehensive computerized database

¹⁵ Different sources finance the budget of the MLFM, namely, the consolidated fund (CF), the IGF, HIPC funds, and donor assistance.

¹⁶ Prior to 2005, the MOFEP either did not capture or only partially captured expenditures funded through the IGFs, statutory funds, and donor aid. Information on the amount of IGFs collected, retained, and lodged by the sector ministries is documented by the recently created Non-Tax Revenue Unit at the MOFEP since 2002. However, prior to 2005, no information was published on the utilization of the retained IGFs at the sector ministry level or in Ghana’s Appropriation Act. Likewise, donor assistance has been reported in the Appropriation Act (by economic classification) only since 2004.

system comprising the Ministry's budget planning and implementation (including the CF, HIPC funds, IGFs, and donor assistance and accessible by all the departments).

82. **Multiple processes drive the information flow between the sector agencies. Ad hoc reports, often extracted by hand from computerized data, confuse the situation.** As a result, confidence in the financial information between the agencies is at a low level. In part, this will contribute to low budget execution, although Killick (2005) reported deviations between budget estimates and actual spending of 42 percent and 68 percent in the ministries of Education and Health, respectively.

83. **Most of the MLFM budget — 40 percent in 2005—is met by donor aid.** 19 percent of the MLFM budget is financed by the CF, 29 percent by the IGF, 12 percent by HIPC resources. The Forestry Commission, as the main executing agency in charge of the forestry and wildlife budget, accounted for 37 percent of the total MLFM budget in 2005. As Table 3-6 below shows: (a) the execution rate of the MLFM budget is very low (56 percent) in 2004; (b) the poor performance can be mainly attributed to the low implementation of donor aid (around 40 percent); (c) execution of the CF and HIPC is also below the national average in 2004; and (d) total budgetary allocations to the MLFM have declined by nearly 8 percent between 2004 and 2005. In particular, a revised downward projection in the collection of IGFs (by 22 percent between 2004 and 2005) has contributed significantly to the drop in total budgetary allocations. This stems from the FC projections that have struggled to implement the competitive bidding for the allocations of timber rights since 2004.

Table 3-6: Funding of the MLFM Budget by Sources of Funding, 2004 and 2005 (in millions of US\$)

| | 2004 | | | 2005 | | 2004/05 |
|--------------|-------------|-------------|--------------------------------|-------------|-------------------------------------|-----------------------------|
| | Budget | Release | Execution rate (in percent) | Budget | Share of the budget (in percent) | Growth rate (in percent) |
| Total | 74.4 | 41.3 | 55.6 | 68.8 | <i>100.0</i> | <i>-7.5</i> |
| CF | 10.7 | 7.84 | 73.0 | 12.9 | 18.7 | 19.9 |
| IGF | 25.6 | 15.1 | 59.0 | 19.9 | 28.9 | -22.4 |
| HIPC | 9.89 | 7.26 | 73.3 | 8.32 | 12.1 | -15.9 |
| Donor | 28.12 | 11.11 | 39.5 | 27.75 | 40.3 | -1.3 |

Source: MLFM data.

84. **The fragmentation of the budget complicates MoFEP's financial oversight.** More than 80 percent of the MLFM budget is financed from funds that have formed only part of the regular budget process over the past years. This level of budget fragmentation complicates budget planning and increases transaction cost (e.g., related to the involvement of multiple agencies) and operational inefficiencies (e.g., because of limited adjustment of the budget related to the ring-fencing nature of donor- and IGF-financed projects, or because of donor funding modalities). Efforts have been made since 2004 to improve the budget unity and transparency, including requirements that (a) sector ministries (as per the Financial Administration Act) remit profits to the budget and disclose their IGFs by economic classification in the 2005 budget; (b) sector ministries report on the allocation of HIPC resources in the 2006 budget; and (c) the 2005 budget statement includes — for the first time — the disbursement of donor programs by loan and grant.

85. **The programming and expenditure framework embedded in the GPRS I and II adds a further level of complexity and is not aligned with the budget.** The GPRS I (2003-2005) and II (2006-2009) seek to provide the broad programming and expenditure framework for the forestry sector in line with government's national development agenda. The GPRS I expenditure framework falls short in its alignment with the MLFM budget. The GPRS II costing is also not yet aligned with the priority

interventions identified for the forestry sector in the strategy document. Both GPRS I and II are being implemented through investment programs financed largely by donor assistance.

86. **The role of HIPC funds is controversial.**¹⁷ In the context of the GPRS I, Ghana's commitment in the forestry and wildlife sector focuses on re-afforestation. Hence, government decided to use a share of the resources released by the debt relief to boost the funding of its Forest Plantation Program in 2003.¹⁸ The Forest Plantation Program was created in 2002 through a President's Special Initiative. Between 2003 and 2004, the MLFM benefited on average from 5 percent of total HIPC funds. The objectives of the program are to plant trees in degraded forest areas and to create employment for depressed rural and urban communities.

Table 3-7: Contribution of HIPC Resources to the MLFM Re-afforestation Program, 2003-2005

| | 2003 | | 2004 | | 2005 | |
|--|---------|--------|---------|--------|---------|--------|
| | Planned | Actual | Planned | Actual | Planned | Actual |
| HIPC funds allocated to re-afforestation program (in millions of US\$) | 3.77 | 4.63 | 9.89 | 7.25 | 8.32 | 6.47 |
| HIPC funds (as a share of total MLFM budget ^a) | | | 13.3 | 17.6 | 12.1 | |
| HIPC funds allocated to re-afforestation/plantation program (as a share of total HIPC funds, in percent) | 6.3% | 6.0% | 7.4% | 4.0% | 4.7% | 5.0% |
| Memo | | | | | | |
| Total HIPC resources (in millions of US\$) | 60.33 | 76.81 | 133.73 | 180.71 | 176.85 | 128.56 |
| Execution rate of total HIPC resources (in percentage) | | 127.3 | | 135.1 | | 72.7 |

a. Including CF, IGF, HIPC, and donor assistance.

Source: Data from MoFEP, MLFM.

87. **In 2002, the FC was initially assigned to implement 30 billion cedis (US\$ 3.3 million) out of the total 53 billion cedis (US\$ 5.9 million) Forest Plantation Program. Since 2003, HIPC resources have financed the program, and the program administration was brought back to the MLFM and put under the direct supervision of the minister.** The FC was seen as too weak by the ministry to obtain tangible results. Since then, the program has created some controversy. Over the past years, it has focused more on the creation of employment opportunities, notably in urban areas, than on the initial objective of re-afforestation. In addition, the program paid higher salaries, which crowded out other efforts by the FC to promote private sector initiatives on plantation. Recently the ministry began to acknowledge that it should focus on its core function of policy-making, regulation, and supervision, and it is in the process of transferring the program to the FC in 2006.

88. **Over the past two decades, several studies have shown that stumpage fees have only captured a small percentage of the economic rent from forestry.**¹⁹ Setting stumpage fees²⁰ is not based

¹⁷ Ghana reached the Decision Point under the Enhanced HIPC Initiative in 2002 and the completion point in 2004.

¹⁸ For Ghana, joining the HIPC Initiative implied that roughly US\$2,186 million in NPV terms in debt relief would be released over a period of 20 years. Using 20 percent of debt relief for reducing its domestic debt, the country has been able to reduce its annual average debt repayment from US\$392 million to US\$149 per annum.

¹⁹ Between 1992 and 1997, the stumpage rates halved in constant cedi terms, whereas the nominal rate for timber tree species doubled over the same period. According to a study conducted in 2001, it was estimated that the

on market prices; it is set administratively by the Forestry legislation (last determined by the Timber Resource Management Act in 1998). A recent study (Birikorang and Rhein, 2004) on the forest charges concluded that the residual forest tax that remains chargeable to the timber industry amounts to US\$10.5 million (Birikorang and Rhein 2005). The government's failure to update stumpage rates is rooted in Ghana's political economy. Because of increasing pressure from the donor community, the FC committed itself to ensure quarterly adjustment and application of stumpage fees in accordance with FOB prices and currency changes. In 2004, the stumpage fee was revised from a low of 2.5 percent FOB in 2003 to 7.0 percent FOB in 2004.

89. **Although the government is unambiguously committed to competitive allocation of timber resources through market mechanisms, only 4 percent (1,400 km²) of the existing timber rights have been allocated competitively and pay the legally prescribed fees.** Concessions allocated by administrative mechanisms, which account for about 50 percent (approximately 18,000 km²) of production forests, have not been converted to TUCs, as prescribed by the law, and do not pay the fees set out by the legislation. Discretionary allocated Salvage Permits (SPs) and TUPs in off-reserves, which account for 40 percent (14,000 km²) of production forests, operate largely outside of the legal framework.

90. **The FC's role as a fee collector in the sector has been severely curtailed as a result of its own weak capacity, corrupt behavior by the timber operators, and illegal logging by farmers and chainsaw operators.** According to an internal FC report: (a) more than 50 percent of the projected stumpage revenues between 2000 and 2003 were not invoiced because of illegal harvesting; (b) in 2003, the average invoiced stumpage rate was only US\$2.9/m³ compared with the approved average stumpage rate of US\$7.5/m³; (c) about 10 percent of the invoiced stumpage is not collected; and (d) about 30 percent of the export levy is not collected (Government of Ghana 2005b). The main agency within the FC in charge of collecting the stumpage fees is the FSD. While low collection can be partially attributed to limited staff and resources at the FSD, further evidence suggest that in some cases the FC staff were open to fraud (e.g., false measurement, improper supervision, etc.) for monetary gain.

91. **The governance challenges that underpin the sectors problems (and are described at the start of this section) ultimately lead to a vicious circle:** the potential for rent in high-value timber attracts bad governance, which—exacerbated by a range of institutional defects—leads to loss of revenues to the state. This in turn cripples the sector regulator, and prevents the state from exercising the control function needed to extract the potential rent from the sector.

92. **Reversing any vicious circle takes time.** However, small, but significant, successes in the sector demonstrate that a sustained effort—on a range of fronts—can deliver the policy reforms espoused in the 1994 policy. The next section sets out recommendations and a comprehensive road map of actions.

H. Forestry and Wildlife in the GPRS

93. **The first two Growth and Poverty Reduction Strategies in Ghana have focused little on correcting the causes of environmental damage, and both had different approaches.** The first Ghana Poverty Reduction Strategy (GPRS I) focused on poverty reduction and a pro-poor agenda. The second, GPRS II, places more emphasis on growth-inducing policies and programs as a means to wealth creation and poverty reduction.

Forestry Commission could have lost about US\$6 million in revenue over the respective period (Birikorang 2001). Another study concluded that the government's failure to revise stumpage rates reduced the collected revenues by one third compared with what could have been collected in 2000/2001 (Rhein 2002). The use of both the cedi and dollar amount should be standardized for all monetary citations,

²⁰ Stumpage value represents the value of standing timber after all production costs have been deducted. It is also the maximum amount, in a competitive market, that a timber utilization contract (TUC) holder will be willing to pay for harvesting a tree or stand (Birikorang and Rhein 2005).

94. **The forestry and wildlife sector is not well recognized in GPRS II as one capable of supporting growth.** Rather it appears in the context of improving the business and investment environment for agriculture-led growth and in particular “modernized agriculture” (where it appears as a subheading under the *Restoration of degraded environments*).

95. **The analysis in the GPRS II does not fully address the underlying causes of environmental degradation.** It identifies environmental degradation as a major impediment to increased productivity and sustainable agriculture, identifying its root cause as “traditional farming systems.” The text contains little explicit recognition of the informal nature of much rural economic activity. For example, the bushmeat trade, reliably valued at up to US\$200 300 million per annum which is of a dispersed nature and has effectively contributed to rural—particularly poor rural—livelihoods, goes unmentioned.

Box 3-7: Forestry, Wildlife, and GPRS II: Contrasting Messages

A review of the environmental dimensions of the first GPRS showed the existence of highly contrasting messages, and a dichotomy of interests: “[W]hile the GPRS addresses forestry as an environmental issue, mining as a means of increasing foreign revenue and land reform as the conversion of plural systems of land ‘ownership’ into commercial interests, it retains the overall ‘structure’ of the system and keeps political and powerful interests compartmentalized.” By viewing the environment through a conventional and sectoral approach, “the types of narratives that are included...act to limit the scope for the interpretation of environmental problems and the possibilities of change” (Gadzekpo and Waldman 2005).

In the GPRS II—and wider GoG policy—similar conflicting message remain unexplored, for example:

Concentrating on the modernization growth agenda, at the risk of excluding rural populations. Growth must lead economic development, but the level at which rural people can engage in the development process is critical to lifting them out of poverty. Studies at the local level have shown that policy in practice has disenfranchised rural people, sometimes demonizing them and their activities, which, in reality, are often a rational response to externally imposed constraints. The GPRS II attribution that “traditional farming” is the cause of environmental degradation is mirrored in the common statements about the “menaces” of chainsaw logging, Fulani herdsmen, galamsey miners, or bushmeat hunting.

Addressing environmental symptoms rather than underlying causes, example:

- Investing in plantations in degraded forest reserves, without tackling the institutional and policy factors that led to the loss of forest in the first place (underpricing of timber, poor governance, reluctance to devolve authority for forest management).
- Seeking alternative livelihoods (e.g., bee-keeping) rather than developing the potential of existing markets (e.g., bushmeat from off-reserves, which appears to be sustainable from fast-reproducing species in the off-reserve areas).

Focusing on spending to mitigate environmental degradation, rather than capturing new values from forests. The latter requires policy effort and innovation to incorporate in planning, or capture locally, external ecosystem function values (water catchment, climate amelioration, carbon sequestration, biodiversity, future use values, access to genetic resources, and intellectual property rights).

96. **There is a risk that GPRS II focuses GoG spending on program activities rather than on the creation of an enabling policy environment.** Because the GPRS II costing under the focus area restoration of degraded environment and NRM has a different classification of priority interventions (see **Table 3.8 below**), assessing the level of funding forecast to support the implementation of the forestry program is not possible. The misalignment between the costing and the forestry programs also hinders the monitoring and evaluation of the funding and implementation of the priority interventions, and raises questions about the usefulness of the GPRS costing.

Table 3-8: GPRS Costing of the Focus Area Restoration of Degraded Environment and NRM, 2006-2009
(in millions of U.S.\$)

| Goal | 2006 | 2007 | 2008 | 2009 | Total |
|--|-------------|-------------|-------------|-------------|--------------|
| Ensure the restoration of degraded natural resources | 33.5 | 33.5 | 21.5 | 19.3 | 107.9 |
| Promote sustainable natural resource management | 3.9 | 3.9 | 3.9 | 3.5 | 15.2 |
| Build the requisite institutions and strengthen the regulatory framework to ensure sustainable natural resource management | 7.1 | 7.1 | 6.5 | 5.9 | 26.6 |
| Build regional and global linkages toward the management of natural resource management | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Restoration of degraded environment and natural resource management | 44.6 | 44.6 | 31.9 | 28.7 | 149.8 |
| Memo | | | | | |
| Private sector competitiveness | 751.8 | 764.8 | 704.4 | 633.9 | 2,854.9 |
| <i>Restoration of degraded environment and natural resource management as a share of private sector competitiveness</i> | <i>5.9</i> | <i>5.8</i> | <i>4.5</i> | <i>4.5</i> | <i>5.2</i> |
| Grand total | 2,066.4 | 2,083.2 | 2,039.5 | 1,874.0 | 8,063.1 |
| <i>Restoration of degraded environment and natural resource management as a share of grand total</i> | <i>2.2</i> | <i>2.1</i> | <i>1.6</i> | <i>1.5</i> | <i>1.9</i> |

Source: GoG 2005d (GPRS II).

97. **Priority interventions in the forestry sector are centered around the following measures:** (a) to encourage reforestation of degraded forest and off-reserve areas, (b) to promote the development and use of alternative wood products as well as plantation/woodlot development among communities, (c) to manage and enhance Ghana's land and permanent estate of forest and wildlife protected areas, the efficiency of which will depend on increased capacity of the FC and WD, (d) to ensure that every socioeconomic activity is consistent with sound land management practices, and (e) to develop a sustainable strategy for forest and wildlife to support ecotourism (perhaps through public-private partnerships) and generate foreign exchange.

Key Findings and Recommendations

98. *Promote plantation development.* Plantation activities have recently been harmonized, and the anomaly of ministry involvement in operational plantation afforestation through HIPC funding has now ended. An immediate need exists to confirm and clarify the rights of participants in the recent plantation programs, and work toward creating an enabling environment for commercial and small-scale private sector investment in forests.

99. *Restructure the timber industry.* The policy goal of promoting tertiary and added-value processing is not being achieved. Players in the industry are undertaking concerted lobbying efforts to capture GoG policy-making in order to reduce their payment of forest taxes; the specter of job losses is still being used as a rationale to delay change. Industry itself needs to be encouraged to put forward proposals to deal with the overcapacity in the industry relative to a “dwindling” resource and the limited investment in added-value processing.

100. *Provide sustainable financing.* High priority should be given to an agreed financial arrangement—ideally a MoU between MoFEP, MLFM, and FC—that provides secure, predictable and sustainable financing for the operations of all divisions of the Forestry Commission. This arrangement must include provision for the costs of strengthened wildlife PA management.

More Detailed Recommendations

A. Forests and Wildlife Can Contribute More to Growth

101. Although depleted, the remaining forest and wildlife assets represent important opportunities for the GoG to: (i) increase value addition in the timber-processing industry, and create jobs with manufacturing skills—not just commodity product skills (an opportunity largely squandered to date); (ii) increase rural employment and livelihoods through local management of off-reserve forests, through mechanisms such as dedicated forests or CREMAs, and through more aggressive NTFP development and marketing; (iii) support investments in plantation timber, in eco-tourism, and wildlife facilities (though the government needs to improve at managing FDI in a transparent way); (iv) capture economic and financial rents now held by industry, thereby ensuring both an effective regulator and a broader tax base; and, in the future; and (v) capture new ecosystems values, including carbon values.

102. If these changes can be realized, they will provide an opportunity for:

- *Demonstrating that Ghana can escape from the commodity trap.* The GPRS II’s espoused policy is to encourage value-added agricultural processing. So far, this same policy has failed in the timber subsector, where the raw input (timber) was available in abundance. Policy now in practice in Ghana does not do enough to encourage a shift from investment in “extraction” to investment in “value-adding.”
- *Providing a buffer as the economy restructures.* The Ghanaian economy is moving from primary and extractive industries (agriculture, timber, mining) to agro-processing, manufacturing, and services. This will require a change to a new level of human capital. Timber processing could, and should, contribute to this change, given the size of the industry workforce. However, the perverse incentives that continue to favor low value-added timber processing do little to shift the workforce from cheap low-skilled labor, to semiskilled and semiprofessional. Today’s timber policies are therefore squandering the very assets that can be used to build manufacturing skills, tomorrow’s jobs, and decent work for the future.
- *Broadening the tax base, by having MoFEP wrest control of timber rent from the industry.* MoFEP budget projections assume that timber revenues will rise by 6 percent per year. This is an unrealistic assumption given a rapidly diminishing resource base, although more plantation-grown timber is now starting to become available. Moreover, MLFM and MoFEP policies in practice do not always help. Timber processors avoid tax within export-processing zones, the FC is prevented from collecting unpaid debts, and no agreed memorandum of understanding (MoU) exists on the financing framework for funding the work of the FC as regulator and manager of forest and wildlife resources.
- *Encouraging Ghanaian enterprise and investment.* The greatest opportunity is to provide an enabling environment for rural microenterprise, and better, more diversified incomes for small

farmers to invest and better manage forest resources on a small-scale. In addition, Ghanaian participation in eco-tourism and similar projects – in particular, through public-private partnerships for ecotourism development – can develop national commercial skills in specialist and high-value tourism management. While foreign direct investment (FDI) is essential for the largest projects, FDI without tangible domestic investment is politically fragile. However, an investment climate for all firms must strike a balance between the needs of enterprises and the wider needs of society (see Box 3-8)

Box 3-8: Regulating Private Investment—The Underlying Governance Challenge

In applying its policy of business and private sector-led economic growth, the GoG must deal with a basic tension, well described in the World Bank’s 2005 *WDR* on investment:

“Firms are the primary creators of wealth, and a good investment climate must respond to their needs. However, a sound investment climate serves society as a whole, and the preferences of the two can diverge....” Responding to the resulting tensions creates four practical challenges:

Restraining rent seeking, so that elites do not capture the processes of policy debate, law making, and the implementation of policies in order to maximize advantage for themselves.

Establishing credibility, so that the uncertainties of investment are reduced and the “rules of the game” are clear.

Fostering public trust and legitimacy, so that citizens can assume that government interactions with the private sector are based on sound regulation and good contracts, and not on dubious public-private “deals.” Government needs not only to set the rules of the game, but also to follow them.

Ensuring policy responses reflect a good institutional fit.

These issues are most obvious in the forest and mining sectors, but also apply to policies for agro-processing investment, land administration reform, and investment in urban housing and infrastructure.

Source: Adapted from World Bank (2006b), p. 36

- *Creating well-regulated markets for a “golden age of business,” with strong links to legal producers and customers.* Although no one likes to admit it, all forms of poor governance are present in the sector: petty bribery, corrupt deals, and state capture (see Hellman et al. 2000 for definitions). However, the leakages and negative impact of poor governance are increasingly recognized (NEPAD, 2005; Booth et al., 2005). The forest sector is particularly vulnerable. This is the result of the high value of certain Ghanaian forest products (notably timber, but also some wildlife), together with a weak regulator, policies in practice that deviate from the espoused policy, loopholes in legislation, disregard for legislative requirements, and little incentive for communities to regulate illegal activity at local level. The shift in international markets toward legal and sustainable timber (e.g., the current VPA proposal) therefore represents a major opportunity for the GoG to “clean up” the sector, secure long-term markets for Ghanaian forest products, and enable a well-regulated and competitive industry
- *Helping to deepen democratic processes, and reduce the potential for sparking rural conflict.* For many decades, the rights of access to natural resources (trees, wildlife, minerals, and land) have been contested. A combination of population growth and new demands on land has brought this to the fore. The right mix of policies—and policy consultation processes—can ensure more equitable sharing of benefits from natural resources.
- *Supporting more efficient government.* Some aspects of law and institutions are unworkable; for example, having a centralized institution such as the FC’s WD enforce compliance for hunting licenses is impossible. Given limited budgetary and staff resources, CBNRM innovations such as

dedicated forests and CREMAs are a pragmatic solution to the challenge of regulating the use of natural resources across the whole of Ghana, particularly off-reserve.

B. Getting the Balance Right

103. **There is a danger that policy priorities become dominated by particular focuses or agendas. Our main recommendation is for balance in forest and wildlife policies, in order to ensure a diversified platform for economic growth, a more secure resource base, and less vulnerability.** World cocoa prices are at 40-year highs and gold at 25-year highs. If markets revert to the mean, current growth rates may not be sustainable. Five primary areas of balance are:

- *Governance vs. technocratic solutions.* Opportunities are present for improving control over the forestry and wildlife sectors through interventions such as: log tracking and legality assurance schemes, the proposed trade agreement on illegal timber trade, the introduction of improved wildlife-tracking systems in PAs, and the introduction of private management to wildlife tourism lodges or plantation. However, all of these interventions must be nested within a governance and political economy agenda, in order to ensure that the hoped-for outcomes are achieved, and opportunities for tackling community or benefit-sharing issues are not missed.
- *Amelioration vs. fixing the underlying causes.* Reforestation and plantation programs (possibly including enrichment planting of trees), wildlife protection, and intensified fire patrols should be undertaken, and with some urgency. After all, along with agricultural practices, forest fires have been the immediate cause of most forest degradation. However, unless attention is *also* given to tackling the reasons why the forest disappeared in the first place (including intentional bushfires), success is not assured.
- *Spending vs. enabling environment.* Spending is relatively easy, visible, and fast; whereas crafting policies, reforms, laws, and regulations is more difficult, not very visible, challenging, and slow. Yet both are necessary. The HIPC Plantation Program illustrates this point well. HIPC funds were spent rapidly to expand planted areas, but the MLFM has lagged behind in creating the enabling legislation for private sector plantation investment, and for secure property rights for those communities who participated in modified taungya systems. Placing operational responsibility for the HIPC plantations within the ministry has also diverted the ministry from its core policy function.
- *Modernization agenda vs. improving existing systems.* The GPRS II firmly places forestry and wildlife within a “modernizing agriculture” context. Important opportunities exist for the development of export-led crops (oil palm, pineapple, etc.) and for attracting investment in agro-processing. These opportunities can, however, be pursued *at the same time* that forest and wildlife resources are replenished.
- *Centralized authority vs. devolved authority.* Forest and wildlife management is not fully decentralized, as was envisaged in the local government act. However, the FC has an opportunity to genuinely delegate authority, particularly in the off-reserve areas. Centralized management of PAs and FRs can continue (although the FC has not covered itself in glory or proven itself a great custodian of the nation’s forests). Through DFs and CREMAs, mechanisms exist that can transfer management responsibility, reduce costs of management, and improve benefits to communities and the health of the forest and support the PA system.

C. Implications for the GoG's Development Partners

104. **Since governance is a major concern in the sector, changing donor priorities have significant consequences.** The DPs' stance needs to be coherent, consistent, and committed over the medium and long term. Short-term project interventions may do more harm than good when they either support elites or cushion some of the changes needed (i.e., moral hazard problems). DPs also need to be more aware of the political economy: there are factions at all levels that either support reform or support the status quo, and it is not always easy to disentangle those interests, especially when they are overlaid by traditional allegiances or patronage networks.

105. **Nonetheless, donor coordination in the natural resources sector has improved significantly following the establishment of the Environment and Natural Resource Management (ENRM) Group of Development Partners.** The group aims to help institutionalize a dialogue on NRM issues, improve harmonization, and jointly monitor policy reforms in the sector. Moreover, the group shares information between its members and the GoG, in order to reduce the potential for duplication of effort. This progress is valuable and needs to be continued and consolidated by both the GoG and DPs.

106. **Taken together, the opportunities set out above are a compelling rationale for DP support to the forest and wildlife sector.** It is not difficult to construct the right mix of actions: coherent policies (both espoused and in practice), smart fiscal incentives, and clear signals that governance defects in the sector will no longer be tolerated. However, history sends a note of caution. The difficulties of passing laws and regulations, and the avoidance of laws or challenges, all show that in Ghana, vested interests aligned—however temporarily—to political power can easily overcome, avoid, or halt those actions.

107. **The opportunity for DPs is to support the GoG in its efforts to reform the sector, but in ways that learn from the past.** Some clear lessons are:

- *Bring “environmental governance” into the mainstream.* If DPs are to genuinely address the degradation of forests and wildlife in Ghana, it must mean dealing with the underlying causes of the degradation, not just the symptoms. Those underlying causes relate to the rights, revenues, costs, and the allocation of benefits associated with forest resources. In short, who wins and who loses is clearly a governance issue.
- *Recognize the political dimensions of reform of the forest and wildlife sector in Ghana.* As in many other countries, support from donors has tended to be technocratic, ahistoric, apolitical, and acultural in its approach (Levy 2004; Unsworth 2002, 2005; World Bank 2004). New analyses from Ghana are available that can inform DPs (Gadzekpo and Waldman 2005; Booth et al. 2005; Killick 2005), and future investments need to factor in the findings of those analyses.
- *Recognize the policy implementation risks.* Good policies and laws are not enough. They can be ignored, subverted, or avoided. Good process is also critical to good outcomes. For example, the concessioning of wildlife lodges or timber must be handled in a way that is demonstrably fair, open, transparent, competitive, and legal. In dialogue with the GoG, DPs can help ensure that the right resources are available within flexible program schedules.
- *Build a coalition of reform.* The temptation is to look for and support individual reformers, but past experience shows this to be a risky route with uncertain prospects. Rather, DPs must make a judgment as to whether there is a sufficient broad-based coalition of reform interests, against which investments in the forestry and wildlife sector can be undertaken.
- *Stay the course.* Experience shows that reform can be thrown off track, through events, electoral cycles, legal challenges, loss of key players, and periods of “reform overload.” DPs are supporting a reform *process* that is not linear, and engagement mechanisms must be flexible, responsive, and capable of being scaled up or down as appropriate. Disengagement from the forest and wildlife sector in the face of short-term disappointments is risky, for three reasons: first

it ignores the potential contribution that the sector can make to growth; second, it may signal that DPs attach low priority to environmental issues; and third, it may imply that they will turn a blind eye to poor governance *in general* and to “difficult” sectors such as forestry.

- *Analyze the delivery risk, and take steps to reduce that risk.* Low rates of budget execution on many NRM projects and program delays, together with reports of very high levels of leakage elsewhere,²¹ are warning signs of systemic capacity constraints within ministries, departments, agencies, and a dysfunctional bureaucracy:

“Everyone seems to agree that the public service, particularly the civil service, has reached a very low ebb. Incentive structures within the civil service actively discourage initiative and pro-activity. For individuals, the way to move up the system is to avoid mistakes, maintain a low profile and let seniority work its magic. This results in a self-selection process in which those with initiative and drive either do not attempt to enter the public service or are driven out in frustration. There do remain some good, dedicated people within the system. The best of them tend, however, to be frustrated by the absence of personnel management and by nonrecognition” (Booth et al. 2005, p. 5).

108. With the shift from projects to sector programs, policy loans, and direct budget support, the delivery challenge firmly rests with the GoG, as it should. However, DPs will need to pay much more scrutiny to GoG management, financial and procurement systems, and find new ways of strengthening those key functions, while working within GoG structures rather than project structures.

109. *Continue to harmonize.* Many of the institutional challenges facing the GoG lie outside the forestry and wildlife remit. DPs therefore need to work with the GoG both on NRM issues *and* “outside the NRM box” to address nonsector issues, *and in a coordinated way*. These external issues could include: evidence-based policy making at the center of government, public sector reform, civil society strengthening, decentralization, and a broader governance agenda (judicial reforms, anticorruption measures, whistle-blowers bill, freedom of information).

110. **DPs can contribute much to the challenge of tackling environmental degradation in the forest and wildlife sectors.** Spending on investment projects, new technologies, and support for capacity building are activities that can be readily agreed to. But the principle challenges are ones of policy and legislative reform, policy coherence, stronger budget execution, and revenue collection. DPs cannot be effective unless the opportunities outlined above are grasped by the GoG. Because they challenge political and patronage patterns, progressive steps in this sector demand a minimum depth of “ownership,” commonplace though it sounds.

D. A Road Map: 2006-2025

111. **The investment needs for the forest and wildlife sector to address the findings and recommendations presented above fall into four categories:** (i) policy and regulatory measures (establishing a solid governance framework); (ii) institutional capacity building (building sufficient capacity to get things done); (iii) investment (filling financing gaps in infrastructure, technologies, or key outputs); and (iv) knowledge management, monitoring, and evaluation (informing policy and regulatory decision making, and monitoring performance)

112. These investments and an indicative timeframe are set out in the Road Map below, after much consultation.

²¹ For example, pilot expenditure tracker surveys found that only 50 percent of nonsalary resources in education reached schools; in health, only 21 percent reached clinics (Killick 2005).

E. Financing Instruments

113. **A mix of financing instruments will be required in regard to the sector:**

- *Development policy lending.* Forestry issues are included in the Fourth Poverty Restructuring Credit (PRSC) and MDBS matrix, with both a budget execution trigger and monitoring of progress toward achieving a more secure, predictable financing framework for the FC. In order to deliver comprehensive reform, , however, long-term, sustained multidonor commitment to a forestry and wildlife environmental governance support program is necessary. This will be achieved through the NREG development policy operation, which will set out a Program matrix with various objectives to be achieved by the GoG in the forestry and wildlife sector.
- *Grants and trust funds* can provide flexibility for funding of (a) communities in support of establishing dedicated forests, CREMAs, and similar opportunities to enhance community involvement in forestry and wildlife resource management, and (b) advocacy organizations that hold government more accountable.
- *Projects* can fill short-term (2-5 year) gaps in a program, but need to be nested within a sector program, to the extent that they are largely invisible within the program and contribute to wider program goals.

114. To work well, however, this mix will require much more effective aid harmonization.

Forest and Wildlife Recommendations

Policy and Regulatory

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-25) | Final Outcomes |
|---|--|---|--|---|--|
| <p>Refine and promote GoG strategy and regulations to operationalize actions on private sector-led plantation development (including review of land and tenure issues).</p> <p>Complete valid contracts and benefit-sharing agreements in order to achieve the harmonization of plantation programs (HIPC, taungya, plantation fund)</p> | <p>Investor confidence for large-scale investments</p> <p>Stronger security and property rights for local communities</p> | <p>Incentives and fiscal reforms for (a) large commercial plantations and (b) small-scale investments (e.g., a tax regime for plantations vs. agricultural cropping)</p> <p>Pilots involving CDM-type mechanisms and capture of carbon values</p> | <p>Commercial private sector plantation investments</p> <p>Expanded medium- and small-scale investments</p> | <p>Roll-out and expansion of CDM-type mechanisms to utilize carbon values in reforestation</p> | <p>Sustainable forestry regime, based on a mix of natural forests and well-managed private sector plantations</p> <p>More domestic timber needs being met from plantation timber</p> |
| <p>Continue GoG policy commitment to transparent, competitive processes for the allocation of forest and wildlife resources to the commercial private sector operations.</p> <p>Review processes and outcomes of competitive bidding for (a) timber, and (b) wildlife management concessions.</p> <p>Complete TUC conversions, auctions, and the implementation of TRF charges (including stock and yield assessments).</p> <p>Convert administratively allocated TUPs to auctions.</p> <p>Begin initial studies on Payments for Environmental Services.</p> <p>Implement a consistent</p> | <p>Level playing field for all investors (reduced investor uncertainty, greater transparency)</p> <p>Higher proportion of timber rents (values) captured by the state;</p> <p>Improved tax base for MoFEP</p> <p>More sustainable financing for the FC</p> <p>More revenues to communities and resource owners</p> | <p>Legislative and administrative reforms to ensure transparency and rationality in the allocation of forest and related resources</p> | <p>Improved investor confidence—for investment in tertiary and added-value processing of natural timber, plantation, and wildlife tourism assets</p> | <p>Facilitated mechanisms for payment of biodiversity, bio-prospecting, and other environmental services in the forest and wildlife sectors—both public and private</p> | <p>Investor-friendly sector, matched with effective regulation—so that it is perceived as “clean” and reputable by investors</p> <p>More diverse and secure financial resources for effective environmental regulation of the sector</p> |
| <p>Implement a consistent</p> | <p>Domestic and foreign investor</p> | <p>Implementation of incentives</p> | <p>High-quality, world-class</p> | <p>Planning for financial</p> | <p>Increased revenues for</p> |

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| <p>campaign to expand and attract commercial investment in wildlife and ecotourism development in protected areas.</p> | <p>interest in wildlife / ecotourism PPPs Level of uncertainty of stakeholders reduced</p> | <p>and fiscal reforms for ecotourism / wildlife investments</p> | <p>investments in eco-tourism and wildlife tourism in operation Increased incomes available to WD to support protected area operations.</p> | <p>sustainability of eco-tourism development</p> | <p>FC/GoG and financial benefits to communities from visits to ecotourism sites</p> |
| <ul style="list-style-type: none"> Continue implementation of GoG policies on improved governance and law enforcement, including: Multistakeholder negotiations on a voluntary partnership agreement with the EU on illegal logging (as part of AFLEG / FLEGT). Design of support to GoG in meeting requirement of, and mitigating negative impacts of, the VPA. Analyze regional trends in forest and wildlife trade. | <p>Trade agreement that eliminates illegal timber from Ghana's trade with the EU Encouragement for well-regulated legal markets in consumer countries with strong link to legal producers and exporters of timber, wood, and wildlife Policies developed to enable shifts to tertiary and value-added processing, and more value from parks and wildlife resources</p> | <p>Further deepening of trade agreements: consolidation toward legal and sustainable timber and wildlife trade Facilitation of regional trade and investment partnerships</p> | <p>Development and implementation of trade agreements All Ghana timber is legal; most is certified as sustainable. Elimination of timber and wildlife smuggling and low-value exports; prevention of revenue leakages</p> | <p>Consolidation of trade agreements and their implementations</p> | <p>All forest, wildlife, and NTFP exploitation in Ghana undertaken on a sustainable basis Sustainable contribution of forest and wildlife sector to economic growth</p> |
| <ul style="list-style-type: none"> Complete steps to strengthen key gaps in forest, wildlife, and protected area policy and legislation: Enact new legislation (LI) enabling dedicated forests (DFs) and legalize existing DFs. Enact new wildlife act and regulations. | <p>"Legality" of existing DFs in Assin Fosu confirmed Mechanisms for collaboration (including NGO, private sector, civil society, traditional authorities, and GoG) clearly defined, and forest and wildlife resources better utilized</p> | <ul style="list-style-type: none"> Revamped, updated and drafted new consolidated Natural Resource Management legislation, in coordination with revision to relevant agricultural, land, and tenurial legislation. | <p>More collaborative resource management in place (e.g., CREMAs, CFCs, local fora) More diversified, more robust (less vulnerable) rural livelihoods More financial benefits for communities realized</p> | <p>Benefit-sharing arrangements realized Coherent approach to natural resource management</p> | <p>Robust policy and legal framework for integrated system of natural resource management and sustainable land management in place</p> |
| <p>Continue policy commitment to devolve regulation of off-reserve wildlife and NTFP resources to local level Monitor, develop, and scale up CREMA and CFC processes, as well as capacity for local resource development and management Refine and harmonize GoG</p> | <p>Greater awareness and support for CBNRM concepts Increased local management and control over resources and reduced degradation Better understanding of common property management and tenure rights (trees, NTFPs, etc.) in Ghana</p> | <p>Coherent strategies for CBNRM developed (linked to GoG policies on sustainable land management, rural development) Enabling legislation in place, and strategies being implemented Mechanism for secured funding to support</p> | <p>More pluralistic decision making and debate More diversity in land and natural resource management arrangements</p> | | <p>Natural resources providing a stronger base for rural development and poverty reduction</p> |

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| policies and organizational frameworks for community-based natural resource management (CBNRM). | collaborative resource management put into place Promulgation and communication campaign by GoG on community's rights regarding management of trees, NTFPs, and wildlife resources | More informed and evidence-based policy making | Capture of wildlife NTFPs and forest contribution captured in national budgeting | Forest resources contributing more effectively to national GDP MoFEP planning and budgets recognize revenue contributions of wildlife and NTFPs |
| Begin studies on economic, financial, and social value of forests, wildlife, NTFPs, and potential investment opportunities (this should include the relatively neglected northern savanna regions). | Strengthened natural resource and economic policy processes within MLFM and MoFEP | Contribution of forests, wildlife and NTFPs better understood as part of Total Economic Value (TEV) analyses, and reflected in policy documents | | |

Institutional Capacity Building

| Short-term Actions (2006-2009) | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-25) | Final Outcomes |
|--|--|--|---|---|
| Strengthen MLFM and FC Board policy-making capacity: <ul style="list-style-type: none"> Identify legislative and administrative constraints. Make selective investment in capacity building. Install greater transparency of TREC decision-making. | Development and proposal of new sector legislation and administrative frameworks | More robust, transparent, effective legislative and administrative basis for key sector institutions—esp. MLFM and FC | <ul style="list-style-type: none"> Consolidation Policy moving toward “holistic” approach | <ul style="list-style-type: none"> Effective policy making, policy implementation, resource allocation processes |
| Complete planned restructuring and organizational reforms with the FC, including: <ul style="list-style-type: none"> More secure funding for forest and wildlife regulation and management through a financing MoU between | Performance-based management systems [links to the wider public sector reform process] Reward systems merit-based FC revenues based in part on pilot schemes for payment of environmental services | Forestry Commission and all its divisions recognized as efficient and effective Values of externalities and public goods being captured in regulatory processes | Continuing investment in FC capacity to deliver international good practice standard Continued investment in (paid-for) environmental services | GoG's long-term capacity to regulate forestry, wildlife, and related environmental issues secured, and assured |

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| <p>FC, MoFEP, and MLFM Implementation of performance-based assessments of CE & Directors, FC Right-sized, more efficient WD Better revenue and budget management Decentralized FMIS and management accounting reports fully operational.</p> | <p>Well-designed system Effective implementation Multistakeholder support for log and wood tracking, and transparency (domestic and exported wood)</p> | <p>Consolidation of the legality assurance system</p> | <p>Improved revenues—reduced illegal logging More effective regulation of the timber industry</p> | <p>Consolidation of the legality assurance system</p> | <p>A fully legal and sustainable timber regime</p> |
| <ul style="list-style-type: none"> • Design and implement a log and wood legality assurance scheme, including: <ul style="list-style-type: none"> -- Technologies -- Definition of legality -- Implementation of the log-tracking system. • Strengthen capacity at local level to manage forests, wildlife, and environment through: <ul style="list-style-type: none"> -- Support to DAs, District Environment Management Committees -- Better harmonization with other DP programs on decentralization (including financial management) -- Building on and learning from expanded programs for CREMAS and Dedicated Forests | <p>Stronger awareness of opportunities at local and district level</p> | <p>Local level programs that engage both DAs and traditional in improved (environment / forest / wildlife management); building on experience with CREMAS, Dedicated Forests</p> | <p>Local government playing stronger role in forest management, and working more effectively with chiefs and traditional authorities</p> | <p>Further investments in capacity building as required</p> | <p>“Mainstreaming” of environment in local and district planning processes</p> |
| <p>Review opportunities to strengthen CBNRM within local government structures and mechanisms. Consult with local government and with DPs supporting</p> | <p>Results framework with opportunities for community-based NRM</p> | <p>Monitoring of progress in (a) level of community participation, (b) rights of access and use, (c) impacts on DA decision making Legal and regulatory amendments if necessary</p> | <p>More informed policy making at local level Basis for appropriate decentralization or devolution of rights and responsibilities</p> | <p>Monitoring and review Legal and regulatory amendments if necessary</p> | <p>Local democratic structures fully involved in natural resource management.</p> |

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| decentralization. Identify and draft legal and regulatory amendments if necessary | | | | | | | | | | |
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Infrastructure, technologies, and output-based instruments

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-25) | Final Outcomes |
|--|---|---|---|--|---|
| <p>Create studies on (output-based) reforestation grants, including innovative financing mechanisms for reforestation</p> <p>Invest in nurseries and tree seeds (both indigenous and exotics) for plantation and forest recovery investments</p> | <p>Government and industry interest</p> <p>Availability of planting materials</p> | <p>Portfolio of pilot reforestation grants, based on range of innovative financing and benefit-sharing mechanisms</p> | <p>Concepts proved</p> | <p>Consolidation of the reforestation schemes, building on lessons learnt</p> | <p>Sustainable plantation area in excess of 50,000 ha</p> |
| <p>Design a multidonor supported grant fund to assist communities to establish off-reserve CREMAs and Dedicated Forests.</p> <p>Restrict fund to facilitation and process support to communities (no alternative livelihoods elements).</p> | <p>Pilot schemes that deepen experience in the process of facilitating establishment of community management and ownership of forest & wildlife resources</p> | <p>Extension of the area of off-reserve under community management</p> <p>Grant fund that supports communities in negotiations on supply agreements (e.g., with timber companies)</p> | <p>Robust base for community-based management well established in Ghana. Communities benefit more from forests</p> <p>Social problem of chainsaw "menace" reduced</p> <p>Better management of forests, recovery of some degraded forests and wildlife populations</p> | <p>Completion of grant fund activities.</p> | <p>Deforestation in off-reserve areas halted and reversed</p> <p>Tree cover and forest habitats recover in the off-reserve area</p> <p>Strong incentives for sustained "good" management of forests by communities at local level</p> |
| <p>Review and consolidate outstanding government commitments on compensation for acquired lands for protected areas.</p> | <p>More informed and congenial atmosphere for debate the management and development of PAs</p> | <p>Settling of outstanding commitments to stakeholders</p> | <p>Reduced antagonism between GoG and stakeholders</p> <p>Stronger basis for collaborative resource management</p> | <p>Completion and consolidation</p> | <p>Equitable bases for the collection and distribution of PA / wildlife wealth to stakeholders; improved livelihoods capital</p> |
| <p>[See comments on "Scenarios for Tomorrow's Forest and Wildlife Sector" below]</p> | <p>[See comments on "Scenarios for Tomorrow's Forest and Wildlife Sector" below]</p> | <p>Policy goals for restructuring of the industry agreed, with structural monitoring indicators in place</p> | <p>Industry restructuring complete</p> | <p>Investments in support of world-class industries in the timber, eco-tourism, and similar industries</p> | <p>• A restructured industry that provides secure jobs, exports, and value-addition, without degrading the</p> |

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| | | Implementation of fiscal and micro-economic policies that encourage restructuring of timber industry | | | environment and the forest resource |
| Develop framework to protect intellectual property rights and safeguard access to genetic resources. | Security of intellectual property rights. Indigenous knowledge and equitable access to genetic resources | Incorporation of CBD Article 15 and Bonn Guidelines | Transparent and equitable framework for international investment in genetic resources | Development of legal framework for access to genetic resources | equitable access to genetic resources and security of future uses |

Knowledge management and M&E

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-25) | Final Outcomes |
|---|---|--|---|---|---|
| Develop strategic scenarios for tomorrow's forest and wildlife sector (via a robust and inclusive consultative process, linked with related mining analyses). | <ul style="list-style-type: none"> Strategic plan and long-term program, with agreed approaches for dealing with the "difficult" sector issues: <ul style="list-style-type: none"> timber industry over-capacity better and more sustainable jobs protection of biodiversity and environment | Policy goals for restructuring of the industry agreed upon, with monitoring indicators in place | Improved results framework. | Review and evaluation of the framework | Better informed sector policy making and client |
| Analyze Spatial Data Information (SDI) access and Geographic Information Systems (GIS) relevant to forestry, wildlife, and related sectors in Ghana. | Understanding of constraints and opportunities for using SDI / GIS for more informed policy making Pilot "demonstration" tools Pilot programs with local communities, district assemblies, and traditional authorities | Investment in public access platforms and tools for improved access to spatial and GIS data Private sector involvement (e.g., for mapping of locations of certified forest, protected areas, or biodiversity areas) | Broader access to land / forest sector policy information. Improved policy making for ENRM and land use issues Use of GIS tools in monitoring environmental change and performance against the results matrix | Strengthening of district- and local- level capacities to interpret and use SDI / GIS for local-level environmental planning Strengthened coordination between lead SDI and GIS agencies | Evidence-based policy making for ENRM and land use issues—at national and local level Extensive use of GIS tools in monitoring environmental change and performance against the results matrix |

4 Mining

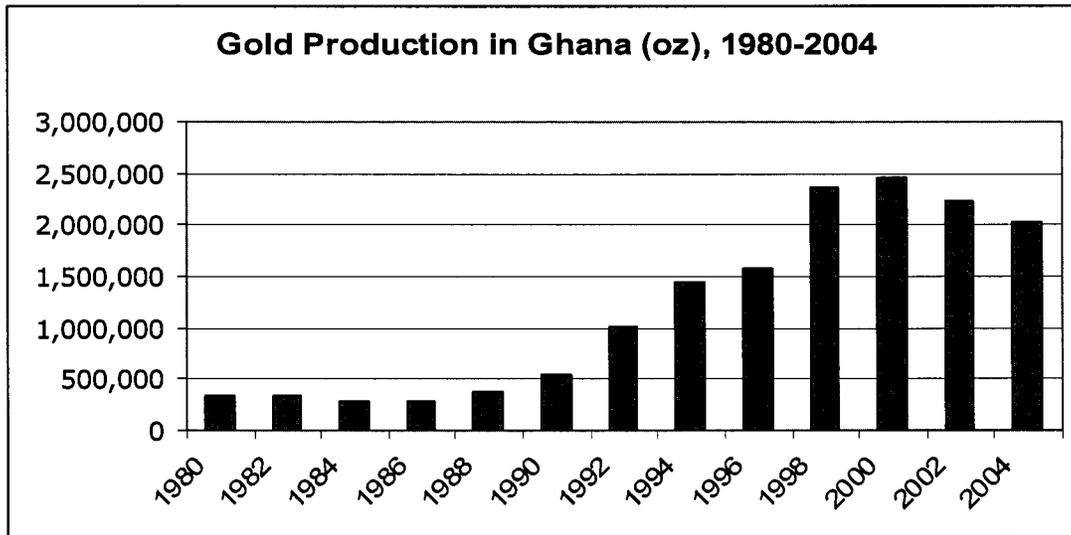
Overview and Diagnosis

A. Mining Sector in Ghana

1. Mining is an important economic activity in Ghana, contributing significantly to the country's export earnings, government revenues, and employment. Mineral revenue represented about 4.1 percent of the national GDP and about 9 percent of government revenues, and the formal mining sector employed some 15,000 workers in 2004 (Minerals Commission, 2004). The Minerals Commission estimates that artisanal and small-scale miners, often called "galamsey," might account for an additional 500,000 people. Many of those involved in artisanal and small-scale mining (ASM) are women and children, and a significant number of them are informal participants in the sector.
2. Gold is by far the largest and most important mineral resource in Ghana in terms of production and contribution to government revenues and employment, making up 93 percent of all mining exports and attracting 60 percent of all foreign investment (MC, 2004). The country is known to have one of the world's largest gold ore reserves, and its production ranked as 11th in the world or second in Africa in 2004 (Chamber of Mines, 2004).
3. Ghana is also the third leading African producer of manganese ore and a significant producer of bauxite and diamonds, although their contribution to the national economy and government revenues is much smaller. Total production of manganese, bauxite, and diamonds was worth US\$30.2 million, US\$10.6 million, and US\$26 million, respectively, in 2004 (CM, 2004). Limestone, sand and gravel, and salt are also produced in smaller scales.
4. Despite its rich mineral endowment, Ghana's mining sector stagnated for four decades before the 1980s because of economic, financial, institutional, and legal problems that impeded investment in the sector. However, the mining sector has seen an impressive growth since the launch of the Economic Recovery Program (ERP) in 1983. The program attracted US\$4 billion of private investment in the first five years after its inception.²²
5. As can be seen in Figure 4-1, gold production increased seven-fold from 300,000 oz in 1985 to more than 2 million oz in early 2000s. Currently, mineral exploration is continuing at more than 200 sites, and the government has approved 58 mining leases for gold and other minerals; the total land area is approximately 3,000 km². Seven large- and one medium-scale gold mining companies are currently operational and provide employment to about 15,000 people. The growth rate of minerals production, however, has slowed down and turned to negative over the last few years. Gold production decreased to 2.0 million oz in 2004, a drop of more than 10 percent. Revenue from gold mining also dropped in 2004 despite a steady price increase of gold. This could be attributed mainly to decreasing production capacity in several large mines such as Obuasi and Bogoso. Several others face capacity constraints and are estimated to have a remaining lifetime of only a few years without heavy investment.

²² See Minerals Commissions, Ghana Minerals Sector Overview, http://www.mincomgh.org/minerals_sector/index.html

Figure 4-1: Gold Production in Ghana



Source: Data from Ghana Minerals Commission.

6. Mineral production in Ghana, however, is set to expand as several new mines become operational in the coming years. Among the new entrants is Newmont, the world's largest gold producer, which is developing two projects in Ghana: Ahafo and Akyem, with combined gold reserves estimated at 16 million oz. The International Financial Corporation (IFC) approved a total financial arrangement of US\$125 million for the Ahafo project. The project was approved after a rigorous environmental impact assessment process and is expected to produce, over a 15-year period, 500,000 oz of gold per year starting in mid-2006. Estimates forecast the Akyem project generating 300,000 oz of gold annually when production commences in mid-2008. Since gold prices exceed US\$600, the current gold boom is likely to continue, and Ghana would remain an attractive destination for foreign investment.

7. The government also plans to boost production of other minerals, notably bauxite, with a view to develop an integrated aluminum industry in the country. Talks are under way with Alcoa, world's largest mining producer of aluminum, for this venture. A key constraint in further expansion of industrial-scale mining is the lack of an essential infrastructure in terms of adequate power, water, and transportation. The Ghana Railway Company, the only bulk mineral carrier in Ghana, is at present in a difficult financial situation, which will need to be addressed to ensure the smooth shipment of ore from the mines to the Takoradi Port.

B. Environmental Issues Associated with Industrial-Scale Mining

8. Environmental impacts of mining activity in general include deforestation, habitat loss, land degradation, and water and air pollution from waste dumps and tailings disposal. All of these impacts have contributed to poverty by negatively affecting livelihoods and health of the poor. In particular, the spread of toxic metals to the environment has been a major concern. Cyanide is commonly used for the recovery of gold from the ore in industrial-scale, hard-rock gold mining in Ghana. Other problems with mining include dust and noise pollution from blasting, and risk of water-borne diseases such as malaria from water collected in mine pits. Box 4-1 summarizes the impacts of mining documented in the Tarkwa region.

Box 4-1: Socioeconomic and Health Impacts of Industrial Mining Activities in the Tarkwa Region

Tarkwa has nearly a century of gold mining history and has the largest concentration of mines in a single district. Out of 16 large-scale mines in Ghana, 8 of them are located in the Tarkwa area. Moreover, around 100 registered small-scale gold and diamond mining companies and 600 galamsey workers operate in the area. About 260,000 people lived in the Wasswa West District (1994 census). Over the past years, mining has overtaken subsistence and commercial farming as the single largest economic activity in the area. In 2001 a study was conducted to assess the socioeconomic and environmental effects of the mining sector reforms implemented under the structural adjustment program (1987-1998), with particular reference to affected mining communities in the Tarkwa mining area. The main results of this study were the following:

Social impacts. According to the study, the concentration of mining operations in Tarkwa has had serious adverse impacts on the social organization and values of the people. Following mining investments in Tarkwa, fourteen communities with a population of more than 30,000 were displaced between 1990 and 1998. Inadequate housing, an increase in youth unemployment, family disorganization, school drop-out rates, prostitution, and drug abuse were found. In addition, mining activities resulted in massive migration of workers into the area.

Environmental impacts. The natural environment has undergone rapid degradation from deforestation. Surface mining concessions have taken over 70 percent of the total land area in Tarkwa; 40-60 percent of the companies' concession areas are being used for mining activities. Furthermore, agriculture lands are degraded, and the decrease of agriculture land resulted in a shortening of the fallow period from 10-15 to 2-3 years. In addition, four major problems involving water pollution have been noted in the Tarkwa mining areas: chemical pollution of groundwater and streams, siltation through increased sediment load, increased fecal matter, and dewatering effects.

Health impacts. The extraction and processing of gold has also given rise to various environment-related diseases. The top six diseases in the area during the observed period 1992-1996 were: *malaria* (mining activities promote environmental modifications that favor malaria vector development), *diarrhea* (high incidence in the area), *skin diseases* (related to cyanide and mercury pollution from gold processing), *upper respiratory diseases* (dust generated by mines includes silica, which causes silicosis and tuberculosis), *acute conjunctivitis* (related to inadequate dust-suppressing measures), and *sexually transmitted diseases* (related to the high inflow of workers).

Source: Akabzaa, T. and Darmani, A. "Impact of mining sector investment in Ghana: A Study of the Tarkwa mining region," 2001.

9. Over the past two decades, major players in the mining industry have increasingly recognized both the need and obligation to identify and mitigate the adverse environmental consequences of their activities. Some companies have committed to sustainable development and set higher environmental and social standards than required by regulations. Gold Fields, which has operated in Ghana since 1993, established a foundation in 2002 to promote and facilitate community development and improve the quality of life of neighboring mining communities. For every ounce of gold produced, US\$1 will go to the fund; Gold Fields is committed to making an additional annual contribution of 0.5 percent of its profit before tax.²³ A recent survey showed that mining companies do not see the environmental regulations as a deterrent to their investment in Ghana (Fraser Institute, 2004/2005).

10. Today, most large-scale mining operators have elaborate and comprehensive environmental impact assessment and management plans. Establishing reclamation bonds for mine closure is also becoming a common practice. In many cases, environmental problems in large-scale mining are a legacy of past mining operations and require funds to restore or rehabilitate degraded lands, if they are reversible at all. In Prestea, for example, roasting of concentrate caused severe air pollution; the resulting acid rain prevented the revegetation of surrounding hills even after the closure of the mines, undermining rehabilitation and reclamation efforts. These past behaviors have created a deep-rooted distrust between large mining companies and local people. Such distrust and lack of communication often lead to concerns or opposition to the operation regardless of the quality of environmental management plans in place.

²³ In 2005, the Gold Fields South Africa Foundation invested US\$1.6 million in Ghana for community development projects (Gold Fields Annual Report 2005).

11. In addition to environmental impacts, mining operations frequently pose social concerns. Large-scale mining operations often cause involuntary resettlement, resulting in loss of land, livelihoods, and resources for local communities. Land and resource rights of indigenous communities in and around mining concessions are often a bone of contention. As surface mining operations become more widespread in Ghana, land-use conflicts are bound to escalate—surface mining usually requires that huge swaths of land be cleared of vegetation, and top soil and soil nutrients are lost. Villagers have often been dispossessed of their farmlands to make way for mining, resulting in loss of livelihoods and traditional community values and linkages.

12. Concerns of communities and civil society organizations in Ghana in relation to mining are focused mainly on land use. The current system of compensation and rehabilitation has been called into question for several reasons.²⁴ First, compensation for land is not consistent and the owners of similar plots of land may receive significantly different compensation payments. The Land Valuation Board could play a greater harmonization role on this matter. Second, people perceive that they are not compensated for all the lost resources because only cash crops are reimbursed, which does not account for biodiversity and natural resource use losses. Third, after mining closure, the lands reclaimed have no or reduced capability to sustain the crops and biodiversity that existed prior to mining. Fourth, Galamsey miners believe they have rights on surface as well as subsurface land, contrary to the law that vests mineral rights with the state. Local chiefs, who are authorities at the local level, often endorse this position. Altogether, local people call into question the existing rights and procedures for miners to access land. These rights are perceived as unfair and biased against landowners.

C. Artisanal and Small-Scale Mining (ASM)

13. In addition to industrial-scale mining, a significant number of artisanal and small-scale mining (ASM) operations are taking place in Ghana. The EPA defines mining activity in concessions of up to 25 ha as small-scale mining, and up to 100 ha as medium-scale mining. Estimates of numbers working in ASM vary greatly. The Minerals Commission estimated employment at 500,000 by end 2004, but it is not clear if this is a full-time equivalent. Earlier Hilson (2001) estimated that of 200,000 people engaged in ASM, only 30,000 operate on legal concessions; women constituted 15 percent of the formal segment of the small-scale labor force, 10 percent of concession holders, but 50 percent of the informal or galamsey workforce. In 2004, ASM accounted for some 12 percent of total gold production in Ghana (MC, 2004).

14. ASM is an important source of livelihood for many poor families and is characterized by poor technological practices with significant environmental, social, and health costs, particularly through the use of mercury for amalgamation (see Box 4-2). Mercury amalgamation — done with bare hands, the waste discarded into streams — is a serious threat to miners' health and the environment. Constant exposure to mercury undermines miners' health and increases medical costs, which further raises the need for and dependency on mercury to extract more gold (Pardie and Hilson, 2006). A number of studies have observed elevated levels of mercury in the hair, urine, blood, and nail samples of people residing in artisanal gold mining communities.²⁵ Moreover, field interviews have identified a number of health problems caused by exposure to mercury.²⁶

²⁴ This summarizes the results of a number of interviews and a workshop with civil society representatives held during a World Bank Mission to Accra March 27-31, 2006.

²⁵ For example, see NSR (1994), Environmental Impact Assessment of Small-scale Mining in Ghana: Part I Physical and Biological Aspect, NSR Environmental Consultants, Australia, unpublished studies by Rambaud et al., Mercury Exposure in an Artisanal Mining Community in Ghana, UNIDO.

²⁶ An estimate of environmental damage costs from mercury use is not provided because no comparable studies were found.

Box 4-2: Environmental and Social Aspects of ASM

Workers who crush the ore-bearing rock often do not use facemasks and inhale large amounts of dust particles. Finely crushed ore is generally hand-washed along riverbanks, causing widespread water pollution. A health problem of a family member forces women and children to participate in mining activities in order to pay for living expenses and additional health costs. Women and children predominantly participate in sieving, sorting, transport of ore and water, washing, and processing of the ore. Consequently, they are highly susceptible to chemical dangers, especially with the use of mercury in gold mining. Also, women often work with young babies tied to their backs and children at their sides. When additional income is needed or alternative childcare or schooling is unavailable, older children accompany women in mining activities and usually participate in them.

Source: The World Bank, Evaluation of the World Bank Group's Activities in Extractive Industries, Background Paper, Ghana Country Case Study, The World Bank 2003a.

15. Past efforts to address health and safety concerns have not been very successful, partly because of either ignorance or skepticism about the danger associated with chemical exposure. Through the Mining Sector Development and Environment Project, the World Bank provided glass retorts to reduce the harmful effect of mercury, but the project failed to make a meaningful impact. Artisanal and small-scale miners were dissatisfied not only with the size and fragility of the products, but also with the price (about US\$60), despite the two-thirds subsidy from the Mineral Commission. Identifying and providing more comprehensive strategies to deal with ASM technical, financial, environmental, social, and health programs is imperative for a sustainable and socially responsible mining development in Ghana.

D. Relationship and Conflicts between Large-Scale Mining and ASM

16. Seasonal small-scale and artisan mining activities have been coexisting with agriculture and husbandry for centuries in Ghana, but the nature of these mining activities has changed with the entry of large-scale mining companies. The lure of potential higher incomes in mining does appear to encourage young men in particular to engage in small-scale mining on a more permanent basis. While poverty and the lack of livelihood is a major underlying cause for galamsey activity, it is important to note that significant numbers of rural inhabitants are attracted to artisanal and small-scale mining because of the income and independence resulting from these activities.

17. Today, the great majority of ASM operations are related in one way or another to industrial large-scale mining. Land conflicts between large mining companies and galamsey miners are becoming common. Closed-down underground mines or open pits are attractive targets for galamsey miners because mineral ore in mines that were or are operating are accessible with their artisanal equipments and technologies. Artisanal and small-scale mining treats old waste rock from a previously mined location that is no longer profitable for large-scale producers. When the large-scale mining activities had stagnated, the tension between large-scale companies and galamsey miners were relatively limited. With increasing gold price²⁷ and government strategy to attract more foreign investment, however, these disputes have been on the rise.

18. With the sector's economic revival in recent years, suspended operations have reopened and new concessions awarded on lands encroached/used by the galamsey. The government often ignores the artisanal miners' traditional rights to the land in favor of large companies, to whom it grants legal entitlement; this action makes traditional mining illegal de facto. While the government receives royalties and income tax from large players, thousands of galamsey, most of whom rely on their mining for subsistence, are gradually forced to leave. Naturally, this negatively affects local communities as the

²⁷ The average gold prices (in U.S.\$) for last five years are: 309 (2002), 363 (2003), 409 (2004), 444 (2005), and over 650 (as of May 2006).

informal mining sector provides important economic sustenance to the local economy.²⁸ After Bogoda Gold took over a gold mine in Dumasi in 1990, for example, the population of a village dropped from a peak of 6,000 to only 2,500, significantly undermining the village's economic activity.²⁹

19. Illegal miners often encroach on currently operating industrial mines. These “hit and run” activities are very common within most concessions operated by large-scale companies. Factors influencing the degree of such activities include accessibility to the mines and waste heap, and the degree of the concession owner's policing activities. In most cases, large-scale mining companies are reluctant to share the mine with the galamsey because the companies, as concession owners, will be liable for the environmental harm caused by galamsey activities. In some cases, galamsey miners came to a closed mine that was rehabilitated, and started working again. This not only harms the reclamation efforts by the companies, but also potentially exacerbates the environmental situation.

