Building Partnerships for Better Poverty-Environment Analyses

Nature's Benefits in Kenya: An Atlas of Ecosystems and Human Well-Being offers, for the first time in one volume, georeferenced information on poverty, water, food, biodiversity, wood, and tourism. It presents sectoral and intersectoral analyses in innovative ways and gives policymakers and decision-makers a quick national view of major spatial patterns in each sector. We are fully aware that Kenya needs a more holistic approach in planning and decision-making to address the complex interactions among different ecosystem processes and to achieve Kenya's multiple development targets. We therefore greatly appreciate the value of this publication and fully support future mapping and other analytical initiatives that take the complexity of nature and the important linkages between poverty and the environment into consideration.

Kenya has made significant investments in collecting environmental and poverty data over the years. This atlas demonstrates that information generated by institutions such as the Central Bureau of Statistics, the Department of Resource Surveys and Remote Sensing, and others can not only be used for better environmental reporting and poverty analyses but can also provide insights into linkages between poverty and the environment in specific locations. Such analyses can shed light on possible competition or synergies among various ecosystem services. Understanding such relationships can be extremely important as the country makes investment decisions and creates new economic opportunities.

The atlas also demonstrates that collecting census and household survey data and building technical skills to produce poverty maps within the Central Bureau of Statistics are useful investments and reach far beyond their more narrow application in the macroeconomic sector—such as disbursing development funds for Constituencies. We believe that investments to better integrate existing environmental and natural resources data and to fill important environmental data gaps will provide high returns and lead to more informed planning and decision-making at *both* national and local levels.

This report will allow decision-makers, both public and private, access to data and the ability to overlay high-quality, detailed maps of ecosystems and ecosystem services with maps of poverty. Integrating spatial information on human well-being and the environment in this way is relevant to many policy issues currently under discussion in Kenya. We see great opportunities to inject some of the ideas outlined in this atlas to help in land-use planning, prioritize livestock and tourism investments, enhance water management and food security planning, and improve environmental impact assessments. We encourage further use of the approaches set forth herein to guide policies under preparation (e.g., environment and geoinformation policy) and to assist in formulating new ones that cut across multiple sectors (e.g., wildlife and livestock policies). Making better use of maps and spatial information can certainly strengthen the implementation of the Millennium Development Goals and the *Economic Recovery Strategy* (and its successor