20. A few large mines have managed to establish rules for peaceful coexistence between the two groups. Gold Fields Ghana, for example, awarded certain areas of the concession land that are unsuitable for large-scale mining to galamsey workers who are local villagers, or to displaced workers from neighboring large-scale mines. The company purchases their product on site at a prevailing market price. In most cases, however, artisanal and small-scale miners are forced to move out from the concession areas either by the companies' security forces, the police, or even the military.

Policy, Legal, and Regulatory Issues

A. Mining Policy and Legislative Framework

21. Ghana's long-term policy objective in the minerals sector has been guided by the need for establishing a legal and macroeconomic environment that would attract investments in new exploration and encourage the expansion of existing mines. This policy objective has led to the evolution of a supporting legislative and institutional framework that encompasses the Constitution, various laws, regulations, and instruments that provide guidance on how mining operations ought to be conducted. Recently passed, the Minerals and Mining Act of 2006³⁰ is the primary law governing the sector. The legal framework draws a clear distinction between large-scale mining operations and artisanal and small-scale mining (ASM) operations.³¹ In fact, the laws and regulations provide generous incentives and benefits for large-scale mining operations but have failed to create a similar incentive and benefit structure for ASM (See Box 4-3).

Box 4-3: Regulation of ASM in Ghana

In Ghana, once a permit is issued, large-scale miners are authorized to sell or export minerals. In contrast, ASM are entitled to sell only in accordance with the rules and regulations prescribed by the Ministry. The case of gold mining is instructive in this regard. For example, buying agents travel to rural areas and purchase gold from both registered and galamsey miners at a near-market price. The fact that small-scale miners can sell their gold regardless of their legal status helps reduce the amount of gold being smuggled, but it has created a strong disincentive for ASM to register. Unless there are obvious benefits to becoming registered miners in the form of technical or financial support from GoG, the majority of ASM will not be persuaded to register, and this undermines the effectiveness of GoG's effort to regularize the informal ASM operations.

²⁸ It is important to note that the informal mining sector brings both positive and negative impacts to local community. Negative impacts include increased crime rates and/or spread of HIV/AIDS, associated with an influx of migratory artisanal miners and workers.

²⁹ Josh Harkinson, Confessions of a Dangerous Mine, *Grist Magazine* (June 24, 2003).

³⁰ The Minerals and Mining Act, 2006, Act 703.

³¹ This is a complex framework where, typically, multiple parties are involved.

B. Mining Rights

22. Two types of procedures currently exist for granting and keeping mining rights. One procedure relates to ASM, and the second procedure pertains to other mining operations that are not considered as small scale. Both procedures require a license in order to exercise a mineral right.

23. Although the law does not explicitly state which licenses are applicable to ASM, by virtue of the capital intensity involved with these licensees, they appear to exclude ASM. Of interest is the fact that the license period varies considerably depending on the type of mining operation. As shown in Table 4-1, the area applicable to licensing for mining activities has varied not only for ASM but also for large- and medium-scale operations (LMS). It must be noted, however, that the new law is unclear on how much ASM are entitled to, leaving it in a very ambiguous manner.

Table 4-1: Comparison of Licenses with Applicable Area Size

| Grantee | Type of license | License period (years) | Size of area applicable to license |
|--|--------------------------|------------------------|---|
| Large-scale/Medium-scale miner /mining company | Reconnaissance License | 1 | No more than 5,000 contiguous blocks ^a |
| ASM: Person, group of persons, co-operative society/ company | None specifically stated | 5 | In accordance with blocks prescribed ^b |
| Large-scale/medium-scale Company | Prospecting License | 3 | No more than 750 contiguous blocks |
| Large-scale/medium-scale miner /mining company | Mining lease | 30 | No more than 300 contiguous blocks |

a. A block is defined as 21 hectares.

b. It is important to note that the law is not clear on who prescribes the blocks or how they are to be prescribed.

Source: *The Minerals and Mining Act, 2006, Act 703*

24. Granting Mining Rights In the case of large-scale mining operations, an application for the grant of a mineral right must provide a statement specifying:

1. particulars of the financial as well as technical resources available to the applicant for the mineral operations,
2. an estimated amount of the operations' expenditure,
3. particulars of the proposed mineral operations, and
4. particulars of the applicant's proposal with respect to employing and training Ghanaians.

25. This application is submitted to the Minerals Commission. Within 90 days of receipt of the application, the Minerals Commission must submit its recommendations on the application to the minister.

26. In contrast, a license for small-scale mining is issued by the Minister for Mines or someone authorized by him. The license is only to be issued to Ghanaian nationals aged 18 years or older who are

registered by the District Office³² in the respective area. Application must be made in the manner prescribed by the minister and is to be accompanied by a prescribed fee. The District Office then issues a certificate of registration. Once licensed, a person is authorized to “win, mine, and produce minerals by an effective and efficient method and shall observe good practices, health and safety rules and pay due regard to the protection of the environment during mining operations.”

27. Keeping Mining Rights Licenses granted to both large-scale and small-scale miners are not transferable except with the minister’s prior approval. In the case of large-scale miners, this approval must be in writing. By comparison, small-scale miners have no such requirement; however, this license may only be transferred to a Ghanaian citizen.

28. In addition, the holder of a mineral right is required to pay a prescribed annual ground rent as well as an annual mineral right fee. The Minerals Commission has indicated that this may affect the financial position of state mining institutions as the annual payments may lead to lower earmarked revenues for these institutions.

29. Suspending or Canceling Mining Rights With regard to large-scale mining operations, the minister may suspend or cancel a mineral right in circumstances where the holder of the right:

- Fails to make payments on the due date required by the law,
- Becomes insolvent, bankrupt, enters into any agreement or scheme of composition with his creditors, takes advantage of an enactment for the benefit of his debtors, or goes into liquidation, except as part of a scheme for an arrangement of amalgamation;
- Makes a statement to the minister in connection with the mineral right that he knows or ought to have known is false; or
- For any reason becomes ineligible to apply for a mineral right under the *Minerals and Mining Act*.

30. Of interest is the fact that the law does not specify breaches of law as grounds for the suspension or cancellation of mining rights.

31. Prior to suspending or canceling the mineral right, the minister gives notice to the mineral right holder as prescribed by law. The notice requires the holder to remedy the breach of the mineral right condition within a reasonable period. In circumstances where the breach cannot be remedied, the holder must show cause as to why the right should not be suspended or canceled.

32. In contrast, the license of small-scale miners may be revoked in circumstances where

- The minister is satisfied that the licensee has contravened or failed to comply with any of the terms and conditions of the license or a requirement applicable to the licensee,
- The licensee is convicted of any offense relating to the smuggling or illegal sale or dealing in minerals, or
- The minister is satisfied that it is in the public interest to do so.

33. Unlike the case of large-scale mining operations, no requirement exists to provide the small-scale miner with notice prior to the revocation of the mining right. Neither is there a stipulation that the mining right holder receive the opportunity to remedy breaches of any of the conditions of the mineral right.

³² Section 90 (3) states: “A District Office shall among other functions a) compile a register of all small-scale miners and prospective small-scale miners particulars that may be determined by the Minister; b) supervise and monitor the operation and activities of the small-scale miners and prospective small-scale miners; c) advise and provide training facilities and assistance necessary for effective and efficient small-scale mining operations; d) submit to the Commission in a form and at intervals directed by the Commission, reports or other documents and information on small-scale mining activities within the District and (e) facilitate the formation of Small-scale Miners Associations”
Source: GoG. *The Minerals and Mining Act, 2006, Act 703*

34. Although the procedures for granting, keeping, and suspending or canceling mining rights are clearly stated in the laws, the issues of weak enforcement of mining sector laws as well as compliance with them continues to be a challenge. The time, labor, and costs associated with obtaining a license are often beyond what ASM workers can afford. ASM workers who rely on mining for daily subsistence are neither able to wait for their application to be assessed and approved nor able to pay for the required fee to obtain a license. Ensuring that all small-scale miners are licensed continues to be a major challenge, and addressing the inefficiency in the licensing process for small-scale mining is an important step in this regard. The reason is not only because of the lack of both human and financial capacity to ensure enforcement and compliance, but also because of the social problems associated with ASM.

35. To this end, a new mining policy is being drafted, with technical assistance from the Commonwealth Secretariat. The drafting of a new mining policy creates a timely opportunity for the government to revisit and address the issue of creating a comprehensive and sustainable mining regime that mainstreams ASM activities and establishes a new and more effective approach toward land use, compensation, and reclamation.

C. Environmental Regulatory Framework

36. The Environmental Assessment Regulations of 1999 speak to the issue of mining undertakings.³³ The regulations state that an environmental impact assessment (EIA) is mandatory for the mining and processing of minerals in areas where the mining lease covers a total area of more than 10 hectares. By virtue of this, EIA is not mandatory for ASM since the grantees mostly operate in fewer than 10 hectares. However, ASM are required to complete a form in lieu of the EIA procedure. In addition, EIA is mandatory for quarrying and sand dredging. Mining undertakings involving metal and nonmetal mines must be registered and issued with an environmental permit.

37. An applicant who requires an environmental permit must first make an application to the EPA and pay the prescribed fees. The Environmental Protection Agency is then responsible for screening the application. In so doing, it takes several factors into account: “(a) location, size and likely output of the undertaking, (b) the technology intended to be used, (c) the concerns of the general public, if any, and in particular the concerns of immediate residents if any, (d) land use, and (e) any other factors of relevance to the particular undertaking to which the application relates.”

38. Once the application is screened, the EPA issues a screening report on the application. The screening report specifies whether the application is approved or not or whether it is necessary to submit a preliminary environment report or an environmental impact statement. In circumstances where a preliminary environmental assessment is necessary, the EPA then requests that the applicant submit a preliminary environment report on the proposed undertaking. If the EPA is satisfied that significant adverse environmental impact is likely to result, the applicant is required to submit an Environmental Impact Statement (EIS) regarding the undertaking.

39. A scoping report sets out the scope or extent of the environmental impact assessment to be carried out, and includes draft terms of reference, which provide the essential issues to be addressed in the EIS. An EIS for mining activities must also have a reclamation plan. It is mandatory that a reclamation bond³⁴

³³ The term *undertaking* is defined as “any enterprise, activity scheme of development, construction, project, structure, building, work, investment, plan, program and any modification, extension, abandonment, demolition, rehabilitation or decommissioning of such undertaking, the implementation of which may have a significant impact.”

³⁴ The regulations state that a reclamation bond means “performance bond, mining bond or rehabilitation bond or funds set aside in a reputable bank agreed upon by the Agency and the person responsible as a security deposit against default on reclamation or rehabilitation of disturbed land arising out of the undertaking.”

based on the approved work be posted regarding the mining activity. An important gap in the law is that the regulations do not provide guidance on how the amount of the reclamation bond should be determined or what it should entail. Within 25 days of receiving the EIA, the EPA informs the applicant whether it is acceptable or not. Once approved, the EPA registers the undertaking and issues an environmental permit. The applicant must then pay a fee, prescribed by the EPA, for the environmental permit.

40. The person responsible for an undertaking for which an environmental impact statement or preliminary environmental report has been approved, is responsible for submitting to the EPA an environmental management plan within 18 months of the commencement of its operation and thereafter every three years. The Environmental Protection Agency is to hold a public hearing on an application in circumstances where (a) there appears to be adverse public reaction to the commencement of the undertaking, (b) the undertaking will involve the dislocation, relocation, or resettlement of communities, or (c) the EPA considers that the undertaking will have extensive and far-reaching effect on the environment. In so doing, the EPA appoints a panel made up of not fewer than three persons and not more than five. At least one third of the panel members must be residents from the geographical area of the intended undertaking and shall reflect varying opinions, if any, on the subject of the hearing.

41. Although Ghana has made important strides toward the development of a comprehensive legal and regulatory framework governing the mining sector, many important legal factors continue to impede progress. For example, issues of enforcement and compliance with mining laws and regulations continue to be a major challenge. The EPA, which is tasked with the responsibility of monitoring undertakings relating to mining, has neither the financial nor human capacity to effectively monitor all undertakings. Other legal constraints include ambiguities in the law that leave room for wide interpretations as well as omissions in some instances.

D. Mining Royalties

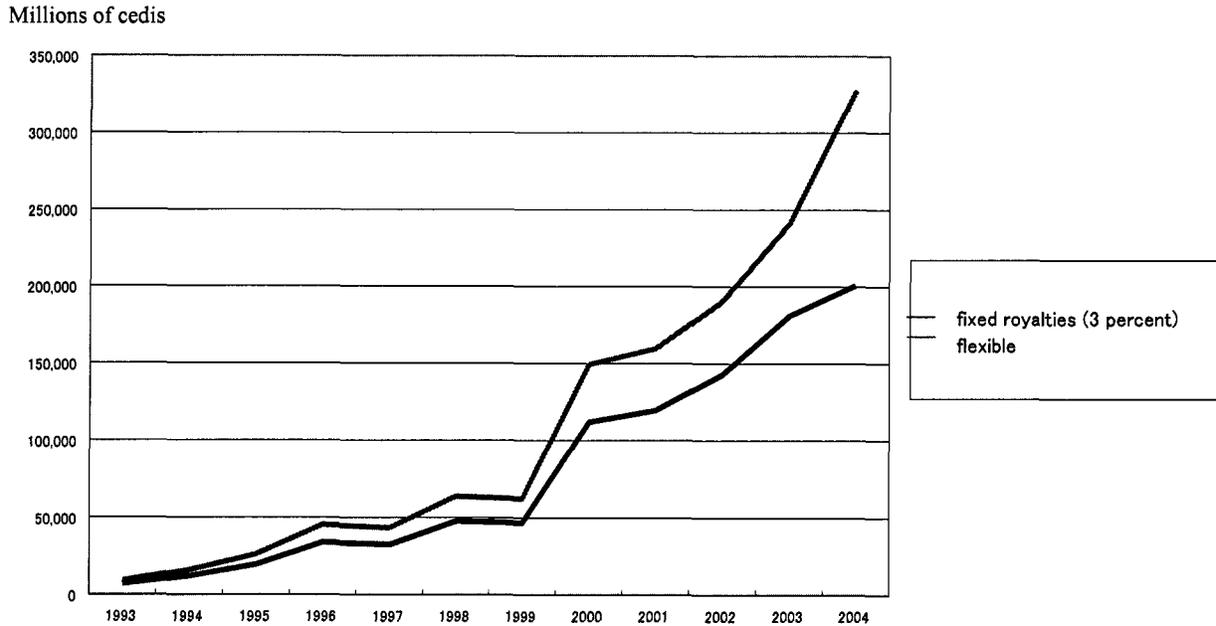
42. The 1987 *Minerals (Royalties) Regulations* guide the payment of royalties regarding mining operations. Royalty payments are to be made quarterly and are based on the profitability of mining operations. The royalty rate ranges from a minimum of 3 percent to a maximum of 12 percent, but in reality, it has been fixed for the minimum 3 percent in past years regardless of the gold price, evidencing the strong bargaining power of large mining companies. It is noteworthy that the royalty formula is negotiated and fixed for the lifetime of the mining lease between the mining company and the government,³⁵ thus limiting government's ability to capture a greater share of economic rent when prices increase, or reducing the tax burden on mining operations when prices are falling. The new Minerals and Mining Bill, which was approved in March 2006, fixes the royalty rate ceiling at 6 percent based upon the estimated operating profit margin calculated for a mine prior to starting production.

According to the mining authorities interviewed, under the new law a legal instrument will be needed to regulate the sliding scale of royalties. The authorities suggest linking the royalty rates to international metal prices within the range of 3 to 6 percent to be established by law. The rates increase when metal prices rise, and vice versa. Figure 4-2 below compares the revenues from both a fixed and flexible royalty regime for gold. The blue line indicates the trajectory of revenues from Ghanaian gold production applying the existing fixed royalty of 3 percent of gross value; the pink line is the hypothetical trajectory of revenues applying the Bolivian gold royalty, which varies in the range of 4 to 7 percent of gross value vis-à-vis the international gold price.³⁶ Revenues are those for the period 1993–2004.

³⁵ For further reference, see *Minerals (Royalties) Regulations*, 1986.

³⁶ The Bolivian royalty has a floor level of 4 percent and a ceiling level of 7 percent. Between the floor and ceiling levels, the royalty rates vary in percentage according to the following relationship: $0.01 * GQ$ (gold quotation).

Figure 4-2: Comparison of Fixed and Flexible Royalties



Source: Ghana Minerals Commission

43. As can be seen in Figure 4-2, part of the difference in the royalties is explained by the higher floor rate in Bolivia (4 percent) than in Ghana (3 percent); see, for example, the period 1996–2000. Yet there is an increasing difference in the revenues accruing to the government in favor of the Bolivian system when the gold prices rises above US\$400 oz-troy, as happened in the period 2003-2004. At the current prices, above US\$600, this difference would be even much larger, more than twice the revenues collected through the Ghanaian royalty system. It is important to note that the flexibility of the system is crucial for sustaining international competitiveness in the royalty system. While a spike in prices results in greater profits as production costs are largely fixed if gold prices drop, the windfall profits disappear and competitiveness is preserved as the royalty rate decreases accordingly. In the current metals market situation, the GoG has an opportunity to increase its revenues from mining. If a flexible royalty system is introduced, Ghana’s international competitiveness to attract investment in the mining sector will not be compromised.

Institutional Analysis

44. Sustainable development of the mining sector offers opportunities for economic growth and poverty reduction in an environmentally and socially responsible manner. The absence of effective institutional arrangements, however, can result in mining growth having significant negative environmental impacts, aggravating existing levels of poverty, and depriving future generations of the option to sustainably utilize minerals resources.

45. The main institutions in the sector, analyzed with respect to their impact on mining policy and its enforcement, are summarized below; a discussion follows on their implications for environmental management.

Table 4-2: Summary of Key Mining-related Institutions

| Agency | Impact on Policy Execution | Notes |
|---|----------------------------|--|
| 1. Central Government Ministries, Departments & Agencies | | |
| Parliament | ●●● | Select Committee is well informed, engaged in debate on new Mining Bill. However, the fact that some MPs sit on board of mining companies is challenged by civil society for its potential conflict of interest. |
| Ministry of Finance | ●●● | Involved, because of revenue concerns; recently established a gold assay facility to monitor underreporting of gold carats. |
| Economy and Planning | ●●● | Collects all mining royalties revenue (with Bank of Ghana). |
| Internal Revenue Service | ●●●●● | Prepares mining licenses; sells data and information to mining companies; acts as one-stop shop for investors; monitors concession areas allocated. Responsible for registering small-scale miners, but lacks capacity to fulfill that function. |
| Minerals Commission | ●●●●● | Lead ministry for mining policy. Minister grants mining licenses. |
| Ministry of Lands, Forestry and Mining | ●●●●● | Involved in the health and safety aspect of mining and also plays an active role in decommissioning. |
| Mines Department | ●●● | Develops primary information on geological resources and produces the geological map of Ghana. |
| Geological Survey Department | ●● | Collect export taxes of minerals and imports of mining inputs/machinery. Representatives from CEPS are attached to every mining company. |
| Customs & Excise Preventative Services | ●●● | Relatively little involvement in the sector, underresourced ministry with limited influence in Cabinet. |
| Former Ministry of Environment | ● | Formally issues environmental permits but underresourced, hence weak regulatory role in the mining sector. Inability to enforce mining environmental regulations, effectively follow up on reclamation bonds, etc. |
| Environmental Protection Agency | ●●● | Allocates revenues from mining to Stools (chiefs) |
| Office of Stool Lands | ● | Encourages Foreign Direct Investments (FDI). |
| Ministry of Trade and Industry | ●● | Regulatory agency for GoG forest & wildlife policy. Forestry Commission issues mining companies with forest entry permit for mining in forest reserves. |
| Forestry Commission | ● | |
| 2. Local and Customary Government | | |
| National House of Chiefs | ● | Critic of management fees retained by the Minerals Commission. Customary land management holds 85percent of land in Ghana, but this excludes rights to minerals. |
| Stools | ●●● | Hold land in custody for people; recipients of mining revenues from royalties. Important in negotiation of compensation for crops and land damaged. |
| Municipalities | ● | Important where mining operations are adjacent to towns. They lack funds and are critical of regulations on compensation; District Environmental Committees are poorly resourced and ineffective. |
| District Assemblies | ●● | Recipients of mining revenues from the Office of Stool Lands but otherwise generally passive. Lead economic development in mining towns. |
| 3. Private Sector | | |
| Chamber of Mines | ●●●● | Represent large- and medium-scale miners. |
| Large-Scale Miners | ●●●●● | Responsible for 80percent of industry's output. Criticized, but now showing a higher level of commitment to environmental and social responsibility. Some provide staff and technical |

| | | |
|--|-------|--|
| Medium-scale Miners | ●● | assistance to small-scale mining. Small concession areas of 25 ha; modest investment in equipment. |
| Artisanal and Small-scale Miners / Illegal /Galamsey Operators | ●●●●● | Represent 20percent of output, but activities, although environmentally damaging, contribute much to income generation, livelihoods, and employment in the rural areas. Profound impact/ unsustainable mining. Social conflicts over access to mining areas. |
| Local Traders | ●●● | Purchase gold from ASM miners, sell to Precious Minerals Marketing Corporation |
| 4. Civil Society—Policy Think Tanks & Academic Institutions | | |
| University of Legon / ISSER | ●● | A few individuals with strong interest in mining and policy. |
| Western University College (Tarkwa School of Mines) | ●● | Technical training for the industry. |
| 5. Civil Society—NGOs, CSOs, CBOs | | |
| Wassa Association of Communities Affected by Mining (WACAM) | ●●● | Main coalition on mining advocacy and community rights. It has ensured high profile in the media on mining issues, as well as making presentations at shareholder meetings in North America of some firms operating in Ghana. |
| Centre for Public Interest Litigation (CEPIL) | ●●● | Undertakes litigation on issues of public interest. At present there are court cases against Anglo-Gold Ashanti, Bogoso Gold, Newmont, Prestea Gold, and against the Government of Ghana (EPA) claiming failure to effectively regulate and enforce compliance on environmental matters. |
| Third World Network (TWN) | ●● | Has a general policy campaign seeking more equity, participation, in government mining policy. |
| Internationally-affiliated NGOs (FoE, CARE, FIAN) | ●● | Active in local services, channeling advocacy work through WACAM. |
| National NGOs | ● | Diverse and varied interest in mining issues. |
| Community-based Organizations | ● | Locally important, but too few, too weak. |
| Trade Unions | ● | Concerned with mine safety. |
| Key: ● Marginal ●● Low ●●● Moderate ●●●● Significant ●●●●● Highly significant | | |

46. The GoG has accorded high priority to sustainable development of the mineral policy with specific focus on ASM in its poverty reduction strategy. As analyzed in the section below, “Funding of the Mining Sector,” weak human and technical capacity and the lack of funds often prevent government agencies in the sector from fully executing their mandates. Constrained by limited capacity and funding, existing mining institutions in Ghana tend to focus on supporting industrial-scale operations because they are a large source of government income. Technical maps and geological information created by the Geological Survey Department (GSD), for example, are commonly used by investors. However, the department has not been successful in either identifying areas for ASM activities or disseminating such information to ASM operators; their daily subsistence could be significantly improved by appropriate geological data.³⁷ The Mines Department has had similar financial constraints and has failed to provide sufficient support to ASM in safety and health issues.

³⁷ Under the umbrella of the Mining Sector Support Program, the GSD is carrying out geological mapping in regions with geological potential and is seeking areas that would be adequate for ASM. At the time this report was written, none of these areas had been demarcated for ASM activities.

47. The Minerals Commission, in charge of the regulation and utilization of the mineral resources and the coordination of related policies, has been better funded than other similar agencies. But in practice, its principal role has been to foster the development of mineral resources by attracting foreign investors and negotiating leases with them. The commission also has the responsibility of promoting the formalization of ASM. Its increased workload is partly the result of weakness in other agencies, and has introduced considerable constraints to its capacity to support ASM workers.

48. In addition, the Commission does not consider environmental or social aspects of regulation within its mandate. Its regulatory role effectively ends once licenses are issued. Key policy decisions, such as opening up new forest reserves for gold mining, are taken at cabinet level. This leaves enforcement and monitoring of environmental regulations mainly in the hands of the Environmental Protection Agency (EPA). In practice, however, the EPA is ill equipped to undertake its regulatory functions (see discussion below, “Funding of the Mining Sector”). Sound coordination between the Minerals Commissions and EPA is crucial to ensure that environmental and social issues are integrated into the process of granting mining licenses. In reality, however, the Minerals Commission cites the EPA as the major source of delay in the process of granting mining exploration and exploitation licenses. The EPA does not—in practice—demand that reclamation bonds be posted prior to operations commencing in the field, and has been ineffective in pursuing defectors. For example, in the case of Bonte Gold Mines Ltd which was liquidated in 2004, the EPA failed to collect the reclamation bond of US\$2.6 million.

49. Also, monitoring of environmental performance is weak because of the EPA’s limited financial and human resources.

Box 4-4: Demand for Improved Compliance

In 2005, the Center for Public Interest Law (CEPIL) and the Center for Environmental Law, two Accra-based NGOs, sued Bonte Gold Mines Ltd. for alleged negligence of regulations and destruction of the environment. The company closed without reclaiming the environment. Negative environmental impacts not only impede revegetation, but also prevent the local communities from using the area for farming. The company left behind a debt of USD\$18 million, including a US\$2.6 million reclamation bond.

The Minerals Commissions and EPA have also been sued for their failure to execute statutory responsibility. The plaintiff claimed that state agencies failed to ensure compliance when the company reneged on its duty to restore the environment.

Source: Runaway Mining Firm Dragged to Court, Public Agenda (April 8, 2005).

50. Improved “Corporate Social Responsibility” trends within the sector have arisen out of pressures from civil society and NGOs, rather than from the compliance efforts that the EPA has been able to exert (see 5). Violence in the sector is not unknown; for example, reports persist of security agents shooting people who trespass in mining areas. A number of civil society organizations are advocating improved environmental governance, social protection, compensation for affected communities, and human rights in mining regions in Ghana. There is also a National Coalition of NGOs on Mining; and three of its members are particularly active: WACAM, CEPIL, and TWN.

Box 4-5: Corporate Social Responsibility in the Mining Sector

Over the past years, mining companies have applied portions of their profits to support national or local projects. This so-called “corporate social responsibility” constitutes an expression of intent; no explicit legal requirements exist for mining companies to provide services to local communities. Indications are that in the major extraction sites, mining companies account for a significant share of the social infrastructure and provision of social services. These typically involve Alternative Livelihood Projects, educational and health care services, infrastructure and utilities, and the sponsoring of recreation and sports activities. Another example of the benefits provided by mining companies is their cross-subsidizing small users’ electricity consumption as a result of the tariff structure that favors large consumers. During a 2004 conference on *Corporate Social Responsibility in Ghana*, the Chamber of Mines stressed the significant fiscal contributions by the mining companies at the local level. The implementation of the Extractive Industries Transparency Initiative—EITI (for a more detailed discussion, section 4.4 D below) will clarify the level of contribution the companies provide.

The Chamber of Mines, a voluntary association of public and private sector actors of the mining industry, promotes corporate social responsibility and human resource development within the industry, and is supporting the Extractive Industries Transparency Initiative (EITI). However, member companies often compete with ASM for limited mining areas, and their strong bargaining power, plus the government’s desire to attract foreign investment, often result in marginalization of ASM.

Source Minerals Commission and Chamber of Mines. Proceedings of National Mining Conference on Corporate Social Responsibility in Ghana, 2004.

51. Recognizing that institutions in the mining sector need to be strengthened, the European Community and GoG are carrying out a Mining Sector Support Program to help mining institutions fulfill their mandate. This program’s aims are: institutional reinforcement and capacity building; provision of geo-scientific data; mining environment protection, including the development of an alternative use of mercury by small-scale miners; and mining infrastructure upgrading in the Western region. One of its projects, the National EIA & SEA Project, will carry out environmental audits of 61 major mining sites, and also consider health and social issues. This information will feed into a strategic environmental assessment that will cover major river basins affected by mining, and communities in a wider area. The results of the project are expected to provide valuable information for environmental management and institutional strengthening in the mining sector.

Fiscal Analysis of the Mining Sector

A. Mining Sector’s Contribution to Government Revenue

52. In Ghana, the mining sector is important because of the large amount of fiscal revenue it generates. However, the sector does not generate substantial employment. In 2004, the government’s revenue from the mining sector was 450.4 billion cedis (around US\$50 million), accounting for 9 percent of total government tax revenues (see Table 4-3 below).³⁸

³⁸ This is equivalent to 6.6 million cedis (about US\$ 732) per worker employed in the sector. This ratio is substantially higher compared with the ratio for total fiscal revenues related to all workers employed in all sectors, 0.5 million cedis, or about US\$ 55 (see Appendix 3, Table A3-2).

Table 4-3: Central Government Revenue Sources by Sector, 2001-2004 (in million of US\$)

| Sector source | 2001 | | 2002 | | 2003 | | 2004 | |
|-----------------------------|---------------|-----------------------------|---------------|-----------------------------|---------------|-----------------------------|---------------|-----------------------------|
| | Revenue | Share of total (in percent) |
| Banking insurance & finance | 45.55 | 20.9 | 57.63 | 19.8 | 70.24 | 16.5 | 92.2 | 16.7 |
| Agriculture | 2.34 | 1.1 | 2.76 | 0.9 | 2.63 | 0.6 | 3.22 | 0.6 |
| Timber | 3.01 | 1.4 | 5.45 | 1.9 | 4.50 | 1.1 | 5.17 | 0.9 |
| Mining | 25.52 | 11.7 | 30.87 | 10.6 | 45.49 | 10.7 | 49.96 | 9.0 |
| Manufacturing | 24.35 | 11.1 | 38.78 | 13.3 | 45.58 | 10.7 | 61.86 | 11.2 |
| Commerce | 15.70 | 7.2 | 21.77 | 7.5 | 28.83 | 6.8 | 45.80 | 8.3 |
| Public Services | 17.19 | 7.9 | 18.84 | 6.5 | 41.69 | 9.8 | 69.42 | 12.5 |
| Miscellaneous | 47.11 | 21.6 | 67.15 | 23.1 | 119.55 | 28.1 | 142.01 | 25.7 |
| Other ^a | 37.64 | 17.2 | 47.74 | 16.4 | 67.48 | 15.8 | 83.64 | 15.1 |
| Total | 218.40 | 100.0 | 290.98 | 100.0 | 425.97 | 100.0 | 553.26 | 100.0 |

Memo

Mining sector revenues

| | | | |
|----------------------------------|------|------|-----|
| Nominal growth rate (in percent) | 20.9 | 47.4 | 9.8 |
|----------------------------------|------|------|-----|

a. Includes: VALCO, Petroleum, Real Estate, Construction, Transport, Printing, and Professional Services. The revenue contribution of each sector is as follows: 0.2 percent for VALCO, 1.9 percent for petroleum, 1.1 percent for real estate, 4.8 percent for construction, 1.5 percent for transport, 0.7 percent for printing, and 2.7 percent for professional services in 2004.

Note: Total tax collection includes: Royalties, corporate tax, stamp duty, capital gains tax, PAYE, gift tax, penalties, dividend tax, rent tax, commission, interest, banderols, management and technical services and registration fees, and miscellaneous, but excludes reconstruction levy.

Source: RAGB.

53. Composition of revenues. The revenues from the mining sector consist of royalties, corporate tax, Pay As You Earn (PAYE) income tax, and a reconstruction levy. As shown in Table 4-4 below, the bulk of revenues stems mainly from mineral royalties (43 percent of total sector revenues in 2004) and income tax of local employee, PAYE (about 27 percent in 2004). The importance of mineral royalties is also reflected in its share of total government royalties (including timber, mineral, and copyright royalties), on average, 99 percent over the years 1999-2004.³⁹ Corporate income tax is relatively low—most companies do not pay income taxes because of the virtual tax holiday enjoyed from generous capital allowances. Accordingly, in comparison to the gross production value of minerals, the total taxes mining companies pay in Ghana are a small amount (see Figure 4-3 below).⁴⁰

³⁹ See Appendix 3, Table A3-3.

⁴⁰ A miner receives as income the gross production value (GPV) less the expenses incurred for smelting and refining the product. While in some cases these expenses could be large, in gold they are very small—from 1 to 3 percent of the GPV.

Table 4-4: Mining Sector by Sources of Revenues, 2000-2004 (in millions of US\$ and percent)

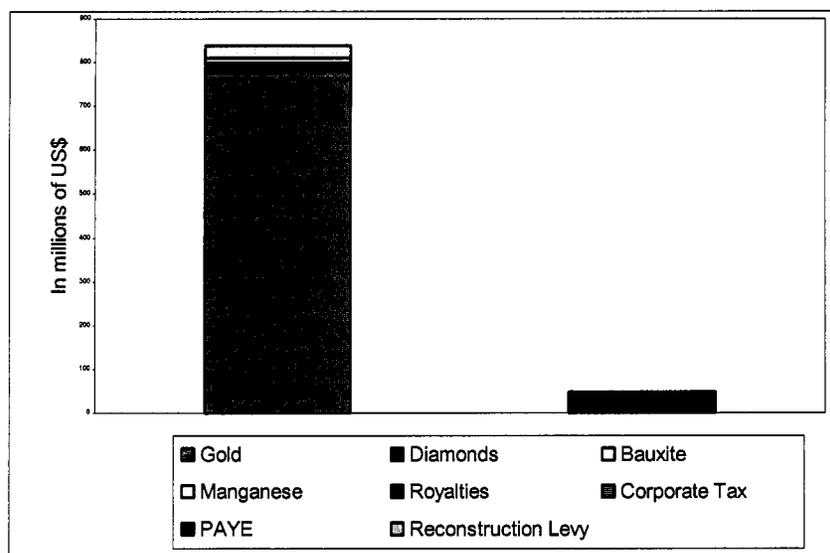
| Year | Corporate Tax | | Mineral Royalties | | PAYE | | Reconstruction Levy | | Total ^a | |
|------|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|
| | (in millions of US\$) | percent |
| 2000 | 1.75 | 8.1 | 13.17 | 61.3 | 6.57 | 30.6 | | | 193.8 | 21.50 |
| 2001 | 2.75 | 10.7 | 14.13 | 54.8 | 8.44 | 32.7 | 0.48 | 1.8 | 232.5 | 25.79 |
| 2002 | 2.61 | 7.7 | 17.03 | 50.3 | 11.26 | 33.3 | 2.94 | 8.7 | 304.9 | 33.82 |
| 2003 | 7.55 | 16.2 | 21.56 | 46.2 | 15.64 | 33.6 | 1.86 | 4.0 | 420.4 | 46.63 |
| 2004 | 11.13 | 19.9 | 23.93 | 42.8 | 14.91 | 26.7 | 5.90 | 10.6 | 503.6 | 55.86 |

a. Excluding miscellaneous.

Note: Reconstruction levy is 2.5 percent of gross profit before tax for 2000-2005, 15percent on gross profit after bad & doubtful debts for financial institutions.

Source: Minerals Commission.

Figure 4-3: Comparison of Gross Production Value and Government Revenue in 2003



Source: Ghana Minerals Commission

54. *Collection arrangements* The Internal Revenue Service is responsible for the collection of most of the revenues in the sector (royalties, corporate tax, PAYE, stamp duty, capital gains tax, rent tax, and gift tax). Property taxes are paid directly to the District Assemblies.⁴¹ Payments of the annual ground rent are made to the owner of the land or, in the case of the stool land, to the Office of the Administrator of Stool Lands (OASL).⁴² The MC only collects fees directly related to its services from the mining

⁴¹ In 1988 Ghana introduced the District Assembly system. There are 110 District Assemblies, 3 of which are Metropolitan Assemblies having a four-tier structure (Regional District, Local Council, and Towns and Village Development committees); three of these are Municipal Assemblies, which have a three-tier structure (World Bank, Decentralization Policies and Practices—Case study Ghana, 2003d).

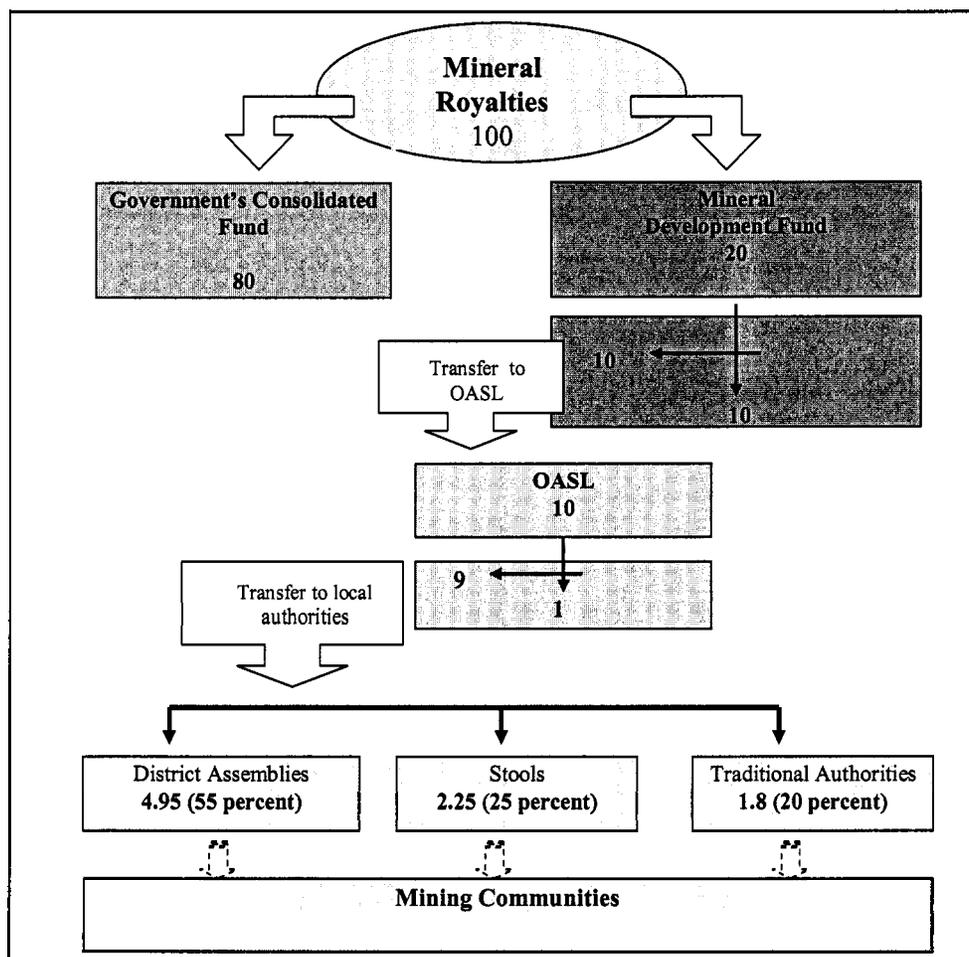
⁴² The OASL is responsible for collecting revenues due on stool lands as well as for transferring revenues to the local authorities (District Assemblies, stools and traditional authorities).

companies (e.g., processing fees, exemption fees, etc.). Since artisanal and small-scale miners are exempt from taxes, tax collection in the mining sector is limited to medium- and large-scale mining companies.

B. Distribution of Mining Revenues and Local Benefit Sharing

55. *At the central level.* The generation of revenue through the exploitation of mineral resources raises the important distributional issue of how revenues are reinvested in the mining sector and shared with the mining communities. Since 1993, 20 percent of total mineral royalties were earmarked for the Mineral Development Fund (MDF), and the remaining 80 percent disbursed in the government’s consolidated fund (see Figure 4-4 below). This indicates that Ghana’s minerals policy focuses on extracting mining revenues mainly at the benefit of the central government.⁴³ Out of the 20 percent of total mineral royalties, 10 percent has been reserved for the MDF supporting the public mining agencies, and 10 percent was transferred to the OASL. Following Ghana’s budgetary crisis in 1998, however, the Ministry of Finance and Economic Planning (MoFEP) has retained the 10 percent for the MDF (World Bank, 2003c).

Figure 4-4: Distribution of Mineral Royalties (percent share)



⁴³ The MDF was initially set up to support the three mining agencies and to fund environmental rehabilitation and development projects for mining communities. It was created in 1993 by a Cabinet decision, not by an Act of Parliament.

56. *At the local level.* According to a distribution formula enshrined in Ghana's constitution, out of the 10 percent of total royalties channeled to the OASL, the office retains 10 percent, while the remaining 90 percent is distributed to the local authorities in the following proportions: (a) the stools of the mining areas receive 25 percent, (b) the traditional authorities of the areas obtain 20 percent, and (c) the District Assemblies with the area of authority in which the stool lands are situated received 55 percent (see Figure 4-4 above).⁴⁴ Revenues for the local authorities have increased over the observed period 1999-2003, and only slightly dropped in 2004 by -15 percent (see Table 4-5 below). If compared with the distribution formula of 9 percent earmarked for the local authorities, in practice, the actual share disbursed is erratic and seems to be ad hoc, depending on circumstances in each year. This provides poor predictability of resources for the mining communities.

Table 4-5: Distribution of Earmarked Mineral Royalties (in millions of US\$), 1999-2004

| | Amount distributed to the OASL | | Amount allocated to the local level | | | Amount local authorities/total mineral royalties | |
|------|--------------------------------|------|-------------------------------------|---------------------|--------|--|----------------------|
| | Total | OASL | Total | District Assemblies | Stools | | Traditional Councils |
| 1999 | 0.06 | 0 | 0.04 | 0.02 | 0.01 | 0.01 | |
| 2000 | 1.32 | 0.13 | 1.19 | 0.65 | 0.30 | 0.23 | 1.0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2002 | 1.40 | 0.14 | 1.25 | 0.69 | 0.31 | 0.26 | 0.82 |
| 2003 | 3.42 | 0.34 | 3.07 | 1.69 | 0.77 | 0.61 | 1.59 |
| 2004 | 2.92 | 0.29 | 2.62 | 1.44 | 0.65 | 0.52 | 1.22 |

Source: Minerals Commission.

In 2001, royalties were not allocated to the OASL and local authorities because of elections and changes in government. Government, however, allocated part of the 2001 royalties in 2002 and 2003.

57. *Shortcomings.* Based on the government's intention to use the MDF as a mechanism both to finance the agencies in the mining sector and to transfer a share of the royalties back to the mining communities, we see that revenues are reinvested in the mining sector either to a limited degree or not at all. As seen above, only a small share of the royalties reaches the mining communities, which are the most affected by the mining activities (see "Overview and Diagnosis" section). Not only is the overall level of revenue low, but the distribution mechanism is inefficient and biased against the local mining communities. Some shortcomings of this distribution mechanism include:

- Delayed payments to the three local authorities (District Assemblies, traditional authorities, and stools), because of the disbursement procedure through the OASL;
- Misuse of these payments by local authorities financing expenditures other than those that benefit the local mining communities; and
- Lack of proper accounting for and reporting of the use of these resources.

⁴⁴ See Article 267 of Ghana's Constitution (Republic of Ghana, Constitution of the Republic of Ghana, 1992).

58. On the whole, the royalties actually reaching the mining communities represent only a small fraction of the mining rent. Yet royalties are the main source of revenue for communities to restore the environment and to reinvest in land and other assets for economic growth and poverty alleviation.

59. Meanwhile, mining agencies have been underfunded. Resources are not being released to the MDF, which thus impacts the regulation and safeguarding function of the agencies (see section on “Funding of the Mining Sector”).

60. *Adequacy of benefits.* Against the benefits provided by the mining companies (employment, improved social services, etc.; see 5), one must recognize that there are also costs such as (a) the environmental legacy of past mining operations, (b) inadequate provision of funds postclosure, and (c) the resettlement of communities, which results in unemployment, alteration of livelihood, changes in housing, and so forth. Present evidence indicates that the government still struggles with the environmental liabilities of past mining operations for which it failed to hold the companies accountable. The problem of inadequate funds available to cover rehabilitation costs at the closure of each mining operation continues to this day. Last, negotiations and compensation payments have not always been transparent, and the level of payments has been considered low and inadequate.⁴⁵ The World Bank Project Performance Assessment of the Mining Sector Development and Environment Project had addressed these issues. It recommended the need for a broader cost-benefit analysis of large-scale mining that factors in social and environmental costs and includes systematic consultation with the affected communities (World Bank, 2003c).⁴⁶

61. The government has also failed to ensure that mining communities affected by extensive resource extraction benefit by receiving sufficient funds. The tangible economic benefits of resource extraction are often not felt by mining communities themselves. An urgent need exists to make the mechanism for transferring resources back to the mining communities more effective, transparent, and equitable. Some companies have decided to establish a specific “Development Trust Fund” for mining areas to respond directly to community development problems, as well as to address development issues emerging after the gold deposits have been mined. The proposed New Mining Law intends to give the MDF more transparency and accountability and increase its resources by establishing mandatory contributions for community development from mining companies.⁴⁷

C. Funding of the Mining Sector

62. *Funding of the ministry through 2004.*⁴⁸ The budget of the mining sector is not significant. Budgetary allocations to the Ministry of Mines amounted to 20.3 billion cedis (US\$2.2 million) or 0.1 percent of the total budget envelope in 2004.⁴⁹ This small budget is determined largely by donor assistance, which has fluctuated over the observed period; this suggests the sector faces difficulty in predicting its future funding levels.⁵⁰ Whereas over the period 2002-2003 the sector has been mainly financed by borrowing, this changed to grant financing in 2004 with the implementation of the mining sector support program, financed by the European Union (see Appendix 4, Figure A4-2). Overall, the

⁴⁵ National Coalition on Mining, Memorandum on the Minerals and Mining Bill 2005.

⁴⁶ for further reference, see also Colin Nov Boocock, Environmental Impacts of Foreign Direct Investment in the Mining Sector in Sub-Saharan Africa, 2002.

⁴⁷ In order to respond to some concerns raised by the mining communities, NGOs, and civil society regarding the limited benefits emanating from the mining activities, the MC, in collaboration with the Chamber of Mines, organized a conference on the theme: “Corporate Social Responsibility in Ghana: Extending the Frontiers of Sustainable Development” in 2004.

⁴⁸ An assessment of the mining sector budget is difficult as the sector was managed by the Ministry of Mines only until 2004 and was merged then with the Ministry of Lands and Forestry. Prior to 2002, the sector was managed by the Ministry of Mines and Energy.

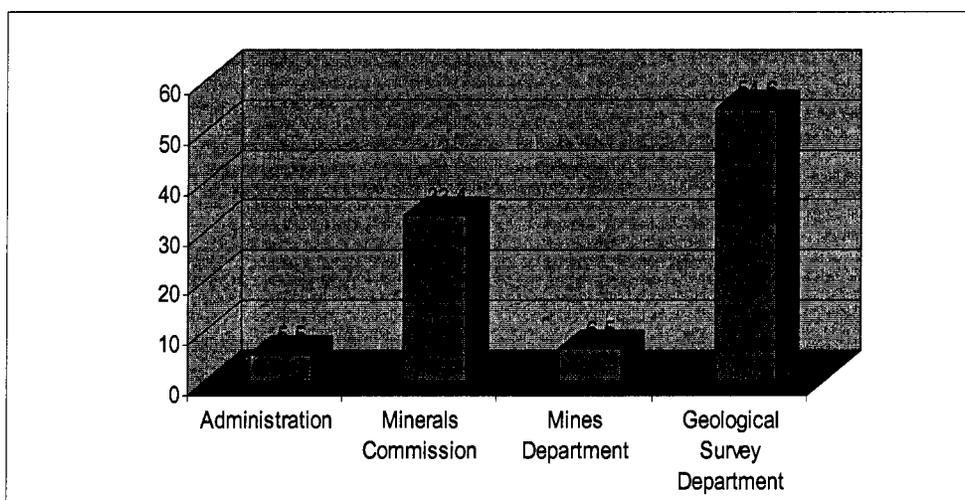
⁴⁹ See Appendix 3, Table A3-4.

⁵⁰ See Appendix 3, Figures A3-1, A3-2, and Table A3-5.

significant donor assistance for the sector's institutional strengthening and investment needs raises concerns about the sustainability of resources for the sector once the EU program is phased out.

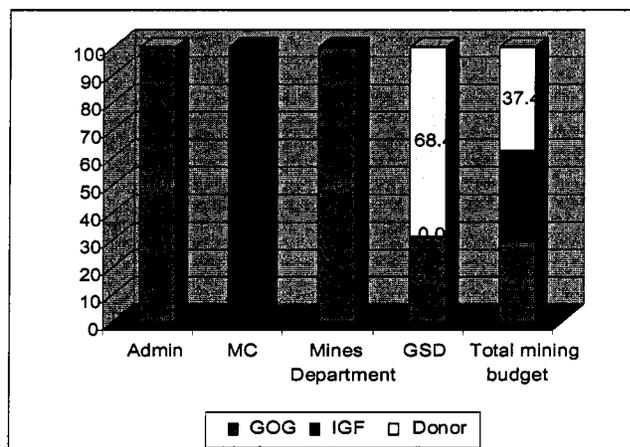
63. *The mining agencies in 2005.* Following the 2005 merger of the Ministry of Mines and the Ministry of Lands and Forestry, the three key mining departments, the Minerals Commission, the Mines Department and the Geological Survey Department, were transferred to the MoLFM. Overall budgetary allocations to the three mining agencies accounted for 33.2 billion cedis (around US\$3.6 million) in 2005, or 8 percent of the total MoLFM budget.⁵¹ Out of this US\$3.6 million, the Geological Survey Department (GSD) received the largest share (55percent), followed by the MC (33 percent) and the Mines Department (6percent) (see Figure 4-5).⁵²

Figure 4-5: Composition of the Allocated Budget by Agency in 2005 (as a share of total mining sector budget)



Source: GOG, Appropriation Act, 2005.

Figure 4-6: Mining sector: Composition of the Allocated Budget by Agency and by Sources in 2005 (as a share of total mining sector budget)



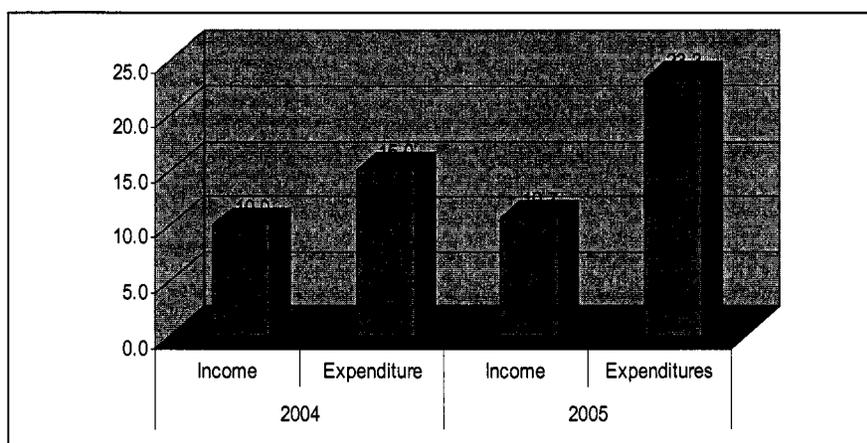
⁵¹ See Appendix 3, Table A3-6.

⁵² See also Appendix 3, Table A3-7.

Source: GoG Appropriation Act 2005.

64. As illustrated in Figure 4-6, the high level of budgetary allocations to the GSD mainly relate to significant donor assistance. In fact, the GSD was the only beneficiary of donor assistance in 2005; GSD's budget accounts for nearly 40 percent of the total mining sector budget. In contrast with the other agencies, the MC is funded out of its internally generated funds, which derive from application fees, publications, public services, and so forth. However, its financial autonomy is at present not sustainable (see Figure 4-7 below). The level of income is not high enough to cover the annual expenditures.⁵³ Resources taken from a reserve established in the 1990s have financed the deficit. The MC estimates that in the next three years the stock of reserves will be diminished; it is in the process of exploring further areas of revenue increases (e.g., the revision of fees and licenses) to avoid dependency on government's budget in the next years.

Figure 4-7: Comparison of MC's Income and Expenditures (in billions of cedis)



Source: Data from Minerals Commission.

65. Shortcomings. Since 1998, the MoFEP has not released resources to the MDF, which undermines the operational capabilities of the mining agencies. This has been particularly detrimental for the operation of the Mines Department and the GSD whose investment budget was topped up by the MDF in the past. The cuts in the investment budget have constrained the Mines Department from monitoring the implementation of health and safety regulations at the mining sites. In addition, the department is short of technical staff. Likewise, the GSD has found its financial situation worsening as funding from the MDF was cut and the Bank's MSDEP closed in 2001.⁵⁴ In the context of the MSDEP, the restructuring of the GSD was discussed because the department faces severe inefficiencies from overstaffing at the lower skill levels; scope for subcontracting exists, but the government has not pursued it further.⁵⁵ Although the MC has sought financial autonomy, the present funding arrangement is not sustainable. Moreover, given the constraints in revenues, the MC has been operating under a tight budget and has not been able to

⁵³ See also Appendix 3, Table A3-8 and A3-9.

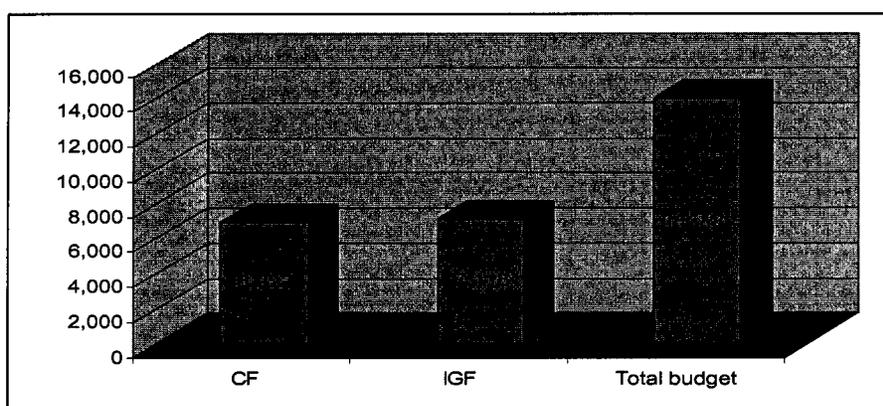
⁵⁴ One of the stated objectives of the MSDEP was to enhance the capacity of the mining sector institutions so that they could carry out their functions of encouraging and regulating investments in the mining sector in an environmentally sound manner (World Bank MSDEP SAR 1995).

⁵⁵ A diagnostic study of the GDS highlighted that it needed radical restructuring and that much of its technical work should be subcontracted to specialized, outside firms. The GSK never accepted the restructuring proposals (World Bank 2003c).

adequately execute all planned programs.⁵⁶ The three mining institutions will benefit over the next years from an institutional reinforcement and capacity building program funded under the EU Mining Sector Support Program.

66. *Funding of the EPA.* As mentioned in the institutional analysis, the EPA is struggling to fulfill its regulatory and enforcement function. The agency's poor performance is mainly attributed to its underfunding. In 2005, the agency received 9 percent (14 billion cedis, or US\$1.5 million) of total former Ministry of Environment and Science (MES) budget.⁵⁷ Also in 2005, the MES obtained 0.8 percent of the total national budget (around 157 billion cedis, or US\$17.2 million).⁵⁸ The EPA budget is financed partly from the consolidated fund and partly from its internally generated funds (IGFs), which accounted for 51 percent of the total budget in 2005 (see Figure 4-8 below).⁵⁹ Around two thirds of the IGFs support the National Environment Fund (NEF), while 25 percent is retained by the EPA for administrative purposes. It is noteworthy that the EPA financing is based on a two-budget system (the consolidated budget and the resources provided by the NEF for the operation of the agency). Until today, the agency has not yet made efforts to consolidate its fragmented budget and to make the funding of the NEF more transparent.

Figure 4-8: Composition of Allocated EPA Budget in 2004 and 2005 (in billions of cedis)



Note: Donor assistance is not included in EPA's budget. The agency has benefited by donor assistance (mainly covering its needs for investment and partially serviced expenditures) over the past years. The funds are directly requested from the development partner but are not document in the EPA budget.

Source: EPA (2004 annual report) and GoG (Appropriation Act 2005).

67. *Sustainability.* The NEF was set up to create a reserve that would allow the EPA to become sustainable in the long-term.⁶⁰ The EPA can apply to the board of the NEF for funds to finance selected activities such as environmental education, research, human resource development, and others. Because of insufficient funds from the consolidated fund over the past years, the agency has not been able to

⁵⁶ According to the MC 2003 annual report, the commission was not able to implement several programs, for example, the restoration of old geological reports and maps as well as the Alternative Livelihood program, because of insufficient resources in 2003.

⁵⁷ See Appendix 3, Table A3-10.

⁵⁸ GoG, Act of the Parliament of the Republic of Ghana, entitled the Appropriation Act, 2005.

⁵⁹ The agency generates revenues (mainly fees and charges) from the following sources: chemical clearance, meat fish clearance, EIA permitting, mining exploration, small-scale mining permitting, and tree cutting permitting.

⁶⁰ The National Environment Fund was established under Part 111, Section 16(1) of the Environmental Protection Agency Act, 1994, Act 490.

increase its reserves as planned.⁶¹ As shown in Table 4-6 below, the budget execution rate of the agency's CF budget in 2003 and 2004 was less than 85 percent, the result of a limited release of resources by the MoFEP during the fiscal year. The deficit had been financed by the internally generated revenues that were foreseen for the reserve.

Table 4-6: The Consolidated Fund of the EPA in 2003 and 2004

| | 2003 | | | 2004 | | |
|-------------------|--|---------------------------------------|---------------------------------|--|---------------------------------------|---------------------------------|
| | Allocated budget (in millions of US\$) | Released budget (in millions of US\$) | Budget execution rate (percent) | Allocated budget (in millions of US\$) | Released Budget (in millions of US\$) | Budget execution rate (percent) |
| Total | 0.82 | 0.69 | 83.5 | 0.80 | 0.68 | 84.7 |
| PE | 0.58 | 0.47 | 80.4 | 0.52 | 0.49 | 93.1 |
| Admin | 0.12 | 0.11 | 90.3 | 0.13 | 0.08 | 60.9 |
| Service | 0.11 | 0.10 | 92.4 | 0.11 | 0.10 | 92.6 |
| Investment | 0.02 | 0.01 | 80.5 | 0.02 | 0.00 | 0.0 |

Source: EPA data.

68. *Performance.* The weak funding position of the EPA has severely impacted its capacity to function effectively and efficiently in the mining sector. The mining unit at the EPA employs only four employees in charge of regulating and monitoring the mining sector. Aside from insufficient agency funds for recruiting more staff, the low contractual status of its staff, including lower salaries and inadequate benefit payments, provides little incentive for new employees compared with civil servants at other public agencies and ministries.⁶² Expenditures that fall under administration and services have been also inadequate; as a result, the EPA is limited in its ability to travel, to set up local offices, and to purchase equipment, material, and vehicles.

D. Fiscal Transparency and Accountability

69. Although the IRS has a high royalty collection rate, mining company reporting on royalties has come into question. Likewise, concerns have been raised regarding the accuracy of the reported retention rate of foreign exchange.⁶³ The Bank of Ghana and the MC are responsible for monitoring the foreign exchange outflows and inflows, including the repatriation of retained export proceeds into domestic commercial banks and the partial settlements of bills with local contractors in foreign currency. However, no independent institution exists to verify the information provided by the mining companies (e.g., regarding exchange earnings, off-shore retention, and voluntary repatriation) (IMF, 2004).

70. The 2006 gold audit conducted by the Ministry of Finance for the first time indicates the government's commitment to improve transparency in revenue collection. The purpose of the audit was to

⁶¹ At present, the reserves amount to about 8 billion cedis (about US\$ 800,000) in 2006, up from 2 billion cedis (US\$ 221,000) in 2002. However, EPA estimates that, if more secured funding had come to the CF in the past, its reserve would have more than 15 billion cedis (US\$ 1.7 million) in 2006.

⁶² Over the past years, the agency has been carrying vacant positions, lacking the resources by MOFEP to fill them. In 2005, the agency was able to fill 27 vacant positions (out of 30); however, only 15 remained occupied at the end of the year.

⁶³ Ghana earned US\$840 million in foreign exchange from gold mining in 2004 (International Monetary Fund. 2005. Ghana: 2005 Article IV Consultation, Third Review Under the Poverty Reduction and Growth Facility, and Request for Waiver of Nonobservance of Performance Criteria and Extension of the Arrangement—Staff Report.).

determine whether the mining companies are making a total accounting of gold produced in terms of quantity and quality.

71. Moreover, the Government of Ghana has signed the EITI, in which governments and industry each agree to report on transfers and receipts using standard reporting templates.⁶⁴ The initiative has the support of the Chamber of Mines; it recognizes that EITI participation will not only improve the industry's public image, but also increase corporate governance standards and encourage more mining companies to list on the Ghana Stock Exchange. Unfortunately, progress with EITI has been relatively slow.⁶⁵ Limited testing of revised templates has taken place in Tarkwa, and the audit-like contract for the "Independent Aggregator"—a key component of EITI processes—was only advertised in January 2006.

Box 4-6: Benefits of Implementing EITI

The primary beneficiaries of EITI are the governments and citizens of resource-rich countries. Some of the key advantages of improved transparency in the payment flow between companies and government are:

- (i) Decision makers holding companies accountable for the use of those revenues;
- (ii) An improved investment climate since the government is committed to strengthening transparency and accountability over natural resource revenues;
- (iii) Mitigated investment risk for companies because of reduced corruption and political instability;
- (iv) Benefits to civil society from increased information in the public domain about those revenues that governments manage on behalf of citizens, thereby increasing accountability and improving transparency.

Source: EITI.

Key Findings and Recommendations

72. *Modify the royalty structure to take advantage of market booms.* Based on the current metals market situation in Ghana, great potential exists for significantly increasing revenues that are derived from the mining sector without affecting the competitiveness of the sector.

73. *Review the procedures for access to land and forests for mining activities, compensation, and rehabilitation after mine closure.* The fact that the central government grants mineral rights without the consent of landowners has created tensions between miners and landowners, who have to strike an agreement with a more powerful counterpart. Compensation for the land lost to mining is also at stake. On the one hand, landowners feel that they are not fully compensated for all the values lost, which in their opinion go beyond cash crops and trees, reaching biodiversity and cultural aspects. On the other hand, mining companies have aggravated this situation by paying different compensation amounts for similar lands. Moreover, the Land Valuation Board has endorsed this situation. And rehabilitated lands are not as fertile as they used to be prior to mining activities, which means a permanent loss for the landowners. To complicate things, in many cases negotiation of compensation is carried out with the stool lands chiefs, who in several cases have misused the funds received. There is a need, therefore, to review the entire

⁶⁴ The EITI was launched by the UK at the World Summit on Sustainable Development in South Africa 2002 and seeks to encourage governments, the extractive mining companies, international agencies, and NGOs to promote transparency in company payments and government revenues from oil, gas, and mining, and thus to improve revenue collection and contribute to sustainable development and poverty reduction.

⁶⁵ Some of the problems were related to (a) the lack of leadership by an institution to ensure EITI implementation, (b) inadequate resources to organize and implement the collection of data, and (c) lack of compliance with the EITI template standards because of insufficient information (e.g., there are gaps in the data provided by the mining companies regarding dividends, bonuses, and fees; moreover, the CAGD's accounting and reporting system is too limited).

process to access land for miners in order to bring to it greater fairness and legitimacy. This requires empowering communities and landowners to conduct more favorable negotiations. More concrete suggestions are provided in paragraphs 77 and 78.

74. *Strengthen institutions to reinforce sector and environmental regulations.* The EPA is particularly affected by lack of funding and the shortage of human resources. Moreover, institutional weaknesses for sector management are also present mainly from lack of funding. This insufficiency points to the need to strengthen the MDF, and ensure that it is properly funded and capable of monitoring the funds that are disbursed to mining and regional and local institutions. Also needed would be decentralization of the EPA and an increase in funding (from a reform of the royalty system) at the district level for its monitoring and compliance activities.

More Detailed Recommendations

75. In the late 1980s and early 1990s, Ghana underwent a successful mining reform that led to a seven-fold increase in gold production in 2000. However, this impressive growth sector has not resulted in sizable improvements in the quality of life and growth perspectives of mining regions and local communities. In spite of the adoption of environmental regulations for the mining sector, environmental impacts of mining activities are still an important concern for mining activities, particularly those originating in ASM. Ghana continues to have important geological potential that goes beyond gold and diamonds to construction minerals and bauxite. To make the most of the contribution of mineral resources to Ghana's sustainable development, a New Mining Law was recently enacted, and the government is preparing a new mining policy. Therefore now is a propitious time to highlight those issues that are critical to improving the environmental sustainability and social responsibility of mining development from the existing policy, institutional, and regulatory framework for mining activities in Ghana.

76. Mining in Ghana has followed the pattern of an enclave economy. Besides the traditional factors that created this situation (such as the high technology embedded in mining equipments and machinery, and the high capital intensity of the industry), policy factors have reinforced this situation and aggravated an already existing one of unequal development in mining regions. Mining policy in the last 15 years has focused on creating an enabling environment to attract large foreign investors. This has shaped the legal, regulatory, fiscal, and environmental regime for mining activities. In spite of some success in attracting foreign investment, this has resulted in a marginalization of domestic miners, particularly ASM, and has largely excluded mining regions and local communities from the benefits of development. Moreover, this environment has created tensions between a foreign investment-led development model and the aspirations of large sectors of the population in mining regions. These tensions are very closely related to environmental and natural resource management, indicating that traditional mining policies in Ghana have only partially integrated environmental and natural resource management in their design and implementation.

77. The environmental and natural management issues that would need to be reconsidered and adjusted include **access to land and forests for mining activities, and compensation and rehabilitation after mine closure.** As stated in paragraph 73, key issues for mining to become a sustainable development driver at the local level is to level the playing field between miners and landowners, and ensure that mining activities provide sizeable benefits not only to miners and GoG but also to landowners. This requires the consideration of new approaches for miners to access natural resources; enhancing transparency and fairness in compensating for land allocated to mining activities; and, revising the prevailing benefit sharing schemes, which mainly focus on the central government and the miners, sidelining landowners and local communities in the process.

78. Some suggestions worth considering are:

- (i) the establishment of prior consultation with communities and/or landowners affected by potential mining activities;
- (ii) a comprehensive framework for compensation, post-closure rehabilitation and benefit sharing, the principle would be that mining should benefit miners as well as landowners, taking into consideration short and long-term issues;
- (iii) state institutions that grant mineral rights and have competence at local level should be involved in the process to guarantee fairness in the negotiation and to align their development plans for these communities with the opportunities opened by the mining project.

79. **A policy focus not only on large, usually foreign investors but also on domestic miners.** A comprehensive program dealing with issues of mining rights, access to appropriate technology and funding, and human and natural resources management for ASM is badly needed. ASM activities in Ghana have significant impacts on the environment; some of them involve child labor. Yet ASM is a major source of employment in the country. In order for mining to become a source of sustainable growth in Ghana instead of a source of conflict and social tension, human rights in the context of the relationship between large-scale mining companies and galamsey deserve especial consideration.

80. **Institutional strengthening to reinforce sector and environmental regulations.** As discussed in paragraph 74, finding creative ways to fund the EPA through a strengthened MDF is imperative. One way would be decentralizing the monitoring and enforcing functions of EPA at district levels and supporting these decentralized entities in the mining regions through MDF. Additional resources to support these activities would be available from an adjustment in the royalty system by allocating a portion of the royalties accrued from mining to the EPA at the district level. This would also ensure that in the mining districts the EPA would have the resources needed to monitor and enforce compliance of mining operations with environmental regulations. Another need is to prepare a financial plan that takes into account the actual and future needs of sector institutions such as the GSD and their dependence on external resources. This would allow for the preparation of a multiyear budget that could be financially sustainable.

81. **Modify the royalty structure to take advantage of market booms.** The current metals market situation presents a great opportunity for Ghana to significantly increase its royalty revenues without affecting the competitiveness of the mining sector.

82. Metal prices have increased markedly in the last two years, in several cases reaching levels that have not been seen since the 1970s. Gold prices more than doubled in the last three years. As established in the New Mining Law, royalty rates in Ghana can vary between 3 and 6 percent; however, because of calculation procedures, it becomes a fixed rate prior to the start of the mine. As an increase in prices mainly translates into greater profits for the operations already established, one suggestion is to allow for royalty rates to vary vis-à-vis metal prices. In this way, the state could share part of the windfall profits resulting from increases in prices. If the price for the floor royalty rate (3 percent) is established taking into account the prices of the last 5 or 10 years, (reasonable periods for identifying an objective indicator), the current royalty rate would be significantly higher than 3 percent.

83. **Redistribute revenues to strengthen institutional capacities and regional development.** An increase in fiscal revenues is strongly recommended to be used mainly for the following two purposes. The first would be to fund and strengthen MDF. Second, it would allocate additional funds for local and regional development as additional resources to those already earmarked in the MDF for local authorities. To guarantee the best use of these funds and to use them for leveraging additional funds, the creation of a Development Fund (DF) is suggested. The fund would receive the corresponding portion of mining royalties and contributions from other donors that will be spent according to a plan approved through public consultation with a mine's neighboring communities .

84. These recommendations and other more specific and complementary to them are presented in the following matrix (Mining Sector Road Map).

4.6 Mining Reform and Investment Road Map, 2006-2025

Policy and Regulatory

| Short-term actions (2006-2009) | Intermediary outcome | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|--|--|--|---|---|---|
| <ul style="list-style-type: none"> • Conduct a trilateral policy dialogue to incorporate environmental and social considerations into legal instruments (LIs) of the new Mining Law and new mining policy. • Conduct a review of the mining royalties regime. • Promote CSR efforts of mining companies. • Decentralize planning activities to address the needs of remote mining communities. • Prepare EITI reporting document. | <ul style="list-style-type: none"> • Legal instrument (LI) for variable royalty rates established in the New Mining Law • Ratification of MDF by Parliament • LI to promote mining companies' contribution to MDF • Creation of Development Fund • Involvement of key stakeholders in strategic decision-making and policy dialogue • Lis for access to land resettlement, mine closure, compensation, and rehabilitation • Policy recommendations for mining induced sustainable development at the regional and local levels • Increased transparency in income reporting of mining activities | <ul style="list-style-type: none"> • Full implementation of Lis, policy recommendations, and MDF • Comprehensive program to mainstream/ formalize ASM activities • Regulations on disclosure of information • Public consultation for mining activities and mining-related regional development plans and programs established | <ul style="list-style-type: none"> • Flexible and more equitable state participation in mining revenues • Transparent and equitable participation of local communities in mining revenues • Mining more inclusive and better integrated into the local and regional economies • Amelioration of environmental degradation and social dislocation from ASM • Improved environmental and social performance of mining companies • Fewer conflicts and trust built between government agencies, mining companies, communities, and ASM | <ul style="list-style-type: none"> • Fine tuning of mining policy based on adaptive learning | <ul style="list-style-type: none"> • An environmentally sustainable and socially responsible mining industry |

Institutional Capacity Building

| Short-term actions (2006-2009) | Intermediary outcome | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|--|--|---|--|---|---|
| <ul style="list-style-type: none"> • Strengthen Land Valuation Board. • Establish incentives and programs to strengthen ASM organizations. • Establish incentives and programs to increase the transparency and accountability of chiefdoms and District Assemblies. • Strengthen enforcement and monitoring capacity of EPA. • Empower vulnerable stakeholders, i.e., women, in the mining sector. | <ul style="list-style-type: none"> • Better assessment and greater harmonization in compensation related to mining activities • ASMs voicing their needs and increasing their awareness of its environmental and social responsibilities • Greater awareness of local communities' rights and use and of the value of biodiversity • Communities better organized to represent and articulate their interests • Improved administration of EIA process • Increased access by women to mineral rights | <ul style="list-style-type: none"> • Social capital in mining communities strengthened • Communities trained on environmental aspects and monitoring of mining activities • Strengthened transparency and accountability of chiefdoms and District Assemblies • Strengthened enforcement and monitoring capacity of EPA | <ul style="list-style-type: none"> • Greater transparency and accountability in management of mining revenues of chiefdoms and District Assemblies • ASM organizations integrated into the local, regional, and national economies • Local communities and regional governments entering into meaningful negotiations with central government and the mining industry • Involvement of local governments and civil society in monitoring environmental performance of mining activities • Improved compliance with environmental regulations • Improved performance of EPA | <ul style="list-style-type: none"> • Strengthen property rights • Improve mechanisms to acknowledge and protect the interests of weaker and vulnerable stakeholders | <ul style="list-style-type: none"> • Mining drives a more equitable development processes at the local and regional levels |

5 Land Resources

Introduction

1. **Land is a critical resource for Ghana's economic growth.** It underpins the national economy by generating the bulk of the country's income and employment, both directly and indirectly. The agricultural sector—which contributes 38 percent of the GDP, employs 45 percent of the active population (about 60 percent of the rural labor force), accounts for about 75 percent of the export earnings, and contributes to meeting more than 90 percent of the food needs of the country, has led Ghana's economic growth in the past. On the basis of present projections and the priorities set in the country's strategy for growth and poverty reduction (GPRS II, GoG 2005), the agricultural sector will continue to be the key driver for growth for Ghana in the near future.
2. **However, land degradation is increasingly affecting land resources in Ghana, thus undermining the growth potential.** Past studies estimate that 69 percent of the total land surface is prone to severe or very severe soil erosion (EPA 2002), the main manifestation of land degradation in Ghana. A recent study estimated soil erosion to cost around 2 percent of the national GDP (World Bank et al. 2006), thus offsetting some of the past achievements of the country in terms of economic growth, and limiting the capacity of Ghana to fulfill its full potential for growth. Sustainable utilization of the country's land resources is therefore a necessary precondition for achieving and maintaining the economic growth rate necessary for Ghana to reach its main development objectives of attaining the status of middle-income country.
3. **Evidence suggests that adopting sustainable land management technologies can reduce soil erosion and enhance productivity.** A recent World Bank, DFID, and ISSER study (2006) concluded that sustainable land management (SLM) is key to addressing land degradation in Ghana. However, evidence shows that large-scale adoption of SLM technologies continues to be limited in Ghana. This chapter completes and complements the previous study by analyzing in depth the key barriers and bottlenecks that prevent the scaling up of sustainable land management practices in the country. In particular, this chapter will look at the policy, regulatory, institutional, and economic factors that prevent a large-scale adoption of SLM in Ghana. The chapter will then identify and propose a set of actions that could unlock these barriers and help improve sustainable land management in the country.
4. **In line with the new architecture of development assistance in Ghana, and given the multisectoral nature of land degradation, this chapter recommends moving toward a more programmatic, multisectoral approach to sustainable land/landscape management.** The chapter proposes a number of actions that would contribute to developing a programmatic framework for sustainable land/landscape management. These actions focus on (a) creating an enabling environment for sustainable land management (to strengthen and harmonize the policy, legal, and incentive framework), (b) strengthening SLM governance (to fortify cross-sectoral coordination mechanisms, streamline the existing institutional set-up, and build capacity), and (c) improving SLM knowledge management and monitoring and evaluation (to support policy and investment decisions through better knowledge management). The proposed actions could be implemented through a set of different implementation mechanisms and financial modalities, which integrate interventions in different landscapes (i.e., agricultural land, forest land, reserves, corridors, mines) and in different areas/sectors, including infrastructure, financial services, and private sector development..
5. **The chapter is organized as follows.** Section 5-2 provides a general overview of the land resources—with a specific focus on the agricultural sector—and of the scope, extent, causes, and impact of land degradation in Ghana. Section 5-3 describes some of the existing sustainable land management practices in the country. Section 5-4 analyzes the key underlying causes that prevent a wide adoption of sustainable land management practices. Section 5-5 presents a set of possible actions to scale up sustainable land management and address land degradation. Conclusions and a description of the possible

financing and implementing mechanisms are discussed in section 5-6. Proposed actions are synthesized in a recommendations matrix in section 5-7.

6. **The analysis is based on desk review** of available literature and key policy documents (both published and unpublished), **and on a series of consultations with key stakeholders** (government, development partners, research institutions, and civil society organizations). It is important to state at the outset that most of the data on the extent and intensity of land degradation in Ghana refer to studies undertaken in the 1980s. Although assumptions and methodologies on which these data have been built have a number of underlying weaknesses, they often are the only data available for analysis.

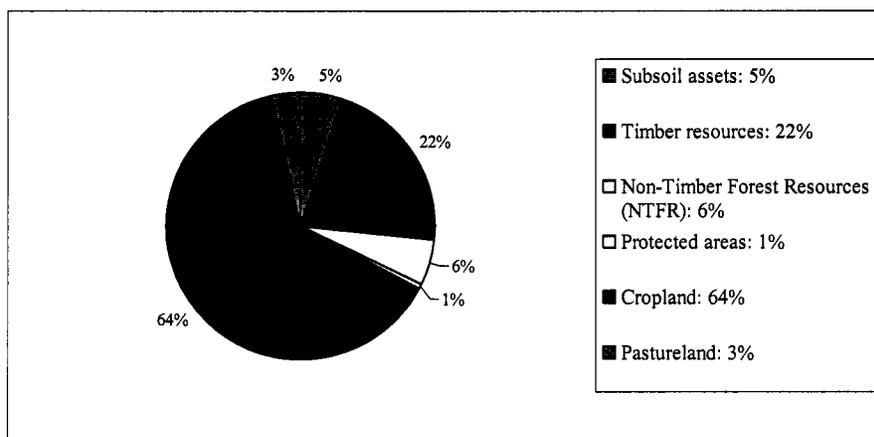
7. **This chapter will focus mainly on agricultural land and on the impact that land degradation has on agricultural productivity.** The impact of degradation of nonagricultural lands, i.e., forests and lands for mining, will be extensively treated in the chapters on forestry and mining. Nonetheless, solutions must comprehensively address land degradation in both agricultural and nonagricultural lands. The aspects and the impact of land degradation not covered in this Country Environmental Analysis may constitute an agenda for further research.

Land Resources and Land Degradation in Ghana: Overview

A. Economic and environmental significance of land resources

8. **Land is a key resource for Ghana's wealth.** As shown in Figure 5-1 below, most of the natural capital in Ghana (which represents about two thirds of the total wealth of the country) depends directly or indirectly on land resources (World Bank 2006b). Cropland represents almost two thirds of the natural capital in the country.

Figure 5-1: Natural Capital in Ghana



Source: Adapted from World Bank 2006b.

9. **The agricultural sector—which has been leading Ghana's economic growth with a 6 percent average growth rate in the recent past (GoG 2005)—contributes 38 percent of the GDP, employs 45 percent of the active population (GoG 2005) (about 60 percent of the rural labor force), accounts for about 75 percent of the export earnings (IFAD 2006), and contributes to meeting more than 90 percent of the food needs of the country (EPA 2002).** Within the agricultural sector, the *livestock subsector*, which mainly relies on permanent natural pastures, contributes to about 8 percent of the Agriculture GDP (AGDP), which is about 2 percent of the total GDP (GoG 2003). The *industrial* and *service sectors*, which account for about 12 and 28 percent of the GDP, respectively, also heavily depend on the

agriculture sector for raw materials and forward linkages (IFAD 2006). (A more detailed description of the agriculture sector in Ghana is reported in Appendix 5-1.)

10. **On the basis of current projections, the agricultural sector will continue to constitute the key driver for growth for Ghana in the near future** (see Table 5-1).

Table 5-1: GDP vs. Sectoral Growth Rate (2001-2009)

| | 2001 | 2002 | 2003 | 2004 | 2005* | 2006* | 2007* | 2008* | 2009* | 2001-09 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Real GDP | 4.20 | 4.50 | 5.20 | 5.80 | 5.80 | 6.11 | 5.83 | 6.06 | 5.72 | 5.47 |
| Agriculture | 4.02 | 4.36 | 6.06 | 7.49 | 6.50 | 5.24 | 6.71 | 5.18 | 6.60 | 5.8 |
| Industry | 2.93 | 4.73 | 5.06 | 5.13 | 5.80 | 6.11 | 5.83 | 6.06 | 5.72 | 5.26 |
| Services | 5.07 | 4.70 | 4.68 | 4.73 | 5.40 | 5.75 | 5.90 | 5.99 | 5.72 | 5.33 |

* Projected.

Source: Adapted from GoG 2005.

11. **Most of the rural households** (which represent 63 percent of the total population; World Bank 2006) **directly depend on land resources for their livelihoods**. The majority depends on small-scale agriculture. Small-scale farmers dominate the sector, accounting for about 80 percent of the total agricultural production (GoG 2003).

12. **Increasing agricultural productivity and developing an agro-based industrial economy are key pillars in the country's main strategy for growth and poverty reduction** (GPRS II, GoG 2005). Agricultural productivity in Ghana depends primarily on soil productivity.⁶⁶ Sustainable utilization of the country's land resources is therefore a necessary precondition for Ghana to fully develop its potential in agricultural development.

13. **Land contributes to the provision, maintenance, and regulation of critical ecosystem functions**. Land is the key environmental asset of the country and includes forests, wildlife, wetlands, and water resources. In addition, land provides habitats for biodiverse species; supports nutrient cycling; contributes to the provisioning of food, fresh water, and wood; and helps regulate the climate and floods. For instance, the forest, savanna, wetland, and coastal ecosystems provide habitats for at least 2,975 plant, 728 bird, 225 mammal, and 221 reptile species. Ghana's forests provide a significant contribution to carbon sequestration (UNDP 2006).

B. Land Use Patterns in Ghana

14. **About 63 percent of land in Ghana is considered agricultural land** (World Bank 2005), i.e., land suitable for agricultural purposes. However, only 18 percent is currently under cultivation (World Bank 2006). Land under irrigation is only 0.5 percent of agricultural land (IFAD 2006), or 0.04 percent of all land (GoG 2003).

15. **Land use in Ghana is classified as agricultural or nonagricultural**. *Agricultural land use* includes cultivation of annual crops, tree crops, bush fallow and other uses, and unimproved pasture; agricultural land represents 52 percent of the total area of the country. *Nonagricultural land use* includes forest reserves, wildlife reserves, unreserved closed forests, unreserved savanna lands, lands for mining, settlements, and institutional uses; this land covers the remaining 48 percent of the country's surface (Quansah 2001) (see Table 5-2 for breakdowns in land use).

⁶⁶ The agriculture sector in Ghana, particularly in the desertification-prone areas of the country, is characterized by low input technologies (i.e., fertilizers, improved seeds, mechanization, etc.). Agricultural production depends primarily on soil productivity (EPA 2002). In this regard, FAO (2004 in USAID 2005) describes declining soil fertility as the major constraint to agricultural production in Ghana today.

Table 5-2: Percentage of land area affected by soil erosion

| Land use | Area (1000 km ²) | Area (percent of total) |
|------------------------------|------------------------------|-------------------------|
| 1. Agricultural | | |
| - Annual crops | 12 | 5% |
| - Tree crops | 17 | 7% |
| - Bush fallow and other uses | 60 | 25% |
| - Unimproved pasture | 35 | 15% |
| Total Agricultural | 124 | 52% |
| 2. Nonagricultural | | |
| - Forest reserves | 26 | 11% |
| - Wildlife reserves | 12 | 5% |
| - Unreserved forests | 5 | 2% |
| - Savanna woodland | 71 | 30% |
| Total NonAgricultural | 114 | 48% |
| Total | 238 | 100% |

Source: Adapted from Ministry of Food and Agriculture 1990, in Quansah 2001.

C. Land Degradation in Ghana: Scope, Causes, Processes and Geographical Distribution

16. **Land degradation⁶⁷ in Ghana is increasingly affecting the country's land resources.** According to the results of the GLASOD (Global Assessment of Human Induced Soil Degradation) survey, about 69 percent of the land area in Ghana is affected by moderate to very severe soil degradation (FAO 2000)^{68,69} (see Table 5-3). As shown in Table 5-4 below, the percentage of area affected by soil degradation in Ghana is well above the average for degraded land area in Sub-Saharan Africa (43 percent), and well above that for degraded land area in all Ghana's neighboring countries, excluding Togo.

⁶⁷ Land degradation is defined as reduction or loss of biological or economic productivity of land resulting from processes such as soil erosion; deterioration of the physical, biological, or economic properties of the soil; or long-term loss of natural vegetation (Pagiola 1999). Soil degradation is defined as declining of soil quality, encompassing the deterioration in physical, chemical, and biological attributes of the soil (Enters 1998). Soil erosion is a particular physical process that causes land and soil degradation, and refers to the wearing away of the land surface by water and/or wind, as well as to the reduction of soil productivity from the physical loss of topsoil, reduction in rooting depth, removal of plant nutrients, and loss of water (ibid.) Desertification is land degradation in arid, semiarid, and dry subhumid areas resulting from various factors, including climatic variations and human activities (United Nations 1994). Land is defined as "the terrestrial bio-productive system that comprises soil, vegetation, other biota, and the ecological and hydrological processes that operate within the system" (United Nations 1994).

⁶⁸ At the moment, the GLASOD survey by UNEP and ISRIC between 1987 and 1990 remains the only uniform global source of land degradation data.

⁶⁹ This estimate seems to be comparable with the results of the Asiamah (1987) study reported in the National Action Program to Combat Drought and Desertification (EPA 2002), which estimated that 69percent of the total land surface of the country is subject to severe soil erosion. An estimate of the erosion hazards on a regional basis is reported in Appendix 4-2.

Table 5-3: Percentage of Land Area Affected by Human-Induced Soil Degradation (Ghana)

| Severity of degradation ^a | Area affected (km ²) | Area affected (percent of total) |
|--------------------------------------|----------------------------------|----------------------------------|
| Light | 60,000 | 25% |
| Moderate | 142,000 | 60% |
| Severe | 7,000 | 3% |
| Very severe | 15,000 | 6% |

Source: Adapted from FAO 2000.

a. Severity of degradation is defined as follows:

- *Light*: somewhat-reduced agricultural suitability;
- *Moderate*: greatly reduced agricultural productivity;
- *Severe*: biotic functions largely destroyed, nonreclaimable at farm level;
- *Very Severe*: biotic functions fully destroyed, nonreclaimable

(Oldeman et al. 1990, in FAO 2000).

Table 5-4: Percentage of Land Area Affected by “Moderate to Very Severe” Soil Degradation (Cross-country Comparison)

| Ghana | SSA (average) | Ivory Cost | Mali | Niger | Benin | Burkina Faso | Togo |
|-------|---------------|------------|------|-------|-------|--------------|------|
| 69% | 43% | 18% | 36% | 45% | 46% | 68% | 76% |

Source: Adapted from FAO 2000.

17. **Approximately 30 to 40 percent of the total land area of Ghana is estimated to be subject to desertification** (EPA 2005), i.e., land degradation in arid, semiarid and dry subhumid areas. About 72 percent of the whole land area of the country is considered vulnerable to desertification (about 16percent highly or very highly) (see Table 5-5).

18. **Land degradation is rising**: according to the National Action Program to Combat Drought and Desertification, the land area prone to desertification has almost doubled in the last decades. In addition, pressure on land resources is likely to increase in the next few decades from population growth and growth in food demand (90 percent of the food needs of the country depend on the agricultural sector).

Table 5-5: Percentage of Land Area Vulnerable to Desertification

| Vulnerability | Area vulnerable (percent) |
|---------------|---------------------------|
| Low | 7.47percent |
| Moderate | 48.78percent |
| High | 15.15percent |
| Very high | 1.04percent |

Source: EPA 2002.

19. **Land degradation is a complex phenomenon, influenced by a multitude of direct and indirect factors.** Unsustainable farming practices (particularly the traditional bush-fallow system) and removal of vegetation cover (mainly through deforestation and overgrazing) are the main direct causes of land degradation in Ghana. It is estimated that more than two thirds of the degraded area in the country is a consequence of unsustainable agricultural activities, twice more on average than in Sub-Saharan Africa

(FAO 2000). Population growth and poverty are the main socioeconomic factors indirectly contributing to land degradation (see Box 5-1 and Box 5-2). The major direct factors causing land degradation, which include *biophysical* factors (e.g., physical characteristics of the soil, topography, and climate conditions) and *anthropogenic* factors (e.g., unsustainable farming practices, removal of vegetation cover, mining activities, and urbanization and industrial activities), are extensively discussed in Appendix 5-3.

Box 5-1: Population Growth and Land Degradation

Rapid population growth is putting land resources under pressure because it is often accompanied by unsustainable agriculture intensification, shifting cultivation to marginal areas, deforestation, and overgrazing. Ghana has experienced a rapid population growth in the last decades. Population almost tripled over the last 40 years, from 6.7 million in 1960 to 18.4 million in 2000 (Ghana Statistical Service 2000). Based on current population growth rates (2.7 percent), the World Bank estimated a population of 20.3 million in 2003 and 25.8 million in 2015 (World Bank 2006). It is estimated that 63 percent of the total population lives in rural areas (World Bank 2006), and that 51.4 percent of the total population lives in the zones most vulnerable to land degradation (Coastal, Guinea, and Sudan Savannas) (EPA 2002). Population density has increased from 36 persons/km² in 1970 to 77 persons/km² in 2000. In the Upper East, Upper West, and Northern Regions, the regions most prone to land degradation, population density has increased between 1984 and 2000 from 87, 24, and 17 to 104, 31, and 21 persons/km², respectively, an increase of 20, 29, and 24 percent, respectively (Ghana Statistical Service 2000). The main implication of these figures is that pressure on the natural resource base, and particularly on land, has increased over the last years, and will likely continue to increase in the years to come. The availability of agricultural land per capita has already decreased from 1.56 ha/person in 1970 to 0.74 ha/person in 2000 (EPA 2002). In the absence of a change in the current farming system, and in an economic system where the agriculture sector employs the majority of the population, and in which the majority of the rural households depend almost entirely on land resources for their livelihoods, population growth will result in increased land degradation, mainly from unsustainable intensification, shifting cultivation to marginal and fragile areas, deforestation, and overgrazing. Moreover, the small margins between overall growth rates of the agriculture sector vis-à-vis the annual population growth rate (EPA 2002) may well undermine the attainment of food security, employment generation, and improvement in rural incomes and national economy.

Box 5-2: Poverty and Land Degradation

The incidence of poverty in Ghana is concentrated in the areas most vulnerable to land degradation, thus suggesting a correlation between poverty and land degradation. In Ghana, the incidence of poverty is higher in rural areas. About 50 percent of the rural population in 1998-99 (World Bank 2005)—which constitutes 63 percent of the total population (World Bank 2006), 59 percent of food crop farmers, and 55 percent of people employed in agriculture (GoG 2003)—lived below the poverty line. Poverty in Ghana is concentrated in the Upper East, Upper West, and Northern Regions. According to the Growth and Poverty Reduction Strategy I (GoG 2003), 88, 84, and 69 percent, respectively, of the people living in these regions were classified poor in 1999 (income poverty). These regions are more vulnerable to land degradation. An analysis from Osgood and Lipper (2001), which combined the use of spatially referenced GIS with socioeconomic data in Ghana, observes that increased soil degradation is associated with higher incidence of poverty. Although these results do not necessarily prove a causal relationship between poverty and land degradation, they nonetheless suggest that poverty could be a determinant in soil degradation.

Poor people, who rely on natural resources for their livelihoods, are in fact often forced—for their short-term survival—to unsustainably exploit their natural resources. Poor people in Ghana tend to be highly dependent on natural resources, including land, vegetation, water, and other land-based resources, for their livelihoods and income generation opportunities (EPA 2002). According to the Growth and Poverty Reduction Strategy I (GoG 2003), the majority of rural households depend on small-scale agriculture for their livelihoods. In a situation of rapid population growth, these farmers may lack the incentives, the means, or the options to diversify their type of livelihood, or to adopt new technologies. Therefore they may be forced—for their short-term survival—to unsustainably exploit their natural resources, or—in the absence of access to the best or equally productive lands—to move to new, marginal, fragile areas. Cultivation in Ghana is already taking place in marginal lands in some regions, particularly the Upper East (EPA 2002). In addition, because of the high dependence of the poor on their natural resources, loss or deterioration of these resources is more costly to them. The reduction of crop yield because of soil erosion and nutrient depletion will in fact reduce the poor's source of income or increase the costs to maintain the same crop yield, which, in many cases, they cannot afford.

20. **Paradoxically, agricultural production has increased in spite of the scope of land degradation in Ghana.** Despite the fact that one of the main effects of land degradation is a decline in soil productivity, agricultural production in Ghana has increased in the last 10 to 15 years. The average annual growth between 1990 and 2003 has been 3.6 percent (World Bank 2006). Between 1995 and 2003, cereal production increased by about 16 percent and root and tuber production by 38 percent (ISSER 2004, in World Bank et al. 2006).

21. **However, increases in agricultural production are primarily the result of the extension of cultivated land,**⁷⁰ and only to a limited degree from increases in productivity through improved technologies (improved seeds and fertilizer)⁷¹ (EPA 2002). According to the National Action Program to Combat Drought and Desertification, the expansion of cultivated area contributed to about 57 percent of the overall growth rate, and increases in productivity to about 37 percent. Increase in output has in fact been accompanied by relatively constant yield per hectare (see Table 5-6 and Table 5-7, and Figure 5-2 and Figure 5-3).

Table 5-6: Roots/Tubers: Production, Cultivated Land, and Productivity (1995-2003)

| Year | Output (thousands of tons) | Area (thousands of ha) | Yield/ha |
|------------------------|----------------------------------|------------------------------|----------|
| 1995-99* | 13,151 | 1,251 | 10.51 |
| 2000 | 15,027 | 1,412 | 10.64 |
| 2001 | 16,275 | 1,540 | 10.56 |
| 2002 | 17,770 | 1,653 | 10.78 |
| 2003 | 18,186 | 1,691 | 10.78 |
| Variation 95-03 | +38% | +35% | +3% |

* Average.

Source: Adapted from ISSER 2004, in World Bank et al. 2006.

⁷⁰ Arable land increased by about 54 percent between 1999 and 2002 (World Bank 2006).

⁷¹ Fertilizer consumption fell from 21.9 kg/ha of arable land in 1978 (EPA 2002) to 3.6 kg/ha in 1989-91 following the introduction of the structural adjustment program and the removal of most of the agricultural support, including fertilizer subsidies. Fertilizer consumption then increased in the 1990s after an improvement in the national economy and reached 6 kg/ha in 2000-2002 (World Bank 2005). However, this quantity represents almost half of the quantity of fertilizer per hectare of arable land in Sub-Saharan Africa (FAO 2005), and almost one tenth of the quantity of fertilizer per hectare in developing countries (GoG 2003).

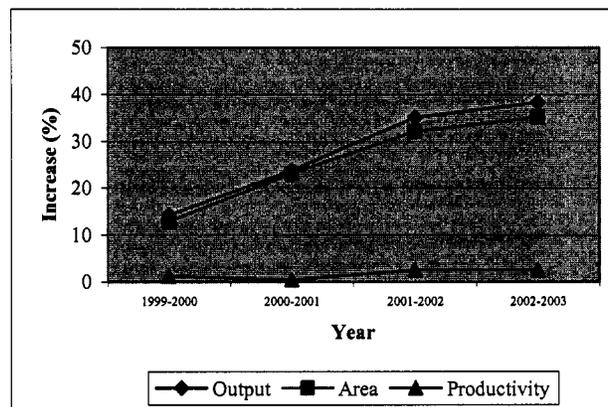
Table 5-7: Cereal/Crops: Production, Cultivated Land, and Productivity (1995-2003)

| Year | Output (thousands of tons) | Area (thousands of ha) | Yield/ha |
|------------------------|----------------------------------|------------------------------|------------|
| 1995-99* | 1,753 | 1,297 | 1.35 |
| 2000 | 1,711 | 1,307 | 1.30 |
| 2001 | 1,648 | 1,373 | 1.20 |
| 2002 | 2,155 | 1,598 | 1.35 |
| 2003 | 2,042 | 1,463 | 1.40 |
| Variation 95-03 | +16% | +13% | +4% |

* Average.

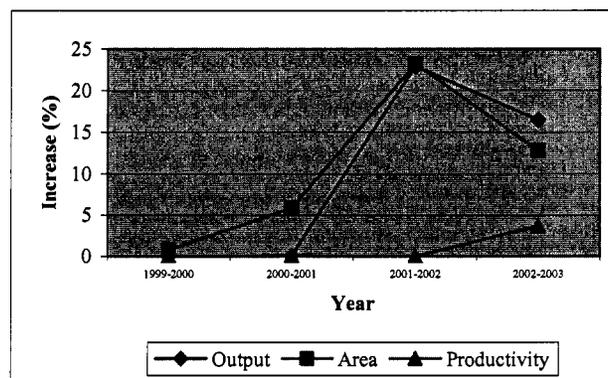
Source: Adapted from ISSER 2004, in World Bank et al. 2006.

Figure 5-2: Percentage of Increase in Production, Cultivated Land, and Productivity (Roots/Tubers)



Source: The author

Figure 5-3: Percentage of Increase in Production, Cultivated Land, and Productivity (Cereal/Crops)



Source: The author

22. In addition to this, growth performance of the agriculture sector has considerably benefited from the excellent achievements in one subsector, the cocoa sector, whereas other subsectors remained relatively stagnant, as shown in Table 5-8 (GoG 2005).

Table 5-8: Production Growth in the Agricultural Sector and Subsectors (2002-2004)

| | Agriculture | Cocoa production and marketing | Crops and livestock | Forestry and logging |
|-------------|--------------------|---------------------------------------|----------------------------|-----------------------------|
| 2002 | +4.4% | -0.5% | +5.2% | +5% |
| 2003 | +6.1% | +16.4% | +5.3% | +6.1% |
| 2004 | +7.5% | +29.9% | +5.3% | +5.8% |

Source: GoG 2005.

23. **Land degradation in Ghana can be attributed to physical** (in the form of soil erosion, compaction, crusting, and iron-pan formation), **chemical** (depletion of nutrients, salinity, and acidification), **and biological** (loss of organic matter) **processes**. Soil erosion is the primary form of land degradation in Ghana (EPA 2002). A more detailed description of the processes of land degradation in Ghana is reported in Appendix 5-4. The main forms of soil erosion in Ghana are *sheet erosion* through surface runoff, *rill erosion* in permanent and shifting microchannels, and *gully erosion* in permanent channels (EPA 2002).

24. **Land degradation is geographically widespread in all areas of the country**. Soil erosion, in its various forms, is present in all agro-ecological zones and regions, although the most vulnerable zone in the country is the Northern Savanna (Guinea and Sudan Savannas); this zone covers about 50 percent of the country, the Upper East Region being the most degraded area (see

25.

26. Figure 5-4—the darkest areas are the most degraded). Although nutrient depletion is also a widespread phenomenon in the country, the Sudan and Central Savanna zones are the most vulnerable to chemical erosion because their soils are already low in organic matter. Salinity is a problem of most of the soils along the coast (EPA 2002).

Figure 5-4: Distribution of Soil Degradation in Ghana



Source: GLASOD in Osgood et al. 2001.⁷²

D. Economic, Environmental, and Social Impact of Land Degradation in Ghana

27. **Land degradation has a potentially significant negative economic impact on the agricultural sector and therefore on Ghana's economy and economic growth**. The agricultural sector is the main contributor to GDP and to employment (particularly among the poor). In addition, it is the sector that will

⁷² http://www.fao.org/documents/show_cdr.asp?url_file=//docrep/004/y1796e/y1796e04.htm

lead the industrialization process, according to the GPRS II (GoG 2005). However, in a country where - as explained earlier - agricultural production depends mostly on soil productivity, and in the absence of technological improvements, land degradation has negative economic implications that are potentially significant. First, depletion of soil nutrients and loss of organic matter reduce soil productivity, which in turn will reduce crop yield.⁷³ This has a direct negative impact on both income generation/cash saving opportunities and food security, particularly in the presence of a rapidly growing population (see Box 5-1 on the relationship between population growth and land degradation in Ghana). Second, land degradation associated with deforestation—one of the major direct causes of land degradation in Ghana—results in a reduction of forest products (wood and nonwood, both for domestic consumption and for export), and in negative consequences on both income generation and rural livelihoods. Finally, the reduction in the quality and quantity of vegetative biomass associated with land degradation negatively affects livestock productivity, and has negative implications for income generation, food security, and rural livelihoods.

28. **Moreover, land degradation has a significant impact on the environment and natural resource base of the country.** Land contributes in effect to the provision, maintenance, and regulation of critical ecosystem functions, such as a habitat for biodiverse species; nutrient cycling; provisioning of food, fresh water, and wood; and climate, flood, and so on. The consequences of degrading land resources are many: loss of vegetation cover and biodiversity; instability in hydrological regimes; a reduction in the land's resilience to natural climate variability (see Box 5-3 for a brief discussion on the potential impact of climate change on land resources in Ghana); and increased vulnerability to natural hazards. These include such hazards as droughts and a number of off-site damages, such as downstream flooding and sedimentation and siltation in rivers and lakes. For example, the Volta River and Lake—which provide several ecosystem services that form the basis for a rich biodiversity and other environmental goods—have been increasingly damaged by severe environmental degradation in the form of lake level fluctuations, water scarcity, nitrification, and siltation mainly from watershed degradation (soil erosion and deforestation) (World Bank et al. 2006).

Box 5-3: Potential Impact of Climate Change on Land Resources and Economic Growth in Ghana

The impacts of climate change on land resources in Ghana have not yet been studied in depth or quantified. However, it seems likely that climate change, in the absence of an adaptation strategy, will negatively affect land resources in Ghana, and have a potentially negative impact on agricultural productivity and economic growth. Climate change will in fact probably result in, among other things, increased rainfall variability, and an overall drop in rainfall (10 percent lower rainfall is expected by 2050; IPCC 1997); this would increase the chances of drought periods and probably reduce agricultural productivity. Moreover, climate change will probably result in rising temperatures (1.4-1.6 higher temperature is expected by 2050; IPCC 1997), potentially resulting in increased forest and bushfires. Finally, it will probably also lead to increased evaporation, resulting in reduced soil quality. Moreover, climate change may also contribute to accelerated coastal erosion, to which Ghana is particularly vulnerable (World Bank et al. 2006).

29. **Land degradation may have significant social costs.** Reduction of soil productivity and associated increased food insecurity—particularly in the northern regions of the country – and reduction of available land from coastal erosion both contribute to the abandonment of previously productive lands and increased migration (from north to south and from rural areas to urban centers). This degradation will have potentially high social costs, including unemployment and loss of cultural identity (EPA 2002).

30. **A recent World Bank, DFID, and ISSER study (2005) estimated that the annual cost of land degradation would range from 1.1 to 2.4 percent of the GDP.** This figure would correspond to about 2.9 to 6.3 percent of AGDP. It is in line with other past estimates of the cost of land degradation in Ghana. Convey and Tutu (1990), for instance, estimated the cost of annual production loss through

⁷³ As explained in paragraphs 21-22, increases in agricultural production were mainly from expansion of cultivated land, rather than from intensification, and from the outstanding performances in the cocoa sector.

erosion and nutrient depletion to be about 5 percent of the AGDP. Drechsel and Gyiele (1999) assessed the costs of productivity loss at around 4 to 5 percent of the AGDP. The World Bank/DFID/ISSER figure is considered conservative, as it only considers soil erosion from water and does not consider the impact of livestock overgrazing on soil degradation, other physical degradation, the off-site effects of land degradation, and environmental or social costs from land degradation. All of this suggests that the economic, environmental, and social cost of land degradation in Ghana could be even higher.

Box 5-4: Linkages between Land Degradation, Forestry and Mining Activities

Deforestation represents probably the most serious form of natural resource degradation in Ghana, and is one of the main direct causes of land degradation in the country. Rapid population growth fuels the demand for more agricultural land and for fuelwood and other wood products (e.g., charcoal). The reduction of soil fertility/productivity in turn forces farmers to expand their cultivated lands and clear forest areas. The poor enforcement of regulations favors unsustainable logging practices and indiscriminate fuelwood extraction. A market price that is lower than the real value of wood further contributes to overexploitation of forestry resources in the country. Rehabilitation and sustainable management of degraded forestlands should be an integral part of any intervention aiming at addressing land degradation in the country.

Mining and particularly illegal mining activities are one of the direct causes of land degradation and most specific to the Ghanaian context. These activities are in fact accompanied by deforestation and removal of the fertile topsoil of adjacent agricultural lands.

Solutions to Land Degradation: Sustainable Land Management in Ghana

31. **Evidence suggests that sustainable options that can reduce soil erosion are currently adopted in Ghana.** In fact, several low-input technology conservation practices used in the country are socially acceptable and technically feasible, and can substantively reduce land degradation while enhancing productivity. These practices and/or technologies are generally known as sustainable land management (SLM), and may represent a viable solution to land degradation in Ghana.

32. **At micro/farmer level, Table 5-9 below summarizes the benefits, in terms of reduction of soil loss and improvement in crop yields, of some of the technologies used in the country.** For instance, the practice of zero-tillage with herbicide application in various ecological zones has demonstrated its potential to reduce soil erosion by more than 80 percent and increase yields by more than 50 percent, compared with the traditional slash-and-burn system (Boa-Amponsem et al. 1998, in World Bank et al. 2006).

Table 5-9: Benefits of Low-input Technologies in Mitigating the Effects of Land Degradation

| Technology | Ecological zone | Benefits |
|--|---|--|
| 1. Cover crops | | |
| a. Macuna | Transition/ Semideciduous Forest | Control weeds and increase soil nitrogen from 0.14 to 0.18percent. Increased maize grain yield by 86percent |
| b. Groundnut | Guinea Savanna Semideciduous Forest | Reduced soil loss by 94percent and run-off by 70percent. Reduced soil loss by 66percent and run-off by 24percent. |
| c. Bamabra nut | Semideciduous Forest | Reduced soil loss by 57percent and run-off by 38percent. |
| d. Cover crops (cowpea) | Semideciduous Forest | Reduced soil loss by 79percent and run-off by 38percent. |
| 2. Strip cropping (maize-cowpea, maize-groundnut) | Transition Zone | Reduced soil loss by 92percent and run-off by 70percent. |
| 3. Zero-tillage | Sudan Savanna Transition, Semideciduous Forest | Reduced soil loss by 80-99percent and run-off by 76-99percent. |
| 4. Zero-tillage with weedicide | Sudan Savanna Transition, Semideciduous Forest | Raised yield by 50percent more than traditional slash and burn. |
| 5. Mulching | Guinea Savanna Transition, Semideciduous Forest | Reduced soil loss by 90percent. |
| 6. Contour/vegetative barriers | Semideciduous Forest | Controlled soil erosion and conserved moisture to increase maize yields. |
| 7. Liming (acid soils) | High rain forest | Reduces soil loss when liming rate increased from 1 t/ha to 5 t/ha. |
| 8. Organic matter | Guinea Savanna Transition Semideciduous Forest | Reduced soil loss and increased crop yields. Yield for maize increased from 1.94 t/ha to 3.16 t/ha. |
| 9. Crop rotation (groundnut-maize, cowpea-maize) | Guinea Savanna | Reduced soil loss and increased yield. Maize yield increased from 2.11 t/ha to 4.82 t/ha and 4.75 t/ha respectively |

Source: Adapted from Quansah 2001, in World Bank et al. (2006).

33. Among the various SLM systems, *conservation agriculture*⁷⁴ (which involves techniques described in Table 5-9 above, under Technology, items 1-5) seems to represent a viable option to reduce soil erosion and improve productivity in the country. *Inter-cropping agro-ecosystems*⁷⁵ also reduce runoff and soil erosion (Bonsu et al. 1979, in ODI 1999) and are commonly adopted in Ghana, particularly in the Northern Region (Diehl 1984, in ODI 1999). *Agro-forestry*, however, has shown mixed results in Ghana (ODI 1999) and Carter 1995, in ODI 1999). Appendix 5-5 describes in more detail the technical options for soil conservation in different agro-ecological zones, the characteristics of some indigenous soil and water conservation systems in Northern Ghana, the risks and the long-term effects associated with various

⁷⁴ Conservation agriculture is a farming approach that makes more efficient use of soil, water and biological resources, and natural processes through improved soil-water-plant nutrient management.

⁷⁵ Intercropping is defined as “the growing of two or more crops simultaneously on the same plot for a significant part of their growing period” (Adolph et al. 1993, in ODI 1999).

SLM practices in Ghana, and an assessment of the various methods for soil fertility management in Ghana.

34. **Despite the existence of a significant number of sustainable land management practices, and potential benefits at both farmer and aggregate level, large-scale adoption of these practices continues to be limited in Ghana.** This fact suggests that technological solutions alone cannot represent the solution to land degradation, and that there are other factors—beyond technical feasibility—that prevent SLM from being adopted. The next section will examine and discuss the underlying factors preventing a large-scale adoption of SLM technologies in the country, factors that are responsible for continuing land degradation.

Why SLM is not widely adopted: Underlying causes

35. **Past efforts that aimed at addressing land degradation focused on the symptoms, rather than on the root causes of land degradation** (TerrAfrica 2005). Failure to understand the real underlying causes of land degradation/limited adoption of SLM technologies results in failure to successfully tackle the problem.

A. Policy Barriers

A-1: Weak implementation

36. **Most environmental and agricultural policies and strategies reflect sustainable management concerns.** The principles of the sustainable management of environmental resources, sustainable use of land, and restoration of the productive capacity of degraded resources are captured in most of the sectoral policies and action plans. These include Ghana's Environmental Policy, the National Environmental Action Plan (NEAP), the Soil Fertility Management Plan, the Accelerated Agricultural Growth and Development Strategy (AAGDS), and the recently formulated National Wildfire Policy and Water Policy (being finalized), among others (see Appendix 5-6 for a more comprehensive overview of the existing policy framework). The *National Land Policy* (see Appendix 5-7 for a more detailed description of the goal, guiding principles, and policy provisions) is the key policy that addresses land sector issues in Ghana. This policy strives toward the judicious use of the nation's land and other natural resources in support of the various socioeconomic activities, and endorses the principle of sustainable resource management. More specifically, the Land Policy provides the framework for dealing with the issues of land ownership, security of tenure, land use, and conservation on a sustainable basis. Finally, the *National Action Program to Combat Drought and Desertification* (NAP) provides a long-term strategy to address land degradation in affected areas in Ghana (see Appendix 5-8 for a more detailed description of the main purpose, overall objective, thematic Action Programs and Action Plans, institutional set-up, and financing mechanisms).

37. **However, implementation continues to be a challenge.** Although the National Land Policy sets the framework for the development of subsequent instruments, neither an action plan nor an implementing strategy exists to set targets, activities, timeframes, funding, and implementation mechanisms. Development of a Land Use Action Plan could be an important tool to implement the policy provisions of the Land Policy. The National Action Program to Combat Drought and Desertification (NAP) also provides a quite comprehensive set of detailed and well-budgeted action programs and action plans (see Appendix 5-8). However, in spite of parliamentary approval in 2004, the NAP still remains unimplemented. In the absence of clear political will, evidenced by lack of clear budgetary allocation from the government or identification of the issue as a national priority, implementation will continue to remain a challenge.

A-2: Weak integration

38. **Sustainable land management is still weakly integrated in most other key policies, strategies, and action plans.** For instance, the first *Food and Agriculture Sector Development Policy* (FASDEP, 2002) only marginally discusses the use of sustainable land management technologies and practices. The *Ghana Poverty Reduction Strategy I* (GPRS I, GoG 2003)—the main strategy for promoting growth and reducing poverty—does not include sustainable land management among its priorities. On the contrary, emphasis is placed on modernizing agriculture, which, if elements of sustainability are not carefully taken into consideration, may contribute to increased land degradation.⁷⁶ The strategy does include a few considerations on land degradation and the sustainable use of natural resources, but not in a systematic way. Overall, the GPRS I lacks a comprehensive strategy to address the many factors that in turn result in various forms of land degradation, and it only indirectly deals with the problem of land degradation through the government’s reforestation program. Although the NAP provides an overall strategy to deal with the issue of land degradation, its key elements were weakly integrated.

39. **Considerations of the impact of land degradation receive more attention in the *Growth and Poverty Reduction Strategy II* (GPRS II, GoG 2005), but integration is still limited.** In the GPRS II, land degradation that is associated with unsustainable agricultural practices, and low crop yields and outputs that result from low soil fertility, are acknowledged as key challenges to the growth potential of the agricultural sector, and, consequently, to the growth potential of the country. The strategy also gives more emphasis to natural resource management, and identifies a number of interventions that could—directly or indirectly—favor the wider adoption of sustainable land management practices. These practices include reforming land acquisition and property rights, improving access to rural credit, and increasing access to markets through improvements in farm roads, among others. However, sustainable land management does not clearly emerge as an agreed-upon strategy to improve agricultural productivity—instead, it is presented in a narrow way as an element for ensuring environmental sustainability. Moreover, the general focus of the strategy remains agricultural modernization rather than land productivity, and strategic interventions seem to favor the restoration of degraded resources rather than their sustainable management. In conclusion, although the GPRS II offers a number of possible entry points for integrating sustainable land management, the document’s treatment of the results of sustainable land management is unfortunately weak. Because the GPRS serves as the reference framework for the government and DP development strategies, this is a major shortcoming.

A-3: Policy gaps

40. **Although the government has developed a policy framework that seeks to address the issue of land management comprehensively, some gaps are in evidence.** For example, although there is some recognition of the importance of agricultural lands, no instrument is in place that stipulates the principles for their management. The Crop Service of the Ministry of Food and Agriculture (MoFA) has embarked upon the development of a policy that would help to guide land use planning. The development of the policy provides an opportunity to better integrate sustainable land management into the existing policy framework. At the same time, the revision of the NEAP, whose implementation ended in 2000, and the need to incorporate the new conditions in it, plus the ongoing process of reviewing the FASDEP, represent two important opportunities to mainstream sustainable land management in the country’s policy framework.

⁷⁶ For example, the introduction of large-scale mechanized farming in the 1970s in the north of the country created several environmental problems, including soil erosion, degradation of soil structure, decrease of soil matter content, and compactation, among others (Van der Meijden 1998, in ODI 1999).

Table 5-10: Policy Issues and Impacts on Land Degradation/SLM

| Issue | Impact |
|--|---|
| <ul style="list-style-type: none"> ▪ Implementation of the land policy remains a challenge. ▪ Implementation of NAP has not yet started. ▪ Allocation of public resources to address land degradation is limited. ▪ Land degradation and SLM elements are weakly integrated into the key development and sectoral policies, strategies, and action plans ▪ Land degradation does not appear among the development priorities of the country ▪ No policy exists on the management of the agricultural lands. ▪ No land use action plan exists. | <ul style="list-style-type: none"> ▪ Issues highlighted by the Land Policy and by the NAP are not addressed. ▪ Implementation of programs to address land degradation or to promote SLM are not supported by adequate financial resources. ▪ Approaches to address land degradation are not integrated and do not address the cross-sectoral nature of the problem. ▪ Some policies/strategies may be in conflict with the objective of addressing land degradation, and/or may hinder the adoption of SLM practices. ▪ No general principles or specific provisions on how to manage (agricultural) land exist. ▪ No guidance is provided for land use planning. |

B. Legal barriers

B-1: Complex legal framework

41. **The legal framework governing land administration and land management is complex.**⁷⁷ Various pieces of legislation that the government has enacted to address fundamental land issues in fact overlap with the existing traditional system; the latter is recognized as an equally legitimate source of law in Ghana. The resulting framework is characterized by an intricate combination of constitutional provisions, common law principles, enacted legislation, and traditional law. Approximately 166 land laws in Ghana deal with land issues (see Appendix 5-9 for a list of the major land laws). The plethora of land laws has resulted in the existence of outdated laws and, in some instances, inconsistencies and contradictions within the legislative framework. For example, the Lands Commission Act of 1971 (Act 362) established the Lands Commission. Yet the Lands Commission Act of 1994 (Act 483) also established the Lands Commission and provides for its composition, qualification, appointments of members, and matters related to the commission. However, Act 483 does not expressly repeal Act 362. The absence of express repeal provisions in the act creates confusion about which law is operative. Furthermore, inconsistent and outdated legislative provisions make it difficult to determine which legislative provisions are operative, and by extension, weaken the framework that was created for administering lands.

B-2: Land registration and tilting system

42. **Unclear demarcation of boundaries increases transaction costs and reduces incentives for long-term investments in land management.** Land in Ghana is either public or private. Private land—which represents the majority of the land in Ghana—is, in most parts of the country, held by the traditional authority (“stool” or “skin”) in trust for the community. Traditional law regulates access to and tenure of stool/skin lands. However, stool/skin lands often have unclear boundaries. This problem is a direct result of a dearth of legal and institutional mechanisms to provide accurate maps, data, or plans. This lack often results in protracted litigation in the court system as landowners seek to assert their property rights. Litigation often freezes the land for development; frequently, there are encroachments on the land. This situation contributes to haphazard developments that often reduce the incentives for long-term investment in land management.

⁷⁷ Issues concerning land ownership are discussed in detail in the section below, “Tenure Security.”

43. **An inefficient and nontransparent system of land titling complicates the matter.** Land is not always registered, and transactions have been often oral. The same parcel of land is therefore often sold to or claimed by multiple owners/users. The result is an increased number of land-related cases (acquisition and litigation), which in turn raise the number of backlog cases; thus transaction costs rise, and tenure security decreases (see the section below, Incentive Barriers”). Ultimately, the incentive for investments in land management is weakened.

B-3: Weak enforcement and compliance

44. **Overall weak enforcement and compliance with the environmental laws continues to be a challenge.** The key issues that have impeded adequate implementation and subsequent compliance with the law include an overall weak capacity, including lack of adequate resources, to cover the operation costs. As a result, illegal activities that negatively impact on land, such as bushfires in forest areas, illegal logging and mining activities, or cultivation over river banks and hillsides, remain largely uncontrolled.

Table 5-11: Regulatory Issues and Impacts on Land Degradation/SLM

| Issue | Impact |
|---|--|
| <ul style="list-style-type: none"> ▪ Multitude of laws and regulations, often contradictory or outdated ▪ Co-existence of statutory and customary law | <ul style="list-style-type: none"> ▪ Unclear regulatory framework increases land-related litigation, impacts on compliance, increases transaction costs, and, overall, reduces incentives for long-term investments in land management. |
| <ul style="list-style-type: none"> ▪ Unclear demarcation of boundaries/ lack of accurate maps ▪ Lack of proper land titling/ oral transactions | <ul style="list-style-type: none"> ▪ Land disputes increase, tenure security is reduced, and incentives for long-term investments in land management weaken. ▪ Transaction costs increase, which reduces available resources for investing in land management. |
| <ul style="list-style-type: none"> ▪ Weak capacity to enforce laws and regulations | <ul style="list-style-type: none"> ▪ Illegal activities remain largely uncontrolled and undermine the effectiveness of legislative provisions designed to address land degradation. |

C. Institutional Barriers

C-1: Duplication of Roles and Responsibilities

45. **The existing institutional set-up—characterized by duplication of roles and responsibilities and by the absence of an SLM “champion”—does not provide a clear direction for land utilization and management.** Land management and administration in Ghana is the responsibility of a number of ministries and governmental agencies. At least 10 agencies and institutions at the central level have—directly or indirectly—a mandate for land management and administration in the country.⁷⁸ However, these institutions have mandates that are often not well defined and are sometimes conflicting. This makes it difficult to identify the right authority to deal with land issues, and to pin down the institutional accountability. For example, it is not always clear whether land management is the mandate of the Ministry of Environment and Science (MES)—which is responsible for the environmental sustainability of the country—of the Ministry of Lands, Forestry and Mines (MLFM)—which is responsible for the use

⁷⁸ These include: the Ministry of Environment and Science (MES), the Ministry of Food and Agriculture (MoFA), the Ministry of Lands, Forestry and Mining (MLFM), the Environmental Protection Agency (EPA), the Lands Commission, the Land Title Registry, the Deeds Registry, the Land Valuation Board, the Office of the Administrator of the Stool Lands, the Survey Department, the Forestry Commission, the Water Resource Commission, and the Department of Cooperatives, among others.

of the state lands and forestry reserves—or of the Ministry of Agriculture—which is responsible for agricultural lands (including forests that are not reserves).

46. **Different institutions, reporting to different ministries, manage land administration and land use planning.** Six different institutions—with often overlapping mandates—fall under the MLFM and manage land administration.⁷⁹ Land use planning at the national level is the responsibility of the Survey Department. At the local level, however, land use planning is in the mandate of the Town and Country Planning Department, which falls under the MES. As a result, land use at the local level is not always consistent with that planned at the national level.

C-2: Weak Coordination

47. **In addition, weak coordination does not favor a comprehensive and integrated approach toward land degradation.** Coordination among government agencies is generally weak, especially at the national level. Opportunities and forums for strategic dialogue between the MES, MLFM, and MoFA are in fact limited. The MES seems not to have either the resources or the political weight to play a coordinating role in the environment/NRM sector. The cabinet could and should play a key role in coordinating line ministries, but has not taken this initiative, because it lacks either the technical capacity or political commitment. A provision found in all groups calls for each line ministry to establish an “environmental desk.” This provision would enhance cross-sectoral coordination. However, MoFA is the only ministry at the moment that has established such a desk. An interministerial technical committee was established, but it is not functioning because of insufficient resources. A National Desertification Committee was also established in the framework of the NAP, but it has been dormant so far. Weak intersectoral coordination, particularly for such a cross-cutting issue as land degradation, makes policy harmonization and coherence more difficult and reduces information flow; this leads to uncoordinated interventions and an inefficient or suboptimal allocation of resources.

C-3: Weak institutional capacity

48. **Furthermore, an overall weak institutional capacity for dealing with land issues exists at all levels.**⁸⁰ A generally poor institutional capacity includes, specifically—but is not limited to—planning/participatory planning, policy development, overall strategic thinking, data collection, and technical issues (e.g., technical requirements of SLM practices, knowledge of what works where, and mitigation measures).

49. **Lack of capacity is particularly serious regarding monitoring and enforcement activities.** Limited numbers of properly trained staff cannot effectively implement and enforce policies, programs, and regulations. This includes controlling those illegal activities directly responsible for land degradation, such as illegal logging, illegal mining, bushfires, encroachment in forest reserves, and cultivation on river banks and hillsides.

50. **Some of the main reasons for the weak SLM capacity include:**

- (i) **Focus on production/commodities**, rather than on land productivity and resource management in the government’s policy agenda.
- (ii) **Focus on technological aspects of land degradation**, rather than on socioeconomic factors that determine adoption of technologies in the research agenda of the key research institutions.

⁷⁹ The Land Commission, the Survey Department, the Land Valuation Board, the Title Registry, the Deeds Registry, and the Office for Administration of Stool Lands.

⁸⁰ For example, line ministries and natural resource agencies, parliamentary committees, research institutions, local government authorities, extension officers, and farmer organizations.

- (iii) **Weak linkages between technology generation** (the responsibility of the Council for Scientific and Industrial Research)⁸¹ **and dissemination** (the responsibility of the extension system).
- (iv) **A generally high rate of staff turnover**, the result of—among others things—frequent institutional restructuring, which causes loss of institutional memory.
- (v) **General lack of adequate resources.**

Table 5-12: Institutional Issues and Impacts on Land Degradation/SLM

| Issue | Impact |
|---|---|
| <ul style="list-style-type: none"> ▪ Duplication of roles and responsibilities among the institutions with a mandate for land management and utilization ▪ Sometimes conflicting mandates among the institutions that are authorized to handle land management and utilization ▪ Absence of an SLM “champion” ▪ Weak coordination among the institutions having a mandate for land management and utilization ▪ Lack of institutionalized mechanisms for institutional coordination for land management issues ▪ Lack of institutional capacity for SLM | <ul style="list-style-type: none"> ▪ Unclear direction for land utilization and management ▪ Difficulties in determining responsibility/accountability ▪ Often incoherent and unharmonized policy development ▪ Reduced information flow ▪ Inefficient or suboptimal allocation of resources ▪ Inadequate land use planning, SLM mainstreaming, technical backup, implementation capacity, etc. ▪ Inadequate M&E and enforcement |

C-4: Decentralization

51. **The decentralization process adds complexity to the institutional framework.** The decentralization process, which the government has been pursuing in the recent past, adds a new dimension to an already complex picture. Line ministries/departments are unevenly represented at the regional and district levels. For example, the EPA and the Land Commission are represented only at the regional level. There are Forest Offices at district level, but not in all districts. The Town and Country Planning Department—which is responsible for, among other things, land use planning—is represented at the district level, but reports to the Ministry of Local Government and not to the MES. Within the District Assemblies—the primary legislative forums at the local level—the main environmental body is the District Environmental Management Committee (DEMC), responsible to develop plans for the environment. However, the mandate of the DEMCs often overlaps with that of the Forest Service, particularly on forest-related issues. Consultation mechanisms for land resource users are limited. High turnover, frequent changes in the institutions’ mandates, the complexity of the institutional framework, and weak coordination only exacerbate the situation. Streamlining the functions of the various government institutions at many levels and ensuring local participation in decision-making processes are greatly needed.

⁸¹ The Council for Scientific and Industrial Research (CSIR) reports to the Ministry of Environment and includes: the Crop Research Institute, the Soil Research Institute, the Water Research Institute, the Forestry Research Institute, the Food Research Institute, the Animal Research Institute, the Savanna Research Institute, and the Atomic Research Institute.

Table 5-13: Decentralization Issues and Impacts on Land Degradation/SLM

| Issue | Impact |
|--|--|
| <ul style="list-style-type: none"> ▪ Line ministries/departments are unevenly represented at regional and district level ▪ Complex vertical reporting system ▪ Overlaps in the mandate of some institutions ▪ High turnover and frequent changes in the institutions' mandates | <ul style="list-style-type: none"> ▪ Weak institutional framework for land management ▪ Inconsistency between land use at local level and that planned at national level |

D. Incentive Barriers

D-1: Tenure security

52. **The existing tenure system does not provide adequate long-term security to resource users, and may reinforce the tendency toward short-term horizons in land management decisions.** Tenurial rules are in fact generally unfavorable to primary users:

- (i) **Stewardship of the land:** The ultimate stewardship of the land is vested in the chief (or in the state for public lands), not in the resource user/tenant. The traditional authorities (stools/skins)—who hold the communal land in trust for the community—have absolute freedom to deal with or dispose of the land. Investment choices have to be agreed upon with the owner of the land. Consequently, because farmers may fear eviction from the land, they may refrain from adopting long-term investments to improve land management. In addition, in sharecropping tenancy agreements, an increase in production is usually more beneficial to the landlord than to the tenant. Therefore, tenants may lack the incentives to undertake investments to improve land management. Finally, land tenure arrangements limit the farmers' ability to use land as collateral for loans. This may limit their ability to access credit, as explained below.
- (ii) **Compulsory acquisition of land:** The provision by which the government has the power to acquire land once it is in the public interest (Article 20 of the Constitution) may reduce tenure security, and, as above, discourage resource users from sustaining long-term investments on their land for fear of eviction or of insufficient compensation for their investments. This power vested in the government has in fact often been exercised in a nontransparent and adverse manner. Kasanga et al. (2001), for instance, argues that state management of land has generally benefited the government bureaucracy to the detriment of the poor. Moreover, even though the law guarantees compensation for the compulsory acquisition of private land, in several instances, land that the government seized was not utilized for the explicit purposes for which it was acquired, and owners did not receive prompt and adequate compensation (in particular, compensation for land improvement, is not recognized).
- (iii) **Oral agreements:** A lot of the agricultural tenancies are based on oral agreements. Consequently, there are frequent disputes concerning the duration of the tenancies, which in most cases lead to eviction of tenants from the farms they lease, especially when the original landlord is deceased and the farm is taken over.
- (iv) **Inheritance system:** The existing inheritance system may obstruct or not provide the adequate incentive for adopting sustainable land management technologies. In patrilineal systems (as in northern Ghana), land is divided among the male heirs of the family. This system of inheritance often leads to fragmented gifts. As a result of fragmentation,

contiguous plots may not be held by different persons, but may be under different tenure.⁸² Thus, where soil conservation measures should, for technical reasons, extend over a whole area, it may be difficult for all farmers concerned to adopt them.

- (v) **Land boundaries:** Unclear land boundaries, oral transactions, lack of land titles, and a backlog of land cases have all contributed to increase a sense of tenure insecurity among resource users, thus reducing their incentive to long-term investments.

D-2: Access to credit

53. **Inadequate access to credit prevents farmers from sustaining the upfront costs associated with adoption of SLM technologies.** Changes in technology are often associated with high upfront costs and/or with returns deferred in the long-term. Limited access to credit in the agriculture sector may limit farmers' capacity to bear the initial costs associated with adoption of a new technology. In fact, access to financial services and credit support from commercial banks is very limited in Ghana's agriculture sector. Because of the high risk associated with agriculture and the low level of investment collateral, few funds are available for lending to farmers. For example, in 2002 the percentage of credit support from commercial banks to agriculture, forestry, and fisheries amounted to 2.1 percent, as opposed to 20.3 percent to the manufacture sector (MoFA 2003, in FAO 2005). The high interest rates for the agriculture sector (worsened by inflation) further deter farmers from obtaining commercial bank loans.

D-3: Access to markets and fiscal and trade barriers

54. **Limited accessibility to and poorly functioning markets increase the transaction costs and discourage farmers from investing in and adopting SLM technologies.** Increased land productivity does not necessarily represent an incentive for farmers to adopt new technologies if they don't have the means to control the price of their products. Moreover, rural roads needed for access to markets are either in very bad condition or nonexistent. In addition, inadequate storage facilities and insufficient agro-processing plants hinder agricultural production and have impeded adoption of measures to enhance soil productivity.

55. **Fiscal and trade barriers and price subsidies—including those in developed countries—may act as disincentives to SLM by hampering agricultural and economic growth.** Agricultural products suffer from having to compete with lower prices in other developing countries, countries that may enjoy agricultural subsidies. To lower cost of production, opportunistic and non sustainable practices are in fact often adopted.

Box 5-5: Impact of Trade Liberalization on Land Use Decisions in Ghana

Since 1983, Ghana has introduced major structural reforms in its economy, including liberalizing its exchange rate and removing distortions in the prices of agricultural commodities. However, trade liberalization reforms could potentially have a negative impact on soil productivity. Because of traditional farming practices, farmers would likely react to an increase of agricultural prices by expanding their cultivated land rather than intensifying crop production. In a study on the impact of economy-wide reforms and land management decisions of poor farmers, Lopez (1997, in Barbier 2000) estimated that the overall impact of trade liberalization on average causes a 2.5-4.4 percent decline in biomass in western Ghana as a result of the increased cultivated area. As in the traditional bush-fallow system, the biomass serves as natural fertilizer; depletion of biomass is likely to cause land degradation and loss of soil productivity.

⁸² This happens when the plot that a farmer was renting from one owner is divided among the heirs of the owner. Contiguous plots could therefore be held by one farmer, but be owned by different persons.

D-4: Economic return of resources

56. **Inappropriate pricing of resources may encourage overexploitation.** If the market price of a natural resource is below the economic value of the resource, overexploitation and depletion of the resource may result. For instance, the market price of timber is relatively low in Ghana, and this provides an incentive for overexploitation of the resource. The prices of firewood and charcoal do not take into consideration the opportunity cost of wood, making their pricing fall below the real cost and serving as an incentive for depletion of forest resources.

Table 5-14: Incentive Issues and Impacts on Land Degradation/SLM

| Issue | Impact |
|---|--|
| <ul style="list-style-type: none"> ▪ Stewardship of land is invested in the chief or in the State. ▪ Government has the right to compulsorily acquire land if in the public interest. ▪ Compensation to resource users for expropriation of land is not always paid or paid in a timely manner, and may not reflect land improvements. ▪ Land boundaries are unclear, transactions are oral, and land titles do not exist. ▪ Resource users cannot use land as collateral for loans. ▪ In patrilineal inheritance systems, contiguous plots of lands may be under different tenure systems. ▪ Provision of financial services and credit from commercial banks in the agricultural sector are limited. | <ul style="list-style-type: none"> ▪ Tenure insecurity, which reduces resource users' incentives for long-term investments on the land they use. ▪ Access to credit for sustaining the upfront costs associated to the adoption of a new technology may be more difficult. ▪ If contiguous plots of lands are under different tenure systems, SWC measures that, for technical reasons, must be extended beyond one user's plot may be difficult to be adopted. ▪ In patrilineal inheritance systems, it may be difficult for farmers to adopt measures that need to be extended over a whole area. ▪ The ability of farmers to access credit in the agricultural sector is limited, and therefore their capacity to bear the initial costs associated the adoption of a new technology is constrained. |
| <ul style="list-style-type: none"> ▪ Rural roads are nonexistent or in bad condition. ▪ Storage facilities are inadequate. ▪ Agro-processing plants are insufficient. ▪ The market price of natural resources is often below the real economic value of the resource (e.g., timber, firewood, charcoal). | <ul style="list-style-type: none"> ▪ The ability of farmers to benefit from potential improvements in land productivity derived from adoption of SLM technologies is constricted. ▪ An incentive to overexploit natural resources exists. |

E. Knowledge Barriers

57. **Generally limited knowledge of the extent, impact, and costs of land degradation, as well as on the economic benefits of sustainable land management, impede a comprehensive approach toward the problem.**

- (i) **Lack of benchmarks and indicators:** Overall, Ghana lacks any systematic benchmarks or indicators for assessing the rate, the extent, and the impact of land degradation in various parts of the country; the country also has no baseline information from which to monitor progress in addressing the problem. Moreover, most of the available information is outdated (assessment of the extent of land degradation in the country refers mainly to studies undertaken in the 1980s).
- (ii) **Flow of information:** Most of the information is compartmentalized among various research institutions, ministries, and agencies, and the flow of information is very limited,

as data are often made available only against payment. At the local level, access to information is virtually nonexistent.

- (iii) **Focus of present research:** Information on the impact of land degradation in economic terms is relatively limited, and mainly involves on-site effects (loss of productivity). In general, research focused on the technological requirements for SLM rather than on what drives adoption of SLM and what are its constraints. Farmers' views are rarely captured in the present research, making it difficult to implement conclusions on the ground. The capacity of the CSIR centers⁸³ must be strengthened.
- (iv) **Spatial Data Information and Geographic Information Systems:** Capacity and the use of Spatial Data Information (SDI) and Geographic Information Systems (GIS) for assessing land degradation are still limited.

58. **Decision makers lack critical information to underpin their decisions.** Lack of adequate information on the magnitude and costs of land degradation resulted in key policy makers who were generally unaware of or inattentive to the problem. Consequently, land degradation was not among the key development priorities of the country, sustainable land management elements were not adequately integrated into the Poverty Reduction Strategy, and the National Action Program to Combat Drought and Desertification was not implemented.

59. **In addition, the lack of unified information on the technical, social, and economic requirements of SLM practices and on their applicability to diverse agro-ecological zones of the country limits the wide-scale promotion and replication of these practices.** Information is limited and unorganized on the specific characteristics and the technical requirements of SLM practices, including design, technical standards, management requirements, what works where (suitability to the different agro-ecological zones of the country), and so on. In addition, information on the contextual socioeconomic factors that determine the sustainability of SLM practices⁸⁴, technology gaps, and conditions for their replication is scant, and the perspective of the resource users is rarely captured. Without such critical information, promotion and replication of these practices are problematic.

⁸³ Crop Research Institute, Soil Research Institute, Water Research Institute, Forestry Research Institute, Food Research Institute, Animal Research Institute, Savanna Research Institute, and Atomic Research Institute.

⁸⁴ E.g., social acceptability, and implications in terms of costs and labor for the targeted beneficiaries.

Table 5-15: Benefits of Low-input Technologies in Mitigating the Effects of Land Degradation

| Issue | Impact |
|---|--|
| <ul style="list-style-type: none"> ▪ Benchmarks or indicators for assessing the rate, extent, and impact of land degradation are lacking. ▪ Information on the rate, extent, impact, and costs of land degradation is limited, outdated, or compartmentalized. ▪ The flow of information is poor, and the capacity of CSIR centers weak. ▪ Research focuses on technological issues rather than to socioeconomic factors influencing the adoption of SLM. ▪ Use of SDI and GIS for assessing land degradation is limited. ▪ Information on the specific characteristics and technical requirements of SLM practices is limited and unorganized. ▪ Information on the contextual socioeconomic factors that determine the sustainability and replicability of SLM practices is poor. ▪ The perspective of resource users is rarely captured. | <ul style="list-style-type: none"> ▪ Decision makers lack critical information to proper land use planning or implementation of SLM. ▪ Awareness of the problem of land degradation and the benefits of SLM is lacking and/or attention is limited. ▪ Research conclusions are often too theoretical and hardly implementable. ▪ An incapacity to promote the replication of SLM technologies on a wider scale exists. |

Proposed Solution

60. **The proposed actions aim at developing a sustainable framework for sustainable land/landscape management in the long run.** The analysis of the root or underlying causes of land degradation highlights the existence of a number of barriers and bottlenecks that prevent long-term investments in land management and indirectly contribute to land degradation. This section identifies a number of concrete actions that can contribute to removing these barriers.

61. **Three sets of actions are proposed:** (a) actions aimed at creating an enabling environment for sustainable land management (policy and regulatory, and institutional capacity), (b) actions to support on-the-ground activities scaling up sustainable land management practices (infrastructures, technologies, and output-based investments), and (c) actions for supporting policy and investment decisions through SLM knowledge management (knowledge management, and monitoring and evaluation). The third set of actions is to provide an analytical back-up for the first two sets of actions.

62. **The long-term vision behind the proposed actions is the development of a sustainable framework for land/landscape management,** ultimately helping Ghana attain and maintain the economic growth necessary to reach middle-income country status. A sustainable framework for land/landscape management is defined as one in which: land degradation is recognized as a key development priority; a policy and regulatory framework conducive to SLM and effective SLM governance is put in place; decision making, adoption of technology, and investment decision processes are underpinned by strong, evidence-based analysis; and an effective SLM planning system, in which SLM interventions are harmonized and coordinated, is in place.

63. **The proposed set of actions can be implemented through an integrated multisectoral programmatic approach for SLM** (a sector-wide approach-type). An integrated multisector programmatic approach (as opposed to a project-based approach) would be defined as an approach in which investments and interventions are aligned against a commonly agreed set of objectives and priorities, with a common monitoring and evaluation system, and supported by strong operational

linkages with knowledge management and a public expenditure framework. Since land degradation is a cross-sectoral issue, the program should integrate investments of different sectors.

64. **The proposed actions are summarized in a matrix** (section 5-7). The matrix organizes the proposed actions in four categories: (a) policy and regulatory, (b) institutional capacity building, (c) infrastructures, technologies, and output-based investments, and (d) knowledge management and M&E, and along three time horizons: short (until 2009), medium (2009-2015), and long term (2015-2025). In most cases, the actions proposed for the medium term are the continuation of those proposed for the short term. It would be unrealistic to assume that the proposed actions would have a significant impact if not implemented for a significant time horizon. Actions in the medium term will therefore mainly review, correct, and continue implementing the actions proposed for the short term. Recommending specific actions for the long-term, i.e., 10 to 20 years from now, is more difficult. In this case, the desired outcomes described in the matrix serve as a guide to provide direction for policy and investment choices in the future.

A. Actions Aimed at Creating an Enabling Environment for SLM

A-1: Policy and regulatory

65. **Integrate SLM elements into and ensure the “sustainability test” of a new policy, strategy, program, expenditure, and planning framework**—at national and decentralized levels. One of the major policy constraints identified is the still-weak integration of land degradation considerations and sustainable land management elements into key development and sectoral policies, strategies, and action plans.⁸⁵ In addition, crucial policy gaps have been identified, including the lack of a strategic plan to implement the land policy, and of a land use policy and action plan. It is therefore recommended that SLM consideration be more clearly integrated into the definition of a new policy, strategy, program, and expenditure framework.

66. **Entry points.** The ongoing processes of revision of the Food and Agriculture Sector Development Policy (FASDEP), design of an Agriculture Sector-Wide Approach (AgSWAp) and of an Agricultural Development Policy Operation (Ag DPO), and formulation of the Agriculture Land Management Policy and of a National Land Use Plan represent concrete and immediate entry points for SLM mainstreaming. However, in the medium term, this process should be extended progressively to any national policy, strategy, or action plan (starting from the next GPRS).

67. **Tools to support SLM mainstreaming** may include the mandatory set-up of special intersectoral committees for SLM during the preparatory phases of any policy, and the systematic and prior application of the already-existing “sustainability test” (a strategic environmental assessment that EPA promotes during the design/revision of policies that have a potentially negative impact on the environment). Further analytical and stock-taking work can also support SLM mainstreaming.

68. **Revise and harmonize existing laws and regulations, as well as implementation of an effective land certification system, for an effective and efficient land administration and tenure system.** As observed above, the existing regulatory framework contributes to increased transaction costs and reduced tenure security, thus ultimately lowering farmers’ incentives for long-term investments in land management. Revision and harmonization of the existing land policies and laws would therefore be advisable. The Government of Ghana has recently embarked on an ambitious land administration reform program (Land Administration Project—LAP; see Appendix 5-10 for more details), that seeks, among other things, to harmonize land policies and a legislative framework with traditional law, and to establish an efficient and transparent system for land registration and titling. Although the LAP has only recently started and it is therefore too early to assess the impact and the results so far achieved, it could

⁸⁵ The country’s Food and Agriculture Sector Development Policy (FASDEP), the country’s Agricultural Services Sub-sector Investment Project (AgSSIP), and the Growth and Poverty Reduction Strategy are key examples.

nonetheless represent the platform for revising and harmonizing the existing laws and regulations, and for implementing a fair land registration and titling system. Periodic revision of the program may enhance the adoption of corrective measures as required, if needed. However, due attention to equity concerns is required.

69. **Revise and harmonize the existing incentive system for SLM.** The adoption or nonadoption of sustainable land management technologies and practices is influenced by many factors that go beyond the mere profitability of the technology. These factors include, among others, tenure security, access to credit, access to markets, and price of resource. Therefore, to be successful, policy and regulatory interventions in the land sector must be accompanied by specific interventions aimed at improving tenure security, facilitating access to credit, supporting upfront investments, and facilitating farmers' access to markets.

70. **Interventions to improve the incentive system for SLM may include:** (a) designing and facilitating private (and possibly public) payments for environmental services schemes for services provided by SLM adoption (including water regulation and quality control, carbon sequestration, etc.), (b) providing matching grants to land users switching to SLM in order to facilitate adoption (to overcome the barrier of up-front investment requirements), (c) fostering provision of credit for investments in SLM through existing and new financial service providers, (d) improving farm roads and water transport to market, and (e) improving storage facilities.

Box 5-6: Payment for Environmental Services (PES) and Sustainable Land Management

The Payments for Environmental Services (PES) approach is an innovative market-based approach to conservation financing. The approach, in essence, seeks to link those who benefit from environmental services ("the buyers") with those who contribute to generating these services ("the sellers"). It creates a mechanism whereby those who derive benefits pay for the environmental services, while those who help generate the services receive compensation for providing them. The key point of note is that the service(s) can be identified and there is a demand, thus a value can be placed on these services in order to effect a transaction. Environmental services encompass a variety of 'goods' or benefits that the ecosystem generates, such as carbon sequestration by trees, water related services such as maintenance of hydrological cycles and prevention of floods, water quality improvements, and maintenance of biodiversity, with a variety of benefits. Unfortunately, environmental services are not always clearly or easily identified 'products', and traditional markets may not be the appropriate mechanisms to bring together the 'buyers' and 'sellers' of the services. The PES approach is attractive in that (i) it generates new financing, which would not otherwise be available for conservation; (ii) it is likely to be sustainable, as it depends on the mutual self-interest of service users and providers and not on the whims of government or donor funding; (iii) it is likely to be efficient, in that it conserves services whose benefits exceed the cost of providing them.

This approach has increasingly used in Latin America in recent years and is being introduced in a variety of forms in Africa. An interesting example of how the PES approach can be used to promote sustainable land management (SLM) is provided by the regional the World Bank/GEF 'Integrated Silvopastoral Approach to Ecosystem Management' project in Colombia, Nicaragua, Costa Rica. This project seeks to target the barriers that impede the widespread adoption of improved land use systems in order to achieve biodiversity and agricultural productivity benefits, through a PES model. The project uses a PES modality to provide incentives to small holder farmers to adopt SLM. This approach holds great promise for many countries in Africa. Two recently submitted project concepts for GEF funding seek, among other objectives, to test the PES approach to replace the traditional grant based systems for supporting agricultural productivity and adoption of SLM technologies in Ghana and Nigeria.

Table 5-16: Policy and Regulatory Issues, Opportunities and Proposed Actions

| Issue | Opportunity | Proposed actions |
|--|---|--|
| <ul style="list-style-type: none"> ▪ Land degradation and SLM elements weakly integrated into the key development and sectoral policies, strategies, and action plans | <ul style="list-style-type: none"> ▪ Revision of the FASDEP ▪ Development of the AgSWAp and design of the Ag DPO ▪ Formulation of the Agriculture Land Management Policy ▪ Formulation of a National Land Use Plan ▪ Revision of NEAP ▪ GPRS IV (in 2008) | <ul style="list-style-type: none"> ▪ Integrate SLM elements into new policy, strategy program, expenditure, and planning framework. ▪ Ensure the “sustainability test” of new policy strategy, program, and expenditure and planning framework. |
| <ul style="list-style-type: none"> ▪ Co-existence of statutory and traditional system ▪ Multitude of laws and regulations, often contradictory or outdated ▪ Unclear boundaries and inadequate land administration system | <ul style="list-style-type: none"> ▪ Ongoing land administration reform program (LAP), which aims at revising and harmonizing existing land policy and regulatory framework for land administration | <ul style="list-style-type: none"> ▪ Revise and harmonize the existing laws and regulations, and implementation of effective land certification system, though the existing LAP. |
| <ul style="list-style-type: none"> ▪ Inadequate security of land tenure ▪ Inadequate access to credit ▪ Poorly functioning markets ▪ Inadequate pricing of natural resources | <ul style="list-style-type: none"> ▪ Agriculture financing, agriculture marketing, and land administration considered among the GPRS II strategies ▪ Improving the land titling, registration, and information system one of LAP’s activities | <ul style="list-style-type: none"> ▪ Revise and harmonize the existing incentive system for SLM. ▪ Provide/develop incentives for SLM adoption: PES schemes for services provided by SLM adoption, matching grants and credit provision for SLM, farm roads/water transports, storage facilities, etc. |

A-2: Institutional Capacity

71. Streamline the functions of the public land agencies, and develop and strengthen cross-sectoral coordination mechanisms for SLM at all levels. One of the most critical bottlenecks to the successful addressing of land degradation is the duplication of roles and responsibilities, and the weak coordination among institutions with a mandate for land management and utilization. On the one hand is the need to streamline the functions of existing land management institutions; on the other hand is the necessity to develop and strengthen cross-sectoral coordination mechanisms among those institutions to coordinate and facilitate national actions in support of SLM.

72. Streamline the functions of the public land agencies: One of the objectives of the LAP is to review the functions of the public land agencies⁸⁶ and propose their reorganization. The recent proposal for merging these six public land agencies into one corporate entity responds to this need, and is worth pursuing.

73. Develop and strengthen cross-sectoral coordination mechanisms for SLM at all levels: The proposal is to set up two committees at the national level specifically for policy dialogue and enhancing coordination among the various institutions’ efforts toward sustainable land management: (a) a Steering Committee in charge of providing strategic guidance (at the cabinet or ministers’ level to give a very high

⁸⁶ The Land Commission, the Survey Department, the Land Valuation Board, the Title Registry, the Deeds Registry, and the Office for Administration of Stool Lands.

profile to the issue of land degradation and sustainable land management), and (b) a Technical Committee to provide technical support and be responsible for the coordination, implementation, and follow-up of the SLM multisector program (e.g., planning, implementation, monitoring, reporting and evaluation, etc.). These committees should involve a large number of sectoral and nonsectoral institutions, including, among others, the Ministry of Finance and the National Planning Commission. The recent initiative of the Ministry of Finance to set up a National Committee for TerrAfrica⁸⁷ can provide the basis for the Technical Committee, but clear terms of reference must be developed and agreed upon. This structure should be replicated (and adapted, if needed) at the district or watershed level. Mechanisms for vertical coordination and reporting should also be put in place.

74. **Identify a champion for SLM:** A national champion is needed to take the lead in promoting and implementing the SLM agenda and to bring together decision makers, land users, experts, and stakeholders.

75. **Create SLM partnerships with development partners and civil society.** Similarly, analogous coordination mechanisms and partnerships for SLM should be engendered among the development partners and civil society engaged in sustainable land management activities; mechanisms for dialogue with the Steering and Technical Committees should also be formulated. In this regard, the Environment and Natural Resource Management (ENRM) Sector Group (the group of donors that coordinates development partner support to the environment and natural resource sector in Ghana) may offer a platform. However, additional efforts to define and agree on a joint work program for SLM (i.e., a common set of objectives and possible outcomes and indicators) should be pursued further. For example, TerrAfrica's multipartner initiative can support building and strengthening the partnership by channeling knowledge and support from TerrAfrica partners and promoting or supporting the development of joint work programming or collaborative assistance strategies. The benefits of such a framework would include a more harmonized and coordinated approach to dealing with land degradation at the policy, strategy, and program levels; benefits would be in terms of efficiency (duplication of efforts would be avoided, and resources would be optimized), and effectiveness (economies of scale and comparative advantages).

76. **Strengthen the technical capacity for SLM at all levels.** Lack of institutional capacity has been identified as one of the main constraints in the country; direct consequences are an impaired general awareness, insufficient capacity to enforce policies and regulation, and an inability to implement program and projects. Significant efforts and investments in capacity building for SLM are therefore recommended. It should primarily focus on the following areas: cross-sectoral (spatial) planning, participatory planning, policy development and the incentive implications in policies and public expenditure strategies, design of SLM strategies and land use plans, integrated watershed and land management (IWLM), technical requirements for SLM, EIA, GIS use, and monitoring and evaluation.

77. **Capacity-building programs may include** training, workshops, expert services, and goods (publications/training materials, equipment, software, etc.). These programs should target all levels, from national to local and communal, and possibly (and progressively) be extended to parliamentary committees, civil society, community-based organizations (CBOs), farmer associations, and the private sector. Critical to the successful scale-up of SLM are strengthening the links between the generation of research and technology and dissemination and extension, and the training extension officers in SLM technologies. In the latter case, developing guidelines for SLM watershed planning and requirements may further this end.

⁸⁷ TerrAfrica is a multipartner initiative to support the SLM scale-up in Sub-Saharan Africa. Ghana is a member of its Executive Committee.

Table 5-17: Institutional Capacity Issues, Opportunities, and Proposed Actions

| Issue | Opportunity | Proposed action |
|--|---|--|
| <ul style="list-style-type: none"> ▪ Duplication of roles and responsibilities among the institutions with a mandate for land management and utilization ▪ Weak coordination among the institutions with a mandate for land management and utilization ▪ Lack of institutional capacity for SLM ▪ Overall limited capacity to enforce policies and regulations | <ul style="list-style-type: none"> ▪ TerrAfrica multipartner platform ▪ TerrAfrica National Steering Committee ▪ National Desertification Committee ▪ ENRM Sector Group ▪ Provision for establishing an “environmental desk” in each line ministry ▪ One of LAP’s activities includes restructuring of public sector land agencies. | <ul style="list-style-type: none"> ▪ Develop and strengthen cross-sectoral coordination mechanisms for SLM at all levels. ▪ Develop SLM partnerships with development partners and civil society in line with TerrAfrica principles. ▪ Streamline the functions of agencies in the land sector (through, among other actions, continuing implementing the LAP). ▪ Identify a SLM champion. ▪ Strengthen technical capacity for SLM at all levels. |

B. Actions Aimed at Supporting On-the-ground Activities to Scale up SLM Practices

78. **Develop and support on-the-ground SLM investments.** This program includes a set of on-the-ground investments for SLM activities with an embedded scale-up strategy. There are two typologies of on-the-ground investment that could be potentially supported:

(1) **Scaling up of existing SLM technologies/practices:** As described in Table 5-9 and in section 5-3, a number of locally specific, low-tech sustainable options in Ghana have shown benefits in both reduction of soil loss and improvement in crop yields. Many of these technologies are applied on a limited scale. On-the-ground investment could specifically focus on spreading and scaling up these technologies. Investment support could focus on research and development networking, knowledge dissemination, and rural finance.

(2) **Incorporating SLM approaches in the production system:** On-the-ground investments should address intensification, diversification, and value-adding by incorporating SLM approaches in the production systems of existing farming systems. These investments should also facilitate and support gradual exit strategies from unsustainable farming systems. Investment support should include a mix of different investments, ranging from those facilitating access to credit, to physical infrastructures, training, research and development, and extension services.

79. **A number of actions can prepare the ground and support the scale-up of SLM investments, including:**

(i) **Identification of lessons and best practices and scale-up strategy in ongoing projects.** A number of ongoing activities directly or indirectly dealing with land degradation already exist. Their implementation should allow us to learn lessons and identify best practices that can be scaled up. Specific focus would be on identifying the requirements and geographic suitability of SLM best practices that can be used to update existing technology packages. To this end, a scale-up strategy may be embedded in the design of SLM projects.

(ii) **Capacity building for SLM implementers** (farmers and farmer associations, CBOs, etc.). Capacity building may include: (a) development of skills to promote farmer-driven innovation and adoption, including the provision of a set of SLM technologies and practices (along with those based on traditional best practices and knowledge) that farmers

can test and adapt, (b) development of the capacity to explore the multiple monetary benefits SLM activities can provide, such as through CDM, payments for ecosystem services, and conservation management, (c) support for increased community awareness of land degradation and desertification issues and of cost-effective measures to mitigate them, (d) training in participatory methodologies that facilitate community-based management approaches, (e) strengthening of the farmer/producer organizations (including youth and women), and (f) field trips, farmer-to-farmer exchange events, and workshops for dissemination and replication of SLM best practices, technologies, and lessons learned.

- (iii) **Capacity building for SLM service providers** (extension staff and local government). Included in this action are: (a) SLM training in participatory integrated approaches to natural resource management, with a modified curriculum that includes socioeconomic and environmental components related to SLM, (b) capacity building of extensionists and other advisory service providers to build the necessary skills for helping farmers in production diversification, processing, marketing, and marketing organization as related to SLM, (c) support for networking among service providers to increase awareness and adoption of SLM practices and marketing organization, and (d) development of SLM curriculum for farmer field schools.
- (iv) **Identify and develop financial mechanisms to support SLM scale-up, strengthen financial service providers, and develop incentives to involve the private sector.** Mechanisms for improving access to financial resources for SLM to individual farmers or community-based organizations may include: (a) microcredit programs and the development of appropriate financial services products (savings and credit) that can facilitate the adoption of SLM, (b) matching grants to land users who switch to SLM, (c) payment for environmental service schemes for services provided by SLM adoption (including water regulation and quality control, carbon sequestration, etc.). Financial service providers should be strengthened to extend their reach to rural areas, and should be encouraged and facilitated in developing financial service products that can ease the adoption of SLM. Incentives for promoting progressive involvement of the private sector should be considered.

80. **Specific examples of on-the-ground activities that could be supported** include, among others: (a) technology transfer, and technical and financial support to develop and implement strategies for promoting the development and use of machinery, tools, and equipment for SLM, (b) experimentation and dissemination of sustainable agriculture, (c) adoption/expansion of soil and water conservation measures to protect watersheds, including reforestation of riparian or other fragile areas and erosion control in rural roads, (d) SLM activities that promote crop diversity, preserve breeding grounds, and provide buffers for changing habitats in protected areas, (e) SLM activities that integrate climate adaptation components, such as those that (i) support forest and vegetative cover restoration to reduce siltation and the associated water flow problems, or (ii) improve community resilience to climate change through the development of non-climate-proof rural livelihoods.⁸⁸

81. **A wide-ranging set of actions must complement and support the above actions, ones that go beyond direct land management and are integrated with measures that promote rural development.** Land degradation is a multidimensional issue. It is unrealistic to assume that investments in SLM practices and technologies alone will address land degradation. To be successful, investments in sustainable land management must be accompanied by supportive actions, including, for instance (a) appropriate interventions aimed at enhancing access to markets and reducing risks to investments in SLM,

⁸⁸ These activities may include, for example, improved water management by water harvesting, conservation and small-scale irrigation, or diversification of crops (e.g., drought resistant crops) and livestock to accommodate the incidence of droughts.

for example, infrastructures and facilities (farm roads and water transports to markets, storage facilities, rural energy programs, small-scale irrigation systems, etc.), (b) diversification of activities that generate rural income, and (c) increased involvement of local communities in NRM/SLM.

Table 5-18: Technological/Investments Issues, Opportunities, and Proposed Actions

| Issue | Opportunity | Proposed action |
|--|---|--|
| <ul style="list-style-type: none"> ▪ Unsustainable farming practices ▪ Lack of institutionalized mechanisms to scale up SLM | <ul style="list-style-type: none"> ▪ Existing SLM practices in the country ▪ Endorsed NAP ▪ Ongoing SLM operations | <ul style="list-style-type: none"> ▪ Update, prioritize, and cost the activities included in the NAP. ▪ Continue the ongoing operations, investments, and identification of lessons and best practices. ▪ Build capacity for SLM implementers and service providers. |
| <ul style="list-style-type: none"> ▪ Limited domestic and international financial resources allocated for SLM ▪ Inadequate access to credit ▪ Limited involvement of private sector | <ul style="list-style-type: none"> ▪ Agriculture financing and agriculture marketing considered among the GPRS II strategies | <ul style="list-style-type: none"> ▪ Develop mechanisms to improve access to financial resources for SLM to individual farmers and CBOs (e.g., microcredit, matching grants, PES, etc.). ▪ Strengthen financial service providers. ▪ Promote incentives for private sector involvement. |

C. Actions aiming at Supporting Policy and Investment Decisions through SLM Knowledge Management

82. **Strengthen key research institutions and statistical services, and encourage the development of and support to applied research on land degradation and SLM. This will strengthen both decision-making and the links between research, extension, and farmers.** Limited or unorganized information on the extent, impact, and cost of land degradation has resulted, on the one hand, in policy makers who give limited attention to the problem, and, on the other hand, in policy and investment decisions that are based on poor analysis. An important proposal, therefore, is to strengthen key research institutions, divisions, and statistical services dealing with land issues (e.g., Soil, Crop, Water, and Savanna Research Institutes). One consideration is the possible restructuring of the existing CSIR centers into a national institute for research. An additional recommendation is to support the development of pragmatic applied research on land degradation and sustainable land management in order to enhance decision making and the links between research, extension, and farmers.

83. **Future applied research could include**, for instance: the socioeconomic costs of land degradation and the benefits of SLM; the impact of land degradation in terms of conflicts; land management and its impact on and adaptation to climate change; and SLM technologies. The latter comprise, among others, inventory and characterization of “what works where,” what are the factors influencing the acceptability, replicability, and sustainability of good practices and successful replication, and the upscaling of SLM practices beyond existing demonstration areas and technology gaps.

84. **Build, harmonize, and improve baseline information, statistical data, and information systems specific to land degradation, and develop info- and data-sharing mechanisms.** In general, Ghana lacks any systematic benchmark or indicators on land degradation, which undermines the country's capacity to properly planning and monitor progress toward addressing land degradation. Actions are therefore recommended to build, harmonize, and improve the baseline information and data (including Spatial Data Information and Geographic Information System) specific to land degradation. These actions will include data collection, collation, analysis, and dissemination of results, and the development and testing of a harmonized set of specific benchmarks and progress indicators. Data building and collation on the extent and geographical distribution of land degradation is a priority. To be effective, the development of a proper mechanism of data and information sharing should accompany the development of such an information system. These activities constitute the baseline activities for the development of a monitoring system for land degradation.

85. **Establish and implement a comprehensive and integrated mechanism for monitoring natural resources and land degradation processes.** Based on the activities described above, it is recommended that a comprehensive mechanism for monitoring natural resources and land degradation processes be established and implemented. This would include, among others, the establishment of M&E action plans, M&E technical committees, feedback loop mechanisms, and training. The established M&E system would support the proposed multisector investment program for SLM.

Table 5-19: Knowledge Management Issues, Opportunities, and Proposed Actions

| Issue | Opportunity | Proposed action |
|--|--|---|
| <ul style="list-style-type: none"> ▪ Limited or unorganized information on the extent, impact, and cost of land degradation ▪ Limited and unorganized information on the specific characteristics and requirements of SLM practices and their suitability to different AEZs | <ul style="list-style-type: none"> ▪ MES has developed a set of indicators to monitor sustainable development | <ul style="list-style-type: none"> ▪ Strengthen key research institutions and statistical services (reform of existing CSIR centers to be considered). ▪ Develop and support applied research on land degradation/SLM. |
| <ul style="list-style-type: none"> ▪ Lack of baseline information, systematic benchmarks, or indicators to assess land degradation and to monitor progress in addressing the problem ▪ Available information either outdated or compartmentalized ▪ Flow of information very limited ▪ Use of SDI and GIS for assessing land degradation still limited | | <ul style="list-style-type: none"> ▪ Build, harmonize, and improve baseline information, statistical data, and information systems (including SDI and GIS) specific to land degradation. ▪ Establish and implement a comprehensive and integrated mechanism for M&E. ▪ Develop info and data-sharing mechanisms. |

Implementation Mechanisms and Short-term Follow-up Actions

86. **Consistent with new architecture of development assistance in Ghana, characterized by a shift towards sector-wide programs and budgetary support, a more programmatic and multisectoral approach to address land degradation and promote sustainable land/landscape management is**

recommended. A programmatic approach (as opposed to a project-based approach) would allow the alignment and harmonization of current and future SLM interventions along a commonly agreed upon set of objectives and priorities and with a common monitoring and evaluation system, thus increasing the impact of interventions and achieving greater economies of scale. SLM interventions would include interventions in different landscapes and land uses (e.g., agricultural and nonagricultural land, forests, reserves, corridors, and mines), and would integrate interventions in different sectors (e.g., infrastructures, financial services, and private sector development).

87. **Given the cross-cutting, multisectoral nature of land degradation, the main implementation instruments through which the above-proposed set of actions can be delivered** could include:

- (i) **The Natural Resource and Environmental Governance Program (NREGP)**—which can promote sectoral and cross-sectoral policy reforms that contribute to address land degradation and promote sustainable use of land resources, particularly in the forestry and mining sectors.
- (ii) **The ongoing Food and Agriculture Budget Support (FABS) and the Agricultural Development Policy Operation (Ag DPO)**—which can support reforms and interventions that would contribute to improve soil productivity and promote sustainable management of land resources in agricultural lands.
- (iii) **The ongoing Land Administration Project (LAP)**—which would deal with the land administration, tenure, and legislative aspects of land management, and with some institutional reforms.
- (iv) **The GEF Strategic Investment Program for Sustainable Land Management in Sub-Saharan Africa (SIP)**—which will provide catalytic and complementary resources to support strategic interventions to strengthen the enabling environment for SLM (i.e. address policy, institutional and incentive barriers to SLM adoption), and as well as to promote on-the-ground activities to scale-up SLM practices.
- (v) **The Ghana Environmental Management Project (GEMP)**—which will specifically focus on desertification issues in the Northern Regions of the country.

88. Implementation of some identified interventions could receive support from the creation of a basket fund or from the Desertification Fund (established in the framework of the NAP), whenever replenished.

89. **Improved donor alignment and coordination** through the proposed development of cross-sectoral coordination mechanisms and partnerships for SLM would also help optimize the allocation and use of already-existing domestic and international financial resources. Support for this coordination could come through the TerrAfrica platform.

90. **TerrAfrica may support the implementation of the proposed recommendations** by, among other things: helping to build and strengthen SLM partnerships (e.g., channeling support from TerrAfrica partners, promoting or supporting the development of joint work programming, or collaborative assistance strategies); increasing and leveraging support for identified interventions and/or implementation instruments; supporting and disseminating targeted knowledge (methodologies, best practices, etc.) through regional networks and toolkits; technically supporting the integration of SLM elements in country investments; and coordinating and supporting the advisory dialogue on SLM.

91. To develop a programmatic approach to address land degradation and promote SLM, the following short-term actions are considered critical:

- (1) **Identify and appoint an SLM champion and establish a functioning SLM Committee.**

- (2) **Develop a multisectoral programmatic framework and action plan for SLM** (i.e. CSIF – Country SLM Investment Framework). This framework and action plan would help the government to identify, select, prioritize, cost and provide a timeframe for interventions and investments to promote SLM, and to define the most appropriate and harmonize the implementation and financial modalities to scale-up SLM. The formulation of this programmatic framework could be supported by an analysis of the levels, distribution, trend, sources, efficiency and effectiveness of public expenditure in land management across the various ministries and institutions responsible for land management in Ghana.

5.7 Land Resources Reform and Investment Road Map, 2006-2025

Policy and Regulatory

| Short-term actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|--|---|---|---|---------------------------------|--|
| <p>Ensure “sustainability test”(SLM impact assessment) and integration of SLM elements into new policy, strategy program, expenditure, and planning framework</p> <ul style="list-style-type: none"> - FASDEP and Strategic Plan - Agriculture Land Management Policy - AgSWAP - Land Use Action Plans (national, regional, district, and community) | <p>Intermediary outcomes</p> <ul style="list-style-type: none"> - An increasingly harmonized policy and regulatory framework, conducive for SLM - SLM embedded in an increasing number of national and local development and sectoral frameworks | <p>Medium-term actions</p> <p>Revise and ensure “sustainability test”(SLM impact assessment) of, and integrate SLM elements into, existing key and/or new policy, strategy, program, expenditure, and planning framework (e.g., GPRS III).</p> | <p>Intermediary outcomes</p> <ul style="list-style-type: none"> - Land degradation recognized as key development priority - A harmonized policy and regulatory framework, conducive to SLM, in place - SLM embedded in national and local development and sectoral frameworks - Conflicts over land access and use reduced | <p>Long-term actions</p> | <p>Final outcomes</p> <p>A sustainable framework for SLM in place:</p> <ul style="list-style-type: none"> - Land degradation set as key development priority - A harmonized policy and regulatory framework, conducive to SLM and informed by strong analytical underpinnings, in place - SLM embedded in national and local development and sectoral frameworks |
| <p>Revise and harmonize existing laws and regulations for an effective and efficient land administration and tenure system, including dispute resolution mechanisms; and streamline the functions of agencies in the land sector</p> <p>(e.g., continue support to the LAP, revision and update of Land Planning and Soil Conservation Ordinance No. 32 [1953]).</p> | <p>Intermediary outcomes</p> <p>Revise and harmonize existing laws and regulations for an effective and efficient land administration and tenure system, including dispute resolution mechanisms, and streamline the functions of agencies in the land sector</p> | | | | |

| | | | | | |
|--|--|--|--|--|--|
| <p>Revise and harmonize existing incentive system for SLM (e.g., land tenure system, compensation system for government-acquired lands, financial mechanisms and access to credit, price-setting mechanisms, market access regulation, etc.).</p> | | | <p>Revise and harmonize existing incentive system for SLM</p> | | |
|--|--|--|--|--|--|

Institutional Capacity Building: This component should be integrated into and accompanied by the ongoing administrative and financing decentralization process.

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|--|---|--|---|--------------------------------------|---|
| <p>Develop and strengthen cross-sectoral coordination mechanisms at all levels and develop SLM partnerships and coalitions with development partners and civil society.</p> <ul style="list-style-type: none"> - Establishing an SLM National Steering Committee (at cabinet or minister's level) - Technical Committee on SLM (including MoFEP, MES, MoFA, MLFM, MLGRD, EPA, FC, WRC, NPC) <p>SLM committees at district and watershed level</p> | <ul style="list-style-type: none"> - Cross-sectoral coordination on SLM strengthened - Capacity of key institutions/actors to develop and support SLM planning, cross-sectoral integration, and on-the-ground implementation and enforcement strengthened at all levels, particularly at decentralized level <p>Capacity of communities to access credit, inputs, and other services enhanced</p> | <p>Strengthening of cross-sectoral coordination mechanisms at all levels and development of SLM partnerships and coalitions with development partners and civil society</p> | <ul style="list-style-type: none"> - Operational framework to support SLM actions at various levels established - Efficiency and effectiveness of SLM sectoral investments improved (thanks to better harmonized and coordinated interventions and more efficient allocation of resources) - SLM elements integrated in country planning/investments | | <p>A sustainable framework for SLM in place:</p> <ul style="list-style-type: none"> - Effective SLM governance in place - Effective SLM planning system in place, SLM investments coordinated and harmonized <p>Capacity to plan and implement SLM investments ensured at all levels</p> |

| | | | | | |
|--|--|--|--|--|--|
| <p>Strengthen technical capacity for SLM (e.g., for cross-sectoral and participatory planning, policy development, design of SLM strategies and land use plans, IWLM, SLM technologies, GIS, M&E) at national (including Parliament and the judiciary), regional, district, and local/ community levels (e.g., inclusion of an SLM component in the capacity-building programs for local governments and training of extension officers on SLM technologies, development of SLM guidelines).</p> | | <p>Strengthening technical capacity for SLM at national, regional, district, and local and community levels</p> | | | |
| <p>Continue strengthening community- and farmer-based organizations (e.g., farmer cooperatives, women's associations).</p> | | <p>Continue strengthening community- and farmer-based organizations</p> | | | |

Infrastructure, technologies, and output-based investments: This component should be complemented and supported by: (1) Appropriate interventions aiming at enhancing access to markets and reducing risks to investments in SLM, e.g., infrastructures and facilities (farm roads/water transports to markets, storage facilities, rural energy programs, small-scale irrigation systems, etc.); (2) diversification of rural income generation activities; and (3) increased involvement of local communities in NRM/SLM.

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|---|--|--|---|---|--|
| Update, prioritize, and cost activities included in the NAP, and develop implementation plan. | <ul style="list-style-type: none"> - Land degradation reduced - Agricultural productivity, food security, and household income increased - Critical ecosystem integrity, functions and services improved - Vulnerability to natural hazards (e.g., droughts) reduced | <p>Development of a programmatic approach for SLM for validation, adoption, and replication of SLM best practices on a wider scale (i.e., development of a sequenced, programmatic, priority-based and locally tailored portfolio of investments in SLM, aligned with a common set of objectives, outcomes, and indicators, supporting SLM scale-up)</p> | <ul style="list-style-type: none"> - Land degradation reduced and possibly halted; degraded lands increasingly rehabilitated - Agriculture productivity, food security and households income increased - Critical ecosystem integrity, functions and services improved - Local livelihoods and food security improved and overall poverty reduced - Vulnerability to natural hazards reduced | <p>Scale-up of SLM technologies and practices</p> | <p>A sustainable framework for SLM in place:</p> <ul style="list-style-type: none"> - Land degradation halted and possibly reverted; degraded lands restored - Agricultural productivity increased - Critical ecosystem integrity, functions, and services restored - Sustainability of local livelihoods ensured, and rural poverty reduced and possibly alleviated - Vulnerability to natural hazards minimized |
| Continue implementation of ongoing operations and pilot investments. | See above | <p>Set up of financial mechanisms to support SLM scale-up (e.g., basket-fund), including improving access to rural financing (e.g., micro-credit for individuals and communities, payment for environmental services, etc.) and progressive involvement of private sector in SLM investments</p> | See above | <p>Progressive involvement of private sector in SLM investments</p> | See above |

| | | | | | |
|--|--|--|--|--|--|
| Identify existing SLM best practices, update existing technologies packages, and transfer appropriate SLM technologies. | | | | | |
|--|--|--|--|--|--|

Knowledge management and M&E

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|--|---|---|---|---|---|
| <p>Strengthen key research institutions and statistical services, and develop and support targeted, demand-driven, applied research on land degradation and SLM to support decision making and links between research, extension, and farmers (e.g., socioeconomic costs of land degradation and benefits of SLM; land management and the impact of, and adaptation to, climate change; SLM technologies: inventory of what works where, and what are the factors influencing the acceptability, replicability, and sustainability of good practices).</p> | <ul style="list-style-type: none"> - Stronger analytical underpinnings to support “evidence-based” decision making - Information sharing and SLM technology and knowledge transfer increased - Baseline data and information specific to land degradation improved | <p>Continuous support to research institutions and targeted, demand-driven, applied research on land degradation and SLM to support decision making and links between research, extension, and farmers</p> | <ul style="list-style-type: none"> - “Evidence-based” decision-making processes supported by strong analytical underpinnings - Information sharing and technology transfer increased - Investment development and management supported by reliable data and M&E system | <p>Continue support to applied research that supports extension services and farmers.</p> | <p>A sustainable framework for SLM in place:</p> <ul style="list-style-type: none"> - Well-informed, “evidence-based” decision-making and technology adoption processes - Investment development and management supported by reliable data and M&E system |
| <p>Build/ harmonize/improve baseline information/statistical data/information systems (including Spatial Data Information and Geographic Information System) specific to land degradation and develop info/data sharing mechanisms</p> | <p>See above</p> | <p>Establish and implement a comprehensive and integrated mechanism for monitoring natural resources and land degradation processes (including establishment of M&E action plans, M&E Technical Committees, feedback loop mechanisms, etc.)</p> | <p>See above</p> | <p>Implement a comprehensive and integrated mechanism for monitoring natural resources and land degradation processes</p> | <p>See above</p> |

6 Urban Environment

Introduction

A. Why Focus on the Urban Environment?

1. **Slum dwellers worse off than their rural relatives.** It has been a general assumption that urban populations are healthier, more literate, and more prosperous than rural populations. UN-HABITAT's State of the World Cities Report 2006/7 shows that the urban poor are more likely to die earlier, experience more hunger and disease, attain less education, and have fewer chances of employment than those urban residents who do not reside in a slum. There are often two cities within one city—one part of the urban population that has all the benefits of urban living, and the other part, the slums and squatter settlements where the poor often live under worse conditions than their rural relatives.

2. **Sub-Saharan African cities among the ones worst off.** In many Sub-Saharan cities, children living in slums are more likely to die from water-borne and respiratory illness than rural children. Women living in slums are also more likely to contract HIV/AIDS than their rural counterparts. The slum population in many Sub-Saharan cities accounts for more than 70 percent of the urban population. Annual slum and urban growth rates are the highest in the world in these cities, 4.53 and 4.58 percent, respectively—nearly twice those figures of Southern Asia. The UN-HABITAT report expects that 95 percent of the world's urban growth in the next two decades will be absorbed by cities of the developing world, which are least equipped to deal with rapid urbanization. Asia and Africa will continue to dominate global urban growth through 2030.

3. **Slum formation can be prevented.** The UN-HABITAT report shows that the most deprived slums, in terms of access to basic services and adequate shelter, are to be found in Sub-Saharan Africa where 51 percent of the slum population lacks two or more of the following: access to water, access to sanitation, durable housing, and sufficient living area. The report notes that countries need not achieve significant milestones in economic growth before they tackle growing slum populations. Countries like Egypt, Thailand, and Tunisia have not only managed to reduce slum growth in the last 15 years, but have made considerable investments in improving slums. Some low- or middle-income countries around the world have managed to prevent slum formation by anticipating and planning for growing urban populations: they have expanded economic and employment opportunities for the urban poor. Thus, with the right policies and practices, it is possible to prevent slum formation.

B. Ghana is becoming more urbanized

- **Ghana is still a predominately rural population.** Ghana's population is still predominately rural (EPA, 2005), but this is rapidly changing. In 1960, only 100 localities had a population of 5,000 or more, and these constituted 23.4 percent of the total population. In 2000, the share of the population living in urban areas had increased to 43 percent of the population. Ghana's total population almost tripled during the same period. The urban population is skewed toward the south, and Accra has 17 percent of the total population. As the rate of urbanization increases (4.5 percent, similar to the average growth rate for Sub-Saharan countries) compared with the overall population growth (2.7 percent), the high rural-to-urban drift becomes evident.

4. The density of the average national population rose from 28 people per km² to 77 people per km² in 2000. While the population densities for the rural Northern and Upper West regions increased from 17 and 24 in 1984 to 21 and 31 in 2000, respectively, that of the Greater Accra Region escalated from 441 persons per km² in 1984 to 897 in 2000, more than 103.3 percent. These figures clearly illustrate the enormous changes taking places in some areas, particularly the Accra area.

C. Environmental and Health Problem from Urbanization

5. **Environmental problems associated with rapid urbanization.** The rapid urbanization puts an enormous pressure on natural resources and infrastructure like water supply, sanitation, waste management, transportation, and housing; if these services are not adequately provided, the negative effect on people's lives is serious. The environmental problems associated with urban overpopulation in Ghana are those that have direct bearing on human health, such as water supply, basic sanitation, and disposal of waste; shortage of essential facilities; and disregard of approved land use allocations. Other problems are overcrowding, and poor and inadequate transportation.

6. The most commonly preventable health problems and treatable diseases in urban areas are diarrhea, malaria, malnutrition, cholera, respiratory infection, and intestinal and urinal worms. Important underlying causes of high morbidity include poor environmental sanitation, lack of good drinking water, lack of access to basic health care, low levels of education, negative health-seeking behavior among vulnerable groups, and poverty.

7. **Improved infant mortality rate but no significant changes in the morbidity pattern.** Over the years, the death rate has declined because of improvement in public health, sanitation, medical facilities, education, and modernization (EPA 2005). The infant mortality rate went from more than 100 per 1,000 in the 1970s, to 66 in 1993. This declining mortality level is also reflected in the expectation of life at birth, which increased from 45 years in 1960 to 58 years in 1993.

8. However, according to the EPA (2005), the morbidity pattern has not changed significantly. The pattern has shifted somewhat over the past two decades toward more "modern" diseases like HIV/AIDS and diabetes, while retaining most of the "traditional" diseases. However, the incidences of guinea worm and measles have dropped considerably. About 70 percent of the morbidity can still be attributed directly to the environment, the lack of proper water, and means of sanitation; the population seems to be afflicted largely with the same diseases, for example, malaria, upper respiratory infections, and water-borne diseases.

5. *Main diseases.* Malaria is behind most outpatient and hospital admissions in health facilities across the country. Malaria patients are about 43 percent of all outpatients and around 33 percent of all admissions; it accounts for 18 percent of all deaths. Cholera is endemic to the coastal regions, and the Greater Accra and Central regions are the most affected; outbreaks occur at the peak of the rainy and dry seasons. The incidence of guinea worm is linked to the availability of safe water, and is found mostly in the Northern, Volta, and Brong Ahafo regions. A basic, underlying cause of the persistence of these diseases is the widespread prevalence of poor sanitary conditions, unhygienic personal habits, poor nutrition, poverty, inadequate housing, and lack of access to potable water. Studies indicate that the prevalence of many of the diseases in urban slums is from bad living conditions rather than income levels. For instance, municipal supplies of safe drinking water rarely penetrate slums. Children from the highest income groups in slums have higher rates of diarrhea than children in the poorest rural families because they are exposed to contaminated water and food.

9. **Impact of urbanization on housing infrastructure.** The adverse impact of rapid urbanization has also exacerbated the incidence of unplanned changes in land use in the larger cities, especially Accra and Kumasi. Typical examples are the rapid conversion of agricultural lands for urban development, and excessive urban sprawl with its associated problems of inefficient use of land. The inability of the housing delivery system to meet demand over the years has created a strain on the existing housing stock and infrastructure, especially in urban areas. Indeed, the housing of some urban inhabitants is often restricted to substandard structures and unsanitary environments in squatter and slum communities.

10. **Impact of urbanization/industrialization on air quality.** According to the EPA (2005), increased urbanization and industrialization in areas like Accra, Tema, Kumasi, and Sekondi-Takoradi has caused concern for the air quality. The main reasons for deteriorating air quality are inefficient use of

fuels, poorly planned modes of transport, poorly maintained vehicles, inefficient cook stoves and fireplaces, and the primitive condition of industrial kilns and stoves. Along the main roads in Accra, Tema, and Kumasi where traffic is high, concentrations of particulate matter, sulfur dioxide, and sometimes lead are high. An assessment of roadside air quality in 2003 indicated that people living along roads experience extreme pollution. In Tema, the main pollution sources are the industry.

11. The main factor behind increased air pollution has been the import of old, overused vehicles. In the past this import of second-hand vehicles was restricted. But relaxed regulations have increased both the number of these vehicles and pollution. A growing vehicle fleet and the use of old vehicles will continue to deteriorate the air quality. However, Ghana did phase out the production and use of leaded fuel in 2004.

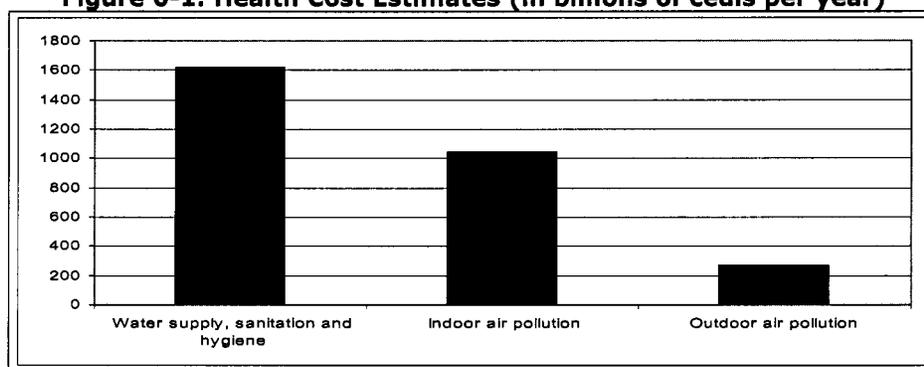
12. *Particulate matter pollution.* Land preparation for large-scale housing schemes and road construction are major sources of particulate matter pollution (EPA, 2005). Particulate matter (smoke and soot) causes upper respiratory problems. Chest diseases are now widespread, prevalent in construction, mining, and any areas where the air is polluted. Thus, particulate matter pollution seems to be a larger problem in areas other than rural. We will not go further into air pollution issues in this chapter; see Appendix 1 for the health impacts of air pollution.

13. *Indoor pollution.* Indoor pollution occurs when cooking is done with fuelwood in kitchens that have poor ventilation; fuelwood usually comprises firewood and charcoal. The problem mainly affects women and any children with them during the activity. However, this is not a particularly urban problem (see Appendix 1 for a discussion of the health impacts of indoor air pollution).

D. Sustainable Economic Growth and Infrastructure Services

14. **Importance of access to sustainable infrastructure services.** Good access to potable water and environmentally sound sanitation is critical to achieve favorable health outcomes, which in turn facilitate economic growth and sustained poverty reduction. In particular, improvement in access to safe water enhances school attendance, reduces women’s workload, and frees them to be productive in other activities, including those that are economically rewarding and empowering. Morbidity and mortality from poor infrastructure services has put great pressure on the Ghanaian economy, and resulted in high treatment costs, as well as reduced production and absence from work.

Figure 6-1: Health Cost Estimates (in billions of cedis per year)



Source: Larsen 2006.

15. Figure 6-1 illustrates the costs related to mortality and morbidity from inappropriate water supply, sanitation, and hygiene practices: approximately 1,620 billion cedis (about US\$ 180 million). This figure is almost 2.1 percent of the Ghanaian GDP in 2004. Around 26 percent of these costs occur in urban areas. More than 8,000 people die every year in Ghana from diseases related to poor water supply, sanitation, and hygiene conditions.

16. Indoor air pollution also results in large costs: around 1.5 percent of GDP in 2004. By comparison, outdoor air pollution in urban areas creates relatively minor costs.

17. **Government's commitment reflected in the GPRS.** Water supply and sanitation play a key role in the Ghana Poverty Reduction Strategy (GPRS I, GoG 2003). GPRS I was completed in March 2003 and maps out the medium-term strategy for promoting growth and reducing poverty. It acknowledges that efficient delivery of basic services is a necessary ingredient to sustainable development. Energy supply, roads, telecommunications, clean water, and sanitation are all essential components of the basic infrastructure package needed for robust economic activity; they are also necessary to ensure a healthy and vibrant population. The 2004 JSA commended the GPRS I for the important links it established between water, sanitation interventions, and health outcomes.

18. **In the Millennium Development Goals.** Access to clean water and proper sanitation facilities are Millennium Development Goals (MDG). Ghana is one of three countries chosen to prepare a MDG water and sanitation action plan.

19. In the remainder of this chapter, we concentrate our assessment on urban water, sanitation, and waste management issues. The basis for the assessment is the relatively high estimated damage costs resulting from the poor qualities of these services, costs that particularly affect the poor, and the expected increased pressure on them in the years to come from continued, rapid urbanization.

Water Supply

A. Overview

Access to Service

20. **Overall limited access to water.** About 42 percent of all Ghanaian households have access to pipe-borne water or a tanker service, while a third (33 percent) use a well or borehole. The remaining one quarter of households depend on natural water sources such as rainwater, rivers, and ponds (EPA 2005).

21. **Urban water coverage.** *The Ghana Water Company Ltd. (GWCL)*, a fully owned public company, is responsible for urban water supply, and at the beginning of 2005, had about 80 systems serving a total population of some six million. GWCL supplies around 60 percent of the total demand for potable water in the country (EPA 2005). As of 2004, urban water coverage is estimated at about 60 percent and is expected to reach 85 percent in line with the MDGs (PURC 2005a).⁸⁹ The Ghana Poverty Reduction Strategy (GPRS I, GoG 2003) finds that 70 percent of the urban population had access to safe water in 2000 (i.e., a somewhat higher figure than PURC's), and establishes a target figure of 78 percent in 2005. For the rural population, these figures are 40 and 54 percent, respectively. The World Bank (2004a) states that 61 percent of the urban population has access to an improved water source. These figures deviate somewhat from those quoted from other sources, which indicates that clarification of the actual coverage of the water supply is necessary.

22. **Access of the poor to urban water supply.** According to the PURC (2005a) many urban communities face shortfalls in water supply. The poor (defined by living standard measurement criteria) account for around 47 percent of the total population in urban piped-system areas. The PURC found that only 15 percent of the poor have access to piped water either directly or via yard taps. Only 4 percent of them have access to private sources at home. The situation is most critical in Accra and other major cities, because of rapid population growth in the outer urban areas. In these areas, the poor sometimes have to pay more than ten times the tariff for water from GWCL deliveries through secondary and tertiary providers.

⁸⁹ Under the seventh Millennium Development Goal, "Ensure environmental sustainability," the Government of Ghana in 2002 committed to achieve access to improved water sources for 79 percent of the population

23. Customers have no choice in some areas about the sources of water available to them, and sellers can exploit the situation. Tanked water in particular is very expensive because of the unavoidable costs of transport. About 4.6 percent of the urban poor obtain water by this route (PURC 2005 a). However, the most common access for consumers in urban areas is from neighbors and secondary suppliers (35 percent of the poor, at prices three to four times more expensive than piped supply), and from communal sources and standpipes (32 percent of the poor, around double the price of piped supply).

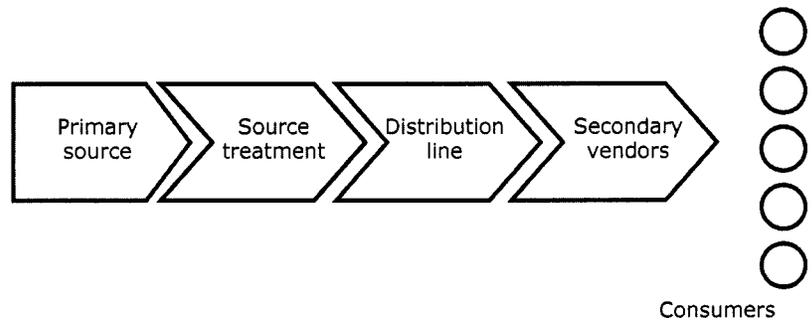
Quality of Services

24. The PURC (2005a) reveals that water leakage is very high in some areas, and the network is in strong need of maintenance. Illegal connections to the GWCL network abound, and poor billing and ineffective collection have resulted in a significant shortfall in revenues for water supplied. Moreover, abuse of flat-rate charge assessments occurs where meters are not working.

Water Quality

25. Water quality may be viewed from several parts of the supply chain. Assessing “water quality” must take into account: the quality of the raw water at intake, water quality after treatment, the quality of the water fed into the distribution lines and what happens to it before it is delivered to the consumer, and the water quality at the consumer’s premises, including the cleanliness of household storage facilities. Figure 6-2 shows the supply chain, including secondary vendors. When consumers are directly connected to a pipeline, grid secondary vendors are not involved in the supply.

Figure 6-2: Water Supply Chain when Secondary Vendors are Involved



26. **Surface water.** According to the EPA (2005), the quality of freshwater in the three major water systems in Ghana is generally good for multipurpose use. However, data on water quality analysis show marked variation in river water quality for urban and rural settlements. This is particularly true for rivers close to settlements with a population above 5,000 where records of high fecal contamination (FC) and biological/biochemical oxygen demand (BOD) levels have been observed. These levels result from the disposal of liquid and solid waste and human excreta directly into the watercourses, mainly from inadequate urban waste disposal systems.

27. Rivers located near industrial areas have received several toxic discharges; consequently, almost all aquatic life has died. These industrial plants (food processors, brewery, tannery, textile) poorly treat or fail to treat their effluent before they discharge it into receiving watercourses, which leads to accelerated nutrient enrichment, eutrophication, and odor (EPA 2005). Examples are the Chemu and Odaw rivers in Accra. A 2000 EPA survey of sewage treatment plants in Accra showed that over 70 percent of the plants were dysfunctional.

28. **Groundwater.** The quality of most groundwater in Ghana is suitable for multipurpose use (EPA 2005). However, independent monitoring at various locations indicates a wide variability in groundwater quality in the country. Marked differences occur in the chemical and bacteriological quality of groundwater.

29. Seawater intrusion and high salinity of the groundwater is mainly attributable to the lowering of the groundwater table, which allows the freshwater-saline water boundary to extend into the freshwater zone. This happens with the overabstraction of borehole water, natural geologic conditions, and a persistent dry season leading to the lowering of the groundwater table.

- **Future pressure on water sources.** Because rapid growth in urban areas is expected in the future, so also should increased pressure on both surface and groundwater sources. This could threaten the long-time sustainability of water sources, an issue that should be addressed in future water management policy.

30. **Urban household water quality.** The quality of the piped water reaching consumers is relatively good, and the water is generally potable. However, frequent and long interruptions of the water supply require people to keep their own back-up storage in water tanks to avoid shortages. The quality of the water in these tanks deteriorates when stored too long, which can cause illness.

31. According to the PURC (2005a), causal evidence suggests that water quality can be severely compromised by the way water is handled and stored by secondary and tertiary providers, that is, tanker and domestic vendors. Contamination can take place during discharge of the water when hoses are not properly handled, when tanks are not regularly cleaned, and, in some cases, when they are used in the transport of raw water.

B. Institutional and Financial Analysis

Institutions and Their Responsibilities

32. **Management of the sector.** There are two distinct management arrangements for the provision of water in Ghana, separated into urban and rural/small town water supply. Whereas the GWCL is in charge of urban water supply, the rural and small town water supply is the responsibility of District Assemblies, who are custodians of the systems that are required to be community-managed. The Community Water and Sanitation Agency (CWSA) provides facilitation and advisory support to District Assemblies and communities in the planning, implementation, operation, and maintenance of their water supply systems.

33. **Public institutions.** *The Ministry of Water Resources, Works and Housing (MWRWH)* is the responsible ministry for water supply. It includes a Water Directorate, which has the mandate of dealing with all water-related issues under the ministry (rural, urban, and water resources management). It is in charge of overseeing the Community Water and Sanitation Agency, the Ghana Water Company LTD, and the Water Resources Commission.

34. *The Environmental Protection Agency (EPA)* is responsible for the regulation of ground- and surface water sources, including imposing water quality standards and regulating discharges into the various sources. Section 2(h) of the Environmental Protection Agency Act of 1994⁹⁰ states that the EPA is tasked with the responsibility of prescribing standards and guidelines relating to inter alia water. *The Water Resource Commission (WRC)* is responsible for the overall management of surface and groundwater reservoirs. Section 2 of the Water Resources Commission Act of 1996⁹¹ provides that the commission shall be responsible for the “regulation and management of the utilization of water resources and for the co-ordination of any policy related to them.”

⁹⁰ The Environmental Protection Agency Act, 1994 Act 490

⁹¹ Water Resources Commission Act, 1996 Act 522

35. *The Ghana Water Company Ltd. (GWCL)* is responsible for urban water supply to industries and households, and is also involved in sewage control systems. Their operations have been subcontracted to a private company.

36. *The Public Utilities Regulatory Commission (PURC)* was established as an independent body under Act 538 in 1997 to regulate and oversee the provision of utility services in Ghana. The PURC is committed to ensuring the development and delivery of the highest quality of utility services to consumers, and aims to achieve efficiency, reliability, and equity in the provision of these services. At present, the PURC only regulates the water and electricity sectors. Its tasks are to:

- Provide guidance for rates to be charged for the provision of utility services.
- Examine and approve water and electricity rates.
- Protect the interest of consumers and providers of utility services.
- Monitor and enforce standards of performance for provision of utility services.
- Promote fair competition among public utilities.
- Receive and investigate complaints and settle disputes between consumers and utilities.
- Advise any person or authority with respect to any public utility.

37. Under the Energy Commission Act of 1997 (Act 541), the PURC is also required to approve charges for the supply, transportation, and distribution of electricity and natural gas, as well as the bulk storage and transportation of petroleum products.

Financing of the Sector

38. **The budget of the MWRWH.** As mentioned above, the MWRWH is in charge of oversight of the urban water sector. In 2005 the budget of the MWRWH accounted for 5.2 percent of total budgetary allocations (including donors assistance), representing 1.0 of GDP.⁹² Under the aegis of the MWRWH are the GWCL and the Water Resource Commission (WRC). The GWCL received around one third of the MWRWH's budget, whereas the WRC received 0.4 percent of the total budget.⁹³ A large share of the resources transferred to the GWCL derive from donor assistance (around 95 percent of total GWCL budget), which represents about one third (35.6 percent) of total donor assistance allocated to the MWRWH.⁹⁴ The high share of donor assistance to the utility company originates from the World Bank Urban Water Project, which was implemented in 2004 and whose main beneficiary is the GWCL.

39. **The GWCL.** Over time, the financial situation of the GWCL has deteriorated. The main reason for the weak financial base is that the utility company barely generates sufficient revenues to pay for maintenance of existing assets; needed investments and refurbishment costs are lacking. The company's operational efficiency is low because of overstaffing which puts constraints on financial resources for maintenance and investment. As a result, the company has not been able to adequately service its current stock of debt. Larger investments are carried out through a GoG grant or bilateral donor support. Subsidies from the GoG through the MWRWH's budget have served to pay mostly for electricity and debt service.

40. **Implementation of a private sector partnership (PSP).** In the past to restore financial stability, the Government of Ghana made efforts to outsource services to the private sector. Since 2005, the government began to pursue a five-year management contract with a new private company to operate the urban water supply systems. The operator is in charge of day-to-day operation and maintenance of the

⁹² See Appendix 5, Table A5-1.

⁹³ See Appendix 5, Table A5-2.

⁹⁴ See Appendix 5, Figure A5-1.

GWCL water supply systems while reporting to a director in GWCL headquarters.⁹⁵ Responsibility for long-term investment planning and implementation remains with the GWCL. The contract became effective mid-April 2006.

41. International experience in the sector has confirmed that strong utility management is key to cost recovery, better service delivery, and long-term sustainability. To improve the commercial and technical performance in the GWCL, the company implemented a large severance program.⁹⁶ This program reduced the wage bill of the company by 40 percent. The severance program is accompanied by increased training for those staff remaining. Efforts are also on the way to gradually restore staff salaries in line with the private sector. Another key priority is the debt rationalization of the GWCL, which has only serviced a few of its 40 loans. GWCL's present debt structure is unsustainable, and a debt reorganization is ongoing. The reform is supported by the Urban Water Project that will enable expansion of services to low-income households and seek to restore financial stability to the GWCL.

42. In recent years, the GWCL has received debt forgiveness from the Ministry of Finance totaling more than US\$100 million. It has also acquired a new loan that will, among other purposes, support the restructuring of its debt. In order to ensure prudent management of the new loan, GWCL is required to establish a robust framework for determining investment priorities (Strategic Investment Plans), how much and when to borrow, the returns expected, and the impact on tariffs. Of particular importance in the discussion is how the GWCL loans are contracted (the role of the MoFEP and on-lending terms), what investment projects are private sector-driven (such as the ORET), and how these impact the investment planning process and financial outcomes.

43. **Revenue collection.** As indicated above, GWCL revenue collection is very weak. Several factors have contributed to low collections, such as the limited number of houses with meters, a high number of illegal connections, and a low level of investment; these result in deterioration of service quality and in lowered customer motivation to pay). To tackle the illegal connections, the GWCL intensified its public campaign, and now rewards the denunciation of illegal connections with 200,000 cedis (US\$ 20). Leakages or unaccounted water are mainly the result of weak management of the sector. The GWCL has prepared an investment plan but lacks the funding to implement it. Removal of these inefficiencies would allow for an increased lifespan of the system.

44. **Donor assistance.** The Bank is the only multilateral donor active in the urban water sector. Bilateral participation is limited to a few countries, most notably the Dutch and Spanish governments. By contrast, the rural water sector enjoys widespread support from both multilateral and bilateral donors. Donors have been reluctant to invest in the urban water sector because of both the long gestation period required for a viable PSP option to be identified and implemented and the weak financial situation of the GWCL's.

45. In light of this background, in 2004 the World Bank approved a credit of US\$103 million for an Urban Water Project (World Bank 2004a). The project's two principal development objectives are to: (a) significantly increase access to the piped water system in Ghana's urban centers, while emphasizing improving access, affordability, and service reliability to the urban poor; and (b) restore long-term financial stability, viability, and sustainability of the GWCL.

⁹⁵ The Urban Water Project will pay 100 percent of the operator's fees in the initial four years of the contract and 75 percent of its fees in year 5. In year 5, the operator is expected to obtain 25 percent of its fees from the improved cash flow of the urban water systems (World Bank, Urban Water Project 2004).

⁹⁶ In 2004, the GWCL employed 4,750 staff and has about 320,000 connections. Based on industry benchmarks and the widespread nature of the company's service area, the GWCL believes that it should employ not more than 10 staff per 1,000 water connections. The current ratio is 15 staff per 1,000 connections. To reach the target of 10 staff per 1,000 connections, the number of employees would have to be about 3,200 (a reduction of 1,550 workers); however, the GWCL would like to provide for the eventual retrenchment of about 1,600 staff in total. This reduction equates to an approximately 40 percent decrease in staffing (World Bank, Urban Water Project 2004).

46. In addition, Danida has supported the establishment of the Water Directorate in the MWRWH through its policy, monitoring, and management support (PMMS) component.⁹⁷ The objectives of the ongoing PMMS are fourfold: (a) water supply and sanitation sector institutions at ministerial, interministerial, and agency levels are performing their stipulated roles with respect to policy development and sector coordination, (b) adequate mechanisms for monitoring and evaluation of the effects of current water and sanitation practice to support policy decisions are in place, (c) NGOs and civil society are actively participating in the dialogue on water and sanitation issues, and (d) environmental sustainability is enhanced through the promotion of SEA in the water sector.

C. Incentives

47. Generally, all customers should pay full costs of the water supply services. This would ensure optimal operation and expansion of the services. However, poor people may not be able to afford the full costs of what is considered to be a basic commodity, and monopoly in supply could yield prices higher than optimal. Thus, regulations of prices and supply conditions could be justified, both from an efficiency and social point of view.

Regulating the Price of Water

48. **Purpose of regulation.** The PURC sets up the tariffs at levels that ensure that the amount of water required for basic needs is affordable for all customers, including the urban poor. Following the PURC decision, the GWCL applies a uniform tariff structure throughout its area of supply, irrespective of the differences in the costs of supply and the level of service.⁹⁸ This allows for cross-subsidization from larger population centers, where incomes are higher than average and the cost of service is low (through economies of scale), to those centers where incomes are lower but the cost of service is generally higher. (PURC 2005b).

49. The general guidelines for tariff regulation presented in PURC (2005b) state that, in the short term, tariffs shall be based on cash flow requirements plus an increasing allowance for depreciation, but also allowing for reasonable expectations of improvements in efficiency (including reduced water losses). In the medium to long term, tariffs should allow for full cost recovery, including capital cost and allowances to return on total capital.

D. Government's Reform Agenda

50. **Actions taken by the government.** As part of a water sector reform, the GoG has investigated several alternatives to improve the performance of the GWCL, and stakeholders have discussed their potential impacts. This has included a 1995 study that examined a public sector option with greater decentralization to the regions. However, this option was rejected. Then the GoG, in consultation with a wide range of stakeholders in 1996, opted to explore a significant public-private partnership (PPP) arrangement through a lease option for the urban water sector; this would both restore financial stability and lay the foundations for attracting private sector investment in the long run. However, this approach has failed to attract private sector investments. Today international financial markets and international water supply operators are much more reluctant to expand their business to developing countries because less investment money is available and similar assignments have previously resulted in large losses.

⁹⁷ The PMMS is a component of the Danish support to the water sector. The program (2004–2008) comprises four components: the District Based Water and Sanitation Component (US\$60 million), the Integrated Water Resources Management Component (US\$3.5 million), the School Hygiene Education (US\$2.5 million), and the PMMS (US\$3.5 million).

⁹⁸ Act 538 allows, but does not oblige the PURC to determine, a nationwide uniform rate structure for the provision of services provided by a public utility.

51. In 2003, given the low likelihood of achieving financial closure, the GoG reassessed the lease option. The PPP option the government is now pursuing is a management contract of up to five years for a private sector operator. The GoG has recognized the importance of a qualified and adequately compensated staff and has committed itself to financing a large staff reduction program in the GWCL, increased training for those remaining with the utility, and gradual restoration of salaries in line with jobs of comparable skills and responsibilities in other sectors of the economy.

52. **Actions taken by the PURC.** One of the primary functions of the PURC is to protect consumers' interests, especially those of the poor. The PURC (2005a) states that the agency will support any interventions that result in improved and more reliable access to water, and improved continuity and reliability of supply, with the ultimate goal of direct connections. Improvement in supplies will necessarily be incremental in order to reach the greatest number of low-income consumers, and the PURC will support interventions that move consumers to lower priced access routes. In the short to medium term, many consumers will have to accept improved access to container supply routes while engineering and management improvements seek to increase the amount of water and funding available for improved service; the ultimate goal is of direct connections when systems have been restored and then extended. The PURC has started several pilot interventions that should provide useful lessons in this regard.

53. The PURC will insist that the public utility includes pro-poor criteria when undertaking water supply projects. However, the PURC also recognizes that providing piped water access will take time, and that secondary water suppliers will continue to play a role in the supply chain. Therefore, the PURC has taken the following short-term steps to enhance the capacity of secondary suppliers to deliver acceptable services at an affordable price:

- Prices charged by secondary suppliers are not to be regulated. Currently the prices charged by the GWCL to the secondary market providers are subject to price regulation. Transportation makes up to 85 percent of the cost of tanked water, over which the PURC has no control. However, where there are market distortions and exploitation of the poor, the PURC will support interventions that move consumers to cheaper access routes and/or support lower prices from secondary suppliers by reducing the costs.
- Through collaboration with the GWCL, tanker filling points are being brought closer to areas of need, recognizing technical limitations.
- The GWCL will allocate a percentage (e.g., 10 percent) of their production to secondary providers.
- Cooperation has been promoted between the GWCL and secondary providers to safeguard the quality of service given to consumers.
- A "Water Tanker Service Guidelines" has been developed to safeguard the quality of drinking water supplied by tanker and other secondary and tertiary suppliers; the PURC is monitoring their application.
- The PURC is collaborating with the relevant agencies, NGOs, community-based organizations and research institutions to address the provision of service to the urban poor and low income households; promoting the involvement of local communities in decisions concerning water supply and service improvements; and building and sharing knowledge with the poor.

54. The PURC intends to undertake pilot studies that test interventions in delivering water to low-income communities; the goal is to provide lessons to improve its regulatory policies, the supply and payment options available to the utility, and the criteria for determining investments targeted to the urban poor.

55. The PURC (2005a) notes that no agency seems to have taken the responsibility to create awareness for water quality and for hygiene education that could complement the services in the urban

and periurban communities. This is in contrast to what is taking place in the community water supply subsector.

56. **Actions taken by the GWCL.** The GWCL has undertaken an Urban Water Project (UWP) aimed at rapid restoration of water supplies in certain urban areas. The target for the program is to provide an additional 50,000 connections (either directly or as standpipes). According to the PURC (2005a), at best this number of connections will not reach all of the unconnected population unless at least 15,000 connections are installed as standpipes, each serving 200 people. This means that more than 90 percent of the unconnected population will remain on container supply.

57. New direct connections cannot be served unless a reliable water supply and spare resource and treatment capacity already exist to meet the additional demand. Alternatively, new standpipe connections make available only the existing quantity of water that container users currently obtain from GWCL pipes via secondary supplies. They do, however, simplify supply—it would be nearer to home and could stabilize or even reduce the price of water to consumers.

58. It is also the intention of the GWCL to address water leakage and remove illegal connections. According to the PURC (2005a), this is possible without major investment in additional resources and treatment, and some scope for additional connections may exist if sufficient losses can be recovered. Improvements of this nature are relatively inexpensive and assist all consumers, but they are not targeted specifically at the poor.

59. The GWCL has agreed to disinfect the tanks belonging to tanker associations that purchase water from the utility, to ensure good-quality water. The PURC will insist that regular disinfection be carried out or tanker operators cannot stay in business.

60. The PURC (2005a) concludes that the UWP will not make system improvements for all consumers without significant additional investment, only part of which can come from improved billing and collection arrangements.

Sanitation and Solid Waste Management

A. Overview

Sector Policy

61. **The Growth and Poverty Reduction Strategy (2006-2009).** Government's strategy for urban environmental sanitation is embedded in the Ghana's Growth Poverty Reduction Strategy 2006-2009 (GPRS II, GoG 2005). The GPRS II highlights the fact that adequate sewerage and sanitation facilities are vital to a clean environment and to the prevention of many infectious diseases such as diarrhea and dysentery. The revised strategy is centered around two main objectives: to accelerate the provision of adequate sanitation and to improve environmental sanitation, which are linked to a clear set of policy measures (see below for a more detailed discussion).

62. **The Environmental Sanitation Policy (ESP) of 1999.** This policy assesses the causes of the poor sanitation and waste management conditions that prevail, establishes the basic principles and objectives for better environmental management, and specifies the institutional responsibilities in the pursuit of these objectives.

Box 6-1: Principal of Environmental Components

The principal components of environmental sanitation and waste management as listed in the ESP are:

1. Collection and sanitary disposal of wastes, including solid waste, liquid waste, excreta, industrial wastes, and clinical and other hazardous wastes;
2. Stormwater drainage;
3. Cleansing of thoroughfares, markets, and other public spaces;
4. Control of pests and vectors of disease;
5. Food hygiene;
6. Environmental sanitation education;
7. Inspection and enforcement of sanitary regulations;
8. Proper disposal of the dead;
9. Control of animal rearing and of strays;
10. Monitoring the observance of environmental standards.

Note: The assessment of the sanitation and waste management subsector focuses on collection and sanitary disposal of household waste (including excreta) and related issues, i.e., nos. 1, 3, 6, 7, and 10.

Quality of Sanitation Services

63. **Urban latrine coverage.** Reliable statistics of urban latrine coverage is difficult to come by, but there is no doubt that the provision of facilities is far from satisfactory. The World Bank (2004a) estimates that 30 percent of the population in the largest cities is covered by household latrines, and 30 percent with public toilets. In some poor communities the coverage with household latrines is below 10 percent.

64. **Household toilet facility.** According to the GoG (1999), less than 30 percent of urban residents are served by an acceptable household toilet facility. The GPRS I (GoG 2003) found that 34 percent of the urban population had household latrines in 2000, and established a target for this figure to increase to 45 percent by 2005. Around 10 percent of household latrines still have pans that are emptied manually; the government wants to phase these out. A sizable proportion of urban schools are without toilets and some even without water supply. The worst case is Tamale, where less than 40 percent of the nearly 4,000 schools have toilets (World Bank, 2004b).

65. **Limited sewage infrastructure.** Sewage infrastructure is limited, but the majority of dwellings have on-site sanitation systems for disposal of wastewater. Septic tank systems are often characterized by failed soak pits, which invariably end up discharging into open roadside drains and ultimately into storm drains. In Accra, where the largest central sewerage network is located, the system covers only about 15 percent of the city, mainly areas in the central business district. Close to 20 satellite systems are serving neighborhoods but most have broken down.

66. The operation and hygienic condition of the public toilets seems to have improved considerably after operation was handed over to private operators, but many toilets are still badly managed. However, people are often careless when visiting the toilets and some avoid the use of them altogether, in some cases because of the user fees. Open-air defecation is widespread, particularly among the itinerant traders

and workers who live in rural areas and stay in Greater Accra only during the day or the work week; their number is estimated to be about 500,000.

67. Most low-income communities originally had a planned layout, but their growth from within created a situation where some neighborhoods are difficult to access by vehicle (e.g., making it impossible to empty latrines with a vacuum truck) (World Bank, 2004b).

68. **Health impact related to poor environmental sanitation.** At the household level, poor hygienic practices by individuals and communities are compounded by insufficient and ineffective hygiene education. Vector-borne diseases such as malaria and bilharzias are rife because of the virtual absence of programs to control pest and disease vectors. These factors have a serious health impact—more than half of all reported diseases are related to poor environmental sanitation with attendant social and economic costs. Flooding causes major damage to public infrastructure and private property. Pollution of water resources increases the technical difficulty and cost of providing water. In addition, the sight and smell of inadequately managed wastes create not only a major discomfort, but also a noxious environment for both citizens and visitors.

69. **Water- and excreta-related diseases** are prevalent among the poor, and Ghana is unfortunately among the countries with the highest cases of guinea worm. Diarrhea-related diseases are the third most reported cases in health centers across the country. A combination of all these factors contributes to the high infant mortality rate in Ghana.

70. In 1999, the ESP identified some of the underlying causes of this situation as:

- Lack of a clear national goal or vision of environmental sanitation as an essential social service and a major determinant of the standard of living.
- Lack of a formally constituted environmental sanitation subsector in the governmental system of sector development planning.
- Lack of a comprehensive policy assigning responsibilities for the environmental sanitation subsector in the governmental system of sector development planning.
- Lack of technical capacity in the MLGRDE to orient and support the District Assemblies in the provision of environmental sanitation services.
- Attempts to transfer to the assemblies environmental sanitation functions performed by ministries and central government agencies, without transferring the accompanying budgets, personnel, and equipment.
- Weak and/or outdated and poorly enforced legislation on environmental sanitation.
- Inadequate allocation of resources for environmental sanitation services, both nationally and at the district level.
- Lack of adequate professional manpower, including engineers, planners, and administrators for planning, management, policy formulation, and research.

71. Some of these shortcomings may have been addressed, for instance, at the institutional and legislative level; however, the situation regarding the quality of the services does not seem to have improved considerably since 1999. The World Bank (2004b) underlines the same shortcomings of the system, but adds that the legal and institutional arrangements are by and large adequate for environmental and social management of these sectors. However, the study emphasizes the importance of institutional strengthening.

Quality of Solid Waste Management Services

72. The GPRS I (GoG 2003) found that in 2000, 91 percent of the population faced unsafe methods of solid waste disposal (dumping), and it established a target for this figure to fall to 75 percent by 2005.

According to the ESP, less than 40 percent of urban residents were then served by a solid waste collection services. This is about the same share as that found by the World Bank (2004b).

73. **Waste production.** Ewool (2004) estimates that every Ghanaian produces close to 0.5 kg of solid waste daily (somewhat more in the largest cities), compared with 1 to 2 kg in developed countries. Of this figure, 60 to 80 percent is food waste. Less than a third of the daily refuse generated is properly disposed of, and the rest is abandoned to pollute the environment.

74. **Poor quality of waste collection services.** In a few residential areas, door-to-door collection systems are in place, removing the waste at least two times a week. Households pay a fixed fee for this service. However, these services are very irregular because they use old trucks, which break down; they also have a low capacity to receive and treat the waste, and so on. Thus, people are unwilling to pay for the services.

75. For people in areas where residential collection is not available (typically in poorer areas), communal collection is offered. This consists of large containers in central places where people can deliver their waste for free. However, many people often need to walk some distance to deliver their waste, leading to frequent illegal dumping in the streets, bushes, and elsewhere. In addition, burning of waste in other city areas is common.

76. **Disposal sites.** According to the ESP, collected refuse has up to now been disposed of in refuse dumps with very little consideration for their environmental and social impact. None of the dumps are being covered, and leachate is polluting the surface and groundwater. Because of population and economic growth in the cities, the amount of waste has been increasing, and landfills are being filled up. In Accra one landfill is in operation; another designed landfill is located in Kumasi. In Tema and some other cities, attempts to build new landfills are in progress. The existing landfills are poorly managed, some of them are leaking polluted water to the surroundings, and they are a breeding ground for mosquitoes, worms, and the like.

77. **Difficulties in setting up landfills.** Land acquisition problems will continue to impede the efforts of local authorities to acquire lands for sanitary landfill operations. Recently, out of 14 major towns known to have acquired land for landfill or other waste disposal operations, seven sites encountered problems that either caused long delays in project set-up, or resulted in reselection of a site, which further prolonged construction. Yet according to Ewool (2004), landfills will continue to be the only viable option for solid waste disposal in the foreseeable future. Kwabenya (1994) shows that incineration would be rather costly (US\$40–60/ton) compared with landfilling (US\$0.5–2/ton).

78. **Problems associated with refuse.** Kesse-Tagoe and associates (1998) assessed the development need and investment prospects for solid waste management in 25 urban areas in Ghana. Solid waste management proved to be a very arduous task for the District Assemblies in most towns. Some of the general problems outlined in the report include: (a) inaccessibility to refuse disposal sites, (b) refuse sites that have become feeding grounds for domestic animals, (c) refuse collection bins at refuse sites that are scarcely used; and (d) inadequate personnel to supervise waste disposal activities at refuse sites.

79. In most cases, refuse is collected at the household level and sent to dumping sites by members of the households—these are most often children. The distance to the refuse site and the height of the refuse container determines the way and manner in which the child disposes of the refuse. The longer the distance to refuse dumps, the more haphazard the dumping of the refuse in drains and other open areas; children who are not able to reach the top of the refuse containers dump the refuse around, rather than in, the designated receptacles.

80. A notable exception is Akwatia, where households pay refuse contractors a monthly fee of 500 cedis (about 6 US cents) to take away their refuse; these contractors employ donkeys and carts. Because the system is subsidized by St. Dominic Hospital in Akwatia, the fee is on the low side. Akwatia turned out to be one of the few areas where refuse management was very well under control.

B. Institutional and Financial Analysis

Institutions and Their Responsibilities

81. Under the Local Government Act of 1993 (Act 462), the provision of appropriate environmental sanitation services, including sanitary sites and final disposal sites at strategic location in urban, periurban and rural areas, falls under the responsibility of the local government (GLFPSF 2005). However, a wide range of institutions participates in policy making and execution of various tasks in these sectors. The following overview is based on the ESP.

82. **Government level.** *The Ministry of Local Government, Rural Development and Environment (MLGRDE)* is the responsible ministry for overall sanitation sector policy development at the government level. It has been recently merged with the Ministry of Environment, Science and Technology, which is responsible for setting standards and guidelines for environmental quality. The Local Government Act specifies that its functions include coordination and formulation of policy, developing and issuing technical guidelines on environmental sanitation services and their management, promulgation of national legislation and model bylaws, and direction and supervision of the *National Environmental Sanitation Policy Coordination Council (NESPCC)*. The NESPCC includes representatives from relevant government agencies, NGOs, and private sector groups and is responsible for coordinating policies and ensuring effective communication and cooperation between the many different agencies involved in environmental sanitation; it also expedites implementation of the national environmental sanitation policy.

83. *The Environmental Protection Agency (EPA)* is the regulatory agency for environmental quality and effluent standards. The EPA Act of 1994 (Act 490) empowers the EPA, among other things, to prevent and control the release of waste into the environment,⁹⁹ and to issue environmental permits and pollution abatement notices.¹⁰⁰ *The Council for Scientific and Industrial Research (CSIR)* and its member institutions are to support and undertake research and development activities related to environmental sanitation. *The Department of Town and Country Planning* is responsible for supporting the physical planning activities of the District Assemblies (see below), which has wide implications for environmental sanitation management.

84. *The Ministry of Education* and the tertiary education institutions are responsible for hygiene education in schools, universities, and technical institutions. *The Ministry of Health* is responsible for managing and providing health data, supporting hygiene education activities, and contributing to regulation and standard setting for environmental sanitation services. The ministry may also use environmental sanitation information to contribute to the prevention and control of disease.

85. **Local Level.** Metropolitan (Accra, Kumasi, Sekondi-Takoradi, and Tamale), Municipal, and District Assemblies are responsible for:

- **Waste Management.** Assemblies may provide the services directly or indirectly through private contractors or franchises. They should in all cases maintain an in-house capacity to provide at least 20 percent of the services directly.
- **Public Health Management.** This is carried out by Health Departments, with private sector inputs where appropriate.

⁹⁹ Section 2(d) of the EPA Act of 1994 (Act 490) states that one of the EPA's functions is "to secure in collaboration with such persons as it may determine the control, and prevention of discharge of waste into the environment and the protection and improvement of the quality of the environment."

¹⁰⁰ Section 2(f) of the EPA Act of 1994 (Act 490) provides that the EPA is to "issue permits and pollution abatement notices for controlling the volume, types, constituents and effects of waste discharges, emissions, deposits or other source of pollutants and of substances which are hazardous or potentially dangerous to the quality of the environment or any segment of the environment."

- **Environmental Monitoring.** Assemblies are responsible for monitoring and enforcing environmental standards and regulations set by the EPA and other national regulatory agencies, and for organized and continual public education on safeguarding the environment. This includes responsibility for monitoring the environmental impact of assemblies' own waste management activities. When private sector service providers are contracted, assemblies are responsible for imposing sanctions on and correcting any violations against environmental standards by such service providers according to the relevant agreement or license.
- **Planning, Monitoring, and Public Relations.** The assemblies shall monitor the effectiveness of the services, take actions to resolve any problems identified, make short-term and strategic environmental sanitation plans to respond to community needs and wider environmental considerations, and ensure good public relations.

86. Regarding **liquid waste management**, the assemblies have the authority to regulate, control, and coordinate the activities of all agencies involved in liquid waste management services. These include regulating technologies for domestic toilets by legislation and application of the building code. Recommended technologies are the water closet (WC), the pour-flush latrine, the ventilated improved pit latrine (VIP), the aqua privy, the chemical toilet, and any other proven technologies recommended by the MLGRDE. According to the ESP, bucket (pan) and open trench latrines are actively discouraged and must be phased out as they do not meet minimum sanitary standards.

87. Assemblies should arrange for the provision of public facilities in central business districts, major commercial and light industrial areas, local markets, and public transport terminals. Public (communal) facilities should also be provided in low income, high-density neighborhoods where domestic toilets are not provided in individual residential premises. However, the assemblies should promote the construction and use of household toilets, including the conversion of pan latrines to one of the approved types.

88. **Setting standards and monitoring of private sector involvement.** The ESP requires that local assemblies transfer management and maintenance of all public toilets to the private sector, either by franchising existing facilities or by granting concessions for the construction and operation of new ones. The assemblies should establish minimum design and operational standards and monitor their implementation. They should also inspect the plans of all new buildings to ensure that they conform to sanitary regulations, and approve issues related to the Certificate of Habitation when the building is completed. All premises (residential, commercial, institutional, and industrial) shall be inspected periodically to ensure that the occupants observe provisions of the relevant laws and the building code.

89. **Regular update of bylaws and sanctions.** The assemblies are expected to pass and regularly update bylaws for the effective management of liquid and solid wastes, aggressively market the construction and use of domestic latrines, and enforce bylaws requiring landlords to provide sanitation facilities (World Bank 2004b). For instance, the 1995 bylaws of the Accra Metropolitan Assembly (AMA) Solid and Liquid Waste Management specify the exclusive responsibility of the AMA, its agents, or registered contractors for the management of solid and liquid waste in its area of jurisdiction, and outline the responsibilities of households, industries, and offices regarding bylaw violations and sanctions. Sections 10 and 11 of the laws prescribe a fine not exceeding 200,000 cedis (about US\$ 22) or, in the case of default of payment, a term of imprisonment not exceeding six months, or both, to any person who commits the following offenses:

- Failing to provide a standard refuse container as specified by the AMA.
- Receiving refuse management services from unauthorized persons.
- Refusing to allow the AMA or its authorized agents or contractors to collect refuse from one's premises.
- Indiscriminately dumping refuse in open spaces, drains, gutters, or behind walls, or burning refuse in one's compound.

90. **Assemblies' responsibilities for solid waste management** The ESP states that the assemblies shall:

- Require all premises to have primary storage facilities (dustbins), which meet the approved size, material, and capacity.
- Prescribe the minimum standard of collection service (including the sorting of refuse, if applicable), taking into account household incomes, housing patterns, and the infrastructure in the service area.
- Require that the collection service be rendered on the basis of cost recovery. In deprived areas where the ability to pay may be low, service charges may be related to the recovery of operation and maintenance cost only.
- Designate communal storage sites where solid waste can be discharged into a fixed or movable container in communities where house-to-house collection is not appropriate. These sites should be formally and suitably developed for the purpose, so as to contain the wastes dumped and maintain the sanitary conditions of the surrounding area. The containers should be readily accessible to those dumping wastes, including to children.
- Require that the collection and removal of wastes from individual premises and communal storage sites be collected at least twice a week. Use of intermediate transfer stations may be considered where haulage distances are uneconomical.
- Require that treatment and disposal sites be located so as not to create safety and health hazards or aesthetic problems in the surrounding areas.
- Produce medium- and long-term plans for the provision of treatment and disposal sites, including preparation of Environmental Impact Assessments.

91. **Private sector provision of environmental sanitation services.** According to the ESP, the bulk of environmental sanitation services should be provided by the private sector, including NGOs and community-based organizations under the supervision of the assemblies. The assemblies reserve the rights to take measures to intervene and provide the services in the event of failure of the private sector to deliver the services.

92. The private sector should operate within policies regulations, supervisory, and licensing arrangements set up by the public sector to promote efficiency and competitiveness. No single private sector organization shall be given a monopoly in the delivery of services in any one human settlement, except in settlements with a population of 15,000 or less. In all other settlements, the town or city should be zoned for purposes of sanitation services delivery (GoG 1999).

93. The ESP stresses that, where possible, the private sector should, under franchise or concession agreements, provide environmental sanitation services on a full cost-recovery basis. Where full cost recovery is not possible, the assemblies may enter into contracts with service providers. The ESP also emphasized that tariffs should be set at levels that will not discourage the use of the services, especially where this would create health risks.

94. **Provision of solid waste management services.** As for sanitation, the private sector should provide the bulk of services. The ESP recommends the following technologies for solid waste disposal:

- Sanitary Landfill, which is recognized as one of the most cost-effective methods of waste disposal, and is recommended for use by Metropolitan and Municipal Assemblies.
- Controlled Dumping with a cover represents the most basic method of solid waste disposal to meet minimum requirements, and is recommended for all other District Assemblies.
- Incineration should be considered as a treatment option only for clinical and other hazardous or noxious wastes. Only simple, easily maintained incinerators should be used.

- Composting should be practiced at both municipal and domestic levels where possible. Composting should only be carried out using simple methods and on a decentralized basis, as near as possible to the point of waste generation. And it should only be done if it results in net savings to the assembly in terms of reduced transport and landfill requirements.
- Recycling should be encouraged for all items such as plastics, bottles, paper, metals, glass, and so forth, as inputs for production.

Financing of the Sector

95. Financing of the Sector at the Central Level: **The budget of the MLGRDE.** The ministry's budget focuses on promoting the decentralization process and providing capacity building to the District Assemblies. With the introduction of the Local Government Act, the core functions of the MLGRDE have focused on decentralization, rural development, and improved sanitation. In 2005, the budget of the MLGRDE accounted for 1.9 percent of total budgetary allocations, representing only 0.4 percent of GDP.¹⁰¹ In 2004, one third of the ministry's budget financed the decentralization implementation program, which mainly covers salary payments to the District Assemblies (see Table 6-1 below). The three other key programs of the ministry are the Urban Environmental Sanitation Project (Urban IV), PRODICAP, and the Urban V; each received around 15 percent of the ministry's public resources in 2004.¹⁰²

Table 6-1: MLGRDE : Spending and Budgetary Allocations in 2004 (in percentage)

| | 2004 | | 2005 |
|--|------------------|-----------------------|------------------|
| | Allocated budget | Budget execution rate | Allocated budget |
| Ministry Headquarters | | | |
| General Administration | 2.3 | 60.8 | 5.8 |
| Inspectorate Division | 0.3 | 53.5 | 0.3 |
| Local Government Support Unit | 0.3 | 46.5 | 12.2 |
| Decentralization Implementation | 33.3 | 107.6 | 27.0 |
| Development Planning | 0.9 | 49.3 | 0.7 |
| Environmental Health Division | 0.8 | 76.2 | 0.6 |
| Urban IV Project | 16.0 | 121.5 | 21.0 |
| Urban V Project | 14.6 | 204.0 | 2.8 |
| National Sanitation Project | 3.8 | 172.4 | 0.8 |
| Promotion of District Capital Project (PRODICAP) | 16.0 | 91.8 | 20.2 |
| Local Government-PRSP | 0.1 | 53.1 | 0.1 |
| Strengthening Community Development Project | 0.0 | 2152.2 | 0.0 |
| Community-Based Development Project | 0.0 | 97.6 | 0.0 |
| Department of Parks and Garden | | | |
| Parks and Gardens | 3.6 | 80.2 | 2.7 |
| Births and Deaths | 3.2 | 86.6 | 2.5 |
| Department of Community Development | | | |
| Community Development | 4.8 | 82.6 | 3.4 |
| Total | 100.0 | 119.5 | 100.0 |

¹⁰¹ See Appendix 5, Table A5-3.

¹⁰² The PRODICAP finances the improvement of markets, truck parks, and related infrastructure in 22 towns. The objective of the URBAN V was to strengthen the technical, financial, and management capacities in 23 participating DAs and to finance the provision or rehabilitation of basic infrastructure (including water supply, liquid and solid waste management, storm drainage, markets, etc.).

Source: MLGRDE data.

96. **In the past, sanitation and waste management services have been subsidized at the local level.** The MLGRDE subsidized the collection and disposal of solid and liquid waste in Accra and Kumasi under its National Sanitation Program (NSP), accounting for 80 percent of the NSP funds. In addition, the program financed the improvement of the drainage system in major cities, the training of environmental health workers, and awareness campaign on the need to keep a healthy environment.¹⁰³ Notably, complementary assistance to MMDAs has also been provided under the UESP IV, a donor-funded program managed by the MLGRDE, that supports infrastructure needs related to urban environmental management as well as financing and institutional capacity building in the five largest cities of Ghana (Accra, Kumasi, Sekondi-Takoradi, Tamale, and Tema).

Financing of the Sector at the Local Level

97. **More responsibilities on environmental sanitation and waste management have been transferred to the MMDAs, but adequate transfer of resources and institutional strengthening is lagging behind.** Under the Local Government Act of 1993 (Act 462), the responsibility for all urban infrastructure services has been transferred to the assemblies under a decentralized system. In the past, much of the responsibility, particularly with regard to large investment operations and salary payments, has been managed at the central level because of delays in the fiscal decentralization (for more information, see Box 6-2 below). Recently some efforts have been made to strengthen the capacity of the MMDAs in waste management services and sanitation.^{104, 105} The NSP will be phased out by 2007, by which time budgetary allocations to the District Assembly Common Fund are expected to increase from the present 5 percent to 7.5 percent. This allows the MMDAs (notably Accra and Kumasi) to directly finance the collection and disposal of solid waste.¹⁰⁶ Further, the MMDAs already directly manage several components of the follow-up project UESP II (2004-2010) (see below). However, these efforts seem to be too little if compared with the MMDA's overall weak capacity to deliver services, which is compounded by limited fiscal decentralization (see Box 6-2 below) as well as poor internal revenue generation.

¹⁰³ Information on the allocation of resources per project that is related to sanitation and waste management is not available; therefore it is not possible to assess the level and adequacy of allocations provided from the MLGRDE directly in support of these services.

¹⁰⁴ In the 2004 Performance and Outlook, the MLGRDE identified as a high priority area for 2005 the policy of strengthening leadership and capacity of the District Assemblies and increasing access to safe sanitation.

¹⁰⁵ Since 2002, the MMDAs have also benefited by HIPC funds that came to 402 billion cedis (US\$ 44.6 million) between 2002 and 2004. About 20percent had been used by the MMDAs for sanitation projects; however, information on the type of programs financed, the allocated and released share per MMDA, and the effective utilization of the funds are not available at the MLGRDE. Overall it seems that the level of HIPC funds allocated to sanitation programs for each MMDAs (around 110) is relatively low.

¹⁰⁶ Article 252 of Ghana's 1992 Constitution provided for the setting up of a District Assembly Common Fund (DACF) to serve as a mechanism for the transfers of resources from the central government to the local authorities. The article provides that 5percent of Ghana's total revenue should be paid into the fund for distribution to the local authorities (ISODEC, Tracking the Disbursement of the District Assemblies Common Fund 2003).

Box 6-2: Ghana's Fiscal Decentralization

Under the Local Government Act of 1993, Ghana's Metropolitan, Municipal, and District Assemblies (MMDAs) were given the status of autonomous local governments with legislative and executive powers within their areas, and the power to prepare and approve annual budgets, raise revenues, borrow funds, acquire land, and provide basic services and local infrastructure. The Local Government Service Act of 2003 provides the legal basis for significant advances on empowering MMDA fiscal capacity.

Section 240 (2c) of the 1993 Local Government Act provides that each local government unit shall have a sound financial base with adequate and reliable sources of revenue. MMDA revenues are limited to the District Assembly Common Fund (DACF) under which 5 percent of the national budget is allocated to the districts for capital investment, grants, transfers, ceded revenues, external credits, as well as other internally generated funds (IGFs). Central government transfers (the DACF and ceded revenues) are the main source of revenues for MMDAs.

Shortcomings. The overall resource base of the MMDAs is inadequate vis-à-vis their mandates. Available resources are limited to mainly capital projects. Investment needs of the MMDAs are far greater than the transfers from the DACF. The central government transfers to the DACF are often not reliable in terms of amount, timing, and predictability. Discretion of local government over the use of the DACF is limited, in that about half of the fund is earmarked from the center, mainly for capital projects. The remaining half is used as matching funds for donor projects.

The MMDAs face considerable problems, including limited capacity and lack of appropriate skills on financial management and budgeting, as well as the implementation of programs and projects in their jurisdictions. The local revenue base of most MMDAs is very weak, thus most of the MMDAs depend on the DACF for funding of both service delivery and the provision of infrastructure. Little incentive exists to control local expenditure since financial oversight and control are primarily done by the central level. Finally, the MMDAs do not have full control over their personal management issues. Because the MMDA staff is appointed through the central civil service and the government transfers cover most of their salaries, there is little incentive for MMDAs to mobilize and use staff efficiently.

Source: ISODEC, Tracking the Disbursement of the District Assemblies Common Fund, 2003, World Bank, Decentralization Policies and Practices Case Study Ghana Participants Manual, 2003.

Financing waste management services (the examples of Tema Municipality and Kumasi Metropolitan Assembly)

98. **Waste management in Tema.** The Tema Municipality struggles greatly to provide adequate sanitation in the face of accumulating complaints about refuse accumulation, lack of drain maintenance, or inadequate public toilet facilities.¹⁰⁷ Budgetary allocations provided for waste management services in Tema are relatively low. In 2004 and 2005, less than 5 percent of Tema's total budget was transferred to its waste management department (WMD), while on average 92 percent of the budget was allocated to the central administration. Often, even less is released to the WMD during the fiscal year; for example, the budget execution rate of the WMD came to only 85 percent in 2004.¹⁰⁸ Inadequate funding for waste management services is reflected in the often old infrastructure, equipment, and vehicles. Furthermore, because the sewer lines are old, the maintenance cost from frequent repairs by staff is high. Evidence also suggests that more than half of the vehicles may be out of order.¹⁰⁹

¹⁰⁷ Tema houses a population of 380,770.

¹⁰⁸ See Appendix 5, Table A5-4.

¹⁰⁹ Tema WMD, Financial accounts, January–December, 2004.

Table 6-2: Budgetary allocations to the municipality of Tema by Department, 2004-2005 (in percentages)

| | 2004 | 2005 |
|------------------------------|------------|------------|
| Waste Mgt. Dept. | 4.9 | 4.0 |
| Environment Health Dept. | 0.8 | 0.0 |
| Horticulture Dept | 0.1 | 0.2 |
| Engineers Dept. | 0.2 | 0.6 |
| Town & Country Planning Dept | 0.0 | 0.1 |
| Development Planning/budget | 0.9 | 1.0 |
| Internal Audit Dept. | 0.2 | 0.4 |
| Finance Dept. | 0.6 | 1.5 |
| Legal Dept. | 0.1 | 0.1 |
| TEMA Central Admin. | 92.0 | 92.1 |
| Total | 100 | 100 |

Source: Data from Tema municipal government.

99. **Waste management system in Kumasi.**¹¹⁰ In contrast to Tema, Kumasi allocates proportionately more resources to waste management.¹¹¹ However, in Kumasi, as in Tema, the quality of waste management services has sharply deteriorated over the past years. The population growth rate of the city has exceeded its capacity to provide adequate refuse management services. Authorities are able to collect and appropriately dispose of only 40 percent of refuse generated by households, institutions, and markets daily. Because of the city authority's lack of capacity, almost 66 percent of refuse generated in residential areas does not reach the city landfill and is dumped in the immediate surroundings. The city's final waste disposal site is currently at Kenyaase, 12 km from the town center, where open dumping is practiced with no prior treatment of the waste. This method creates a nuisance to nearby residents in the form of litter, foul odor, smoke, and fire hazards. Recycling in Kumasi is in its infancy. A study evaluating the solid waste management system in Kumasi (Post 1999) concluded that the Kumasi Metropolitan Assembly (KMA) lacks the resources, the authority, a clear and consistent mandate, and sufficiently trained and supported staff to ensure effective and appropriate waste services for its communities.

100. **Revenue collection is in general very weak across all MMDAs.** The assemblies regulate user charges for such services as collecting refuse and emptying septic tanks; the central government also regulates some charges. These charges are generally kept below cost and are affordable as most services are for low-income beneficiaries. Consequently, the low cost recovery and overall low financing base of the MMDAs make it difficult for them not only to operate and maintain the existing systems, but also to carry out their own infrastructure investments. A study by the German development assistance organization GTZ on revenue collection in the Accra solid waste and night soil disposal system over the period 1995–1997 showed that revenue, as a percentage of the operational cost of the Accra Metropolitan Assembly (AMA) Waste Management Department, consistently remained under 41 percent.¹¹²

101. Another critical factor that contributes to poor revenue collection is low remuneration in public service. As a result, revenue collectors are less motivated and, in turn, collection services are irregular;

¹¹⁰ Kumasi is the second-largest city in Ghana after Accra, and has a population of around 1.170 million.

¹¹¹ According to a World Bank study, in 1997 the solid waste and sanitation sector benefited by the largest share of recurrent expenditures from Kumasi's budget, while receiving around 45 percent of capital expenditures (mainly for refuse trucks). (World Bank, *The Role of City Governance in Reducing Urban Poverty—The Case of Kumasi*). This high allocation of resources in favor of waste management services seems to be still the case through the present (World Bank, *Project Appraisal Document Second UESP 2004*).

¹¹² GTZ, *Towards an Improved System of Revenue Collection for the Waste Management Department of Accra Metropolitan Assembly (AMA)*, 1997.

staff lack qualifications; also, frequent staff changes occur, which impact the performance of the MMDAs.¹¹³ Other factors are the lack of an effective control mechanism to check flaws in revenue collection at dumping sites and from houses for department services, deficiencies in the system to calculate the collection cost, the compound housing structure (constraints in the targeting of individual consumers), and management laxness in enforcing revenue contracts with some major agencies (encouraging other contractors to default).¹¹⁴ On the whole, the difficulty in institutionalizing effective mechanisms for revenue generation and in retaining staff to do so is a major challenge for the MMDAs.

102. Efforts in strengthening internal revenue collection pay off. Several examples show that efforts undertaken by several MMDAs in the past to strengthen internal revenue collection have yielded positive results. Tema started an intensive program of public education, especially on refuse collection. Its WMD also improved the collection system: the WMD had increased the number of collection points by engaging banks and post offices in revenue collection in addition to the district office. As a result, the WMD was able to achieve a 120 percent collection rate in 2004 and it reduced the incidence of fraud. Tema also won an award for being the cleanest city in 2004, mostly because of high investment in equipments (e.g., the purchase of a bulldozer). Another example is Takoradi, the third largest city in Ghana, which won an award in 2002 as the nation's cleanest city after vigorous efforts to improve internal revenue generation, better enforce bylaws related to the urban environment, and establish a well-functioning contracting system for refuse collection that included drain cleansing.¹¹⁵

103. Many efforts have been made to increase private sector involvement in refuse collection over the past few years. At the end of the 1990s, the MMDAs began to divide their city into waste collection zones and to contract out solid waste collection to the private sector. They collected fees for services and used them to pay the private firms. However, the fees charged by the private operators impacted the MMDAs' ability to pay them. For example, after first creating a private monopoly for refuse collection in 1990, Accra could not afford the collection fee of US\$12 per ton in the long term and in 2001 had to abrogate the contract. Recently MMDAs began to award franchises on a pilot basis whereby the contractor recovers at least part of the cost directly from the user. However, this partnership has had limited success so far—MMDAs have continued to accumulate arrears in payments to the private operators. For example, in 2003 AMA was 28 billion cedis (US\$3.1 million) in arrears in payments to the members of the Association of Service Providers, mostly for evacuating communal containers in low-income areas, where the residents pay no collection fee.¹¹⁶

Donor Assistance in the Sector

104. The World Bank Urban Environmental Sanitation Program (UESP). The main donor-financed program in the sector is the UESP. The program is based on an integrated approach combining infrastructure provision with capacity building. The first UESP started in 1996 and was closed by the end of 2003, but the AFD and the MLGRDE still finance some components. Some of the main lessons learned from the project so far include: (a) the inadequate capability of the assemblies to plan for and carry out adequate O&M of the infrastructure in spite of past capacity building, (b) the importance of limiting public latrines to public places and household latrines to residential areas in order to achieve significant sanitation-related health improvement, and (c) the need to mainstream project management into the

¹¹³ According to a recent study assessing the disbursement of the DACF, improved efficiency of land administration and stricter monitoring of revenue collectors and finance officers by their supervisors and the public could bring about positive results in revenue generation (DFID, "Tracking the Disbursement of the District Assemblies Common Fund" 200[4]).

¹¹⁴ DFID, "Tracking the Disbursement of the District Assemblies Common Fund" 200[4], GTZ, Towards an Improved System of Revenue Collection for the Waste Management Department of Accra Metropolitan Assembly (AMA), 1997

¹¹⁵ World Bank, Project Appraisal Document Second UESP 2004.

¹¹⁶ World Bank, Project Appraisal Document Second UESP 2004.

responsible MMDAs (past program components were not adequately integrated into the operation of the MMDAs, which reduced their ability to carry on with the activities without project support).

105. The new project, UESP-2, seeks to improve urban living conditions with regard to environmental health, sanitation, drainage, vehicular access, and solid waste management in a sustainable fashion, with special emphasis on the poor. The project area comprises the five largest towns in Ghana: Accra, Kumasi, Sekondi-Takoradi, Tamale, and Tema.

- **Mainstreaming the management of UESP-2 in the MMDAs.** With the exception of Kumasi, the MMDAs have not implemented sizable infrastructure projects on their own in the past years. Programs financed by donor assistance (e.g., UESP-1) had been carried out by the MLGRDE or other sector ministries. In January 2004, the MLGRDE decided to mainstream the management of all externally assisted projects in response to one of the recommendations of the 2002 Country Portfolio Performance. UESP-2 is the first project in which the MMDAs will be responsible for the implementation of their part of the project. The MLGRDE implements only the institutional strengthening component and is responsible for the coordination and monitoring of the project.

- In addition, the Netherlands intend to provide aid to the PMMS component (financed by Danida) to support the creation of a directorate for environmental sanitation within the MLGRDE. Other assistance provided by the Development Partners is limited largely to road and drainage work, financed by the Agence Française de Développement. The Nordic Development Fund is also providing some assistance in the form of institutional strengthening for urban waste management.

C. Incentives

106. **Environmental sanitation and waste management are public goods.** Improper waste disposal by one individual affects all community members. Mosquitoes that breed in one place may bite people in another, and contamination of food will affect all who consume it. Ensuring good sanitation and waste management is therefore the responsibility of all citizens, communities, private sector enterprises, NGOs, and government institutions.

107. As for water supply, **all customers should pay full costs of sanitation and waste management services.** This would ensure an optimal operation and expansion of the services. However, if charges are too high, people will go into the bushes for defecation and dump solid waste in places where it would harm the environment. Thus, delivery of waste at public collection sites should continue to be free, and public toilet charges should not be set at levels so high they cause a drop in service demand.

108. **Private solutions—contracting private operators for providing sanitation and waste management services—should be encouraged.** Experiences from Ghana and other countries show that this tends to improve the quality and efficiency of the service. Local private operators are flexible and free to make efficient solutions, and, through properly written contracts, will also have incentives to implement cost-efficient services.

109. **The lack of a sanitation subsector or independent implementing body at the local level to provide the services in a cost-efficient way is in evidence.** Giving the same institution responsibility for both contracting private operators and operating some of the same activities may cause conflict of roles and interests. To the extent such conflicts exist, the overall policy and contracting responsibility should remain within the assemblies, and a separate public or partly private owned agency responsible for providing some of the various services should be established. This could also facilitate an upgrading of the status of the sanitation and waste management service workers, which is highly needed. Better salaries, training, and improved awareness raising are all necessary incentives to enhance the quality of the services.

110. **The needed upgrading of sanitation and solid waste management systems will require huge investments.** This will in turn increase operational and maintenance costs. High- and medium-income

households may be able to pay for some of this, especially for investments in new toilets in their homes. They might also be willing to pay somewhat more for the operation of door-to-door services, especially if the quality of the services improved and became more regular.

111. **The poor’s willingness to pay for solid waste management and toilet facilities is low.** Thus the public sector and donors would to a large degree have to finance investments and increased O&M costs. The assemblies will hardly be able to finance any of this without huge subsidies from the government. However, because of the huge investments needed, the GoG will have difficulty raising the necessary funding. Thus, donor funding will be essential for these sectors to enable the country to reach its Millennium Development Goals.

D. Government’s Reform Agenda

Target and Strategies for Sanitation and Solid Waste ESP

112. The ESP has established some outputs and targets for environmental sanitation and waste management to be achieved by 2020. Table 6-3 below indicates the progress made so far, as well as challenges faced in achieving the ESP outputs.

Table 6-3: ESP Targets for Environmental Sanitation and Waste Management

| Target | Reform progress |
|--|--|
| All solid wastes generated in urban areas are regularly collected and disposed of in adequately controlled landfills or by other environmentally acceptable means. | Eighty percent of solid waste is collected; present system is not adequate (1) not enough landfill equipment |
| All excreta are disposed of either by hygienic on-site disposal system or by hygienic collection, treatment, and off-site disposal system. | Off-site: Central sewer system with defects, treatment plan is not functioning. On-site: largely fine but with some deficits . |
| All pan latrines are phased out. | Ongoing |
| At least 90 percent of the population has access to an acceptable domestic toilet, and the remaining 10 percent have access to hygienic public toilets. | Not yet achieved—some parts successful, other less so. |
| Hygienic public toilets are provided to the transient population in all areas of intense public activity. | To a large extent implemented |
| Active sanitary inspection and vector control programs are in place, and the incidence of malaria, bilharzias, and other vector-borne diseases is falling. | No active vector control program. Sanitary inspection is not adequate, has low impact. |
| Environmental standards and sanitary regulations are strictly observed and enforced. | Legislative enforcement is low. |
| The majority of environmental sanitation services are provided by the private sector. | About 80 percent of the services (notably collecting and disposing solid waste) are provided by the private sector. |

113. **Strategies stated in the GPRS II (2006-2009).** The GPRS II (GoG 2005) include a set of policy measures that will be revised on an annual basis (see Table 6-4 below).

Table 6-4: Targets in GPRS II

| Target | Reform progress |
|---|---|
| Improve environmental sanitations. | |
| Promote physical planning in both urban and rural areas (acquisition of land for the treatment and disposal of solid waste in major towns and cities and the establishment of water and sanitation boards in small town). | Ongoing |
| Support public-private partnership in solid waste management. | Ongoing |
| Build the capacity of District Assemblies to better manage environmental sanitation. | Ongoing |
| Accelerate the provision of adequate sanitation | |
| Promote the construction and use of domestic latrines. | Both are ongoing under the UESP II. |
| Improve the treatment and disposal of waste in major towns and cities. | Solid waste (progress had been made to some extent) Liquid waste (sewerage area is better; however, still deficits in slum neighborhoods). |
| Enforce laws on the provision of sanitation facilities by landlords. | Enforcement is low, need for significant institutional strengthening of District Assemblies. |
| Promote widespread use of simplified sewage systems in poor areas. | None (lack of funds). |
| Improve the management of urban sewage systems. | Ongoing under UESP. |
| Improve household and institutional sanitation, including schools. | Ongoing under UESP. |
| Rationalize and update local assembly bylaws on safe management of liquid and solid waste at the household level. | Ongoing (submitted bylaws to Regional Coordinating Council). |
| Integrate hygiene education into water and sanitation delivery. | Ongoing on small scale. |

Implementation of Reforms

114. **Difficulties in implementing Ghana's sanitation strategy.** The government's strategy and emphasis on wastewater is less advanced than it is for water supply (World Bank, 2004a), and the adopted sanitation sector policy is proving difficult to implement. Apparently, little demand exists for piped sewer service, collection, and treatment. Further, the country has serious constraints on its operational capacity for treatment. Finally, a perceived, but as yet undocumented, inability to pay for this service is seen among urban residents. Following a recent workshop in May 2006, steps will be taken to discuss a revised sanitation policy and to develop a sanitation directorate in the MLGRDE to order to strengthen the implementation of sanitation policies.

115. **Progress in waste management.** Waste management is one of the most frequently raised concerns by people in urban areas and by government representatives (World Bank, 2004b). Considerable progress has been made in recent years to improve the situation, notably through the creation and empowerment of the Waste Management Departments of the Metropolitan or Municipal Assemblies (MAS), the growing involvement of the private sector in collection, the increasing reliance on user charges for solid and liquid waste collection, some improvements in internal revenue collection by the MAS, and a greater awareness that refuse dumps have to be replaced with sanitary landfills.

116. **A need to improve revenue collection.** The required subsidy from the MAS, which today amounts to nearly half their total budget, is not regularly available. Urged on by external assistance agencies, the central government is putting pressure on the MAS to increase their internal revenue

generation. Experience has shown that consumers are ready to pay more for waste management services as they improve, especially if the private sector provides for these services.

117. **Preparing an annual waste management plan for the EPA.** Because of their weak financing base, one of the main challenges for the MMDAs is the maintenance of infrastructure and equipment. In an effort to tackle this problem, the EPA announced that it would put in place modalities making it mandatory for all assemblies to present the agency with a yearly waste management plan. The plan would help curb the haphazard waste disposal provided by most assemblies; it would also address issues like target groups charged with waste collection and sites for waste disposal.

The Way Forward

Key Findings and Recommendations

118. *Strengthen the planning and monitoring capacity of the Ghana Water Company Ltd. (GWCL), and follow through with a management contract for an external operator.* The supply of piped water is inadequate, regarding both the extension and the quality of the services. A low proportion of the poor urban population has access to potable water. In fact, the supply to those who are connected is often interrupted because of leakages and other factors. Thus, a general upgrade of the water supply sector is needed, both through improved operation practices, extension of the pipe grid to new areas, and better maintenance of the existing grid. New water sources are also needed, especially in Accra. The main challenges to improving the urban water supply are to improve the operations of the GWCL, provide funding for further expansion of the piped system, and improve the quality of the water supplied by secondary vendors. Strengthening the planning and monitoring capacity of the GWCL should ensure that the management contract with the external operator is efficiently managed, and should contribute to improved quality and fewer interruptions of services. Furthermore, it should improve GWCL'S role in strategic investment planning to facilitate medium- and long-term investment in the new capacity. This measure would increase GWCL revenues in the medium term and enhance investor confidence. By extension, it would also contribute to medium- and long-term financial stability in the sector, and increase its ability to sustain debt repayment.

119. *Invest in new landfill capacity, upgrade all waste collection and treatment facilities, and expand existing collection systems to uncovered areas.* Almost all parts of the sanitation facilities and solid waste treatment in Ghanaian urban areas are far from satisfactory. Most sections of the various systems are working poorly, and in several poorer urban areas, these services are almost nonexistent. Therefore, the sanitation and solid waste management systems need upgrading, as does the quality of the services. The services must be expanded to poorer urban areas that are without these services today. Domestic and public toilet facilities must be expanded and upgraded. Most cities need new landfills immediately.

120. *Continue the implementation of the Local Government Service Act and the outsourcing of operations to private operators.* Badly needed is a responsible subsector at the assembly level, where the responsibility for providing the sanitation and waste management services lies. Moreover, the overall financial resource base of the local assemblies is inadequate, given their responsibilities.

More Detailed Recommendations

A. Water Supply

121. The above analysis shows that the supply of piped water is inadequate, both regarding the extension and quality of the services. A low proportion of the poor urban population has access to potable water, and the supply to those who are connected suffers from frequent interruptions. Sales of water through secondary vendors and improper storage of the water in households frequently lead to disease. Thus, a general upgrade of the water supply sector is needed, through improved operational practices,

extension of the pipe grid to new areas, and better maintenance of the existing grid. New water sources are also needed, especially in Accra. The main challenges to improve the urban water supply are to improve the operations of GWCL, provide funding for further expansion of the piped system, and improve the quality of the water supplied by secondary vendors.

122. Most of the necessary framework for implementing a sustainable water supply system for the urban areas is in place. The necessary legislation regarding the various parts of the system is adopted, and the institutions needed to run the system are established and their roles clearly defined. Establishing the PURC has been particularly important to facilitate the regulation of tariffs and quality of supply of the utility and the secondary providers. However, the PURC is still in its infancy and its enforcement power is weak.

123. The achievement of these overall, long-term goals would result in a healthier urban population and increase life expectancy. The following actions are therefore proposed:

Policy and Regulatory Improvements

- **Follow through with the management contract and increase private sector participation.** This should increase GWCL revenues in the medium term and enhance investor confidence. It should also contribute to medium- and long-term financial stability in the sector, and increase its ability to sustain debt repayment.
- **Reduce leakages and illegal connections.** This action should make more water available for new customers in the medium term (2015).
- **Introduce a self-financing mechanism for the PURC.** This measure could contribute to the strengthening of the institution.

Institutional Capacity Building

- **Strengthen the planning and monitoring capacity of the GWCL to better manage the service delivery of the private operator.** This would ensure that the management contract is efficiently managed, would contribute to improved quality, and would ensure fewer service interruptions. Furthermore, it should improve GWCL's role in strategic investment planning to facilitate medium- and long-term investment in new capacity.
- **Improve monitoring of secondary providers.** The PURC has begun actions to improve the quality of the water supplied by secondary vendors. However, this work needs to be substantially strengthened, regarding both capacity and quality.
- **Intensify awareness raising about healthy water storage and treatment among the population.** People need to be made aware of the relation between water storage and illness in order to safeguard their health.
- **Ensure long-term water quality and source sustainability to provide increasing water supply in urban areas.** The water quality at the source is relatively good today, but this will likely change in the future from increased pressure on surface and groundwater sources. This calls for a proactive planning approach.
- **Develop water management practice in line with international best practice.** This should be the long-term goal for water management, and should include introducing risk management tools related to water safety planning.

Infrastructure, technologies, and output-based instruments

- **Renew the old distribution system.** The need for this is huge, both in the short and medium term.
- **Improve maintenance of infrastructure.** Upgrading maintenance is also an urgent need.

- **Improve water storage facilities.** This measure could yield substantial short-term health benefits.
- **Establish new tanker filling points closer to areas of need.** For short-term water supply improvement in the poor areas, this would be a relatively inexpensive option.
- **Expand pipeline systems to uncovered areas.** This expansion is important both in the medium and long term to improve human health.
- **Develop new water sources.** Existing water sources are overexploited, and new sources are greatly needed.

B. Sanitation and Solid Waste Management

124. It is obvious from the analysis that the sanitation facilities and solid waste treatment in Ghanaian urban areas are far from satisfactory. Almost all parts of the various systems are working poorly, and in several poorer urban areas these services are almost nonexistent. The resulting diseases among the population impose large costs on Ghanaian society.

125. The lack of a responsible subsector at the assembly level, where the responsibility for providing the services lies, is a major problem. Given the responsibilities of the local assemblies, their overall financial resource base is inadequate.

126. Contrary to some indications, it seems that the legislation and institutional structure in both the sanitation and solid waste management sectors are for the most part adequate to implement sustainable services in these sectors. The roles and responsibilities of the various actors and stakeholders are defined. Also, overall goals for the service standards in these sectors are well defined, and detailed guidelines for how the various parts of the systems should be designed and operated are mostly in place.

127. The achievement of these overall, long-term goals would, as mentioned above, mean better health and an increased life expectancy for the urban population. Toward this end, the following actions are proposed:

Policy and Regulatory Improvements

- **Continue the implementation of the Local Government Service Act.** Focus should be on fiscal decentralization, leading to increased autonomy of the local government regarding public services.
- **Improve overall management of decentralized functions.** In the longer term, this would lead to increased sustainability of urban services at the central government level.
- **Begin implementing the Waste Management Policy.** A start would be to conduct a Sanitation and Waste Management Policy Assessment and increase the involvement of key stakeholders in strategic decision-making and key policy dialogue.
- **Continue outsourcing operations to private operators, and improve revenue collection.** This action should improve the efficiency of the services in the short term and yield better services.
- **Make adjustments in sanitation and waste management policy.** Included should be the harmonization of the functions of institutions tasked with the responsibilities of the sanitation and waste management sector. An important outcome could be better integration of sanitation and waste management issues into the local economies.
- **Implement recommendations of the Law Reform Commission on harmonization of laws and bylaws.** The result should be a clear, coherent, and efficient institutional approach.

- **Consider establishing a regulatory/supervisory body for the sector (a Sanitation Directorate),** which could help improve operations and services.

Institutional Capacity Building

- **Intensify a sustained program of raising awareness among the population on safe sanitation and waste management practices.** Raising awareness about the relation between good sanitation and waste handling, pollution, and illness is essential to change peoples' behavior and to experience the full effect of new investments. This program should be an important part of the education in schools, but should also be targeted at the population in general, especially the poor. The responsibility for hygiene issues and education should be clarified, both at the ministerial and local level.
- **Conduct an assessment of staff training needs** as a preparation for a training program.
- **Strengthen the capacity of District Assemblies with a focus on waste management services,** including improved control and enforcement of building codes, and so on.
- **Retrain and reorient sanitary inspectors.** This training could be important for the enforcement of rules and guidelines.
- **Further develop and implement the policy for recycling and composting into a more systematic segregation of waste,** which could improve environmental and public health in the longer run. Private initiatives to start recycling projects should be encouraged.

Clarify the responsibility for hygiene policy and education. This seems necessary both at the government and local levels. The Ministries of Health and Education should be given more responsibility.

Improve infrastructure, technologies, and output-based instruments by:

- **Investing in a new landfill capacity.** Most cities need new landfills immediately.
- **Upgrading all waste collection and treatment facilities.** Almost all parts of the sanitation and solid waste management systems need upgrading, as does the quality of the services.
- **Expanding the existing collection systems to uncovered areas.** These services must extend to poorer urban areas that are without these services today. Domestic and public toilet facilities must be improved and upgraded.

Urban Environment Reform and Investment Road Map, 2006-2025

Policy and Regulatory

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-25) | Final outcomes |
|--|--|---|--|--|---|
| <p>Water Sector Improve revenue collection</p> | <p>Improved GWCL operation Enhanced investor confidence</p> | <p>Follow through with the management contract and increase private sector participation. Reduce illegal connections. Reduce leakages. Introduce self-financing mechanism for PURC.</p> | <p>Increased GWCL revenues Ensured financial stability in the sector, Increased ability to sustain debt repayment More water available</p> | | <p>More efficient and cost-effective water supply sector Reliable and safe water supply for all</p> |
| <p>Sanitation and Waste Management Continue implementation of the Local Government Service Act (with a focus on fiscal decentralization). Begin implementing the Waste Management Policy. Improve wastewater policy. Continue outsourcing of operations to private operators. Improve revenue collection.</p> | <p>Increased autonomy of local Government with regard to public services Involvement of key stakeholders in strategic decision making and key policy dialogue Improved efficiency and operation, and better services</p> | <p>Improve overall management of decentralized functions. Make adjustments in sanitation and waste management policy (including the harmonization of the functions of institutions tasked with the responsibilities of the sanitation and waste management sector). Implement recommendations of Law Reform Commission on harmonization of laws and bylaws. Consider establishing a Sanitation Directorate.</p> | <p>Increased sustainability of urban services at the central government level Sanitation and waste management issues more integrated in the local economies Clear, coherent, and efficient institutional approach developed Improved operation and better services</p> | <p>Fine-tuning of the sanitation and waste management policy based on adaptive learning.</p> | <p>More environmentally and socially sustainable management of services relating to the sector Safe and reliable sanitation and waste management sector</p> |

Institutional Capacity Building

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-25) | Final outcomes |
|---|---|--|--|--|---|
| <p>Water Sector Strengthen planning and monitoring capacity of GWCL to better manage the service delivery of the private operator. Create capacity at the PURC and the GWCL to improve monitoring of the quality of water provided by secondary providers. Improve PURC's capacity and practice in monitoring of secondary providers and other regulatory practice. Intensify a program of sustained raising of awareness among population on healthy water storage/treatment. Ensure long-term water quality and source sustainability to provide increasing water supply in urban areas.</p> | <p>Contract managed efficiently Improved quality and fewer interruptions of services Improved safeguarding of water quality of secondary water providers A healthier population</p> | <p>Continue efficient monitoring of secondary providers. Continue strengthening PURC. Continue intensified awareness raising among population on healthy water storage/treatment.</p> | <p>Improved strategic investment planning role of GWCL to facilitate medium- and long-term investment in new capacity A healthier population</p> | <p>Develop water management practice in line with international best practice, including introducing risk management tools related to water safety planning.</p> | <p>A healthier population Increased life expectancy</p> |
| <p>Sanitation and Waste Management Intensify a program of sustained awareness raising among people on safe sanitation and waste management practices. Conduct an assessment of staff training needs. Improve planning and monitoring capacity of TCPD. Strengthen capacity of District Assemblies with a focus on waste</p> | <p>Improved quality and frequency of services Better environment and human health</p> | <p>Continue with short-term actions. Further develop and implement the policy for recycling and composting into a more systematic segregation of waste. Clarify the responsibility for hygiene policy and education.</p> | <p>Improved quality and frequency of services Better environment and human health</p> | <p>Continue medium-term actions.</p> | <p>A healthier population Increased life expectancy</p> |

| | | | | |
|--|--|--|--|--|
| management services (including improved control and enforcement of building codes, etc). | | | | |
|--|--|--|--|--|

Infrastructure, Technologies, and Output-Based Instruments

| Short-term Actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-25) | Final outcomes |
|---|--|--|--|-------------------------------|--|
| Water Sector Renew the old distribution system. Improve maintenance of infrastructure. Improve water storage facilities. Establish new tanker filling points in poor areas. Continue improving overall network. | Improved existing supply systems and maintenance Better human health | Develop strategic investment plan. Continue to renew the old distribution system. Continue improving the maintenance system. Expand pipeline systems to uncovered areas Develop new water sources. Improve protection of water sources. | An environmentally sound water supply system covering large parts of the poor areas | Continue medium-term actions. | An environmentally sound water supply system covering all areas |
| Sanitation and Waste Management Create new landfill capacity. Upgrade all waste collection and treatment facilities. Upgrade infrastructure for wastewater. | Improved quality and regularity of services Better environment and human health | Develop a strategic investment plan. Expand existing collection systems to uncovered areas. Continue creating new landfill capacity. | An environmentally sound sanitation and waste management system covering large parts of the poor areas | Continue medium-term actions. | An environmentally sound sanitation and waste management system covering large parts of the poor areas |

7 Conclusion

1. **Environmental degradation continues to be a major challenge for the Government of Ghana.** Although the challenge prima facie appears to only impact the natural resource and environment sector, it has far-reaching economic implications for the GoG. This is clear upon close examination of the main sectors/assets driving growth in Ghana, namely, forests and wildlife, mining, agriculture, and urban areas. In fact, the CEA identifies environmental degradation as one of the main impediments to Ghana's economic growth. The key to addressing this challenge lies in the adoption of a multifaceted approach designed to examine the legal, institutional, and policy regime underpinning the environment sector. This chapter summarizes the conclusions of the CEA, provides key recommendations that are designed to assist the Government of Ghana, and discusses various financing instruments that are being used or will be used in the near future to implement the recommendations of the CEA.

Findings

2. **The new estimate of the cost of natural resource and environmental degradation reinforces the need for making environmental concerns a priority in policy-making.** The CEA extends the earlier estimates of the costs of natural resource degradation to cover the costs of environmental health effects related to water and air pollution. The total estimated annual cost of natural resource and environmental degradation is nearly US \$730 million or 9.6 percent of GDP.¹¹⁷ The degradation of the two key natural resources – agricultural soils and forests and savanna woodlands – costs at least US\$405 million annually (about 5.3 percent of Ghana's annual GDP) and health effects account for nearly US\$325 million or 4.3 percent of GDP. This underscores the urgency for policy makers to understand and integrate environmental concerns into the broader economic policy-making process.

3. **Natural resource and environmental management are key to sustaining growth and poverty reduction.** This CEA illustrates very clearly the linkage between natural resource management and economic growth. It demonstrates that, based on the current trends, natural resource and environmental depletion is a limiting factor for sustained economic growth. By contrast, better natural resource and environmental management can contribute to sustainable growth. More specifically, under reasonable assumptions, in an economy such as Ghana's, for each percentage point of environmental degradation, the rate of growth decreases by 0.1 percent. In practical terms, this means that environmental and natural resource depletion in Ghana (which accounts for 9.6 percent of GDP) is reducing by 1 percent the potential for economic growth in the country.

4. **Ministries, departments, and agencies in all the natural resource and environment sectors face common challenges.** It has become clear that developing collaborative cross-sectoral approaches to address these common issues will be more useful and efficient than dealing with them separately in each sector. The following section outlines overarching policy recommendations for natural resource and environmental issues.

Recommendations

5. **The three main recommendations (summarized in table 7.1 below) to ensure adequate consideration of environmental and natural resource issues in the broader policy agenda are as follows:**

- **Removing policy, regulatory, and institutional bottlenecks is vital for reducing vulnerability of the poor in both rural and urban areas.** In the agriculture and urban environment sectors, cleaner and low-tech options such as additional water pipes and SLM techniques are available to reduce environmental stress. These technologies may contribute

¹¹⁷ This is a percentage of GDP in 2003. Please see Appendix 1 for how these estimates were reached.

significantly to lessening the vulnerability of the rural and urban poor. However, these technologies are not widely adopted because a number of obstacles and bottlenecks exist, including policy, regulatory, and institutional barriers. To remove these barriers, actions that can create an enabling environment for scaling up these technologies are urgently needed.

- **Strengthening environmental governance is key to ensuring that natural resources contribute to greater wealth and sustainable growth.** In high rent-seeking sectors such as forestry and mining, more transparent and accountable fiscal management of relevant agencies, including the Forestry Commission and Minerals Commission, is of particular importance to avoid short-lived consumption of natural resources that will leave a country poorer than before. Getting the most from natural resources implies better regulation and management, and less wasteful utilization, of natural resources; more effective capture of the economic value of the resource; better collection of revenues; and higher levels of reinvestment and savings.

Box 7-1: What is environmental governance?

Governance, broadly speaking, relates to who has authority, how decisions are made, and how decision-makers are held accountable. It then follows that environmental governance concerns who has decision-making authority over natural resources and the environment. The seven elements of environmental governance, all of which are covered by the NREG Program, are the following: 1) institutions and laws relating to who makes and enforces rules for governing NR, 2) participation and representation of the public, 3) authority level (from local to international) over NR, 4) property rights and tenure over NR, 5) the impacts of markets and financial flows on NR and the environment, 6) how ecological and social science is incorporated into decisions on NR use to reduce risks and identify new opportunities, and 7) accountability of those who manage NR and transparency of their actions.

Source: "Decisions for the Earth: Balance, Voice and Power." World Resources Institute, 2003

- **Reinforcing coordination and dialogue to mainstream ENRM is critical.** Environment is a cross-cutting issue that requires coordination at the highest level. Recognizing this, the Government of Ghana is considering the creation of an environmental oversight mechanism—perhaps at cabinet subcommittee level—to examine environmental integration across the full range of GPRS interventions. Typically, government agencies prepare, review, and approve environmental policies that have an impact on local communities. Although local communities have the potential to play a pivotal role in the better management of Ghana's natural resources, to date they have not been actively engaged in the decision-making processes. In order to create a comprehensive system for environmental management, it is important that all stakeholders are actively engaged in the policy dialogue.

Table 7-1: Cross-Cutting Recommendations

Policies

| Short-term actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|--|--|--|---|---|--|
| Strengthen coordination and consistency of policy making and implementation at the highest level of the government on cross-cutting issues (e.g., cabinet subcommittee on environment). Establish priority ENRM policy goals, with monitoring indicators, consistent with GPRS II. | Enhanced inter-institutional coordination and development policy coherence in relation to ENRM issues. ENRM analyses reflected in policy decision making at cabinet and ministerial levels | Continue integration of ENRM issues into overall economic and development policy processes within GoG. Develop green accounting. | Coherent multi-agency approach to environmental and natural resource management developed | Enhance ability of institutions to address multi-sectoral ENRM issues. Capture NR and environmental values in national budgeting. | Effective evidence-based policy making, implementation and resource allocation processes. MoFEP planning and budgets take account of financial and fiscal implications of ENRM factors |

Institutions

| Short-term actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|--|---|---|---|--|---|
| Clarify institutional roles and strengthen capacity to develop and use environmental and financial information. Agree on sustainable funding basis for regulatory functions and oversight on ENRM. Develop ENRM institutional strategies in relation to local government capacities and functions. | Policy reforms implemented on more informed evidence base. More effective legislative and administrative platform for key sector institutions. Better linkages between central policies and local implementation of ENRM strategies | Improve financial reporting, transparency, and corporate governance of ENRM regulatory agencies and commissions. Provide incentives (both fiscal and non-fiscal) for ENRM investment. | Enhanced contribution of ENRM toward growth and poverty reduction | Have public financing needs of ENRM institutions be reflected in national budgeting processes. | GoG's long-term governance capacity to address environmental and NR management and regulation is secured. |

Dialogue

| Short-term actions (2006-2009) | Intermediary outcomes | Medium-term actions (2010-2015) | Intermediary outcomes | Long-term actions (2016-2025) | Final outcomes |
|---|---|--|--|--|--|
| <p>Enhance dialogue on ENRM in relation to GoG policies, plans, and programs.</p> <p>Support multi-donor and multi-stakeholder dialogue processes on trade, responsible business, revenue transparency, and regional integration.</p> | <p>Involvement of key stakeholders—including civil society, Parliament, local government, private sector, and sectoral institutions—in policy dialogue and strategic decision making</p> <p>Improved awareness on importance of multisectoral consequences of ENRM</p> <p>Improved private sector willingness and ability to address environmental factors in investments</p> | <p>Strengthen application of best practices relating to ENRM (e.g., strategic environmental assessment & other participatory mechanisms and sustainability tools).</p> <p>Continue to support dialogue processes on key ENRM issues.</p> | <p>Improved democratic accountability and governance</p> <p>Enhanced international and regional cooperation, coordination and lesson learning on key ENRM issues</p> | <p>Further strengthen dialogue mechanisms.</p> | <p>Better informed ENRM and development policy making and implementation, with due consideration of cumulative and multisectoral consequences</p> <p>Improved democratic accountability and governance</p> |

Integration of CEA Sector Recommendations

6. There are a number of vehicles and instruments that GoG has used and can continue to use to carry forward the recommendations outlined in this CEA. The CEA sector recommendations have to a certain extent been included in the general budget support provided by the Multi-Donor Budget Support (MDBS) and the World Bank's Poverty Reduction Strategy Credit (PRSC), and have been incorporated in a number of donor investment projects, as discussed below. However, the CEA has served to increase the recognition among GoG and DPs that many natural resource and environmental problems are related to poor governance and are common to all sectors. It was considered that the MDBS/PRSC could not focus enough on natural resource and environmental governance issues, while existing donor investment projects were too small or limited in scope to adequately address these issues. The Natural Resource and Environmental Governance (NREG) sector budget support program was thus designed to address this recommendation of multi-donor support for the broader issue of NRE governance. The NREG Program benefits from economies of scale by including the three sectors of forestry and wildlife, mining, and environment, rather than having three separate programs for each sector. The CEA has also driven the policy orientation of the upcoming NREG Program: the NREG policy matrices draw significantly from the recommendations provided at the end of each chapter.

7. The following sections give an overview of the integration of CEA sector recommendations into the harmonized general budget support provided by DPs

A. General Budget Support

8. Harmonized general budget support has been provided by bilateral donors through the MDBS and by the World Bank through the PRSC, which is part of the greater MDBS and had until recently a performance assessment framework (PAF) separate from that of the MDBS. This general budget support has played an important role in supplementing the GoG's GPRS II. This GoG strategy consists of three pillars: (a) private sector competitiveness, (b) human resource development, and (c) good governance and civic responsibility. The CEA has attempted to identify areas and objectives that will best fit the GPRS II. Most of the CEA sector work (on forestry, land, and mining) falls under "Private Sector Competitiveness," which contains the objective (among others) of "sustainable natural resource development." Health issues, insofar as they are related to mining and environmental protection, fall under the third objective of the human resource development pillar (the second pillar). Furthermore, the support to artisanal sectors recommended by the CEA falls in line with one of the second pillar's objectives of protecting the rights of vulnerable members of society. The third pillar of governance issues cuts across all three sectors..

9. The CEA was prepared in parallel to the Multi Donor Budget Support (MDBS) group's preparation of a new Joint Assistance Strategy to Ghana (G-JAS). The CEA provided input to the Consultative Group meeting in June 2006 and thus to the discussions on the G-JAS and to the Performance Assessment Framework (PAF) for the implementation of the MDBS. For instance, the 2006 MDBF PAF includes two targets (numbers 22 and 23) for the forestry sector. Target 22, which reflects a specific recommendation of the CEA (and is also a trigger), intends to have put in place a financial framework and policy to secure (i) forest revenue and Forestry Commission (FC) budget release for its core functions, (ii) transparency and accountability in financial management, and (iii) collection and distribution of revenue to stakeholders. Target 23 consists of continuing the implementation of the GoG's strategy for the management of forestry resources to (i) conduct two competitive bidding events to allocate new Timber Utilization Contracts (TUCs), (ii) convert existing timber leases into TUCs, and (iii) design and implement a logtracking

system. Furthermore, the MDBS PAF includes target 24, which would strengthen coordination and consistency of policymaking and implementation on cross-cutting environmental issues by developing an operational inter-ministerial governance mechanism.

10. The inclusion of these forestry and environmental governance targets in the 2006 MDBS PAF was not exclusively due to the CEA. However, the CEA played an important part in their presence in the MDBS: the strong anchoring of the CEA analysis in the G-JAS and the MDBS decisively has brought the issue of natural resource and environmental management and governance on the GoG agenda.

11. Like the MDBS more broadly, the PRSCs in Ghana have always articulated the GPRS priorities, and PRSC IV was specifically focused around three key development results parallel to the GPRS II pillars: higher growth and employment generation, improved service provision for human development, and stronger governance and public sector management. Influenced by the analysis conducted in the CEA, PRSC IV recognized that strengthening the management of natural resources and the environment would be one of the key drivers to achieving sustainable growth. Therefore, the MDBS forestry target 23 mentioned above, which was a specific recommendation of the CEA, was also included in the PRSC IV as its trigger for the forestry sector.

12. Following the PRSC IV, it had been further recommended that there be a future trigger linked to a financial agreement between the MOFEP, MLFM, and the Forestry Commission (FC) that would establish secure, predictable financing for the FC. Consequently, target 22 from the 2006 MDBS PAF was also included in the 2006 PRSC V such that a financial and policy framework for the FC would be developed. It should be noted that future MDBS/PRSCs will have only one, joint PAF for the sake of simplicity.

B. Existing Sector Investment Projects

13. Given the stretching mandate and increasing responsibility that is being placed on country institutions, a range of DPs felt that additional instruments were needed to support country systems for the environment beyond general budgetary support alone. Budget support can and may be enhanced by the use of other funding mechanisms. Some of the proposed CEA actions are therefore in the process of being implemented through a set of investment projects. Some of the sector-specific interventions are outlined below.

Forestry and Wildlife

14. There exist a handful of programs financed by DPs related to forestry and wildlife, many of which have almost reached completion. From the RNE, there is an approximately US\$15 million Wildlife Program, a US\$17 million Wildfire Management Program, and a US\$0.5 million Validation of Legal Timber Project, all of which have a closing date of December 2007. Additionally, the Fonds Français pour l'Environnement Mondial (FFEM) is financing a US\$1.7 million biodiversity and forestry project in Ghana. This project is linked to the US\$12 million PADP (Protected Areas Development Program) funded by the EC, which started in 2006 and will end in 2009. The GEF-funded Northern Savanna Biodiversity Conservation Project, with a total budget of about US\$8 million, will end in December 2007. Meanwhile, Switzerland is funding (or preparing to fund) several smaller projects in the forestry sector for a total of approximately US\$1.5 million; these include a program on processing and utilization of trees on farmlands and logging residues through collaboration with local communities via the International Timber Trade Organisation (ITTO), a project on quality control and standardization of Ghanaian wood products, and a project in support of standard setting for *Allanblackia* trade and of sustainable supply chain management. However, few of these programs will continue past 2007.

15. In view of the reforms needed to strengthen the sector's institutional capacity, overall donor aid to the sector does not seem adequate to improve present reforestation programs. Furthermore, the large number of donors in the sector indicates that the government will have a high transaction cost from coordinating and implementing donor assistance. The sector will thus benefit from the multidonor-supported NREG Program, as it harmonizes the DP financing into one large budget support program.

Mining

16. Development assistance committed for the mining sector (around US\$25 million) over the next three years is adequate to cover the implementation of the CEA findings of the mining sector. The main donor in the sector, the EC, has agreed to incorporate the CEA recommendations in its Mining Sector Support Program (US\$ 45 million from 2003 – 2010). A key component of the program is the strengthening of the mining agencies' institutional capacity as well as the execution of an Environmental Impact Assessment and a national Strategic Environmental Analysis project. This project would also provide sufficient funding to implement a comprehensive framework for compensation, post-closure rehabilitation, and benefit sharing. The EC program does not, however, include any funding for a program in support of artisanal and small-scale mining (ASM).

Land Resources

17. New GEF resources (about US\$ 7 million) will be channelled through the TerrAfrica SIP to strategically and complementarily support GoG in its efforts to achieve the targets and objectives in the area of SLM both in the agriculture sector and in the ENRM sector. In addition, further resources (ie US\$ 50-60,000) from the TerrAfrica Trust Leverage Fund and the World Bank Development Grant Facility) may be made available to support the Government in achieving specific targets on SLM.

18. With the exclusion of the land administration component (which is being implemented through the Land Administration Project), the existing financing envelope for SLM appears largely inadequate for the scale and scope of the interventions needed to scale up sustainable land management in the country, particularly taking into consideration the large scale of on-the-ground investments needed.

Urban Environment

19. The World Bank is the only multilateral donor active in the urban water, sanitation, and waste management sectors. Bilateral participation is limited to a few countries, most notably the Dutch and Spanish governments. In addition, some assistance for institutional strengthening for urban waste management is provided by the Nordic Development Fund. The World Bank has been engaged in an Urban Water project since 2004, which includes a major capacity building element aimed at strengthening the GWCL operations through a management contract.

20. In the sanitation sector, an Urban Environmental Sanitation Program (UESP) ran from 1996 to 2003, financed by the World Bank; some components are still active. A second project, UESP-2, began in 2004; it comprises the five largest towns in Ghana and focuses on upgrading infrastructure. The MLGRD implements the institutional-strengthening component of the program. In addition, the Netherlands and Denmark have supported the sanitation directorate and the development of a revised sanitation policy since the end of 2006.

Natural Resources and Environment

21. A few ongoing DP projects deal with natural resources and environmental protection more generally. For instance, a US\$1 million Community-Based Integrated Natural Resource Management, funded by GEF, will reach completion at the end of 2007. RNE also supports the

US\$1.3 million Ghana Environmental Assessment Support Programme, which will close in May 2008. Furthermore, a total of approximately US\$4.5 million of the World Bank Community-Based Rural Development Project will be used for an NRE component.

C. NREG Sector Budget Support

22. In addition to the general budget support from the MDDBS/PRSC and the individual investment projects in the NRE sectors outline above, the creation of a multi-donor natural resources and environmental governance sector budget support became a specific request of GoG after the results of the CEA and other analytical studies were made available. The resultant NREG Program will concentrate on the forestry and wildlife, mining, and environment sectors, and will also address cross-sectoral issues. DPs have made tentative commitments to the NREG Program of about US\$20 million per year, although this amount is subject to change.

23. Although some aspects of the CEA recommendations are currently being financed or will be financed in the near future through the NREG Program, the GoG should explore further opportunities for financing. Opportunities for donor assistance also exist to bolster already-existing initiatives.

Appendix 1. Methodology for Evaluating the Costs of Natural Resource and Environmental Degradation¹¹⁸

I. Introduction

This appendix provides an overview of how the decrease in total social welfare from resource depletion and environmental degradation has been valued in monetary terms. More specifically, this appendix estimates the economic costs of reduced productivity and damaged human health – or in other words, the lost direct use values derived from Ghana’s natural assets. Indirect use values such as ecosystem services, option values from the potential future use of the resource, and sheer existence values are not included in the following valuation.

These direct-use costs were calculated by examining (i) the costs associated with product loss from depletion of and degradation to Ghana’s principal growth-driving natural assets, namely agricultural lands and forest and savanna woodlands, and (ii) from the health costs of outdoor and indoor air pollution and inadequate potable water supply, sanitation, and hygiene. A variety of different valuation methods were used, including the productivity loss approach, the replacement cost approach, the human capital approach (HCA), and the value of a statistical life (VSL) approach.

Ultimately, the yearly value of economic costs from environmental degradation is determined to be US\$730 million or approximately 9.6 percent of Ghana’s GDP of US\$7.62 billion in 2003. This does not mean that if degradation were to be reversed, the country would enjoy additional production worth this amount. Rather, framing the costs in these terms is intended to provide a sense of the magnitude of the degradation, which may spur realization among policymakers and the wider public of the importance of natural resources and the environment. From this new and updated calculation of costs, the *genuine* savings rate – an estimator of Ghana’s true sustainability that accounts for reduction in natural assets – can be evaluated.

The magnitude of these environmental costs and concurrent growth trends provides insight as to the sustainability of Ghana’s current development path and brings much-needed attention to the importance of sustainable management of Ghana’s environment and natural resources.

It is important to note that in many cases the data for Ghana are insufficient or non-existent, such that the calculations are very approximate and leave out certain costs that simply cannot be valued. Furthermore, the cost of depletion of other important natural resources – such as fisheries or wildlife depletion – are not included in the total costs. As such, the following analysis provides only a rough sketch of the total costs of environmental and natural resource depletion. However, even such a ballpark figure can be useful to obtain a sense of the magnitude of the degradation at hand.

Section II provides an overview of how the costs of product loss from damage to the two aforementioned natural resource sectors were calculated. The following section III summarizes the calculations for the costs from mortality and morbidity due to environmental degradation.

¹¹⁸ This appendix pools information from the 2005 Ghana Natural Resources Management and Growth Sustainability Economic and Sector Work (ESW) and the Ghana Cost of Environmental Damage study (2006, Bjorn Larsen).

Finally, section IV analyzes the total costs estimated in sections II and III and their implications for Ghana's genuine savings rate.

II. Lost Productivity from Damage to Natural Resources

The following analysis focuses only on the costs associated with the productivity of Ghana's natural assets, *not* with the ecosystem services they provide. In other words, the loss of services resulting from natural resource depletion – which include water purification, carbon sequestration, nutrient cycling, and recreational uses – are not included in the final valuation of costs. Rather, the following analysis values the costs of overexploiting two of Ghana's most productive natural resource sectors: forests and agricultural soil.

By focusing on products, and not services, the costs of depletion directly affect GDP growth in different ways. For instance, if the depletion is calculated as a harvest over the Maximum Sustainable Yield (MSY) and the product market is formal, such as for timber, then the cost of depletion represents the amount from which the sector contribution to GDP is overestimated—the unsustainable part of sector contribution to GDP. Conversely, if the depletion is calculated as a lost production, such as for agriculture, the cost of depletion represents the potential additional sector contribution to GDP when productivity is restored.

i. Agricultural land

Two methods were used to value the costs of depletion to agricultural land: the productivity loss approach and the nutrient replacement cost approach. The productivity loss approach measures the costs of reduced crop productivity due to soil erosion, while the nutrient replacement cost approach estimates the damage from chemical erosion by valuing the nitrogen, phosphate, and potash (NPK) needed to replace lost nutrients. The costs to degradation of pasture lands, or the costs of compaction and acidification of agricultural soil, are not considered in this analysis due to lack of data. The final estimate of costs of soil degradation is US\$135 million per year in 2003 prices (or 1.6 percent of GDP), which was computed by finding the arithmetic average of the lowest estimates generated by the two approaches. The calculations generated for each method are outlined below.

Productivity loss approach

The underlying assumption of the productivity loss approach in assessing costs of soil degradation is that the on-site cost of soil erosion damage is equal to the lost crop production at market prices. Alternatively, it is the difference in crop yields with and without erosion, multiplied by the unit price of crop, less the costs of production. In the absence of total land use by groupings in the regions, the focus is on land use as a result of cropping activities (soil erosion and crop production).

Several pieces of technical information and relationships are needed to assess costs of soil erosion. The sources from which these are drawn are both formal (official secondary data sources) and informal (information based on expert opinion). Key information used in assessing costs of soil erosion is: (i) quantity of soil lost as a result of cropping activities by regions and agro-ecological zones; (ii) nutrient (NPK) content of soil loss by agro-ecological zones, (iii) market price of NPK; (iv) total land area (TLA) and total cropped area by regions and agro-ecological zones (LA_i); (v) other technical parameters such as marginal crop yield loss per cumulative tons of soil loss per hectare and a Crop Management Factor (“C-factor”). This latter parameter, known as the C-factor, is the ratio of soil loss under a given crop to soil loss from bare cultivated soil; it effectively measures the combined effect of all the interrelated cover and management variables.

First, the regional soil loss per unit area is computed for each crop type (specifically: leguminous crops, and cassava and maize¹¹⁹). This is the product of: the potential soil loss (PSL) per region (which is a function of the soil type particular to each region, namely forest, transition, interior savanna and coastal savanna), the Crop Management Factor, and the fraction of total land for each crop.

Formally: t/ha of soil loss = $[\sum LA_i / TLA] \times PSL_i \times C\text{-Factor}_i$

Note that the estimates of potential soil losses are based on the Universal Soil Loss Equation (USLE)¹²⁰ – a widely-used empirical model which estimates the average annual rate of soil erosion – on bare uncultivated soils and are derived from GIS imagery with additional field observations. Local data was used, when available, for each of the variables in the equation.¹²¹

The crop productivity loss per hectare (resulting from the soil loss, calculated above) is then computed. This is the product of the soil loss per hectare and the marginal yield loss (MYL). Three different values of the MYL are used (in three different scenarios, one for each value of the MYL), as prior studies from Ghana, Nigeria, and Vietnam yielded different results for the MYL. Scenario 1 uses a low value of MYL and Scenario 3 uses a (relatively) high value arising from a much higher cassava MYL from the Ghana study.¹²²

Formally: kg/ha of crop loss = (t/ha of soil loss) x (MYL of that crop)

The total crop productivity loss is simply the crop productivity loss (kg/ha) multiplied by the total cultivated area of each crop. The total value of the productivity loss for each crop is then the wholesale price of each crop (cedis/kg) multiplied by the total kilos of crop lost. Finally, the total value is added up for each crop over all regions, yielding the total value in crop productivity lost over all the regions.

The Total Value of Crop Lost in Scenario 2 and 3 are $\text{¢}786.086$ billion and $\text{¢}8005.56$ billion, respectively. Using an average interbank cedi/US dollar exchange rate of 8,677.81 in 2003 (when these calculations were carried out), these lost values are US\$80.97 million, US\$90.59 million, and US\$922.53 million, respectively. The table below summarizes the total value of crop lost (in US\$ per year) for each scenario.

¹¹⁹ The areas under cocoa for less than four years are included in this mix

¹²⁰ The USLE equation is the following: potential soil lost (in tons/unit area/year) = $R * K * LS * C * P$, where R, K, L, S, C, and P are empirical factors representing the effects of rainfall, soil erodibility, slope length and steepness, crop management factor, and conservation practices, respectively (Jones et al.)

¹²¹ For maximum accuracy, the parameters of the USLE, as well as the variables, should reflect the Ghanaian situation, but estimating a Ghana-specific USLE is a significant project in itself and is a task for further research.

Table 1: The Value of Soil Loss on Crop Value: Lost Crop Production

| | Total Soil Lost per ha (from equation 1) | Total Value of Crop Lost (US\$) Scenario 1 | Total Value of Crop Lost (US\$) Scenario 2 | Total Value of Crop Lost (US\$) Scenario 3 |
|-------|--|--|--|--|
| Total | 70,5307 | 80,971,300 | 90,585,702 | 922,531,983 |

Note: Prices used (2003 market prices). Source: MoFA. SRID. WPI for maize –Cassava mix: ϕ 1587.0/kg; WPI for legumes: ϕ 4048.29/kg; Total Value of GDP in 2003: ϕ 65,262 billion; Total Value Lost / 2003 GDP, Scenario 1: 1.077 percent; Total Value Lost / 2003 GDP Scenario 2: 1.205 percent; Total Value Lost / 2003 GDP Scenario 3: 12.267 percent.

It is useful to state the value of the productivity loss as a percent of GDP for comparative purposes. For each scenario, the percentage of GDP is 1.08 percent, 1.21 percent, and 12.3 percent, respectively. While the study has no data to discount the high marginal cassava yield–soil loss parameter used in scenario 3, the 12.3 percent of GDP loss in a year resulting from soil loss on cropped land appears excessive. Ultimately, the lowest estimate from this approach (US\$80 million) was averaged with the nutrient replacement cost to yield the final calculation of costs of damages to agricultural land.

Nutrient Replacement Cost Approach

The replacement cost approach calculates the cost that would be incurred in order to replace a damaged asset. In terms of crop loss from soil erosion, the damaged assets include nutrient and herbicide losses. The underlying assumption of this approach is based on the principle that on-site cost of soil erosion damage is equal to the value of nutrient lost per tons of eroded soil in terms of fertilizers valued at market prices.

A few pieces of information are necessary to calculate the nutrient replacement cost. The soil loss per agro-ecological zone has already been computed above (see equation 1). Using this information, the nutrient contents in the eroded soil (nitrogen, phosphate, and potash) are then converted to the forms in which they exist in fertilizers (N, P₂O₅, K₂O) by multiplying by constants:

$$\begin{aligned} \text{Kg P/ha} \times 2.29 &= \text{kg P}_2\text{O}_5 / \text{ha} \\ \text{Kg K/ha} \times 1.2 &= \text{kg K}_2\text{O} / \text{ha} \\ \text{Kg N/ha} &= \text{kg N} / \text{ha} \end{aligned}$$

The assumption here is that the form of NPK in the eroded soil is the same as in the compound fertilizer. It is further assumed that the NPK lost is, in the conventional fertilizer standards, in the form of 15-15-15 – that is to say, a bag of fertilizer contains 15 percent N, 15 percent K, and 15 percent P. A 50 kg bag of fertilizer then contains 7.5 kg of N, 7.5 kg of P and 7.5 kg of K with a total amount of nutrients in the bag of 22.5 kg NPK. This can be used as a conversion factor: 22.5 kg NPK / 50 kg fertilizer yields .45 kg NPK / kg fertilizer. So the total amount of nutrients lost per hectare has a corresponding amount of Z kg of fertilizer “lost” per hectare, which can be found using this conversion factor. One ton per hectare of soil lost has a corresponding Z lost kg of fertilizer (or more precisely, nutrient-lost-equivalent kg of fertilizer).

Multiplying Z by the tons of soil lost, summing over all the zones, and multiplying by the market price of fertilizer yields the total value of nutrient lost due to soil degradation.

Table 2: The Value of Nutrient Loss in Terms of NPK, 2003

| A. Agro- Ecological Zone | B. Computed Soil Loss t/ha | C. Total Area Cropped (ha) | D. No. of 50 kg bags of NPK lost per ton of soil lost/ha | E. Value of NPK needed to replace lost nutrients (in billions of cedis): B * C * D *(Price of 50 kg NPK bags) = ¢150,000 in 2003 | F. Value of NPK needed to replace lost nutrients (in US\$): E/8,677.81 |
|-----------------------------------|-------------------------------------|-------------------------------------|---|--|--|
| Forest | 0.08974 | 1,669,521.6 | 5.785 | 130.008 | 14,981,751 |
| Transition | 1.8227 | 522,822.4 | 4.002 | 573.3 | 66,065,055 |
| Interior Savanna | 1.5316 | 1,518,900 | 2.4 | 837.352 | 96,512,829 |
| Coastal Savanna | 0.12243 | 24050 | 3.348 | 1.478 | 170,400 |
| Total Costs | | | | 1,542.138 | 177,730,037 |

From Table 2, the costs of NPK lost as a result of erosion-driven soil loss on cropped land in 2003 are estimated as ¢1542.3075 billion. Using the average interbank cedi/US dollar exchange rate of 8,677.81 in 2003, the lost value is US\$177.73 million.

Overall soil degradation cost

The central estimate is that Ghana loses approximately ¢1,170 billion or US\$135 million each year, or 1.7 percent of GDP, to soil erosion as a result of current farming practices. As mentioned above, this is an average from the lowest estimates generated by the productivity loss and replacement cost methodologies used to assess the cost of soil erosion as a result of crop production.

The 1.7 percent of GDP estimate for the cost of soil degradation is somewhat conservative as it only captures one aspect of soil degradation: water erosion, and only that for crop land. Erosion from wind, damage to soil structure (e.g., compaction), and chemical balance (e.g., acidification) impose significant on-site economic costs— (see Scher, 1999), but these have been ignored due to lack of data. The economic cost of degradation of pasture lands is also excluded.

ii. Timber Depletion

The cost of timber depletion can easily and accurately be determined using the timber rent. Although this cost will vary according to the species and the year of extraction, general assumptions can be made to come up with an indicative cost of depletion for a given year. In so doing, it is assumed that this timber rent value is generally applicable across all forest species.

In forestry economics, economic rent is widely referred to as the stumpage value: the international timber price minus all factor costs incurred in extraction, including a normal return to capital but not taxes and royalties. For example, if one cubic meter of timber can be sold for US\$20 and costs a total of US\$12 to cut and bring to market, a rent of US\$8 would be assigned to each cubic meter of timber. Under ideal market conditions, this stumpage value of US\$8/m³ would be equivalent to the present value of the expected future net income that one cubic meter of timber would yield. Thus, the stumpage value would be the maximum amount concessionaires would pay for harvesting rights (Repetto et al., 1989). However, since the rent capture rates are very low in Ghana, stumpage value must be estimated by subtracting costs of extraction and transportation from the export value of timber (Baytas and Rezvani, 2003). The export price is

measured by the free on board (FOB) export unit value, which is the ratio of gross export revenue to the volume of log exports. One problem with this calculation is that the export value of round-timber, for example, does not exist since the export ban in 1996. At this time, all round-timber were limited to the domestic market. In such cases, import parity of round logs and domestic maximum willingness to pay are calculated. This means that even if log exports are banned, mill gate prices for logs assume internationally competitive log prices at the farthest point domestic logs can reach and the maximum price domestic millers are willing to pay with the log ban in place. The timber rent calculated under international competition is US\$102/m³ (see Table 3).

Formally, the formulas for calculating the cost of depletion are as follow:

Timber rent for timber logs = (US\$/m³) – (all extraction and transport costs/m³)

Cost of depletion = (timber rent from (3)) x (volume above maximum sustainable yield)

Table 3: Estimating Timber Rent in Ghana (US\$)

| | |
|--|------------|
| Parity pricing of timber, US\$/m ³ | 246.88 |
| Exportation and transport costs | |
| Ins. & freight | 80.00 |
| Port/bank charges | 8.34 |
| TIDD charges | 3.60 |
| Transport/handling | 5.49 |
| Transport to forest gate | 24.00 |
| Harvesting/loading cost (From ITTO study) | 7.92 |
| Social responsibility costs (nonstatutory) | 8.00 |
| Forest operators margin | 7.50 |
| Calculating timber rent | |
| Timber rent = price – all exportation & transport costs | US\$102.03 |

Given the above assumptions, the average cost of depletion was calculated assuming an average level of depletion (above the annual allowable cut, or AAC) of 2.65 million m³/yr (this is the average depletion above sustainable levels between 1990 and 1996, assuming an AAC level of 1 million), and an average timber rent of US \$102/m³ (as calculated in Table 3). The analysis shows that the average cost of forest depletion, using the formula above, is US\$270 million/year (i.e. 2.65 million m³/yr x of US\$ 102 per m³), or 3.5% of GDP in 2003.

In contrast to this, the 2004 World Bank *Little Green Data Book* calculates net forest depletion to be 2.5 percent of Gross National Product (GNP), which amounts to an approximate depletion cost of US\$147 million per year. The difference between these two estimates is due to the inclusion of illegal forest harvest accounting in the US\$ 270 million/year estimate.

iii. Total cost of natural resource depletion

The total cost of forestry and agricultural land degradation is US\$405 million, or 5.3% of GDP. This represents over a quarter of Ghana's US\$1.5 billion annual Official Development Assistance (ODA) total. This figure is a conservative estimate because some asset products have not

generated enough data to be included in the calculation, other important natural assets were not included, and none of the ecosystem services provided by the resources were assessed.

The cost of depletion for these two natural assets is high in both GDP terms and in its effect on the livelihood of the population. The large majority of this cost threatens growth sustainability because associated flows of products and services come from the natural capital itself and not its sustainable yield. This section has valued the costs of natural resource degradation in Ghana; the following section examines the health costs associated environmental degradation.

II. Health Costs from Environmental Degradation

This section values the annual economic costs of morbidity and mortality in Ghana due to urban air pollution from particulate matter, indoor air pollution, and inadequate potable water supply, sanitation, and hygiene. A distinction between financial and economic costs should be made here: whereas financial costs capture only lost value in terms of nominal market prices, economic costs represent the real underlying cost to society of environmental degradation and the resultant impacts on public health.

The mean estimated annual cost of environmental health effects is presented in Figure 2.1, totaling nearly 3000 billion Cedi per year (US \$330 million).¹²³ The highest cost is from inadequate water supply, sanitation and hygiene (1620 billion Cedi), followed by indoor air pollution (1040 billion Cedi) and urban outdoor air pollution (270 billion Cedi).

i. Outdoor air pollution

There is substantial research evidence from around the world that outdoor urban air pollution has significant negative impacts on public health and results in premature deaths, chronic bronchitis, and respiratory disorders. The air pollutant that has shown the strongest association with these health endpoints is particulate matter (PM)¹²⁴, and especially particulates of less than 10 microns in diameter (PM 10) or smaller. Research in the United States in the 1990s and more recently by Pope et al (2002) provides strong evidence that it is even smaller particulates (PM 2.5) that have the largest health effects. The gaseous pollutants (SO₂, NO_x, CO, and ozone) are generally not thought to be as damaging as particulates. However, SO₂ and NO_x may have important health consequences because they can react with other substances in the atmosphere to form particulates.

The focus of this section is the health effects of fine particulate matter (PM10 and PM2.5). There are three main steps to quantifying the health impacts from air pollution. First, the pollutant needs to be identified and its ambient concentration measured. Second, the number of people exposed to that pollutant and its concentration needs to be calculated. Third, the health impacts from this exposure should be estimated based on epidemiological assessments. Once the health impacts are quantified, the value of this damage can be estimated.

Baseline Data

About 45 percent or 9.5 million people live in urban areas in Ghana (World Bank 2005), of which an estimated 3.5 million live in cities with more than 90,000 inhabitants. The population in Greater Accra alone is more than 2 million. Estimated cost of urban air pollution is for the cities with more than 90 thousand inhabitants.

Ambient monitoring data of PM 10 from 21 sites in Accra during the period of December 2002 to July 2003 was used to calculate the baseline. PM 10 concentrations range from 45 to 115 ug/m³,

¹²³ Using an exchange rate of 8900 Cedi per US dollar as of Dec 31, 2004.

¹²⁴ Also called suspended particulates.

with an arithmetic mean of about 80 $\mu\text{g}/\text{m}^3$. An annual average of 80 $\mu\text{g}/\text{m}^3$ is therefore applied to estimate health effects, which is a conservative estimate.

Systematic monitoring data of PM 10 are not available for cities other than Accra. Excluding them from estimation of health effects of PM would however represent a gross understatement of health effects in Ghana. PM 10 levels in these cities could be higher or lower than in Accra depending on emission sources, climatic factors and city population densities. In the absence of quantitative guidance as to the levels in these cities, it is assumed that population weighted annual concentration level is on average 80 $\mu\text{g}/\text{m}^3$, or the same as applied to Accra.

Annual average concentrations of PM 2.5 and PM 10 applied to the cities in Ghana are presented in Table 12. A PM2.5/PM 10 ratio of 0.5 is used to convert PM 10 to PM 2.5 in the absence of systematic PM 2.5 monitoring data. A lower threshold value of 7.5 $\mu\text{g}/\text{m}^3$ of PM 2.5 is applied, below which there is insufficient evidence of detectable health effects (WHO 2002b). The PM 2.5/PM 10 ratio of 0.5 falls between the ratios observed in agricultural states and states with more industry and traffic in the United States. This ratio is influenced by types of emission sources and fugitive sources.

Table 13: Annual average PM concentrations applied to cities in Ghana

| | Annual values |
|--|---------------|
| PM 10 concentrations ($\mu\text{g}/\text{m}^3$) | 80 |
| PM 2.5/PM 10 ratio | 0.5 |
| PM 2.5 concentrations ($\mu\text{g}/\text{m}^3$) | 40 |
| Lower threshold value of PM 2.5 ($\mu\text{g}/\text{m}^3$) | 7.5 |

Dose Response Coefficients

Based on the current status of worldwide research, the risk ratios, or dose response coefficients from Pope et al (2002) are likely to be the best available evidence of the mortality effects of ambient particulate pollution (PM 2.5). These coefficients were applied by the WHO in the World Health Report 2002, which provided a global estimate of the health effects of environmental risk factors. While the mortality effects are based on PM 2.5, the morbidity effects assessed in most worldwide studies are based on PM 10. Dose response coefficients from Ostro (1994) and Abbey et al (1995) have been applied for morbidity effects. Ostro (1994) reflects a review of worldwide studies, and Abbey et al (1995) provides estimates of chronic bronchitis associated with particulates (PM 10). The mortality and morbidity coefficients are presented in Table 15.

Table 14: Urban Air Pollution Dose-Response Coefficients

| Annual Health Effect | Dose-response coefficient | Per 1 $\mu\text{g}/\text{m}^3$ ambient concentration |
|---|---------------------------|--|
| Mortality (percent change in cardiopulmonary and lung cancer mortality) | 0.8% | PM 2.5 |
| Chronic bronchitis in adults (percent change in annual incidence) | 0.9% | PM 10 |
| Respiratory hospital admissions (per 100,000 population) | 1.2 | PM 10 |
| Emergency room visits (per 100,000 population) | 24 | PM 10 |
| Restricted activity days (per 100,000 adults) | 5,750 | PM 10 |
| Lower respiratory illness in children (per 100,000 children) | 169 | PM 10 |
| Respiratory symptoms (per 100,000 adults) | 18,300 | PM 10 |

Source: Pope et al (2002) for the mortality coefficient. Ostro (1994) and Abbey et al (1995) for the morbidity coefficients.

Pope et al (2002) utilized ambient air quality data from metropolitan areas across the United States for the two periods 1979-83 and 1999-2000, and information on certified causes of

mortality of adults in the American Cancer Society (ACS) database over a period of 16 years. The ACS database contained individual-specific information for more than 1 million adults, which was obtained through questionnaires. The study could therefore control for a large set of factors that may also affect variations in mortality rates across metropolitan areas, such as age, smoking behavior, education, marital status, body weight, occupational risk factors, and dietary indices.

The study found a statistically significant relationship between levels of PM 2.5 and mortality rates, controlling for all the factors discussed above. All-cause mortality was found to increase by 4-6 percent for every 10 ug/m³ increase in PM 2.5. The increase in cardiopulmonary mortality was 6-9 percent, and 8-14 percent for lung cancer. No statistically significant relationship was found between levels of PM 2.5 and all other causes of mortality.

The share of cardiopulmonary and lung cancer deaths in total mortality varies sometimes substantially across countries. It may therefore reasonably be expected that the risk ratios for cardiopulmonary and lung cancer mortality provide more reliable estimates of mortality from PM 2.5 than the risk ratio for all-cause mortality when the risk ratios are applied to countries other than the United States. The mortality coefficient in Table 14 is therefore a combination of the cardiopulmonary and lung cancer mortality risk ratios in Table 15.

Table 15: Mortality Risk Associated with a 10 ug/m³ Change in PM 2.5

| Cause of Mortality | Adjusted Relative Risk Ratios (RR) | | |
|--------------------|------------------------------------|-----------|---------|
| | 1979-1983 | 1999-2000 | Average |
| All-cause | 1.04 | 1.06 | 1.06 |
| Cardiopulmonary | 1.06 | 1.08 | 1.09 |
| Lung cancer | 1.08 | 1.13 | 1.14 |
| All other cause | 1.01 | 1.01 | 1.01 |

Reproduced from Pope et al (2002).

In order to apply the mortality coefficient in Table 14 to estimate mortality from urban outdoor air pollution in Ghana, baseline data on cardiopulmonary and lung cancer deaths are required. The World Bank (2005) reports a crude mortality rate in Ghana of 12.7 per 1000 population, and WHO (2002a) reports that cardiopulmonary and lung cancer mortality in the age group over 30 years is 15 percent of total deaths (all ages) in the region to which Ghana belongs.¹²⁵ These mortality data were applied to the cities in Ghana.

An estimate of annual incidence of chronic bronchitis (CB) is required in order to apply the CB coefficient in Table 14. In the absence of CB incidence data for Ghana, chronic obstructive pulmonary disease (COPD) incidence for the West African region is therefore applied to Ghana (WHO 2002a and Shibuya et al 2001). The COPD rate is converted to a rate for adults (population over 15 years of age) and it is assumed that CB is 90 percent of COPD.

Table 16: Baseline Mortality Estimates for Ghana

| | Rates |
|---|-------|
| Crude mortality rate per 1000 population in 2002 (World Bank 2005) | 12.7 |
| Cardiopulmonary and Lung Cancer mortality (percent of crude mortality) (WHO 2002)* | 15% |
| Chronic Obstructive Pulmonary Disease incidence (per 100,000 population) (WHO 2002) | 33 |

* CP and LP mortality in age group over 30 years as a percentage of total deaths (all ages).

¹²⁵ Pope et al (2002) estimates mortality from PM 2.5 for the age group over 30 years. Baseline mortality therefore needs to be for this age group.

Other morbidity health endpoints considered are hospital admissions of patients with respiratory problems, emergency room visits (or hospital out-patient visits), restricted activity days, lower respiratory infections in children, and respiratory symptoms. These are the most common health endpoints considered in most of the worldwide studies on air pollution. The coefficients are expressed as cases per 100,000 in the absence of incidence data for Ghana. It should be noted that it would be preferable to have incidence data and use coefficients that reflect percentage change in incidence. Increases in asthma attacks among asthmatics have also been related to air pollution in many studies. This however requires data on the percentage of the population that are asthmatic and frequency of asthma attacks, which is not readily available for Ghana.

The health effects of air pollution can be converted to disability adjusted life years (DALYs) to facilitate a comparison to health effects from other environmental risk factors. DALY is a commonly-used measure used to assess the overall impact of premature morbidity and mortality by unifying them into one single measure. DALYs per 10 thousand cases of various health endpoints are presented in Table 17. Table 18 presents the disability weights and average duration of illness that are used in this appendix to calculate the DALYs as presented in Table 17. The weights for lower respiratory illness (LRI) and chronic bronchitis (CB) are at the lower end of values that have been applied in the literature. Disability weights for the other morbidity endpoints are not readily available, and are estimates by Larsen (2004a,b) based on weights for other comparable illnesses. Average duration of CB is estimated based on age distribution in Ghana and age-specific CB incidence for the West African region in Shibuya et al (2001). Average duration of illness for the other health end-points is from Larsen (2004a, b).

Table 17: DALYs for Health Effects

| Health Effect | DALYs lost per 10,000 cases |
|---------------------------------------|-----------------------------|
| Mortality | 90,000 |
| Chronic Bronchitis (adults) | 20,000 |
| Respiratory hospital admissions | 160 |
| Emergency Room visits | 45 |
| Restricted activity days (adults) | 3 |
| Lower respiratory illness in children | 65 |
| Respiratory symptoms (adults) | 0.75 |

Note: DALYs are calculated using a discount rate of 3 percent and full age weighting based on WHO tables.

Estimates of DALYs for mortality and chronic bronchitis (COPD) is based on WHO (2002a) for the West Africa region. DALYs for the other morbidity end-points are from Larsen (2004a,b).

Table 18: Calculation of DALYs per Case of Health Effects

| | Disability Weight | Average Duration of Illness |
|--------------------------------------|-------------------|-----------------------------|
| Mortality | 1.0 | - |
| Lower respiratory illness – children | 0.28 | 10 days |
| Respiratory symptoms – Adults | 0.05 | 0.5 days |
| Restricted activity days – Adults | 0.1 | 1 day |
| Emergency Room Visits | 0.30 | 5 days |
| Hospital Admissions | 0.40 | 14 days* |
| Chronic Bronchitis | 0.2 | 17 years |

* Includes days of hospitalization and recovery period after hospitalization.

Estimated Health Effects

Estimated annual health effects of ambient particulate outdoor air pollution in Ghana are presented in Table 19. Urban air particulate pollution is estimated to cause nearly 1400 premature deaths annually. Estimated new cases of chronic bronchitis are about 740 per year. Annual hospitalizations due to pollution are estimated at 3,300, and emergency room visits/outpatient hospitalizations at 65 thousand per year. Cases of less severe health impacts are also presented in Table 19. In terms of annual DALYs lost, mortality accounts for an estimated 60 percent, chronic bronchitis around 7 percent, restricted activity days (RADs) for 14 percent, lower respiratory illness in children for 6 percent, and respiratory symptoms for 11 percent.

Table 19: Estimated Annual Health Effects of Urban Outdoor Air Pollution

| Health end-points | Total cases | Total DALYs |
|--|-------------|--------------|
| Premature mortality | 1,365 | 12287 |
| Chronic bronchitis | 743 | 1485 |
| Hospital admissions | 3,334 | 53 |
| Emergency room visits/Outpatient hospital visits | 65,402 | 294 |
| Restricted activity days | 9,161,857 | 2749 |
| Lower respiratory illness in children | 200,257 | 1302 |
| Respiratory symptoms | 29,158,607 | 2187 |
| TOTAL | | 20357 |

Estimated Cost of Health Effects

Two distinct methods of valuation of mortality are commonly used by economists to estimate the social cost of premature death, i.e., the human capital approach (HCA) and the value of statistical life (VSL). The first method was dominant in the past but has increasingly been replaced by the VSL approach in the last couple of decades. In this valuation, the HCA has been applied as a lower bound and VSL as a higher bound in estimating the cost of adult mortality. For child mortality, the HCA has been applied.

Human Capital Approach

The HCA is based on the economic contribution of an individual to society over the lifetime of the individual. Death involves an economic loss that is approximated by the loss of all future income of the individual. Future income is discounted to reflect its value at the time of death. The discount rate commonly applied is the rate of time preference. Thus the social cost of mortality, according to the HCA, is the discounted future income of an individual at the time of death. If the risk of death, or mortality risk, is evenly distributed across income groups, average expected future income is applied to calculate the social cost of death. Mathematically, the present value of future income is expressed as follows:

$$PV_0(I) = \sum_{i=k}^{i=n} I_0(1+g)^i / (1+r)^i$$

where $PV_0(I)$ is the present value of income (I) in year 0 (year of death), g is annual growth in real income, and r is the discount rate (rate of time preference). As can be seen from the equation, the equation allows for income to start from year k and end in year n . In the case of children, i is within the 20 – 65 range, assuming the lifetime income on average starts at age 20 and ends at retirement at age 65. An annual growth of real income of 2 percent and a discount rate of 3 percent have been applied to Ghana in this report.

Several important issues are often raised regarding the HCA. The first issue concerns the application of this valuation approach to individuals that do not participate in the economy, i.e., to individuals not having an income, such as the elderly, family members taking care of the home,

and children. One may think of an extension of the HCA that recognizes the value of non-paid household work at the same rate as the average income earner, or at a rate equal to the cost of hiring a household helper. In this case, the HCA can be applied to the death of non-income earners and children (whether or not children will become income earners or take care of the home during their adult life). In the case of the elderly, the HCA would not assign an economic value to old individuals that have either retired from the workforce or do not make significant contributions to household work. This obviously is a serious shortcoming of the HCA approach.

The second issue regarding the HCA is that the social cost of mortality is limited to the economic contribution of an individual, or value of household work if the individual takes care of the home. Alternative approaches to the valuation of mortality, or social cost of mortality, have therefore been developed and increasingly been applied in the past couple of decades. These approaches employ a concept or measure called the value of a statistical life (VSL), which nowadays is much more widely used in public policy than the HCA approach.

The estimated cost of mortality in Ghana based on HCA is presented in Table 21. Average annual income is approximated by GDP per capita, corresponding to around 3.65 million Cedi per year in 2004. The estimates are from the equation above.

Table 20: Cost of Mortality (per Death) using HCA

| | Average Number of Years Lost | Million Cedi |
|-------------------------------------|------------------------------|--------------|
| Adults: | | |
| Mortality from Urban Air Pollution | 9 | 33 |
| Mortality from Indoor Air Pollution | 7.5 | 27 |
| Children: | | |
| Mortality from Indoor Air Pollution | 65 | 113 |
| Mortality from Diarrheal Illness | 65 | 113 |

Value of a Statistical Life (VSL) Approach

While the HCA involves valuation of the death of an individual, VSL is based on valuation of mortality risk. Everyone in society is constantly facing a certain risk of dying. Examples of such risks are occupational fatality risk, risk of traffic accident fatality, and environmental mortality risks. It has been observed that individuals adjust their behavior and decisions in relation to such risks. For instance, individuals demand a higher wage (a wage premium) for a job that involves a higher than average occupational risk of fatal accident, individuals may purchase safety equipment to reduce the risk of death, and/or individuals and families may be willing to pay a premium or higher rent for properties (land and buildings) in a cleaner and less polluted neighborhood or city.

Through the observation of individuals' choices and willingness to pay for reducing mortality risk (or minimum amounts that individuals require to accept a higher mortality risk), it is possible to measure or estimate the value to society of reducing mortality risk, or, equivalently, measure the social cost of a particular mortality risk. For instance, it may be observed that a certain health hazard has a mortality risk of 1/10 000. This means that one individual dies every year (on average) for every 10 000 individuals. If each individual on average is willing to pay 10,000 Cedi per year for eliminating this mortality risk, then every 10 000 individuals are collectively willing to pay 100 million Cedi per year. This amount is the VSL.

Mathematically it can be expressed as follows:

$$VSL = WTP_{ave} * 1 / R$$

where WTP_{ave} is the average willingness-to-pay (Cedis per year) per individual for a mortality risk reduction of magnitude R . In the illustration above, $R=1/10,000$ (or $R=0.0001$) and $WTP_{ave}= 10,000$ Cedi. Thus, if 10 individuals die each year from the health risk illustrated above, the cost to society is $10 * VSL = 10 * 100$ million Cedi = 1 billion Cedi .

The main approaches to estimating VSL are through revealed preferences and stated preferences. Most of the studies of revealed preferences are hedonic wage studies, which estimate labor market wage differentials associated with differences in occupational mortality risk. Most of the stated preference studies rely on contingent valuation methods (CVM), which in various forms ask individuals about their willingness-to-pay (WTP) for mortality risk reduction. Mrozek and Taylor (2002) provide a meta-analysis of VSL estimates from labor market studies from around the world. They identify a “best-practice” sample and control for industry characteristics other than occupational mortality risk that also affect inter-industry wage differentials. The study concludes that a range for VSL of US \$1.5-2.5 million can be reasonably inferred from labor market studies when “best-practice” assumptions are invoked. It should be noted that the VSL range inferred by Mrozek and Taylor is substantially lower than average VSL estimated in other meta-analysis studies. Some of these studies identify a mean VSL on the order of US \$6 million. However, the contribution by Mrozek and Taylor to the meta-analysis literature is their careful assessment of a large sample of VSL estimates and inclusion of industry control variables to better assess wage differentials associated with mortality risk.

However, there are no studies of VSL conducted in Ghana. This implies that values have to be transferred from studies in other countries. The overwhelming majority of VSL studies have been conducted in countries with substantially higher income level than in Ghana. VSL estimates from these countries must therefore be adjusted to Ghana. One commonly used approach in benefit transfer is to apply income elasticities. Viscusi and Aldi (2002) estimate an income elasticity of VSL in the range of 0.5-0.6 from a large sample of VSL studies. The range in income elasticity, however, is influenced by three unusually high estimates of VSL from labor market data from one state in India. Leaving out these three studies provides an income elasticity of about 0.80.

However, the most appropriate income elasticity to apply to middle-income countries, such as Ghana, remains uncertain. The reason for this is that the income level in Ghana falls far outside the range of income in the sample of countries from which the income elasticities of VSL is estimated in the empirical literature. A prudent approach might be to apply an elasticity of 1.0 in order to reduce the risk of overstating the cost of mortality in Ghana.

Table 21: Estimated Value of Statistical Life in Ghana

| | "High" | "Low" | Source: |
|--|--------|--------|--------------------------|
| Average VSL in high-income countries (million US \$) | 2.5 | 1.5 | Mrozek and Taylor (2002) |
| Average GDP/capita in high-income countries (US \$) | 30 000 | 30 000 | World Bank* |
| GDP per capita in Ghana (US \$ in 2004) | 410 | 410 | World Bank (2005) |
| Income elasticity | 1.0 | 1.0 | |
| Estimated VSL in Ghana (million Cedi)** | 304 | 182 | Benefit transfer |

* Weighted average GDP per capita, based on the sample of countries in Mrozek and Taylor (2002). ** Using an exchange rate of 8900 Cedi per US\$ in 2004.

Table 21 presents the VSL for Ghana from benefit transfer based on the range of VSL reported by Mrozek and Taylor (2002) and an income elasticity of 1.0. These figures are substantially higher than the ones from the HCA.

Costs of Morbidity

A measure of the welfare cost of morbidity is often based on the willingness-to-pay (WTP) to avoid or reduce the risk of illness. This measure is often found to be several times higher than the cost of medical treatment and the value of time losses (Cropper and Oates 1992), and reflect the value that individuals place on avoiding pain and discomfort. However, there is not a sufficient number of WTP studies from Ghana. For this reason, the cost-of illness (COI) approach (mainly medical cost and value of time losses) has been supplemented by a proxy for the cost of pain and discomfort in this report. The proxy applied is valuation of DALYs at GDP per capita. This is included in the cost of morbidity in Table 22. Table 23 presents the estimated cost per case of mortality and illness (health endpoint). The figures in the column with total cost per case were applied to the estimated cases in Table 19 to arrive at the total annual costs in Table 22. Table 23 also presents disaggregated cost per case of illness (medical cost and time losses) and DALYs valued at GDP per capita. For most of the health end-points, the cost of illness is substantially higher than the proxy for pain and discomfort. The main exception is chronic bronchitis, which often has a severe effect on people's life without necessarily causing substantial medical treatment cost or time losses.

Table 22: Estimated Annual Cost of Health Impacts in billions of cedis

| Health categories | Total annual cost* (millions US\$) | Percent of total cost* (mean) |
|--|------------------------------------|-------------------------------|
| Mortality: | 45 – 355 (5 – 40) | 70% |
| Morbidity: | | |
| Chronic bronchitis | 6.6 (7.3) | 2% |
| Hospital admissions | 3.6 (0.4) | 1% |
| Emergency room visits/ Outpatient hospital visits | 5.4 (0.6) | 2% |
| Restricted activity days (adults) | 39.6 (4.4) | 15% |
| Lower respiratory illness in children | 17.9 (2) | 7% |
| Respiratory symptoms (adults) | 8.0 (.9) | 3% |
| Total cost of morbidity | 80 (9) | 30% |
| TOTAL COST (Mortality and morbidity) | 125 – 415 (13.9 – 46) | 100% |

Table 23: Estimated Unit Cost by Health End-Point

| Health categories | Total Cost Per Case (000 Cedi) | Cost-of-Illness Per Case (000 Cedi) | Cost of DALYs Per Case (000 Cedi) |
|--|--------------------------------|-------------------------------------|-----------------------------------|
| Mortality | 33-245 | - | - |
| Chronic bronchitis | 8,903 | 1,597 | 7,306 |
| Hospital admissions | 1,087 | 1,029 | 58 |
| Emergency room visits/Outpatient hospital visits | 82 | 66 | 16 |
| Restricted activity days (adults) | 4 | 3 | 1 |
| Lower respiratory illness in children | 90 | 66 | 24 |
| Respiratory symptoms (adults) | 0.3 | - | 0.3 |

Table 24 provides the baseline data that were used to estimate the cost per case of illness. Some of these data require explanation. The value of time for adults is based on urban wages. Economists commonly apply a range of 50-100 percent of wage rates to reflect the value of time. The rate of 13,000 Cedi per day is 75 percent of average urban wages in Ghana. This rate has been applied for both income earning and non-income earning individuals. There are two reasons for applying the rate to non-income earning individuals. First, most non-income earning adult individuals provide a household function that has a value. Second, there is an opportunity cost to the time of non-income earning individuals, because they could choose to join the paid labor force.

Table 24: Baseline Data for Cost Estimation

| | Baseline | Source: |
|--|-----------------|--|
| <i>Cost Data for All Health End-Points:</i> | | |
| Cost of hospitalization (000 Cedi per day) | 150 | Per consultations with medical service providers, and health authorities |
| Cost of emergency visit (000 Cedi) - urban | 40 | |
| Cost of doctor visit (000 Cedi) (mainly private doctors) - urban | 40 | |
| Value of time lost to illness (000 Cedi per day) | 13 | 75% of urban wages in Ghana |
| <i>Chronic Bronchitis (CB):</i> | | |
| Average duration of Illness (years) | 17 | Based on Shibuya et al (2001) |
| Percent of CB patients being hospitalized per year | 1.5% | From Schulman et al (2001) and Niederman et al (1999) |
| Average length of hospitalization (days) | 10 | |
| Average number of doctor visits per CB patient per year | 1 | |
| Percent of CB patients with an emergency doctor/hospital outpatient visit per year | 15% | |
| Estimated lost work days (including household work days) per year per CB patient | 2.6 | Estimated based on frequency of doctor visits, emergency visits, and hospitalization |
| Annual real increases in economic cost of health services and value of time (real wages) | 2% | Estimate |
| Annual discount rate | 3% | Applied by WHO for health effects |
| <i>Hospital Admissions:</i> | | |
| Average length of hospitalization (days) | 6 | Estimates |
| Average number of days lost to illness (after hospitalization) | 4 | |
| <i>Emergency Room Visits:</i> | | |
| Average number of days lost to illness | 2 | |
| <i>Restricted Activity Days:</i> | | |
| Average number of days of illness (per 10 cases) | 2.5 | |
| <i>Lower Respiratory Illness in Children:</i> | | |
| Number of doctor visits | 1 | |
| Total time of care giving by adult (days) | 1 | Estimated at 1-2 hours per day |

There is very little information about the frequency of doctor visits, emergency visits and hospitalization for CB patients in any country in the world. Schulman et al (2001) and Niederman et al (1999) provide some information on this from the United States and Europe. Figures derived from these studies have been applied to Ghana. Estimated lost work days per year is based on

frequency of estimated medical treatment plus an additional 7 days for each hospitalization and one extra day for each doctor and emergency visit. These days are added to reflect time needed for recovery from illness.

Figures derived from these studies have been applied to Ghana. Estimated lost workdays per year are based on frequency of estimated medical treatment plus an additional 7 days for each hospitalization and one extra day for each doctor and emergency visits. These days are added to reflect time needed for recovery from illness.

To estimate the cost of a new case of CB, the medical cost and value of time losses have been discounted over a 17-year average duration of illness. An annual real increase of 2 percent in medical cost and value of time has been applied to reflect an average expected increase in annual labor productivity and real wages. The costs are discounted at 3 percent per year, a rate commonly applied by WHO for health effects.

Overall, the total estimated annual cost of urban air pollution health effects is presented in Table 25.

Table 25: Annual Cost of Urban Outdoor Air Pollution for Three Scenarios

| | Annual Average PM 10 | Annual Cost (Millions US\$) | | |
|--------------|--|-----------------------------|------|--------|
| | | “Low” | Mean | “High” |
| “Lower” case | Accra: 80 ug/m ³ Other cities: 60 ug/m ³ | 12.2 | 26.0 | 40.0 |
| Base Case | Accra: 80 ug/m ³ Other cities: 80 ug/m ³ | 13.9 | 30.0 | 46.0 |
| “Upper” Case | Accra: 100 ug/m ³ Other cities: 80 ug/m ³ | 15.5 | 33.3 | 51.0 |

Note: Accra does here not include Tema and Teshie. Tema and Teshie are included in “Other cities.”

Sensitivity Analysis

As the annual average concentrations of PM 10 in Accra and other cities are quite uncertain, a sensitivity analysis of estimated annual cost of PM pollution is presented in Table 22. The base case, presented above, is applying an annual level of 80 ug/m³ of PM 10 to all the cities in Table 3.1. The “lower” case applies 60 ug/m³ of PM 10 to the cities other than Accra, and the “upper” case applies 100 ug/m³ of PM 10 to Accra. The difference in annual cost in the three cases is not very large, ranging from a mean estimate of 235 to 300 billion Cedi. The highest cost estimate is 460 billion Cedi, or 0.6 percent of GDP, which reflects the use of VSL for mortality valuation and 100 ug/m³ of PM 10 in Accra. This is still substantially below the estimated cost of indoor air pollution or inadequate water supply, sanitation and hygiene.

ii. Water Supply, Sanitation, and Hygiene

Baseline Health Data

Baseline health data for estimating the health effects of inadequate water supply, sanitation and hygiene are presented in Table 26 below. The Global Burden of Disease 2002 (WHO 2002b) indicates that 15 percent of under-5 child mortality could be from diarrheal illness in Ghana. This is the rate in the West African region to which Ghana belongs, and is applied to an under-5 child mortality rate of 83 per 1000 live births in urban areas and 105 in rural areas.

The urban and rural mortality rates are estimated for 2004 by adjusting the preceding 5 years' rural and urban mortality rates reported in the Ghana DHS 2003 in proportion to the difference in the national rate from the Ghana Demographic Health Survey 2003 and the national rate in 2004 reported by World Bank (2005).

For diarrheal morbidity, it is very difficult or practically impossible to identify all cases of illness. The main reason is that a substantial share of cases is not treated or does not require treatment at health facilities, and is therefore never recorded. A second reason is that cases treated by private doctors or clinics are often not reported to public health authorities. Household surveys therefore provide the most reliable indicator of total cases of diarrheal illness. Most household surveys, however, contain only information on diarrheal illness in children. Moreover, the surveys only reflect diarrheal prevalence at the time of the survey. As there is often high variation in diarrheal prevalence across seasons of the year, extrapolation to an annual average will result in either an over- or underestimate of total annual cases. Correcting this bias is often difficult without knowledge of seasonal variations.

The Ghana Demographic and Health Survey 2003 (DHS 2003) provides data on diarrheal prevalence in children under the age of five years. It reports a diarrheal prevalence (preceding two weeks) rate of 16.1 percent in rural areas and 13.6 percent in urban areas. This rate is used to estimate annual cases per child under-5, and then total annual cases in all children under-5. The procedure applied is to multiply the two-week prevalence rate by 52/2.5 to arrive at an approximation of the annual cases of per child.

The Ghana DHS 2003 household survey does not (nor does any other household survey in Ghana) provide information on diarrheal illness in the population above 5 years of age. International evidence indicates that diarrheal incidence in children under-5 is on the order of 5 times higher than the incidence in the population over 5 years of age (Larsen 2004a,b).

Table 26 also presents DALYs per cases of diarrheal illness, which are used to estimate the number of DALYs lost to inadequate water supply, sanitation and hygiene. The disability weight for diarrheal morbidity is 0.119 for children under-5 and 0.086 for the rest of the population, and the duration of illness is assumed to be the same (i.e., 4 days). However, the DALYs per 100 thousand cases of diarrheal illness are much higher for the population over 5 years of age. This is because DALY calculations involve age weighting that attaches a low weight to young children and a higher weight to adults that corresponds to physical and mental development stages. For diarrheal child mortality, the number of DALYs is 34. This reflects an annual discount rate of 3 percent of life years lost.

Table 26: Baseline Data for Estimating Health Effects

| | Urban | Rural | Source: |
|---|--------------|--------------|---|
| Under-5 child mortality rate in 2004 (per 1000 live births) | 83 | 105 | Adjusted from DHS 2003 to reflect estimated national rate of 95 in 2004 |
| Diarrheal mortality in children under 5 years (percent of child mortality) | 15% * | 15%* | AFRO D region (WHO 2002a) |
| Diarrheal 2-week Prevalence in Children under 5 years | 13.6% | 16.1% | Ghana DHS 2003 |
| Estimated annual diarrheal cases per child under 5 years | 2.8 | 3.3 | Estimated from Ghana DHS 2003 |
| Estimated annual diarrheal cases per person (> 5 years) | 0.55 | 0.65 | Estimated from a combination of Ghana DHS |

| | | | |
|--|-----|-----|---|
| | | | 2003 and international experience |
| Percent of diarrheal cases attributable to inadequate water supply, sanitation and hygiene | 90% | 90% | WHO (2002b) |
| DALYs per 100 thousand cases of diarrhea in children under 5 | 40 | 40 | Estimated from WHO tables using age weighting and an average duration of illness of 4 days, and age weighting and 3 percent discount rate for mortality |
| DALYs per 100 thousand cases of diarrhea in persons >5 years | 130 | 130 | |
| DALYs per case of diarrheal mortality in children under 5 | 34 | 34 | |

* A range of 13-17 percent was applied for the “low” and “high” cost estimate presented in Table 25.

Estimated Health Impacts from Inadequate Water, Sanitation and Hygiene

Table 27 presents the estimated health effects from inadequate water, sanitation and hygiene. The estimates are based on the data in Table 24, taking into account the WHO estimate that 90 percent of diarrheal illness is attributable to water, sanitation and hygiene. Although the overall rural population share in Ghana is about 55 percent, estimated number of cases of diarrheal child mortality is twice as high as in urban areas because the child population is substantially higher and the child mortality rate is somewhat higher in rural areas compared to urban areas. The larger rural children population also explains why the estimated cases of diarrheal illness in children under-5 is about the same as in the population over-5 in rural areas while the number of cases is very different in the two age groups in urban areas.

Table 27: Estimated Annual Health Effects from Water, Sanitation, Hygiene

| | Estimated Annual Cases | |
|---|------------------------|-----------|
| | Urban | Rural |
| Cases of Diarrheal illness | | |
| Children (under the age of 5 years) – increased mortality | 2,617 | 5,633 |
| Children (under the age of 5 years) – increased morbidity | 2,992,500 | 5,974,200 |
| Population over 5 years of age – increased morbidity | 4,167,000 | 5,705,100 |

DALYs from diarrheal illness (mortality and morbidity) are presented in Table 28, based on the data in Tables 24 - 26. More than 90 percent of the DALYs are from diarrheal child mortality.

Table 28: Estimated DALYs from Diarrheal Mortality and Morbidity

| | Estimated Annual DALYs | | % of Total DALYs |
|---|------------------------|----------------|------------------|
| | Urban | Rural | |
| Children (under the age of 5 years) – increased mortality | 88,991 | 191,507 | 94% |
| Children (under the age of 5 years) – increased morbidity | 1,197 | 2,390 | 1% |
| Population over 5 years of age – increased morbidity | 5,417 | 7,417 | 4% |
| TOTAL | 95,605 | 201,313 | 100% |

Estimated Cost of Health Impacts

Annual cost of diarrheal mortality and morbidity from inadequate water, sanitation and hygiene is estimated at 600 billion Cedis in urban areas and 1020 billion Cedis in rural areas (Table 29). The cost of diarrheal child mortality is based on the human capital approach (HCA) discussed above. The cost of morbidity includes the cost of illness (medical treatment, medicines, and value of lost

time) and DALYs from morbidity valued at GDP per capita to reflect the cost of reduced well-being associated with illness. Cost-of-illness is presented in Table 30 for diarrheal morbidity. About 30-35 percent of these costs are associated with the value of time lost to illness (including care giving), and 65-70 percent are from cost of treatment and medicines.

Table 29: Estimated Annual Cost of Diarrheal Illness

| | Estimated Annual Cost (million US\$) | |
|--------------------------|---|-------|
| | Urban | Rural |
| <i>Mortality</i> | | |
| Children under age 5 | 32.8 | 70.5 |
| <i>Morbidity</i> | | |
| Children under age 5 | 17.2 | 24.1 |
| Population over age 5 | 16.6 | 18.4 |
| TOTAL ANNUAL COST | 66.6 | 113.0 |

Table 30: Estimated Annual Cost-of-Illness (Morbidity)

| | Estimated Annual Cost (millions US\$) | |
|---|--|-------|
| | Urban | Rural |
| Cost of medical treatments (doctors, hospitals, clinics) | 9.4 | 11.3 |
| Cost of medicines | 11.1 | 15.9 |
| Cost of time lost to illness | 10.6 | 11.4 |
| TOTAL ANNUAL COST | 31.1 | 38.6 |

Baseline data for the cost estimates of morbidity are presented in Table 31. The percent of diarrheal cases in the age group older than 5 years treated at medical facilities is estimated from percent of treated cases among children (Ghana DHS 2003) and international experience (Larsen 2004a,b). Cost of medical services reflects the cost of private health care. This is a better indication of the economic cost of health services than public services, which often are subsidized.

The value of time for adults is based on urban and rural wages. Economists commonly apply a range of 50-100 percent of wage rates to reflect the value of time. 75 percent of urban and rural average wages in Ghana are applied here. These rates for value of time are applied to both income earning and non-income earning adults. There are two reasons for applying the rates to non-income earning adults. First, most non-income earning adults provide a household function that has a value. Second, there is an opportunity cost to the time of non-working individuals, because they could choose to join the paid labor force.

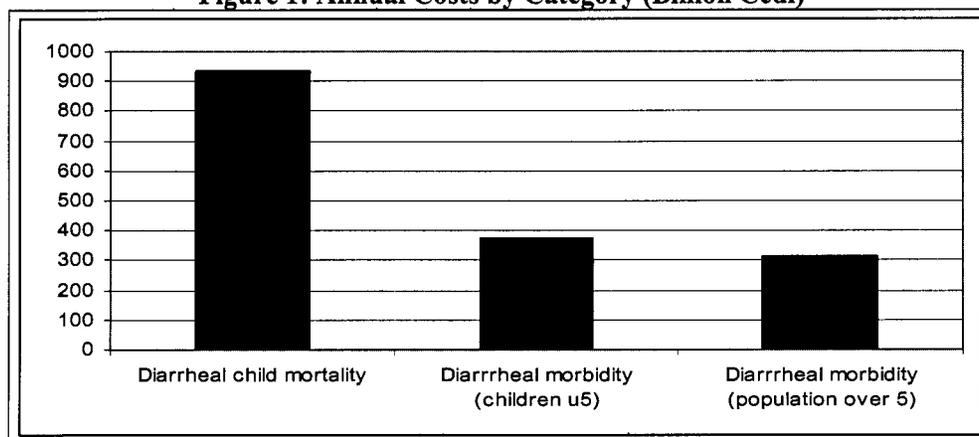
Table 31: Baseline Data for Cost Estimation

| | Urban | Rural | Source: |
|--|-------|-------|------------------------------------|
| Percent of diarrheal cases treated at medical facilities (children < 5 years) | 36 | 21 | Ghana DHS 2003 |
| Percentage of cases with use of pharmacy | 18 | 21 | Ghana DHS 2003 |
| Percent of diarrheal cases treated with ORS (children < 5 years) | 47 | 35 | Ghana DHS 2003 |
| Percent of diarrheal cases treated at medical facilities (population > 5 years) and with medicines | 25 | 22 | Estimated from a combination Ghana |

| | | | |
|---|--------|--------|--|
| | | | DHS 2003 and international experience |
| Average Cost of health services (Cedi per visit) | 40,000 | 40,000 | Per consultations with pharmacies, medical service providers, and health authorities |
| Average Cost of medicines for treatment of diarrhea (Cedi) | 30,000 | 30,000 | |
| Average cost of ORS per diarrheal case in children (Cedi) | 14,000 | 14,000 | |
| Average duration of diarrheal illness in days (children and adults) | 4 | 4 | Assumption |
| Hours per day of care giving per case of diarrhea in children | 2 | 2 | Assumption |
| Hours per day lost to illness per case of diarrhea in adults | 2 | 2 | Assumption |
| Value of time for adults (care giving and ill adults) Cedi/hour | 1,610 | 1,075 | 75% of urban and rural wages in Ghana |
| Percent of diarrheal cases attributable to Inadequate water, sanitation and hygiene | 90 | 90 | (WHO 2002b) |

Estimated annual cost of inadequate water supply, sanitation and hygiene totals about US\$ 166 – 194 (1500-1750 billion Cedis) per year, with a mean of US\$ 180 million (1620 billion Cedis) equivalent to 2.1 percent of GDP in 2004. The costs of each category are presented in Figure 1. Costs include mortality in children and morbidity in children and adults. The estimated cost of diarrheal under-5 child mortality is more than the combined cost of morbidity in children and adults.

Figure 1: Annual Costs by Category (Billion Cedi)



Sensitivity Analysis

The cost of child mortality represents more than 50 percent of total estimated cost of inadequate water supply, sanitation and hygiene. There is also uncertainty about the economic cost of medical treatment and medicines. A sensitivity analysis was therefore undertaken with respect to these issues. The base case, presented in Table 32, reflects a valuation of child mortality using the human capital approach (HCA) with an annual discount rate of 3 percent and an income growth rate of 2 percent, and a cost of treatment based on cost of medical visits and medicines of 40,000 and 30,000 Cedi respectively. A “lower” and “upper” case is presented in Table 32 using lower and higher discount rates, income growth rates, and costs of treatment. Estimated annual cost is 45 percent lower in the “lower” case than in the base case, and 80 percent higher in the “upper” case than in the base case. Nearly 85 percent of the difference between the base case and the

“lower” or “upper” case is from the change in child mortality valuation, and only 15 percent is from the lower treatment costs applied. The estimated annual cost in the “lower” case – ranging from 850-930 billion Cedis – is still substantially higher than the cost of outdoor air pollution. It is also substantially higher than the cost of indoor air pollution when the same parameters for valuation of child mortality are applied to indoor air pollution. Thus the ranking of annual costs for the three environmental health risk factors is unaffected by the sensitivity analysis.

Table 32: Annual Cost of Inadequate Water, Sanitation and Hygiene for Three Scenarios

| | Child mortality Valuation (HCA) | Cost of treatment | Annual Cost (Billion Cedi) | | |
|--------------|-----------------------------------|--|----------------------------|------|--------|
| | | | “Low” | Mean | “High” |
| “Lower” case | Growth = 1% Discount rate = 5% | Cost of medical visit = 30,000 Cedi Cost of medicines = 20,000 Cedi | 850 | 890 | 930 |
| Base case | Growth = 2% Discount rate = 3% | Cost of medical visit = 40,000 Cedi Cost of medicines = 30,000 Cedi | 1495 | 1620 | 1745 |
| “Upper” case | Growth = 2% Discount rate = 1% | Cost of medical visit = 50,000 Cedi Cost of medicines = 40,000 Cedi | 2620 | 2900 | 3180 |

Notes: “Growth” is per capita income growth applied to estimate lifetime income; “Discount rate” is the annual discount rate applied to estimate the present value of lifetime income; “Cost of medical visit” is the economic cost of health service provision; and “Cost of medicines” is the economic cost of medicines typically used for treatment of diarrhea. The difference between “lo,” mean, and “high” annual cost reflect a diarrheal child mortality rate of 13, 15 and 17 percent of total child mortality.

iii. Indoor Air Pollution

There are two main steps in quantifying the health effects. First, the number of people or households exposed to pollution from solid fuels needs to be calculated, and the extent of pollution, or concentration, should ideally be measured. Second, the health impacts from this exposure should be estimated based on epidemiological assessments. Once the health impacts are quantified, the value of this damage can be estimated.

According to the Ghana Demographic and Health Survey 2003 around 97 percent of rural households and 81 percent of urban households used fuel wood, charcoal, and coal products in 2003, constituting a major source of indoor air pollution and respiratory health risk. The cost of indoor pollution is estimated separately for the urban and rural populations.

Health Risk Assessment

Desai et al (2004) provides a review of research studies from around the world that have assessed the magnitude of health effects from indoor air pollution from solid fuels. The relative risk ratios for acute respiratory illness (ARI) and chronic obstructive pulmonary disease (COPD) are presented in Table 33. The risk ratios represent the risk of illness for those who are exposed to indoor air pollution compared to the risk for those who are not exposed. The exact risk ratio depends on several factors such as concentration level of pollution in the indoor environment and the amount of time individuals are exposed to the pollution. A range of “low” to “high” ratios is therefore presented in Table 32 that reflects the review by Desai et al (2004).

Studies have also found linkages between indoor air pollution from traditional fuels and increased prevalence of tuberculosis and asthma. It is also possible that indoor air pollution from such fuels can cause an increase in ischaemic heart disease and other cardiopulmonary disorders. As discussed in the section on urban air pollution, Pope et al (2002) and others have found that the largest effect of urban fine particulate pollution on mortality is for the cardiopulmonary disease

group. As indoor smoke from traditional fuels is high in fine particulates, the effect on these diseases might be substantial. More research is however required in order to draw a definite conclusion about the linkage and magnitude of effect.

The risk ratios in Table 33 have in this report been applied to young children under the age of five years (for ARI) and adult females (for ARI and COPD) to estimate the increase in mortality and morbidity associated with indoor air pollution. It is these population groups who suffer the most from indoor air pollution. This is because they spend much more of their time at home, and/or more time cooking than older children and adult males.

Table 33: Health Risks of Indoor Air Pollution

| | Relative Risk Ratios | |
|--|----------------------|--------|
| | “Low” | “High” |
| Acute Respiratory Illness (ARI) | 1.9 | 2.7 |
| Chronic obstructive pulmonary disease (COPD) | 2.3 | 4.8 |

Source: Desai et al (2004).

Baseline Health Data

Baseline data on ARI and COPD are needed to estimate the health effects of indoor air pollution from the risk ratios in Table 33. These data are presented in Table 34, along with unit figures for disability adjusted life years (DALYs) lost to illness and mortality. Data on COPD mortality and especially morbidity incidence, according to international disease classifications, are not readily available for Ghana. Regional estimates from WHO (2002a) and Shibuya et al (2001) for the AFRO D region (to which Ghana belongs) are therefore applied. The national average two-week prevalence rate of ARI in children under 5 years from the Ghana Demographic and Health Survey (DHS) 2003 is used to estimate total annual cases of ARI in children under the age of five. The procedure applied is to multiply the two-week prevalence rate by 52/3 to arrive at an approximation of the annual cases of ARI per child.

The Ghana DHS 2003 household survey does not provide information on ARI in adults (nor does any other household survey in Ghana). International evidence indicates that ARI incidence in children under-5 is on the order of five times higher than the incidence in the population over 5 years of age (Larsen 2004a,b). For ARI mortality in children under-5, the rate for the West African region to which Ghana belongs is applied, which is 18 percent of total under-5 child mortality.

Table 34 also presents DALY per cases of ARI and COPD, which are used to estimate the number of DALYs lost from indoor air pollution. The disability weight for ARI morbidity is the same for children and adults (i.e., 0.28), and the duration of illness is assumed to be the same (i.e., 7 days). DALYs per 100 thousand cases of ARI is however much higher for adults. This is because DALY calculations involve age weighting that attaches a low weight to young children, and a higher weight to adults, that corresponds to physical and mental development stages. As above, the ARI child mortality the number of DALYs lost is 34. This reflects an annual discount rate of 3 percent of life years lost. DALYs lost per case of COPD morbidity and mortality is based on life-tables and age-specific incidence of onset of COPD reported by Shibuya et al (2001) for the region. A disability weight of 0.2 has been applied to COPD morbidity, which is on the lower end of weights commonly applied to COPD. A discount rate of 3 percent is applied to both COPD morbidity and mortality.

Table 34: Baseline Data for Estimating Health Impacts

| | Baseline | | Source: |
|--|----------|-------|---|
| | Urban | Rural | |
| Female COPD mortality rate (% of total female deaths) | 0.8 % | | WHO (2002a) and Shibuya et al (2001) |
| Female COPD incidence rate (per 100 thousand) | 27 | | |
| ARI 2-week Prevalence in Children under 5 years | 8.9% | 10.6% | Ghana DHS 2003 |
| Estimated annual cases of ARI per child under 5 years | 1.5 | 1.8 | Estimated from Ghana DHS 2003 |
| Estimated annual cases of ARI per adult female (> 30 years) | 0.3 | 0.35 | Estimated from a combination of Ghana DHS 2003 and international experience |
| ARI mortality in children under 5 years (percent of child mortality) | 18% | | AFRO D region (WHO 2002a) |
| DALYs per 100 thousand cases of ARI in children under 5 | 165 | 165 | Estimated from WHO tables and AFRO D region (WHO 2002a). |
| DALYs per 100 thousand cases of ARI in female adults (>30) | 700 | 700 | |
| DALYs per case of ARI mortality in children under 5 | 34 | 34 | |
| DALYs per case of COPD morbidity in adult females | 2 | 2 | |
| DALYs per case of COPD mortality in adult females | 7.5 | 7.5 | |
| | | | |

Estimated Health Impacts

Annual new cases of ARI and COPD morbidity and mortality (D_i) from solid fuel smoke were estimated from the following equation:

$$D_i = PAR * D_i^B$$

(10)

where: D_i^B is baseline cases of illness or mortality, i (estimated from the baseline data in Table 34), and PAR is given by: $PAR = PP*(OR-1)/(PP*(OR-1)+1)$

(11)

where: PP is the percentage of population exposed to solid fuel smoke (81 percent of the urban and 97 percent of rural population), and OR is the odds ratios (or relative risk ratios) presented in Table 33. Child mortality and ARI morbidity in children from indoor air pollution is more than twice as high in rural areas. For adult females the difference between rural and urban areas is substantially less.

Estimated Cost of Health Impacts

Total annual cost of indoor air pollution is estimated at US\$92 - 143 million (825-1285 billion Cedis), with a mean estimate of 1040 billion equivalent to nearly 1.4 percent of GDP in 2004. Respiratory child mortality represents 63 percent of the cost, and acute respiratory illness (ARI) in children represents 21 percent. Chronic obstructive pulmonary disease (COPD) mortality in adult females accounts for 9 percent of the cost, and ARI and COPD morbidity in adult females is 7 percent of cost.

Treatment cost represents private sector health care services, as these are likely to better reflect economic cost. The percent of ARI cases in the age group older than 5 years treated at medical

facilities is estimated from percent of treated cases among children (Ghana DHS 2000) combined with international experience.

Table 35: Estimated Annual Cost of Indoor Air Pollution (Urban areas)

| | Estimated Annual Cost (Billion Cedi) | |
|---|---|------------|
| | “Low” | “High” |
| Acute Respiratory Illness (ARI): | | |
| Children (under the age of 5 years) – increased mortality | 165 | 227 |
| Children (under the age of 5 years) – increased morbidity | 67 | 93 |
| Adult females – increased morbidity | 21 | 29 |
| Chronic obstructive pulmonary disease (COPD): | | |
| Adult females – increased mortality | 6 | 84 |
| Adult females – increased morbidity | 5 | 7 |
| TOTAL | 264 | 440 |

Table 36: Estimated Annual Cost of Indoor Air Pollution (Rural areas)

| | Estimated Annual Cost (Billion Cedi) | |
|---|---|------------|
| | “Low” | “High” |
| Acute Respiratory Illness (ARI): | | |
| Children (under the age of 5 years) – increased mortality | 396 | 529 |
| Children (under the age of 5 years) – increased morbidity | 120 | 160 |
| Adult females – increased morbidity | 26 | 34 |
| Chronic obstructive pulmonary disease (COPD): | | |
| Adult females – increased mortality | 9 | 108 |
| Adult females – increased morbidity | 7 | 10 |
| TOTAL | 558 | 841 |

Baseline data for the cost estimates of morbidity are presented in Table 37. Treatment cost represents private sector health care services as these are likely to better reflect economic cost. Percent of ARI cases in the age group older than 5 years treated at medical facilities is estimated from percent of treated cases among children (Ghana DHS 2000) combined with international experience.

The value of time for adults is 75 percent of urban and rural average hourly wages. The rationale for valuation of time was discussed in the section on water, sanitation and hygiene, and in the urban air pollution section.

Table 37: Baseline Data for Cost Estimation

| | Baseline | | Source: |
|--|----------|--------|--|
| | Urban | Rural | |
| Percent of ARI cases treated at medical facilities (children < 5 years) | 53% | 40% | Ghana DHS 2003 |
| Percentage of cases with use of pharmacy (children < 5 years) | 23% | 26% | Ghana DHS 2003 |
| Cost of medicines for treatment of acute respiratory illness (population < 5 years) (Cedi) | 50,000 | 50,000 | Per consultations with pharmacies |
| Percent of ARI cases treated at medical facilities (females > 30 years) | 52% | 52% | Estimated from a combination of the Ghana DHS 2003 and |

| | | | |
|--|---------|---------|--|
| | | | international experience |
| Cost of medicines for treatment of acute respiratory illness (females > 30 years) (Cedi) | 50,000 | 50,000 | Per consultations with pharmacies |
| Percent of COPD patients being hospitalized per year | 1.5 | 1.5 | Assumption based on Schulman et al (2001) and Niederman et al (1999) |
| Percent of COPD patients with an emergency doctor/hospital outpatient visits per year | 15 | 15 | |
| Average number of doctor visits per COPD patient per year | 1 | 1 | |
| Estimated lost workdays (including household work days) per year per COPD patient | 2.6 | 2.6 | Estimated based on frequency of doctor visits, emergency visits, and hospitalization |
| Cost of doctor visit (Cedi per visit) | 40,000 | 40,000 | Per consultations with pharmacies, medical service providers, and health authorities |
| Cost of hospitalization (Cedi per day) | 150,000 | 150,000 | |
| Cost of emergency visit (Cedi per visit) | 40,000 | 40,000 | |
| Average duration of ARI in days (children and adults) | 7 | 7 | Assumption |
| Hours per day of care giving per case of ARI in children | 2 | 2 | Assumption |
| Hours per day lost to illness per case of ARI in adults | 3 | 3 | Assumption |
| Value of time for adults (care giving and ill adults) – Cedi/hour | 1610 | 1075 | 75% of urban and rural wages in Ghana |
| Average length of hospitalization for COPD (days) | 10 | 10 | Larsen (2004b) |

There is very little information about the frequency of doctor visits, emergency visits and hospitalization for COPD patients in any country in the world. Schulman et al (2001) and Niederman et al (1999) provide some information on this from the United States and Europe. Figures derived from these studies are applied to Ghana in this report. Estimated lost workdays per year is based on frequency of estimated medical treatment plus an additional 7 days for each hospitalization and one extra day for each doctor and emergency visit. These days are added to reflect time needed for recovery from illness.

To estimate the cost of a new case of COPD, the medical cost and value of time losses have been discounted over a 17-year duration of illness. An annual real increase of 2 percent in medical cost and value of time has been applied to reflect an average expected increase in annual labor productivity and real wages. The costs are discounted at 3 percent per year, a rate commonly applied by WHO for health effects.

Sensitivity Analysis

Cost of child mortality represents nearly 40 percent of total estimated cost of indoor air pollution. There is also uncertainty about the economic cost of medical treatment and medicines. A sensitivity analysis was therefore undertaken with respect to these issues. The base case, presented in Table 38, reflects a valuation of child mortality using the HCA approach with an annual discount rate of 3 percent and an income growth rate of 2 percent, and a cost of treatment based on cost of medical visits and medicines of 40,000 and 50,000 Cedis respectively. A “lower” and “upper” case are presented in Table 38 using lower and higher discount rates, income growth rates, and costs of treatment. Estimated annual cost is 45 percent lower in the “lower” case than in the base case, and more than 80 percent higher in the “upper” case than in the base case. About 90 percent of the difference between the base case and the “lower” or “upper” case is from the change in child mortality valuation, and 10 percent is from the lower treatment costs applied. The

estimated annual cost in the “lower” case -- ranging from 420-740 billion Cedi -- is still higher than the cost of outdoor air pollution. Thus the ranking of annual costs for the three environmental health risk factors (water supply, sanitation and hygiene; indoor air pollution; and outdoor air pollution) is unaffected by the sensitivity analysis.

Table 38: Annual Cost of Indoor Air Pollution for Three Scenarios

| | Child mortality valuation (HCA) | Cost of treatment (\$) | Annual cost (millions US\$) | | |
|--------------|-----------------------------------|--|-----------------------------|--------|--------|
| | | | “Low” | “Mean” | “High” |
| “Lower” case | Growth = 1% Discount rate = 5% | Cost of medical visit = 3.33 Cost of medicines = 4.44 | 47 | 63 | 82 |
| Base case | Growth = 2% Discount rate = 3% | Cost of medical visit = 4.44 Cost of medicines = 5.55 | 92 | 115 | 143 |
| “Upper” case | Growth = 2% Discount rate = 1% | Cost of medical visit = 5.55 Cost of medicines = 6.66 | 173 | 212 | 253 |

iv. Total Costs from Outdoor and Indoor Air Pollution, Inadequate Water Supply, Sanitation, and Hygiene

The mean estimated annual cost of environmental health effects, summing up the costs of the above sections, totals nearly US \$325 million (nearly 4.3 percent of 2003 GDP). The highest cost is from inadequate water supply, sanitation and hygiene (US\$ 180 million, or about 2.4 percent of GDP), followed by indoor air pollution (US\$ 115 million, about 1.5 percent of GDP) and urban outdoor air pollution (US\$ 30 million, or 0.4 percent of GDP). Figure 2 below illustrates the relative share of costs by environmental category.

The costs of environmental damage are distributed unevenly across the population. Estimated cost of urban air pollution is for the cities with more than 90 thousand inhabitants. The cost per person in these cities is estimated at nearly 80,000 Cedi (US\$ 9) per year. Hygiene practices, and to some extent inadequate potable water supply and sanitation, affect most of the population (both rural and urban), causing unnecessary diarrheal illness and child mortality with an annual cost of also nearly 80,000 (US\$9) Cedi per person per year. Indoor air pollution from solid fuels is a burden on the whole population, with an estimated cost of 55,000 Cedi (US\$ 6) per person per year. So while the total annual cost of urban air pollution is substantially less than the total cost of the other two major environmental health risks, the cost per person exposed is as high as for water, sanitation and hygiene alone.

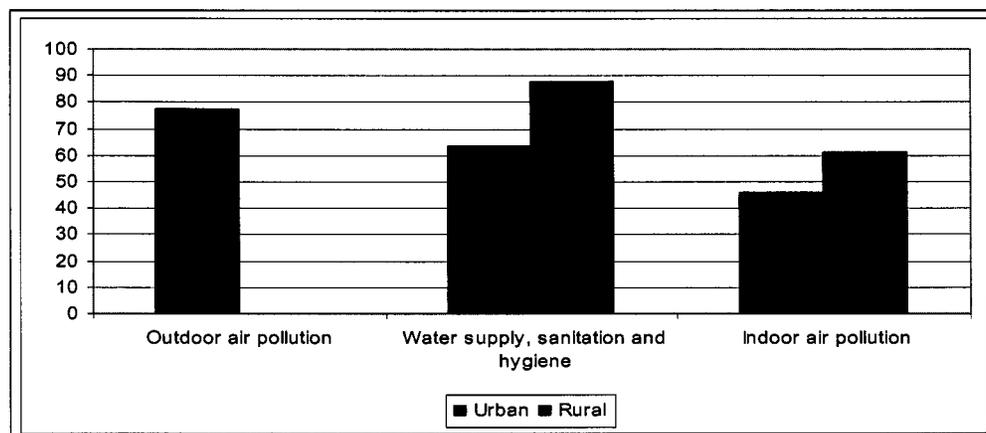
Urban-Rural Cost

The cost of environmental health effects in urban areas is estimated at roughly US\$135 million per year, while the cost in rural areas is estimated at about US\$190 million. In relation to the urban-rural population share of 45 and 55 percent, the estimated cost in rural areas is 15 percent higher than in urban areas. For health effects from inadequate water supply, sanitation and hygiene, and indoor air pollution, the rural cost is substantially higher than the urban cost. The primary reason for this is higher child mortality and morbidity in rural areas, and a substantially higher child population share in rural areas (children bear a disproportionate burden of health effects from these risk factors).

The disproportionate burden of health effects in the rural population from water, sanitation and hygiene, and indoor air pollution is illustrated in Figure 2 below. The cost per capita from these two health risks is 30-40 percent higher in rural areas than in urban areas. This is worrisome

because the rural population is generally much poorer than the urban population and therefore in a worse position to cope with ill health. The disproportionate burden on the rural population is to a large extent associated with higher child mortality from diarrheal illness resulting from inadequate water supply, sanitation and hygiene, and from respiratory illness stemming from indoor air pollution.

Figure 2: Estimated Annual Cost per Person Exposed (in thousands of cedis)



Source: Larsen (2006)

A “low” and “high” estimate of annual cost is presented in Table 39. The range for water supply, sanitation and hygiene is from uncertainties of diarrheal child mortality rate. The range for urban outdoor air pollution is mainly from the use of two valuation techniques to estimate the social cost of premature mortality. The range for indoor air pollution is mainly from uncertainty of exposure level to indoor smoke from solid fuels, and thus a range was applied for the level of health risk.

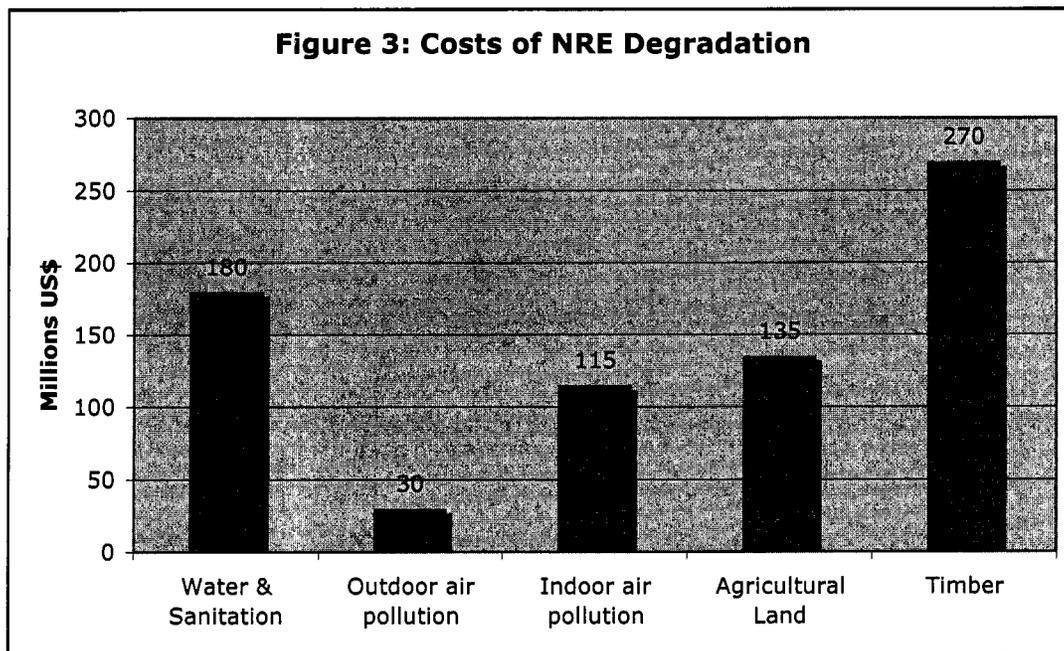
Table 39: Range of Annual Health Costs

| Environmental categories | Millions of US\$ | | |
|---------------------------------------|----------------------|---------------|-----------------------|
| | “Low” (HCA) approach | Mean estimate | “High” (VSL) approach |
| Water supply, sanitation, and hygiene | 166 | 180 | 194 |
| Indoor air pollution | 92 | 115 | 143 |
| Outdoor air pollution | 14 | 30 | 46 |
| Total annual cost | 271 | 325 | 382 |

The cost of environmental health effects in urban areas is estimated at US\$135 million per year while the cost in rural areas is estimated at US\$190 million. In relation to the urban-rural population share of 45 and 55 percent, the estimated cost in rural areas is 15 percent higher than in urban areas. For health effects from inadequate water supply, sanitation and hygiene, and indoor air pollution, the rural cost is substantially higher than the urban cost. This is mainly because of higher child mortality and morbidity in rural areas, and a substantially higher child population share in rural areas (children bear a disproportionate burden of health effects from these risk factors). The disproportionate burden on the rural population is to a large extent associated with higher child mortality from diarrheal illness from inadequate water supply, sanitation and hygiene, and from respiratory illness from indoor air pollution.

III. Analysis of results

From section II, we roughly calculated the aggregate annual costs of natural resource and environmental degradation at US\$730 million: US\$325 million from environmental health costs, and US\$405 million from natural asset degradation.



Note that this does not mean that Ghana could produce US\$730 millions' worth of additional output if depletion were reversed. In fact, if productivity were to be restored, only a portion of this cost might actually contribute new productivity to the economy each year. Rather, the vast majority of this cost represents an unsustainable over-exploitation of natural resources and degradation of the environment.

It is useful to express this cost as a percentage of GDP – in this case, about 9.6 percent of Ghana's total GDP of US\$7.62 billion in 2003 – in order to provide a sense of magnitude.

The largest single sources of costs are timber depletion, amounting alone to 3.6 percent of GDP, followed by inadequate water supply and sanitation (nearly 2.4 percent of GDP) and damage to agricultural lands (1.8 percent of GDP).

Projections of sectoral contributions to GDP in Ghana's policy documents assume that natural assets will continue to contribute significantly to economic growth. However, current national accounting systems neglect the negative economic effects of natural resource degradation. Wealth accumulation is consequently overestimated in the country: the Ghanaian Ministry of Finance currently uses gross savings as a standard indicator of wealth accumulation in order to monitor growth, which it measured to be 28 percent in 2003. However, accounting methods that integrate natural resource depletion show that wealth accumulation is in fact significantly lower than that calculated through traditional measures.

As identified above, a problem with conventional measures of GDP is that changes in such measures fail to distinguish between economic growth resulting from a true increase in income and economic growth resulting from a depreciation of natural assets. Depreciation of the stock of natural capital is incorrectly counted as income. Development strategies that simply "cash in" the

endowment of natural resources are treated in the same way as development strategies that do not depreciate their natural capital assets.

To tackle this problem, a more adequate sustainability indicator is the genuine savings rate, which corrects gross savings by subtracting the depreciation in produced capital stocks and the depletion of natural assets, and adds investment in human capital. Negative genuine savings rates indicate that an economy is not on a sustainable path, and so that future levels of economic welfare will decline. If the rate is positive, the economy is on a sustainable growth path, even with exhaustible resources.

More precisely, genuine savings is calculated by adding expenditures on education (disregarding structures and equipment already accounted for in GDP measures) to the conventional net national savings,¹²⁶ and subtracting (i) the value of natural resource depletion of oil, natural gas, and forests (namely, the total rents on resource extraction and harvest), (ii) the damages from carbon dioxide (calculated as the present value of marginal damages to crops, infrastructure, and human health over the time that carbon dioxide resides in the atmosphere), (iii) the value of health damages from particulate matter pollution, and (iv) the value of damages to produced assets from air pollution, beyond what is counted as depreciation in standard measures of GDP. This estimate provides a better measure of net savings than gross national savings, making it a more precise predictor of future consumption levels.

The World Bank's *Little Green Data Book* cites an adjusted net savings rate of 19.3 percent of GDP in 2003 – as opposed to the 20.9 percent of conventional net savings (that is to say, only adjusting for capital depreciation) estimated by the *Book* and the 28 percent estimated by the Ghanaian Ministry of Finance. This figure of 19.3 percent was reached after deducting natural resource depletion (from forests and minerals) and damage from CO₂ and particulate matter emissions, and adding educational expenditure (2.8 percent of GNI).¹²⁷ Forest depletion only accounted for 2.5 percent, compared to the 3.5 percent calculated in this appendix.

Note that this is not a complete measurement of genuine savings as defined above. In *The Little Green Book's* calculation of adjusted net savings, many types of natural capital were not included for practical reasons. In contrast, this appendix adds elements of depletion and degradation to forests (beyond the 2.5 percent calculated by the *Little Green Data Book*) and agricultural soils, as well as new data on environmental health costs. With these resources accounted for, Ghana's performance on wealth accumulation and sustainability of growth proves to be much less robust than previously thought: using the more comprehensive assessments of costs, it has been determined that the genuine savings rate is closer to 12.3 percent of GDP. This is nearly 16 percentage points below what the Ministry of Finance uses as its standard of wealth accumulation (28 percent). This discrepancy in estimated savings rate is worrying, as the sustainability of growth depends on wealth accumulation: high savings rates may in theory lead to increased wealth, which yield even higher savings rates, whereas low savings rates may lead to economic stagnation. Even more worrying is that the genuine savings rate per capita is *negative* after population growth is taken into account.

Ghana's key development strategies, including the Growth and Poverty Reduction Strategy (GPRS) II, are based on the assumption that natural assets will continue to produce yields that are adequate to fuel economic growth in the country. Evidence presented in this appendix, however, shows that these natural assets are declining in productivity because of overexploitation and poor

¹²⁶ Net national savings is simply the difference between GDP and public and private consumption (adjusted for depreciation of fixed capital) and net transfers.

¹²⁷ World Bank, *The Little Green Data Book 2005*, page 95. The *Little Green Book* in fact calculates net savings as a percentage of GNI; broadly speaking, these two figures are similar in magnitude (2003 GNI of US\$ 7.5 billion vs. 2003 GDP of US\$ 7.6 billion according to UNSTAT)

management. Effective planning and policy formulation must incorporate sustainability of growth into measures of national accounting. Augmented measures of savings and wealth are thus very important in national accounts if sustainable growth is to be achieved.

Appendix 2. Forestry and Wildlife

Appendix 2. Forestry and Wildlife

Table A2-1: Century of State-led Forest Sector Reforms—Timeline

| Year | Regime | Policy / Theme | Catalogue of Events / Outcomes |
|---------------|-------------------------|---|--|
| 1830 | Colonial Administration | Introduction of cocoa into forest zone of southern Ghana | |
| 1880s | Colonial Administration | First colonial treatise on forestry ¹²⁸ | <ul style="list-style-type: none"> • Response to evidence during 1880s from Ghana and other colonies of degradation of resource base • Call for conservation and protection of forests |
| 1890s | Colonial Administration | Attempts to create Crown Lands for Forestry: <ul style="list-style-type: none"> • 1894 Lands Bill • Governor Maxwell drafts a new bill (1895) • Lands Bill of 1897 | <ul style="list-style-type: none"> • Resistance from chiefs, and the Gold Coast Aborigines' Rights Protection Society • Forced acquisition of land by the state seen as untenable |
| 1900s | | | <ul style="list-style-type: none"> • High forest zone seen as not sustainable • Establishment of the Forestry Department (1909) • Timber trade regulated • Formalized native authority of paramount chieftaincy and traditional council. |
| 1910s - 1920s | | Forest Ordinance Law, 1927 (Cap. 157) [still in force] | <ul style="list-style-type: none"> • Cap 157 enabled the constitutions and (compulsory) constitution of forest reserves • Vested in central government the power to constitute and manage the reserves |
| 1930s | | 1939 Concession Ordinance Law | <ul style="list-style-type: none"> • Colonial foresters established, introduced a system of timber-harvesting rights and revenues |
| 1940s | | Gold Coast Forest & Wild life Policy | <ul style="list-style-type: none"> • Establishment of an extensive system of forest reserve covering almost 21percent of the country. • Export markets for timber established • The conservation and management of permanent forest estate |
| 1950s | Nkrumah | Protected Timber Lands Act - Local Government Ordinance | <ul style="list-style-type: none"> • Liquidation of off reserve forest • Postwar boom • Election of local council system introduced decline in informal influence of traditional authority |
| 1960s | K.A. Busiah (Progress) | Administration of Lands Act, Concession Act, Forest Improvement | <ul style="list-style-type: none"> • Economic stagnation • Forest Improvement Fund (FIF) created |

¹²⁸ Moloney (1887) Sketch of the Forestry of West Africa

| | | | |
|-----------------------------|---|--|---|
| 1966-69 | Party) Afrifa | Act | <ul style="list-style-type: none"> • Vested in central government, had the management of stool lands, collection of revenues, and the right to grant timber concessions. |
| 1970s 1969-72 1972-79 | Military Regime - K. A. Busiah Gen. Acheampong Gen. Akuffo J.J. Rawlings | Trees and Timber Decree, Forest Protection Decree | <ul style="list-style-type: none"> • Economic stagnation • Prohibition of any activity in the forest without the consent of FD. |
| 1980s 1980—81 | Dr. Liman (Peoples National Party) | Control of Bushfires Law, 1983 (PNDCL)—criminalizes negligent or reckless starting of fires | <ul style="list-style-type: none"> • Drought and major bushfires throughout West Africa in 1983 destroy thousands of hectares of forest in transition zone; cocoa yields are halved. |
| 1982- 91 | J. J. Rawlings (PNDC) Minister (J.G.A. Renner-82-86) | DFID (ODA)-funded Forest Resource Management Project (FRMP) FD authorized to manage off-reserve forests, and collect revenues from the resource (previously these were collected by Lands Commission) | <ul style="list-style-type: none"> • Export Rehabilitation Project (ERP) • Soft loans given to industry to aid in recovery. • Huge investments in plants and machinery, but majority older machinery • Attempts to control bushfires first through criminalizing offenders and more lately through the regulation and organization of early burns by district assemblies. |
| 1985-1990 | Minister (George Adamu - 86-87) | | <ul style="list-style-type: none"> • Industry back on its feet • Log exporters tripled • Discretionary allocation of concessions on loose terms |
| 1991 | Ministers -Peprah (91) -Danso (92) -Amankwa (93) | | <ul style="list-style-type: none"> • Peak logging period, much of it illegal |
| 1992 | | <ul style="list-style-type: none"> • 1992 constitution sets out revenue sharing arrangements (Art. 267); parliamentary approval of natural resource concessions (Art. 268) and creation of natural resources commissions (Art. 269) • Management of off-reserve forests transferred to FD; replacing unclear arrangements between communities, OASL, FD | <ul style="list-style-type: none"> • Resulted in lack of funds for forest rehabilitation • Timber industry no longer needed to negotiate with communities re: access to off-reserve forests. This led to an acceleration in exploitation of the forests. |
| 1993 | MLF CTA - Kofi Smith appointed | | <ul style="list-style-type: none"> • The FIA was no longer drafted • Thus, FD continued to rely solely on foreign aid • FC established (original) |
| 1994 | Minister - Kwabena Adjei | <ul style="list-style-type: none"> • Forest & Wild Life Policy, which aimed to dismantle the old political economy and replace it with a new legislative framework • Trees and Timber Amendment Act (493) , introduces 6-monthly issuance of property marks and levies on export of logs | <ul style="list-style-type: none"> • Introduction of present policy on forest and wildlife • Biannual renewal of property marks • Deloitte report on institutional reform (to create a forest service agency for the FD) • Illegal logging went into overdrive • Starvation of FD revenue • Timber trade regulated through permits and levies |

| | | | |
|------|--|---|--|
| 1995 | Johnney Francois retires as CCF | <ul style="list-style-type: none"> • Interim Measures to Control Illegal Timber Harvesting Outside Forest Reserves • Deloitte & Touche Report on creating a Forest Service able to retain funds | <ul style="list-style-type: none"> • “Interim measures” introduced and widely seen as a success • Suspension of export of round logs • Massive reduction of illegal logging (paramilitary task force of FD and police) • More value-added processing of logs • Steep increase in revenue • System of regulating off reserve logging (including farmer right of veto and compensation for crop damage) |
| 1996 | Minister - Kwabena Adjei | | <ul style="list-style-type: none"> • Proposed content for a new forest Act tabled • Forestry Development Master Plan was established, outlines strategies, programs, and scheduling for implementation of forest and wildlife policy. • Document on contents of proposed new consolidated law prepared—based on discussions. • Proposals for private participation in plantations flounder (CDC withdraws). • Forest Sector Development Project phase 1 (FSDP I) started (created forest service). • Development in forest conservation. • Annual Allowable Cut (AAC) set at 1 million cubic meters |
| 1997 | Minster - Cletus Avoka | Timber Resource Management Act (TRMA) 1997, ACT 547 | <ul style="list-style-type: none"> • Introduces Timber Utilization Rights / SRAs • Govt. puts the “cream” into packages of TUCs to be allocated by auctions. • Competitive “procedures” study thwarted by industry lobby • TRMA, together with, LI 1649, did away with “interim procedures”—the expectation that the procedures would be reflected in the new law did not happen. |
| 1998 | Minster - Christiana Amoako Nuamah | Timber Resources Management Regulations, 1998 L.I.1649 | <ul style="list-style-type: none"> • Directors for new Forest Service recruited through open competitive recruitment • Forest Management Manuals developed for TUCs. • Plans for forest services meet challenge vs. constitutional role of the Forestry Commission. |
| 1999 | Kofi Smith leaves CCF FD Kofi Nksenkyre Appointed Head FC | Natural Resource Management Program (NRMP) for sustainable management of resources The Forestry Commission Act, 1999 Act 571 | <ul style="list-style-type: none"> • “Reform overload” • Plans for forest services meet challenge vs. constitutional role of the Forestry Commission • “Reform overload” • Established new integrated FC as a corporate body. • SUN System accounting introduced and embodied into FSD. • Ban on chainsaw logging introduced. • 2,000 people made redundant from FC; retraining provided. |

| | | | |
|------|---|--|--|
| 2000 | NDC/NPP - Kwaku Afriyie Sam Appiah appointed CE of FC | | <ul style="list-style-type: none"> • FSDP II starts • 2001 wood export ban study commences; undertakes scenarios. • FC structure review. • Challenge to formation of a unified FC by Wildlife Division and environmental NGOs. Reform plans changed. |
| 2001 | Minister Kassim Kassanga FC CE removed from office and acting replacement Executive Director WLD Nic Ankudey | | <ul style="list-style-type: none"> • Wood industry study results and outline of policy reforms—recommends “soft landing scenario” • Imposition of export duty on timber exports(National Reconstruction Export Levy) • Pursuit of revenue objective by GoG • Policy and institutions reform debate set as agenda under NRMP • Efforts to harmonize donor support to sector increased when it is discovered that 4 pilot collaborative forestry programs (6 pilots each) are being run due to different donor requirements |
| 2002 | ASK - Boachie Dapaah appointed FC CE | TRMA Amendment Act 2002, ACT 617 | <ul style="list-style-type: none"> • Forest Policy Advisory Committee reviewed. • Enforcement of Competitive Bidding • FC publishes its service charter • FC publishes first disbursement report (SRA/royalties). |
| 2003 | Minister - Dominic Fobih | Timber Resources Management (Amendment) Regulations, 2003 L.I. 1721 - for competitive bidding of TUC Africa Forest Law & Governance (AFLEG) Ministerial Declaration (13-16 Oct 2003) | <ul style="list-style-type: none"> • Competitive Bidding System started (Pilot Plantation Auction) • 1st competitive bidding for plantation timber (21 March 2003) • Forest forums piloted • MLF directly manages HIPC plantations program (distortionary effect on FC managed programs). |
| 2004 | | Phase 1 Forest Fiscal Reform initiative - rationalization of forest tax system | <ul style="list-style-type: none"> • MLF run cancellation of NREL • All export duties in the timber industry • 1st competitive bidding for high forest (30 April 2004). • FC produces first set of audited, consolidated accounts. • Validation of legal timber program (VLTP) starts –contract signed with SGS. |

| | | |
|------|---|--|
| 2005 | <p>Boachie-Daapah retires as CE of FC.</p> <p>John Ottoo appointed Acting CE.</p> | <ul style="list-style-type: none"> • Cancellation of NREL • All export duties in the timber industry • FC Board term of office ends (Sept 2005) but continues. • FSDP II main works ends with extension of support for (a) Parliamentary subcommittee, (b) final work in MoFEP. • Wildlife Division launches tender for forest sector investment into Mole, Kakum (May 2005) • FC transfers responsibility for CRNR (the Sunyani Forest School) to KNUST • PFM project established under DFID financial aid to support roll-out of a decentralized FMIS (Adum). |
| 2006 | <p>Noble Biney appointed as Finance Director by Board</p> | <ul style="list-style-type: none"> • FC board continues in office (long delay in approving new board). • FC Board challenges decisions of MoFEP and MLFM on amendment to export levy. • AG rules that Export Levy is legal. |

Table A2-2: Central Government Tax Revenue, 2001-2004 (in billions of cedis)

| Sector | 2001 | | 2002 | | 2003 | | 2004 | |
|---------------|---------------|-----------------------------|---------------|-----------------------------|---------------|-----------------------------|---------------|-----------------------------|
| | Tax revenue | Share of total (in percent) | Tax revenue | Share of total (in percent) | Tax revenue | Share of total (in percent) | Tax revenue | Share of total (in percent) |
| Finance | 410.6 | 19.6 | 519.5 | 18.7 | 633.2 | 15.7 | 831.1 | 16.0 |
| Agriculture | 21.1 | 1.0 | 24.9 | 0.9 | 23.7 | 0.6 | 29.0 | 0.6 |
| Timber | 27.1 | 1.3 | 49.1 | 1.8 | 40.6 | 1.0 | 46.6 | 0.9 |
| Mining | 359.9 | 17.1 | 431.6 | 15.5 | 610.9 | 15.1 | 666.2 | 12.8 |
| Manufacturing | 219.5 | 10.5 | 349.6 | 12.6 | 410.9 | 10.2 | 557.7 | 10.7 |
| Commerce | 141.5 | 6.7 | 196.3 | 7.1 | 259.9 | 6.4 | 412.9 | 7.9 |
| Other | 919.0 | 43.8 | 1205.6 | 43.4 | 2061.8 | 51.0 | 2660.0 | 51.1 |
| Total | 2098.7 | 100.0 | 2776.6 | 100.0 | 4041.0 | 100.0 | 5203.4 | 100.0 |

Source: RAGB.

Table A2-3: Projected and Collected Nontax Revenues, 2003-2005

| | 2003 | | 2004 | | 2005 | |
|-------------|---|--|---|--|--|---------------------------|
| | Projected (in billions of cedis) percent | Collection (in billions of cedis) percent | Projected (in billions of cedis) percent | Collection (in billions of cedis) percent | Projected (in billions of cedis) (in percent) | Projected (in percent) |
| Forestry | | | | | | |
| Commission | 54.8 | 0.0 | 60.0 | 107.0 | 126.5 | 3.2 |
| Grand total | 873.6 | 958.3 | 1,338.4 | 2,193.2 | 2,742.0 | 100.0 |

Source: RAGB data.

Table A2-4: Results of the Competitive Bidding of Timber, 2003-2005

| | 2003 | | 2004 | | 2005* | |
|--|----------------------------------|------------------|-------------------------|------------------------|---------------------------------------|----------------------------|
| | November Plantation timber | 29 23 73.7 | April Natural forest | July Natural forest | March/June/Sept/Nov Natural forest | |
| Number put up for bidding | | 29 | 28 | 48 | | *Planned bidding cancelled |
| Number of successful bids | | 23 | 17 | 25 | | - |
| Total expected revenue of TRFs (in billions of cedis) | | 73.7 | 15.2 | 12.3 | 12.3 | *Planned bidding cancelled |
| Outstanding balance by timber companies | | 56.3 | 12.7 | 12.3 | | |

*Planned bidding cancelled as a result of petition by some bidders against prequalification of some contractors.

Source: FC data.

Public Financing of the Forestry and Wildlife sector

3.1.1 Table A2-5: Allocated and Released Donor Assistance, 2002-2005

3.1.2 (reported by the MoFEP and MLFM) (in billions of cedis)

| Source | 2002 | | 2003 | | 2004 | | 2005 | |
|--------|--------|---------|--------|---------|--------|---------|--------|---------|
| | Budget | Release | Budget | Release | Budget | Release | Budget | Release |
| MoFEP | 63.8 | 32.4 | 68.05 | 56.2 | 59 | 76.8 | 227.8 | |
| MLFM | 39.9 | 12.7 | 46.2 | 41.8 | 253.5 | 100.2 | 250.2 | |

Source: MOFEP, MLFM.

Table A2-6: Planned and Actual Spending of Total CF and HIPC Fund, 2004

| | Planned (in billions of cedis) | 2004 | Execution rate (in percent) |
|------|-----------------------------------|----------------------------------|--------------------------------|
| | | Actual (in billions of cedis) | |
| CF | 10513.1 | 10332.2 | 98.3 |
| HIPC | 1205.6 | 1629.1 | 135.1 |

Note: A comparison of total collected IGFs and spending could not be obtained.

Source: MOFEP, MLFM.

Table A2-7: Composition of the MLFM budget (in billions of cedis)

| | GOG | | IGF | | Donor | | Total | |
|------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | (in percent) | |
| Total | 80.2 | 100.0 | 106.6 | 100.0 | 227.8 | 100.0 | 414.6 | 100.0 |
| Administration | 14.1 | 17.6 | 0.0 | 0.0 | 166.3 | 73.0 | 180.4 | 43.5 |
| Total subsectors | 66.1 | 82.4 | 106.6 | 100 | 61.5 | 27.0 | 234.1 | 56.5 |
| Land | 32.2 | 40.1 | 14.8 | 13.9 | 0.0 | 0.0 | 47.0 | 11.3 |
| Forestry | 24.2 | 30.1 | 80.7 | 75.7 | 49.1 | 21.6 | 154.0 | 37.1 |
| Mining | 9.7 | 12.1 | 11.1 | 10.4 | 12.4 | 5.4 | 33.2 | 8.0 |

Source: MoFEP (Appropriation Act 2005), excluding HIPC assistance.

3.1.3 Table A2-8: Actual Spending of FC by Sources of Funding in 2004

| Funding source | 2004 | |
|----------------|----------------------|--------------|
| | in billions of cedis | (in percent) |
| CF | | |
| P.E. | 20.8 | 87.7 |
| Admin. | 1.6 | 6.5 |
| Service | 0.7 | 2.8 |
| Investment | 0.7 | 2.9 |
| Total | 23.8 | 100.0 |
| IGF | | |
| P.E | 26.4 | 22.9 |
| Admin. | 23.5 | 20.4 |
| Service | 44.7 | 38.8 |
| Investment | 20.5 | 17.8 |
| Total | 115.1 | 100 |

Source: FC data.

Donor Assistance

Table A2-9: Allocated and Released Donor Assistance, 2002-2005 (in billions of cedis)

| Donor | 2002 | | 2003 | | 2004 | | 2005 | |
|--------------|--------|---------|--------|---------|--------|---------|--------|---------|
| | Budget | Release | Budget | Release | Budget | Release | Budget | Release |
| NSBCP | | | 8.3 | 6.4 | 15.5 | 11.7 | 25.5 | |
| HFBCP | | 6.6 | | 2.6 | | 4.0 | | |
| CFMP | | | | | 20.9 | 10.0 | 34.1 | |
| LAP | | | | | 160.1 | 14.4 | 148.8 | |
| WFMP | 34.7 | 2.5 | 11.3 | 5.1 | 14.4 | 17.5 | 41.8 | |
| WDSP | 5.2 | 3.6 | 26.6 | 27.8 | 42.6 | 42.5 | | |
| Total | | | | | | | | |

Note: NSBCP=Northern Savanna Biodiversity Conservation Project, HFBCP= High Forest Biodiversity Conservation Project, CFMP= Community Forestry Conservation Project, LAP= Land Administration Project, WFM= Wildfire Management Project, WDSP= Wildlife Division Support Projects

Source: MLFM.

Appendix 3. Mining

Table A3-1: Key Mining Legislation

| |
|--|
| Additional Profits Tax Law 1985 (PNDCL 122) |
| Concessions Ordinance 1939, (c.136 Laws of G.C. 1951 Revisions), s.38 and Form Schedule |
| Diamond Mining Industry Protection Regulations, 1927 (No.9/1927) |
| Environmental Protection Agency Act, 19994 (Act 490) |
| Explosives Regulation, 1970 (L.I.666) |
| Gold Mining Products Protection Ordinance (c.149 9, Laws of the Gold Coast, 1951 Revision) |
| Mercury Law, 1989 (PNDCL 217) |
| Minerals and Mining Act,2006 (Act 703) |
| Minerals Commission Act, 1993 (Act 450 formerly PNDCL 153) |
| Minerals (Offshore) Regulations 1963 (L.I.257) |
| Minerals Regulations, 1937 |
| -Minerals Regulations, 1962 (L.I.231)especially regulation 1 and Form 5 of the first schedule |
| Minerals Regulations, 1963 (L.I.253) |
| Mining Regulations, 1970 (L.I. 665), especially regulations 4, 6, 10 and 194-205 |
| Mines (Royalties) Regulations, 1987 (L.I.1349) |
| Precious Minerals Marketing Corporation Law, 1989 (PNDCL 219) |
| Prospecting and Digging License Regulations, 1950 (Vol. VIII, 1954c Laws of the Gold Coast, p. 1032) |
| Rivers Ordinance 1903 (Cap 226) |
| State Gold Mining Corporation [Acquisition of Assets Amendment] Decree 1968 (NLCD 218). Subsidiary Transactions in Gold Regulations 1947 |
| Water Resources Commission Act, 1996 (Act 552) |

Table A3-2: Collection of Revenues and Employment

| | 2003 |
|---|-------------|
| Collected revenues in the mining sector (in US\$) | 45,486,000 |
| Total revenues (in US\$) | 426,000,000 |
| Number of persons employed in the mining and quarrying sector | 61,917 |
| Total number of persons employed | 6,441,121 |
| Mining revenues/number of persons employed in the mining and quarrying sector | 734 |
| Total revenues /total number of persons employed | 66 |

Source: World Bank data.

**Table A3-3: Contribution of Mining Sector to total Collection of IRS
(Royalties, PAYE, Corporate/Income) (in percent)**

| Year | Royalties | PAYE | Corporate/Income |
|-------------|------------------|-------------|-------------------------|
| 1999 | 97.4 | 9.4 | 5.8 |
| 2000 | 98.6 | 12.3 | 2.0 |
| 2001 | 99.0 | 11.6 | 2.2 |
| 2002 | 99.5 | 11.0 | 1.6 |
| 2003 | 99.3 | N/A | N/A |
| 2004 | 98.2 | 7.4 | 3.6 |

Source: Minerals Commission.

Table A3-4: Mining Sector—Central Government Allocation and Expenditures, 2002-2004

| | 2002 | 2003 | 2004 |
|---|---------------|-------|------|
| Allocation | | | |
| Total budget allocation (in billions of cedis) | 11.9 | 19.7 | 28.8 |
| Total budget allocation (as a percent of total budget) | 0.2 | 0.2 | 0.2 |
| Total budget allocation (as a percent of GDP) | 0.0 | 0.0 | 0.0 |
| Real allocation (2000 prices) | 7.2 | 9.3 | 11.9 |
| <i>Real growth</i> | 0.0 | 28.7 | 28.1 |
| Actual expenditures | | | |
| Total expenditures (in billions of cedis) | 22.3 | 16.4 | 20.3 |
| Total spending (as a percent of total budget execution) | 0.3 | 0.2 | 0.1 |
| Total spending (as a percent of GDP) | 0.0 | 0.0 | 0.0 |
| Total real spending (2000 prices) | 13.5 | 7.7 | 8.4 |
| <i>Real growth</i> | 0.0 | -42.8 | 8.5 |
| Budget execution rates | | | |
| Total budget execution (percentage) | 187.4 | 83.2 | 70.5 |
| Budget execution of investment expenditures (percentage) | 1566.7 | 140.8 | 55.0 |

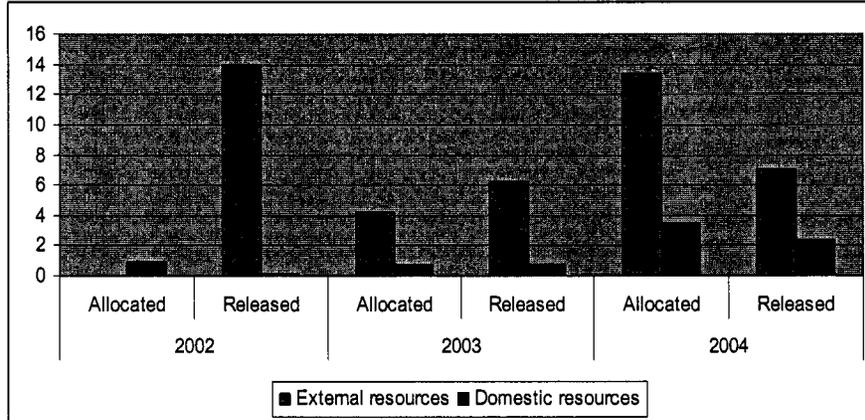
Source: MOEFP.

Table A3-5: Financing of the Mining Sector by Recurrent and Investment Expenditures, 2002-2004 (percentage)

| | 2002 | 2003 | 2004 | <i>Real Growth</i> | |
|----------------------------|--------------|--------------|--------------|--------------------|-------------|
| | | | | 2002/03 | 2003/04 |
| Total | 100.0 | 100.0 | 100.0 | -42.8 | 8.5 |
| Current Expenditure | 36.8 | 57.9 | 54.2 | -9.9 | 1.5 |
| Wages and salary | 6.7 | 34.1 | 26.6 | 190.3 | -15.5 |
| Goods & services | 6.3 | 11.0 | 9.9 | 0.0 | -2.6 |
| Services | 23.8 | 12.8 | 17.7 | -69.2 | 50.2 |
| Capital Expenditure | 63.2 | 42.1 | 45.8 | -61.9 | 18.1 |

Source: MoFEP.

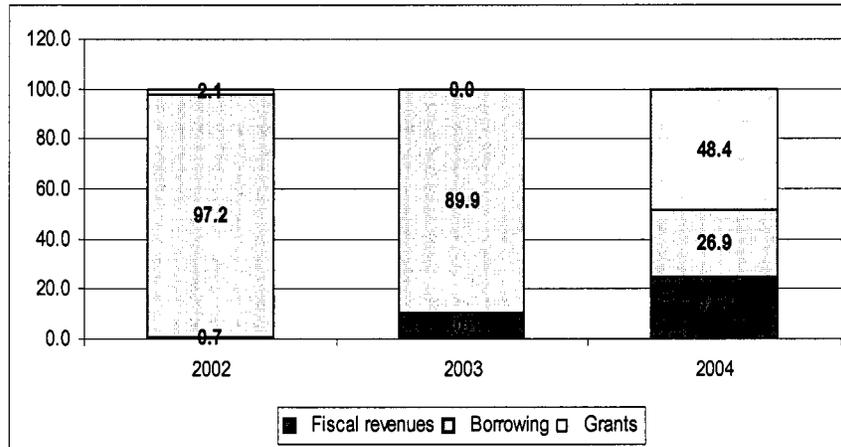
Figure A3-1: Comparison of the Allocation and Execution of the Investment Budget (in billions of cedis)



Source: MOFEP.

4.1.1.

Figure A3-2: Financing of the Investment Budget, 2002-2004 (as a share of total Ministry of Mines investment expenditures)



Source: MOFEP

Table A3-6: Distribution of Public Resources within the MoLFM in 2005

| | GOG | | IGF | | Donor | | Total | |
|------------------------------|---------------------|--------------|---------------------|--------------|---------------------|--------------|---------------------|--------------|
| | in millions of US\$ | in percent |
| Total MLFM budget | 8.9 | 100.0 | 11.8 | 100.0 | 25.3 | 100.0 | 46 | 100.0 |
| MLFM Administration | 1.6 | 17.6 | | 0.0 | 18.4 | 73.0 | 20.0 | 43.5 |
| MLFM subsectors | 7.3 | 82.4 | 11.8 | 100 | 6.8 | 27.0 | 26.0 | 56.5 |
| Land | 3.6 | 40.1 | 1.6 | 13.9 | 0 | 0.0 | 5.2 | 11.3 |
| Forestry | 2.7 | 30.1 | 9.1 | 75.7 | 5.4 | 21.6 | 17.1 | 37.1 |
| Mining | 1.1 | 12.1 | 1.2 | 10.4 | 1.4 | 5.4 | 3.7 | 8.0 |
| Mining administration | 0.2 | 2.3 | | | | | 0.2 | 0.4 |
| Minerals Commission | | 0.0 | | 10.4 | | | 1.2 | 2.7 |
| Mines Department | 0.2 | 2.7 | 1.2 | | | | 0.2 | 0.5 |
| Geological Survey Department | 0.6 | 7.1 | | | 1.4 | 5.4 | 2.0 | 4.4 |

Source: GoG (Appropriation Act 2005).

Table A3-7: Composition of Budgetary Allocations by Sources of Funding, 2005 (in millions of US\$ and as a share of total MoLFM budget)

| | GOG | | IGF | | Donor | | Total | |
|------------------------------|---------------------|-------------|---------------------|-------------|---------------------|------------|---------------------|------------|
| | in millions of US\$ | in percent | in millions of US\$ | in percent | in millions of US\$ | In percent | in millions of US\$ | in percent |
| Mining | 1.08 | 12.1 | 1.23 | 10.4 | 1.38 | 5.4 | 33.2 | 8.0 |
| Administration | 0.20 | 2.3 | | | | | 1.8 | 0.4 |
| Minerals Commission | | 0.0 | 1.23 | 10.4 | | | 11.1 | 2.7 |
| Mines Department | 0.24 | 2.7 | | | | | 2.2 | 0.5 |
| Geological Survey Department | 0.63 | 7.1 | | | 1.38 | 5.4 | 18.1 | 4.4 |

Source: GoG (Appropriation Act 2005).

Table A3-8: Income of the Minerals Commission, 2002-2005 (in billions of cedis)

| | 2002 | 2003 | 2004 | 2005 |
|----------------------------|------------|------------|-------------|-------------|
| Total | 5.0 | 6.5 | 10.0 | 10.7 |
| Consideration fees | 4.1 | 5.1 | 6.5 | 7.7 |
| Exemption fees | 0.3 | 0.3 | 1.8 | 1.3 |
| Sale of publications | 0.0 | 0.1 | 0.4 | 0.4 |
| Other receipts | 0.0 | 0.0 | 0.0 | 0.0 |
| Search & information | 0.1 | 0.2 | 0.7 | 0.2 |
| Processing fees | 0.1 | 0.4 | 0.1 | 0.3 |
| Service fees | 0.4 | 0.3 | 0.6 | 0.7 |
| <i>Nominal growth rate</i> | | 30.8 | 54.7 | 6.6 |

Source: MC data.

Table A3-9: Comparison of MC Income and Expenditure, 2004 and 2005 (in billions of cedis)

| | 2004 | 2005 |
|--|------|------|
| Revenues | 10.0 | 10.7 |
| Expenditures | 15.0 | 23.3 |
| Deficit | 5 | 12.6 |
| <u>Memo</u> | | |
| Ratio Revenue /expenditure (percentage) | 66.6 | 45.9 |

Source: MC data.

Table A3-10: Composition of the MES Budget in 2005 (percentage)

| | CF | IGF | Donor | Total | CF | IGF | Donor | Total |
|---|------------|------------|------------|------------|-------------|------------|-------------|--------------|
| Total | 100 | 100 | 100 | 100 | 81.0 | 7.1 | 12.0 | 100.0 |
| Headquarters | 18.3 | 63.8 | | 19.3 | 76.6 | 23.4 | 0.0 | 100.0 |
| of which EPA | 5.4 | 63.8 | | 8.9 | 49.3 | 50.7 | 0.0 | 100.0 |
| CSIR | 69.3 | 34.0 | | 58.6 | 95.9 | 4.1 | 0.0 | 100.0 |
| Ghana Atomic Energy Commission | 12.4 | 2.2 | 100.0 | 22.2 | 45.4 | 0.7 | 53.9 | 100.0 |

Source: GoG (Appropriation Act 2005).

Appendix 4-1: The Agricultural Sector

The agricultural sector is the main economic sector in Ghana, as it contributes to 38 percent of the GDP, employs 45 percent of the active population (National Development Planning Commission 2005) (about 60 percent of the rural labor force), accounts for about 75 percent of the foreign exchange earnings (IFAD 2006), and contributes to meet more than 90 percent of the food needs of the country (EPA 2002).

The agricultural sector has led the economic growth of Ghana with an average growth rate of almost 6 percent in the period 2002-2004. As shown in Table A4-1-1 below, it is also the sector that will continue to pull economic growth in the near future.

Table A4-1-1: GDP vs. Sectoral Growth Rates 2001-2009

| | 2001 | 2002 | 2003 | 2004 | 2005* | 2006* | 2007* | 2008* | 2009* | 2001-09 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Real GDP | 4.20 | 4.50 | 5.20 | 5.80 | 5.80 | 6.11 | 5.83 | 6.06 | 5.72 | 5.47 |
| Agriculture | 4.02 | 4.36 | 6.06 | 7.49 | 6.50 | 5.24 | 6.71 | 5.18 | 6.60 | 5.8 |
| Industry | 2.93 | 4.73 | 5.06 | 5.13 | 5.80 | 6.11 | 5.83 | 6.06 | 5.72 | 5.26 |
| Services | 5.07 | 4.70 | 4.68 | 4.73 | 5.40 | 5.75 | 5.90 | 5.99 | 5.72 | 5.33 |

* Projected.

Source: Adapted from National Development Planning Commission 2005.

The agricultural sector is predominately *small-holder* (small-scale farmers account for about 80 percent of the total agriculture production (National Development Planning Commission 2003]), *traditional* (the bush-fallow system is the predominant farming system in Ghana), and *rainfed* (only 0.5 percent of the agricultural land or 0.04 percent of the total land is irrigated). In addition, the agricultural sector, particularly in the desertification-prone areas of the country, is characterized by *low input technologies* (i.e., fertilizers, improved seeds, mechanization, etc.). Because of the high cost of fertilizers resulting from the removal of subsidies, fertilizer consumption, for instance, amounts to about 6 kg/ha (World Bank I 2005); this represents almost half of the quantity of fertilizer per hectare of arable land in Sub-Saharan Africa (FAO 2005) and almost one-tenth of the quantity of fertilizer per hectare for developing countries (National Development Planning Commission 2003). Agriculture production mainly depends on soil productivity (EPA 2002).

About 63 percent of the land area in Ghana is agricultural land (World Bank 2005). However, only 18 percent is currently under cultivation (WDI 2005). Only 0.5 percent of the agricultural land (IFAD (2006), or 0.04 percent of the total land (National Development Planning Commission 2003), is under irrigation.

The agricultural sector is made of five subsectors: (a) crops other than cocoa (e.g., cereals, industrial crops and horticulture), (b) cocoa, (c) forestry, (d) livestock and poultry, and (e) fisheries. Contribution of the different subsectors to the Agricultural GDP (AGDP) in the recent past is reported in Table A4-1-2 below. (Please, note that contribution of crops and livestock is jointly calculated. The livestock subsector contribution to the AGDP averaged between 7 and 9 percent).

Table A4-1-2: Agricultural Sector: Percentage of Subsector Contribution to Agricultural GDP, 2000-2004

| Subsector | 2000 | 2001 | 2002 | 2003 | 2004 |
|---------------------|------|------|------|------|------|
| Crops and livestock | 62% | 63% | 64% | 61% | 58% |
| Cocoa | 14% | 13% | 12% | 16% | 20% |
| Forestry | 11% | 11% | 11% | 11% | 10% |
| Fishing | 13% | 13% | 13% | 12% | 11% |

Source: Adapted from National Development Planning Commission 2005.

The production of crops is divided into roots and tubers (such as cassava, yam, cocoyam, and plantain) and cereals (such as maize, sorghum, millet, and rice). Crop production in recent years is reported in Table A4-1-3 below:

Table A4-1-3: Roots/Tubers and Cereal/Crops Production per Year

| Year | Root and tubers (in thousands of tons) | Cereal and crops (in thousands of tons) |
|----------|--|---|
| 1995-99* | 13,151 | 1,753 |
| 2000 | 15,027 | 1,711 |
| 2001 | 16,275 | 1,648 |
| 2002 | 17,770 | 2,155 |
| 2003 | 18,186 | 2,042 |

* Average.

Source: Adapted from ISSER 2004, in World Bank et al.(2005).

Appendix 4-2: Erosion Hazards by Region

Table A4-2-1: Erosion Hazards by Region

| Region | Slight to moderate | | Severe | | Very severe | |
|---------------|--------------------|------------|-----------------|------------|-----------------|------------|
| | Km ² | % | Km ² | % | Km ² | % |
| Northern | 23,310 | 10% | 19,062 | 8% | 23,330 | 10% |
| Upper East | 4,574 | 2% | 3,774 | 2% | 964 | 0% |
| Upper West | 7,288 | 3% | 4,470 | 2% | 7,148 | 3% |
| Brong Ahafo | 10,697 | 5% | 20,932 | 9% | 5,219 | 2% |
| Volta | 6,615 | 3% | 7,376 | 3% | 2,901 | 1% |
| Ashanti | 7,115 | 3% | 11,826 | 5% | 6,017 | 3% |
| Greater Accra | 3,005 | 1% | 101 | 0% | 85 | 0% |
| Eastern | 3,090 | 1% | 11,015 | 5% | 2,852 | 1% |
| Central | 2,002 | 1% | 7,780 | 3% | 521 | 0% |
| Western | 2,745 | 1% | 16,913 | 7% | 3,675 | 2% |
| Total | 70,441 | 31% | 103,249 | 45% | 52,712 | 24% |

Source: Adapted from Asiamah 1987, in EPA 2005.

Appendix 4-3: Immediate Causes of Land Degradation: Biophysical and Anthropogenic Factors

The symptomatic factors that led to land degradation in Ghana may be divided in two categories: biophysical or natural, and human-induced or anthropogenic.

1. Biophysical factors

(A) Physical characteristics of the soil

Physical characteristics of the soil reduce the capacity of the soil to retain or drain water, limit its capacity to absorb nutrients, and obstruct root growth. Most of the soils in Ghana are in fact characterized by extremes of textures (e.g., sand textures, graveliness, stoniness, etc.), particularly in the Sudan and Guinea Savannas and Transitional zone. In addition, extensive areas in the country have shallow concretionary, rocky, and clayey soils. These characteristics reduce the soil's capacity to properly retain or drain water, limit its capacity to absorb nutrients, and obstruct root growth. As a result, the productive capacity of these soils is undermined.

(B) Topography

The topography of the country, characterized—as mentioned above—by gentle and stable slopes, does not represent *per se* a major factor of degradation. However, practices that remove or degrade the vegetation (see below) create large areas of bare land that may become highly susceptible to erosion.

(C) Climate conditions

Climate events, such as rainfalls and droughts, may contribute to land degradation. The prolonged periods of highly erosive rainfalls separated by prolonged dry periods, particularly in the Guinea and Sudan Savanna zones, may contribute in fact to reduction of vegetative cover, thus predisposing those areas to a high risk of erosion. In addition to the seasonal variability in rainfalls, wide fluctuations in distribution, amount of rainfall, and number of rainy days that occur over years and decades frequently lead to droughts. The major droughts of 1968-73, 1982-85, and 1990-92 caused serious hydrological imbalances that negatively affected land resources, particularly soil quality and fresh water supplies (EPA 2002). Each drought cycle exacerbates the vulnerability of the affected area to desertification. Although droughts are climatic events, human-made activities (e.g., removal of vegetation cover, overgrazing, etc.) can also reduce the resilience of the area to droughts.

Moreover, it is likely that climate change will adversely affect land resources in Ghana. Impacts of the climate change on land degradation in Ghana have not yet been studied in depth or quantified. However, it seems likely that climate change, in the absence of an adaptation strategy, will exacerbate land degradation in Ghana. Climate change will in fact probably result in, among other things: (1) increased rainfall variability and probably an overall drop in rainfall (10 percent lower rainfall by 2050 is expected, IPCC 1997), thus increasing the chances of drought periods; (2) rise in temperatures (a 1.4-1.6 degree higher temperature by 2050 is expected, IPCC 1997), likely resulting in increased forest and bush fires; and (3) increased evaporation, resulting in reduced soil quality. Climate change may also contribute to accelerated coastal erosion, to which Ghana is particularly vulnerable (World Bank et al. 2005).

2. *Anthropogenic factors*

Human-induced or anthropogenic factors represent the main cause of land degradation in Ghana. These factors consist of unsustainable land use and land management practices. Four types of human-induced activities are considered relevant in the context of Ghana: unsustainable farming practices, removal of vegetation cover (which includes deforestation and overgrazing by livestock), mining activities, and urbanization and industrial activities.

(A) Unsustainable farming practices

Some widely adopted traditional farming practices are not sustainable anymore. The traditional farming system (bush-fallow system), which involves slashing and burning of forests and grassland, and the rotation of cultivated fields (rather than crops) over years, and which is the predominant farming system in the desertification-prone areas, is only sustainable under the conditions of low population density and abundant land. In a context of rapidly increasing human and animal population (see Box 5-1 on the linkages between land degradation and population growth, and Box 5-2 on livestock increase), the traditional system no longer becomes sustainable. The 8-15 years natural fallow period normally required to regenerate soil fertility after 1-3 years of cropping has been reduced to 2-3 years in Ghana (FAO). In the absence of soil and water conservation measures and external nutrient replacement practices, unsustainable intensification leads to a progressive reduction of soil nutrients, organic matter, and other chemical processes, and to a consequent decline in productivity and crop yields. To overcome the problem of reduced soil fertility/productivity, and—at the same time—support the increasing food requirements, traditional farmers have expanded their cultivated land by either clearing new land (including forests) for agriculture purposes, thus reducing the country's vegetation cover and favoring further soil erosion, or moving toward new, marginal, and more fragile areas, such as riverbanks or hillsides, thus contributing to accelerated erosion. Although agricultural land area is considerably in excess of the area under cultivation (see paragraph. 15, chapter 5), cultivation is already taking place in marginal lands in some regions, particularly the Upper East (EPA 2002). The pervasive use of fires to clear land, besides contributing to the loss of vegetation cover over extensive areas of the country, eliminates crop residues, which would contribute to generate organic matter in the soil.

(B) Removal of vegetation cover: deforestation and overgrazing

Removal of vegetation cover creates conditions that favor physical deterioration of the land (water and soil erosion, soil compaction, crusting, etc). Two major activities in Ghana contribute to the removal of vegetation cover: deforestation and overgrazing. *Deforestation* (see Chapter 3 on Forestry for more details) represents probably the most serious form of natural resource degradation in Ghana, and it is one of the main direct causes of land degradation in the country. In the presence of a rapid population growth, the demand for more land for agriculture, and for fuelwood and other wood products (e.g., charcoal), which the majority of rural people rely on for their livelihoods, has increased. The reduction of soil fertility and productivity has forced farmers to expand their cultivated lands and clear forest areas. The poor enforcement of regulations controlling access to and use of forestry products has favored unsustainable logging practices and indiscriminate fuelwood extraction. A market price that is lower than the real value of wood has contributed to overexploitation of forestry resources in the country. Forest resources have been depleted at a rate of 1.7 percent per annum in the period 1990-2000 (WDI 2005), but, according to the National Action Program to combat Drought and Desertification, at a rate of 3 percent in the most desert-prone areas. *Overgrazing* is caused by the combination of rapid increase in the livestock population, sedentarization of pastoral populations, and the reliance of the livestock sector on extensive grazing on natural pastures and poor development of pasturelands. Goat, sheep, and cattle populations have increased by 32 percent, 20 percent, and 6 percent, respectively, in the period 1997-2003 (ISSER 2004, in World Bank et al. 2005), increasing the pressure on land resources. The majority of livestock herds are concentrated in the Guinea and Sudan Savannas; the Upper West, Upper East, and Northern Regions—the most vulnerable areas to land degradation in the country—host 74.4 percent, 36.5 percent,

43.4 percent of the national livestock, respectively (EPA 2002). In 1996 the density of livestock in the Upper East Region was 130 units/km² (EPA 2002). Moreover, the increase of livestock population is an important factor in physical compaction of the soil.

(C) Mining activities

Mining, particularly illegal mining activities, is one of direct causes of land degradation most specific to the Ghanaian context (see Chapter 4 on Mining for more details). These activities are accompanied by deforestation and removal of the fertile topsoil of adjacent agricultural lands. According to the National Action Program to Combat Drought and Desertification, illegal surface mining is taking place in Dakrupe and near Laribanga in the Bole and West Gonja Districts in the Guinea Savanna zone, and in Nagondi in the Upper East Region.

(D) Urbanization and industrial activities

Rapid urbanization and increased population have increased the pressure on land, not only regarding farming to meet increased food requirements, but also for other competing uses, such as housing and infrastructure development. At the moment, industrial activities leading to land degradation (e.g., chemical pollution of the soil from municipal wastes, excessive use of fertilizers, herbicides, and insecticides) do not represent a major problem in Ghana. However, they may become a factor of increasing importance in the future in presence of rapid urbanization, a shift to agro-industry, and progressive industrialization, and in the absence of effective regulation that controls the disposal and use of toxic substances.

Appendix 4-4: Main processes of Land Degradation in Ghana

The major processes of land degradation in Ghana are *physical* (in the form of soil erosion, compaction, crusting and iron-pan formation), *chemical* (depletion of nutrients, salinity and acidification), and *biological* (loss of organic matter).

Physical degradation - Soil erosion is the main form of land degradation in Ghana. The main causative agents of erosion are water and wind. Despite Ghana's topography does not present steep slopes¹²⁹, the intensity of rainfalls in all ecological zones¹³⁰ is generally high. Rains tend to be therefore highly erosive. Runoff plot studies on bare plots in various ecological zones of Ghana show soil losses ranging from 187 t/ha a-1 to 0,6 t/ha a-1, with corresponding values of runoff as a percentage of rainfall ranging from 47 to 18 percent (Bonsu 1979, in EPA 2002) (see Table A5-4-1). Wind erosion is presently not a major form of soil erosion in Ghana, but it can become more serious as the area of bare land increases due to vegetation removal (EPA 2002).

Chemical degradation - Chemical degradation of the soil is considered the second most severe process of land degradation in Ghana (Sherr 1999, in EPA 2002). Projected figures from 1984 data estimated that the annual depletion of soil nutrients in 2000 was 35 Kg N, 5 Kg P and 20 Kg K/ha (EPA 2002) (see Table A5-4-1). Salinity - salt intrusion in the soil - occurs mostly within the Costal Savannah.

Biological degradation - Organic matter content in soils is generally low (less than 2percent in the topsoil) (MoFA 1998, in Oppong-Anane) as most of the soils are old and have been leached over a long period of time. The levels of organic carbon, nitrogen and available phosphorus are also generally low (FAO 2005). The annual burning, removal and grazing of crop residues prevent the build-up of new organic matter.

Table A4-4-1 - Erosion on bare plots within different ecological zones in Ghana

| Ecological zone | Slope (%) | Soil loss (t/ha a-1) | Runoff % of rainfall |
|----------------------------|-----------|----------------------|----------------------|
| Semi-deciduous forest | 7.5% | 186.9 | 47% |
| Forest-Savannah transition | 3% | 12.8 | 38% |
| Guinea Savannah | 2% | 0.9 | 11.5% |
| Costal Savannah | 2.5% | 0.6 | 18% |

Source: Adapted from Bonsu (1979) in EPA (2002)

Table A4-4-2 - Nutrient depletion rates in Ghana and Sub-Saharan Africa

| Nutrient | Ghana 1982-84 | Ghana 2000* | SSA 1983-2000 |
|----------------|---------------|-------------|-----------------|
| Nitrogen (N) | 30 Kg/ha | 35 Kg/ha | 22-26 Kg/ha |
| Phosphorus (P) | 3 Kg/ha | 4 Kg/ha | 5.73-6.87 Kg/ha |
| Potassium (K) | 17 Kg/ha | 20 Kg/ha | 18-23 Kg/ha |

Source: EPA (2002)

* Projected

¹²⁹ Most slopes are less than 5percent steep, and most do not exceed 1percent [Oppong-Anane].

¹³⁰ Ghana is divided in six agro-ecological zones, defined on the basis of climate and reflected by the natural vegetation, namely Sudan, Guinea and Costal Savannah zones, the Forest-Savannah Transitional zone, the Semi-deciduous Forest, and the High Rainforest zones.

Appendix 4-5: Technical Options, Characteristics, Risks, and Long-term Effects of Soil Conservation in Different Agro-ecological Zones in Ghana

Table A4-5-1: Technological Option for Soil Conservation and Agro-ecological zones

| Technological option | Agro-ecological zone |
|-------------------------------|--|
| Mineral fertilizers | All zones |
| Compost | All zones |
| Minimum tillage | All zones |
| Mulching | All zones |
| Vegetative barriers | All zones |
| Poultry manure | Semi-deciduous forest zone (Ashanti Region) |
| No-till | Forest and transition zones |
| Improved fallow (Mucuna) | Forest and transition zones and Guinea Savanna |
| Tied-ridge | Sudan and Guinea Savanna |
| Farm yard manure/ Animal dung | Sudan, Guinea and Coastal Savanna |
| Ridge furrow system | Sudan, Guinea, Coastal Savanna, and Transition zones |
| Broadbed and furrow system | Costal Savanna, heavy clays |
| Shallot farming | Costal Savanna (salt-affected soils of Keto) |
| Cowdung | Savanna Region |
| Compound farming | Savanna Region (around houses) |
| Stone bunding | Savanna Region (on sloping land) |
| Stone-lines | Sudan Savanna and wherever available |

Source: Adapted from Quansah 2001, and FAO.

Table A4-5-2: Indigenous Soil and Water Conservation System in Northern Ghana

| SWC system | Characteristics |
|--|--|
| Broad beds | These beds, normally planted with groundnuts, millet, and sorghum, reduce the effect of water erosion. |
| Stone bunds/ Terrace system | Stone bunds have been erected to trap water for crops in the rainy season. These bunds have been developed into a terrace system on the slopes. |
| Mounds | Tillage method for cropping. The purpose is to improve the exploitable volume of soils for the crops. |
| Ridging | Method for controlling soil erosion. In the uplands of the Savanna regions, soil is raised in the form of a line perpendicular to the slope of the terrain. In the Northern Region, ridging is done parallel to the contour to enhance runoff during the rainy season and prevent drainage problems. |
| Pit system | Stones are removed to create a pit for collection of water. This system can retain water for some time because of the high clay content of the subsoil. |
| Stone lines | Continuous lines of stones in a field. Stone lines slow down the flow of rainwater, thus enhancing infiltration, and facilitating to a certain extent the deposition of vegetable debris and fine soil particles which increase soil fertility |
| Basins | Pieces of land surrounded by irregularly shaped ridges. They retain runoff occurring during the rainstorm in order to offset water deficit during dry spell. |
| Stone terracing | Used in places with slopes around 10 percent. |
| Mixed cropping | This practice involves planting crops of different rooting depths on the same piece of land to reduce competition for nutrients and water. |
| Cow dung around compound houses | It ensures good vegetative growth around the houses. |
| Planting groundnuts | On flat areas it checks soil erosion by providing surface cover. |

Source: Adapted from ODI 1999,

Table A4-5-3a: Risks Associated with Various SLM Practices

| Method | Long-term effects |
|--|---|
| Soil and water conservation structures | Failure from inappropriate design resulting in increased damage down the slope. Fire and browsing damage to biological soil conservation measures. Trampling by cattle. |
| Minimum tillage | Increased weed infestation. Loss of required mulch to livestock |
| Mineral fertilizer | Loss of capital investment in drought years. |
| Farmyard manure | Increased weed infestation. |
| Rotation and intercropping | Uncertain markets for some leguminous crops in rotation (e.g., soybean). Intercrops may offer alternative hosts for pests and diseases. |
| Improved fallows | Longer dry spells after transplanting. Livestock damages unprotected improved fallows, especially in the first dry season. Late dry season fires. |

Source: Quansah 2001.

Table A4-5-3b: Long-term Effects Associated with Various SLM Practices

| Method | Long-term effects |
|--|--|
| Soil and water conservation structures | If well maintained, the effects will improve with time |
| Conservation tillage | Gradual build-up of soil fertility leads to gradual increases in yields. |
| Inorganic fertilizer | Main effects in the first season. Some residual effects in the second season. Inappropriate fertilizer use over year may lead to nutrient imbalances. |
| Farm yard manure/ poultry manure | Main effects in the first season. Some residual effects in the second season. Repeated use improves soil structure and other characteristics. Poor quality manure likely to result in increased weed infestation. |
| Improved legume pastures | Productivity after the pasture is increased for more than one season. |
| Rotation and intercropping | Immediate effects for one season only. Long-term improvement of soil structure. |
| Green manuring | Immediate effects for one season only. Long-term improvement of soil structure attained with regular use. |
| Improved fallows | Direct effects for 2-3 seasons. |

Source: Quansah 2001.

Table A4-5-3c: Assessment of Various Methods for Soil Fertility Management

| Criteria | Technologies | | | | | | |
|---------------------|-------------------------|------------------------------|-------------------|------------------------------|-----------------------|--------------------------------|--------------------------------|
| | Natural fallow <5 years | Mechanical soil conservation | Manure use | Rotation | Inorganic fertilizers | Green manure | Improved fallow |
| Land requirements | ●●●● | ●● | ○ | ○ | ○ | ●●● | ●●● |
| Labor input | ○ | ●●●● | ●● | No extra | ● | ●● | ●●● |
| Capital input | ○ | ● | ●● (Transport) | ○ | ●●●● | ● | ● |
| Draught power needs | ○ | Helpful | ●●● | Helpful | ○ | ●● | ● |
| Period foregone | <5 years | ○ | ○ | ○ | ○ | 1 season | 2-3 seasons |
| Associated risks | Land tenure | Breakage | Weeds | Low value for some crops | Capital loss | Pests | Pests, livestock, fire |
| Production increase | ● | ●●● | ●● | ●● | ●● | ●● | ●●● |
| Skills required | ○ | ● | ●●● | ●●●● (Depending on crops) | ●●●● | ●●● | ●●●● |
| Lasting effects | ●○ | Increasing | 1-3 | Continuous | 1-2 seasons | 1 season | 2-3 seasons |
| Short-term benefits | ● (pasture) | ●-●● | ●●● | ●● | ●●●● | ●● | ● (fodder, food) |
| By-products | Pasture | Water retention | ○ | Diversified output | ○ | Fodder (food, fiber) | Firewood |
| Side-effects | Weeds -> labor | Need for maintenance | Weeds -> labor | Improved food security | Nutrient imbalances | Weed suppression -> less labor | Weed suppression -> less labor |

●●●● = very high
 ●●● = high
 ●● = medium
 ● = low
 ○ = none

Source: Adapted from Raussen 1997, in Quansah 2001.

Appendix 4-6: Policy Framework—Key Environmental Policies, Strategies, and Action Plans

The Ghana *Environmental Policy*—The Ghana Environmental Policy (1991) aims at improving the living conditions and the quality of life of present and future Ghanaian generations. It seeks to ensure reconciliation between economic development and natural resource conservation, by promoting sound management of natural resources. Key issues in the policy include land, forestry, and water management. Specifically, the policy seeks to (1) maintain ecosystems and ecological processes essential for the functioning of the biosphere; (2) adequately protect humans, plants, and animals, and their biological communities and habitats against harmful impacts and destructive practice, and preserve biological diversity; (3) reduce and, as far as possible, eliminate pollution and nuisances; and (4) integrate environmental considerations in sectoral, structural, and socioeconomic planning at the national, regional, district, and grassroots levels. Among the various principles underlying the policy are (1) the use of the most cost-effective means to achieve environmental objectives, (2) the use of incentives in addition to regulatory measures, (3) the delegation of decision making to the most appropriate level of government, and (4) public participation in environmental decision making. The Ghana Environmental Policy provides the broad framework for the implementation of the National Environmental Action Plan.

The *National Environmental Action Plan*—The National Environmental Action Plan (NEAP) (1991)—based on an extensive review of the key sectors/issues underpinning the country’s economy and environmental sustainability (land management, forestry, wildlife, water management, marine and costal ecosystems, mining, manufactory industries, hazardous chemicals and human settlements)—provides the basic policy framework for overall environmental and land management. At the core of the implementation strategy there are enhanced management practices.

The *Forest and Wildlife Policy*—The Forest and Wildlife Policy (1994) seeks to promote the conservation and sustainable use of the nation’s forest and wildlife resources. The policy endeavors to bring the forest and wildlife sectors together for purposes of conservation through sustainable use. Its guiding principles include (1) the right of people to access natural resources for maintaining a basic standard of living, (2) the concomitant responsibility to ensure sustainable use of such resources, and (3) the wise use of these resources in view of their contribution to the country’s economy. The *Forest Development Master Plan* (2001-2010), which implements the Forest and Wildlife Policy, promotes sustainable forest and savanna woodland management, propagation of forest-based products, and conservation of protected areas.

The *Soil Fertility Management Plan*—The Soil Fertility Management Plan (1998) encourages the sustainable use of lands, by, for instance, promoting crop rotations, agroforestry and soil and moisture conservation practices.

The *Accelerated Agricultural Growth and Development Strategy*—The Accelerated Agricultural Growth and Development Strategy (AAGDS) of 1996 represents the agricultural strategy to improve human welfare and reduce poverty in the country. Its main purpose is to facilitate agricultural growth to 6 percent of the GDP in order to enable the economic growth that will contribute to making Ghana a middle-income country. Programmed for implementation over a 10-year period (2001-2010), the AAGSD seeks to stimulate agricultural production by (1) improving access to markets, (2) increasing access to technology for sustainable natural resource management, (3) facilitating access to agricultural finance services, (4) improving the quality of rural infrastructures, and (5) enhancing human and institutional capacity.

The *National Wildfire Policy*—The National Wildfire Policy seeks to promote the effective management of wildfires to guarantee the sustainable management of natural resources and the restoration of environmental quality. More specifically, it seeks to (1) ensure the prevention and control of wildfires, (2) introduce alternative resource management systems that will minimize the incidence and effects of

wildfires, (3) institute incentives and reward systems in wildfire management, and (4) promote user-focused research on wildfire management.

The ***Water Policy***—The Water Policy aims to ensure effective development and management of the country's water resources. Based on the principle of Integrated Water Resource Management (IWRM), it will in particular encourage the sustainable exploitation, utilization, and management of water resources to ensure full socioeconomic benefits to present and future generations, while maintaining biodiversity and the quality of the environment. Among other measures, it will ensure the availability of water in sufficient quantity and quality for different purposes, including agricultural use to sustain food production and security. Finally, it will promote the development and use of appropriate technologies for sustainable water resources use.

Appendix 4-7: The National Land Policy

The Land Policy of Ghana (1999, revised in 2002) aims at promoting “the judicious use of the nation’s land and all its natural resources by all sections of the Ghanaian society in support of various socio-economic activities undertaken in accordance with sustainable resource management principles and in maintaining viable ecosystems.”

The *guiding principles* upon which the policy is based include, among others:

- Land as a common national or communal property resource held in trust for the people and used in the long-term interest of the people of Ghana;
- Optimum usage of land, including human settlements, industry, commerce, agriculture, forestry, mining, protection of water bodies and the environment;
- Equitable and reasonable access to land, within the context of national land use planning;
- Security of tenure.

Key policy provisions include, among others:

- (a) *Facilitating equitable access to land:* (i) each individual can have access to land in any part of Ghana (unless the area has been declared a protected area), (ii) planning schemes for all land users to facilitate dispositions of land for development should be prepared, (iii) prices for private land transactions will be determined by the market, and (iv) prompt, fair, and adequate compensation should be paid for land acquired through compulsory government acquisition.;
- (b) *Guaranteeing security of tenure and protection of land rights:* (i) all traditional sources of land tenure, as well as those derived from common law, are recognized legitimate, (ii) land-related decision making should take into consideration the conservation of the land and of its natural resources, and (iii) land titling as best and sufficient evidence of title to land;
- (c) *Ensuring sustainable land use:* (i) the use of land in Ghana will be determined through national land use planning; (ii) all lands declared forest/nature reserves, national parks, and wildlife sanctuaries are “fully protected,” (iii) land use involving mechanized agriculture, cattle ranching, the dairy farming and manufacturing industry, and mining and other extractive industries must conform to environmental conservation principles, environmental laws, and—when required—to the Environmental Impact Assessment, and (iv) land development planning for the purposes of human settlement, industry, and large-scale intensive agriculture must make adequate provisions for, among others, land and other environmental conservation requirements;
- (d) *Enhancing land capability and land conservation:* (i) the supply of land will be sustained by all appropriate methods, including soil conservation, improving soil productivity, control of desertification, rehabilitation of degraded land areas, and land reclamation, (ii) no land with a primary forest cover must be cleared for the purpose of establishing a tree crop plantation or mining activity, (iii) encouragement and other forms of incentives will be provided for the adoption of land use methods or practices that sustain land capability or conserve land.

Appendix 4-8: The National Action Program to Combat Drought and Desertification

The National Action Program to Combat Drought and Desertification (NAP) (finalized in 2002 and endorsed by Parliament in 2004) has been developed to fulfill one of the obligations of the affected developing country parties under the United Nations Conventions to Combat Desertification (UNCCD). It provides a long-term strategy to address land degradation in affected areas in Ghana.

NAP's *main purpose* is to identify the causes of desertification in the country, recommend possible prevention and remedial actions to reduce the impact of drought, and halt the rate of desertification in the country.

Its *overall goal* is to “emphasize environmentally sound and sustainable integrated local development programs for drought prone semi-arid and arid areas, based on participatory mechanisms, an integration of strategies for poverty alleviation and other sector programs including forestry, agriculture, health, industry and water supply into efforts to combat the effects of drought.”

The *core strategy* of the NAP is the establishment of permanent and temporary vegetative cover on the land, taking into consideration the principles of economic growth, environmental sustainability, and enhanced livelihoods.

Although the NAP is intended to be executed in an integrated manner, it is presented in seven thematic Action Programs. Each of the Action Programs comprises a number of Action Plans, as follow:

1. *Land Use and Soil Management*
 - 1.1 Action Plan for Land Use Planning
 - 1.2 Action Plan for Soil and Water Conservation
 - 1.3 Soil Fertility Action Plan
 - 1.4 Action Plan for Mining Activities
2. *Management of Vegetative Cover*
 - 2.1 Action Plan for the Management of Forest and Woodland
 - 2.2 Action Plan for Rangeland Management
 - 2.3 Action Plan for Bushfire Management
3. *Wildlife and Biodiversity Management*
4. *Water Resources Management*
 - 4.1 Water Resources Assessment, Monitoring and Usage Action Plan
 - 4.2 Protection of Water Bodies Action Plan
5. *Rural Infrastructure Development*
 - 5.1 Action Plan for Provision of Basic Infrastructure
6. *Energy Resources Management*
 - 6.1 Action Plan for Fuelwood and Alternative Energy Resources Management
7. *Improvement of the Socio-Economic Environment for Poverty Reduction*
 - 7.1 Action Plan for Improvement of Agriculture Production and Yield
 - 7.2 Action Plan for Development of Markets for Agricultural Products
 - 7.3 Action Plan for Creating Financial and Incentive Instruments
 - 7.4 Action Plan for Agricultural Diversification
 - 7.5 Action Plan for Non-Agricultural and Off-farm Enterprises

- 7.6 Action Plan for Reduction of Population Pressure on Land
- 7.7 Food Security Action Plan
- 7.8 Action Plan for Promotion of Access to Inputs to Production
- 7.9 Action Plan for Capacity Building, Training and Public Awareness
- 7.10 Action Plan for Drought Management and Mitigation

NAP *implementation* is the responsibility of the Ministry of Environment and Science. A National Desertification Committee is the national coordinating body, and is responsible for the overall supervision and implementation of the NAP. The focal point is the National Secretariat to Combat Desertification, and is based at EPA.

Funding mechanisms of the NAP include the established National Desertification Fund.

Appendix 4-9: Key Land Legislation

Table A4-9-1: Key Land Legislation

| Legislation | Purpose of legislation |
|--|--|
| Administration of Lands Act 1962 (Act 123) | The act seeks to consolidate with amendments the enactments relating to the administration of stool and other lands. |
| Chieftaincy Act, 1971 (Act 371) | The act amends the statute law on chieftaincy in order to bring it into conformity with the provisions of the Constitution and to make other provisions relating to chieftaincy. |
| Conveyancing Decree, 1973 (N.R.C.D.175) | The decree brings up to date the law relating to conveyancing and simplifies conveyance procedures. |
| Farm Lands (Protection) Act 11962 (Act 107) | The act provides protection for farmers whose titles to land are defective. |
| Lands Commission Act, 1994 (Act 483) | The act establishes the Lands Commission and provides for the composition, functions, and other related purposes of the Commission. |
| Land Development (Protection of Purchasers) Act, 1960 | The act protects purchasers of land as well as their successors in circumstances where their titles are found to be defective after they have erected a building on the land. |
| Land and Soil Conservation Ordinance (1953) | The ordinance provides for the establishment of committees with powers to preserve and reclaim land and to protect water resources in approved areas, and of further committees to coordinate the work and policy therein as well as to make provisions for related matters. |
| Land Planning and Soil Conservation Act (amended 1957) | The act amends the Land and Soil Conservation Ordinance and provides for the establishment of committees that should promote in designated areas proper land use and cultivation for purposes of erosion control. |
| Land Registry Act, 1962 (Act 122) | The act consolidates, with amendments, the law relating to the registration of instruments affecting land. |
| Lands (Statutory Wayleaves) Act, 1963 (Act 186) | The act provides for the entry on any land for the purpose of the construction, installation, and maintenance of works of public utility, and for the creation of rights of way and other similar rights in respect of such works and for purposes connected with those matters. |
| Land Title Registration Law, 1986 (P.N.D.C.L. 152) | The law provides machinery for the registration of title to land and interests in land. |
| Local Government Act, 1993 (Act 462) | The act establishes and regulates the local government system in accordance with the Constitution and provides for other related purposes. |
| National Development Planning Commission Act, 1994 (Act 479) | The act establishes the National Development Planning Commission under the Constitution and provides for its composition and functions relating to development planning policy and strategy and for related purposes. |
| National Development Planning (System) Act, 1994 (act 480) | The act provides for a National Development Planning System, defines and regulates planning procedure, and provides for |

| | |
|--|--|
| | related matters. |
| Office of the Administrator of Stool Lands Act, 1994 (Act 481) | The act establishes the Office of the Administrator of Stool Lands and provides for the administration of Stool Lands generally. |
| Public Conveyance Act 1965 (Act 302) | The act empowers the President to declare, by executive instrument, an area of state or stool land as a "selected area" for creating restricted purposes and to grant titles to such lands to persons displaced by natural catastrophes, compulsory acquisition of land, and readjustment of boundaries under the Town and Country planning laws. etc. |
| Public Lands (Protection) Decree, 1974 (N.R.C.D. 240) | The decree makes it an offense to convey or occupy public land without reasonable cause. |
| Rent Act, 1963 (Act 220) | The act consolidates and amends the law relating to the control of rent and the recovery of premises. |
| Stamp Act, 1965 (Act 311) | The act reenacts, with amendments, the law relating to stamp duties. |
| State Lands Act, 1962 (Act 125) | The act provides for the acquisition of land in the national interest and other purposes connected therewith. |
| State Property and Contract Act, 1960 (CA 6) | The act provides for the declaration of areas as industrial areas and the allocation of land to industrial concerns via leases for industrial development. |
| Stool Lands Boundaries Settlement (Repeal) Act 2000 (Act 587) | The act repeals the Stool Lands Boundaries Settlement Decree and gives the High Court original jurisdiction to determine disputes relating to stool land boundaries. |
| Survey Act, 1962 (Act 127) | The act consolidates, with amendments, the law relating to geological, soil, and land survey. |
| Town and Country Planning (Gold Coast) (Cap. 84) | The ordinance establishes the Town and Country Board, which is tasked with the responsibility of the orderly and progressive development of land, towns, and other areas whether urban or rural, and the preservation and improvement of amenities in these areas. |

Source: The Authors

Appendix 4-10: Land Administration Project (LAP)

4.1.2. The Government of Ghana has undertaken a long-term land administration reform program to improve security of land tenure; simplify the process for accessing land and making it fair, transparent, and efficient; develop a land market; and foster prudent land management. The Land Administration Project (LAP) is the first phase that lays down the foundation for the implementation of this long-term land administration reform.

The specific objective of the project is to develop a sustainable and well-functioning land administration system that is fair, cost effective, and decentralized and that enhances land security. Specifically, it would seek to (a) harmonize land policies and the legislative framework with traditional law for sustainable land administration, (b) undertake institutional reform and capacity building for comprehensive improvement in the land administration system, (c) establish an efficient, fair, and transparent system of land titling, registration, land use planning, and evaluation, and (d) issue and register land titles in selected urban and rural areas as pilot to test (b) and (c) and innovative methodologies, including mechanisms that resolve community-level land disputes.

The Project comprises the following components:

1. Harmonizing Land Policy and Regulatory Framework for Sustainable Land Administration.
 - I.1. Revision of policies laws and regulations for an effective and efficient land administration.
 - I.2. Strengthening of civil courts to expedite resolution of land cases, and developing alternative mechanisms for land dispute resolution.
 - I.3. Inventory of all acquired state lands and determination of outstanding compensation.
 - I.4. Policy studies:
 - i. Land tenure registration to formulate government policy on what rights will be registered on land titles.
 - ii. Divestiture of vested lands.
 - iii. Finance and fees structure of land administration system to formulate government policies on fees and taxes for registration of land transactions.
 - iv. Gender study and analysis.
 - v. Assessment of current land administration services provided by customary land authorities.
 - I.5. Land Policy development process
2. Institutional Reform and Development
 - II.1. Restructuring of public sector land agencies.
 - II.2. Decentralizing and strengthening land administration services.
 - II.3. Strengthening traditional land administration.
 - II.4. Strengthening private land sector institutions.
 - II.5. Strengthening land administration, management training, and research institutions.
3. Improving Land Titling, Registration, Valuation, and Information System

- III.1 Developing the cadastre and land information systems.
 - III.2 Cadastral mapping.
 - III.3 Establishing model land titling and registration offices.
 - III.4 Improving deed and title registration.
 - III.5 Land use planning and management.
 - III.6 Establishing a land valuation database.
 - III.7 Piloting systematic land titling and registration.
4. Project Management, Monitoring, and Evaluation
- IV.1 Project coordination and management.
 - IV.2 Human resource development.
 - IV.3 Communication strategy.
 - IV.4 Monitoring and evaluation, and impact assessment.

Recent achievements:

- A comprehensive review of the public land agencies laws was completed, and proposals for restructuring and merging 6 public land agencies under the Land Administration Project (LAP) into one corporate entity is being drafted.
- Establishment of Customary Lands Secretariat and the strengthening of existing ones to improve traditional land administration.
- Set up of four Deed Registries supporting the process of decentralizing the registration of land transactions and eventually of title registration.
- Conducting the process of systematic land titling on a pilot basis in selected districts.
- Traditional boundary demarcation began in selected areas, and stakeholder sensitization and consultations were held.

Some key challenges:

- The LAP faces widespread resistance to change, lack of incentives, and bottom-up pressure for transparency and accountability (in particular in the area of revenue collection and management).
- Despite activities to promote awareness and partnerships, many stakeholders (e.g., Parliamentarians, District Assemblies, area councils, traditional authorities, and NGOs) are not familiar with the LAP.
- The efficiency of the LAPU is severely constrained because of (i) a lack of a clear implementation strategy, (ii) a lack of key staff, inadequate working facilities, and confusion of roles between the central LAPU and regional LSA staff, and (iii) a lack of reward and incentive system and, which adversely impacts the implementation of the LAP.
- Overall weak capacity of the private sector and a low level of skills for surveying and land use planning technology and business management have hampered the sector in taking the lead in any field activities to survey, demarcate, and inventory lands under state trusteeship.

Appendix 5. Urban Environment

Table A5-1: MWRWH — Central Government Allocation and Expenditures, 2002-2005

| | 2002 | 2003 | 2004 | 2005 |
|---|-------|-------|-------|-------|
| Allocation | | | | |
| Total budget allocation (billions of cedis) | 623.1 | 656.2 | 428.1 | 968.3 |
| Total budget allocation (as a percent of total budget) | 8.4 | 6.3 | 3.3 | 5.2 |
| Total budget allocation (as a percent of GDP) | 1.3 | 1.0 | 0.5 | 1.0 |
| Real allocation (2000 prices) | 377.0 | 308.7 | 176.5 | 347.8 |
| <i>Real growth</i> | | -18.1 | -42.8 | 97.0 |
| Actual expenditures | | | | |
| Total expenditures (billions of cedis) | 884.3 | 841.4 | 827.4 | |
| Total spending (as a percent of total budget execution) | 11.6 | 8.1 | 5.5 | |
| Total spending (as a percent of GDP) | 1.8 | 1.3 | 1.0 | |
| Total real spending (2000 prices) | 1.8 | 1.3 | 1.0 | |
| <i>Real growth</i> | | -26.0 | -13.8 | |
| Budget execution rates | | | | |
| Budget execution | 141.9 | 128.2 | 193.3 | |

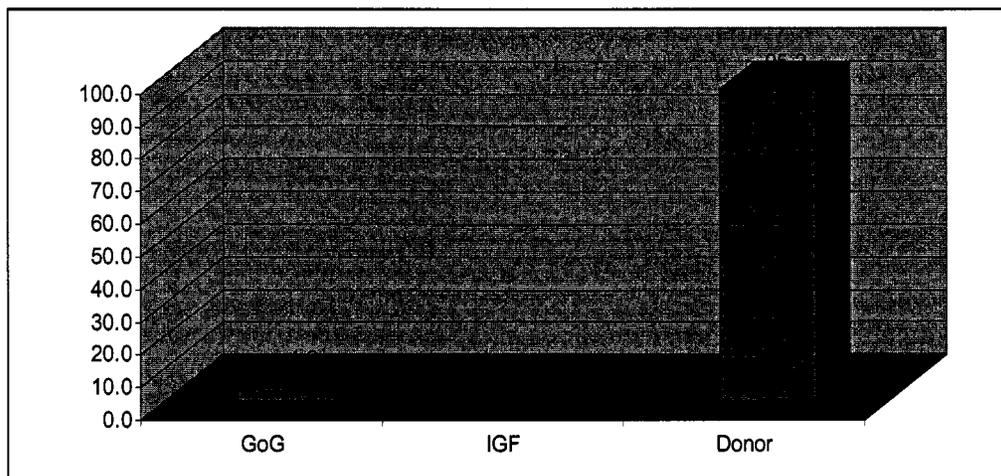
Source: GoG (Appropriation Act 2005), MOEFP.

Table A5-2: MWRWH — Budgetary Allocations by Department and Sources of Funding in 2005

| | GoG | | IGF | | Donor | | Total | |
|--|----------------------|------------|----------------------|------------|----------------------|------------|----------------------|------------|
| | In billions of cedis | In percent |
| Total | 92,200 | 100 | 7,549 | 100 | 865,005 | 100 | 964,954 | 100 |
| Central MoWH | | | | | | | | |
| General Admin. | 15,815 | 17.2 | 0 | 0.0 | 194,192 | 22.4 | 210,024 | 21.8 |
| Rent Control | 1,721 | 1.9 | 0 | 0.0 | 0 | 0.0 | 1,723 | 0.2 |
| Hydrological Services Dept. | 5,904 | 6.4 | 0 | 0.0 | 0 | 0.0 | 5,910 | 0.6 |
| Ghana Water Company Limited | 15,394 | 16.7 | 0 | 0.0 | 307,613 | 35.6 | 323,024 | 33.5 |
| Department of Rural Housing | 4,207 | 4.6 | 7 | 0.1 | 0 | 0.0 | 4,219 | 0.4 |
| Public Servants Housing Loans Scheme Board | 4,457 | 4.8 | 411 | 5.4 | 0 | 0.0 | 4,878 | 0.5 |
| Technical Services Center | 504 | 0.5 | 0 | 0.0 | 0 | 0.0 | 505 | 0.1 |
| Water Resources Commission | 1,850 | 2.0 | 2,353 | 31.2 | 0 | 0.0 | 4,236 | 0.4 |
| Community Water & Sanitation Agency | 16,480 | 17.9 | 0 | 0.0 | 363,200 | 42.0 | 379,698 | 39.4 |
| Architects Registration Council | 1,458 | 1.6 | 150 | 2.0 | 0 | 0.0 | 1,612 | 0.2 |
| Public Works Department | 24,410 | 26.5 | 4,628 | 61.3 | 0 | 0.0 | 29,126 | 3.0 |

Source: GOG, Appropriation Act, 2005

Figure A5-1: GWCL—Budgetary allocations by sources of funding in 2005 (percentage)



Source: GOG, Appropriation Act, 2005

Table A5-3: MLGRDE —Central Government Allocation and Expenditures, 2002-2005

| | 2002 | 2003 | 2004 | 2005 |
|---|-------|-------|-------|-------|
| Allocation | | | | |
| Total budget allocation (in billions of cedis) | 175.6 | 273.7 | 306.5 | 354.3 |
| Total budget allocation (as a percent of total budget) | 2.4 | 2.6 | 2.4 | 1.9 |
| Total budget allocation (as a percent of GDP) | 0.4 | 0.4 | 0.4 | 0.4 |
| Real allocation (2000 prices) | 106.2 | 128.7 | 126.4 | 127.3 |
| <i>Real growth</i> | | 21.2 | -1.8 | 0.7 |
| Actual expenditures | | | | |
| Total expenditures (in billions of cedis) | 427.8 | 581.6 | 408.1 | |
| Total spending (as a percent of total budget execution) | 5.6 | 5.6 | 2.7 | |
| Total spending (as a percent of GDP) | 0.9 | 0.9 | 0.5 | |
| Total real spending (2000 prices) | 258.8 | 273.6 | 168.3 | |
| <i>Real growth</i> | | 5.7 | -38.5 | |
| Budget execution rates | | | | |
| Budget execution | 243.6 | 212.5 | 133.1 | |

Source: GoG (Appropriation Act 2005)

Appendix 6. Conclusion

Table 6A-1: Projected Development Assistance in the Forestry and Wildlife Sector, 2006-2008
(in millions of US\$)

| | 2006 | 2007 | 2008 |
|---|-------------|-------------|-------------|
| Total | 22.9 | 15.5 | 11.4 |
| CEA (World Bank/AFD) | 0.4 | 0.0 | 0.0 |
| Northern Savanna Biodiversity Cons. (World Bank/GEF) | 1.0 | 0.5 | 0.0 |
| Forest Biodiversity (GEF) | 2.6 | 0.0 | 0.0 |
| Forest Sector Development Project II (DFID) | 1.8 | 0.0 | 0.0 |
| Reforestation, identify environmental hot-spots (USAID) | 1.1 | 0.0 | 0.0 |
| Protected Areas Development Program (EU) | 1.4 | 1.4 | 1.4 |
| 6th Microproject (sustainable communities NRM) (EU) | 5.2 | 5.2 | 5.2 |
| Enable sustainable forest use (EU) | 0.7 | 0.7 | 0.7 |
| VERIFOR (EU) | 0.6 | 0.6 | 0.6 |
| Conservation of Biodiversity in the High Guinea Forest (French Embassy) | 0.4 | 0.4 | 0.4 |
| Wildfire Management (RNE) | 1.9 | 1.9 | 0.0 |
| Wildlife Division Support (RNE) | 1.7 | 1.7 | 0.0 |
| Agriculture and NR Program (Forest Livelihood & Rights for Sustain. NRM) (CARE) | 0.9 | 0.9 | 0.9 |
| Forests for the People Campaign (CIDA, CARE Canada) | 0.1 | 0.0 | 0.0 |
| Forest management; support (GTZ/ KfW/ DED) | 1.9 | 1.9 | 1.9 |
| Centre for Biodiversity (RNE) | 0.4 | 0.0 | 0.0 |
| Ghana Environment Assessment Project (RNE) | 0.5 | 0.0 | 0.0 |
| Community-based NRM (Wildlife) (RNE) | 0.4 | 0.4 | 0.4 |
| Ghana National Capacity (UNDP/GEF) | 0.1 | 0.0 | 0.0 |

Source: DP's ENRM involvement in Ghana 2005, GPS Support Overview Table 2005.

Table 6A-2: Projected Donor Assistance in the Mining Sector, 2006-2008 (in millions of U.S.\$)

| | 2006 | 2007 | 2008 |
|-----------------------------------|-------------------|------------------|------------------|
| Total | 12,812,500 | 6,250,000 | 6,250,000 |
| Support to the mining sector (EC) | 12,812,500 | 6,250,000 | 6,250,000 |

Source: GPS Support Overview Table 2006.

Table 6A-3: Projected Donor Assistance in the Land Sector, 2006-2008 (in millions of US\$)

| | 2006 | 2007 | 2008 |
|--|-------------|-------------|-------------|
| Total | 10.9 | 10.9 | 11.6 |
| Land Administration Program (World Bank/DIFID/CARE) | 6.0 | 6.0 | 6.0 |
| Community-based Rural Dev. Project (AFD) | 2.1 | 2.1 | 2.1 |
| Ghana Environment Management Project (GEMP) | 0.7 | 0.7 | 1.4 |
| Support to Agric. Sector (DFID) | 1.4 | 1.4 | 1.4 |
| GEF Small Grants Program (UNDP/GEF) | 0.4 | 0.4 | 0.4 |
| Sustainable Land Management (UNDP/GEF) | 0.2 | 0.2 | 0.2 |
| Sustainable Use of NR and good environmental management (UNDP/GEF) | 0.2 | 0.2 | 0.2 |

Source: DP's ENRM involvement in Ghana 2005.

Table 6A-4: Projected Donor Assistance in the Urban Sector, 2006-2008 (in millions of U.S.\$)

| | 2006 | 2007 | 2008 |
|---|--------------|--------------|--------------|
| Total | 49.93 | 74.09 | 73.1 |
| Urban Water (World Bank) | 15 | 20.38 | 23.83 |
| Urban Water (NDF) | 0.6 | 1.7 | 1 |
| Small Towns Water Supply & Sanitation (World Bank) | 8.99 | 9.12 | 7.89 |
| Water Project (RNE) | 6.82 | 6.82 | 6.82 |
| Water Project (Spanish Embassy) | 3.02 | 6.03 | 3.02 |
| II Urban Environ. Sanitation Project (World Bank) | 14.5 | 14.5 | 14.5 |
| II Urban Environ. Sanitation Project (NDF) | 1 | 2.2 | 2.7 |
| Accra Sewerage Improvement Project (ADB) | 0 | 13.34 | 13.34 |

Source: GPS support Overview Table 2006.

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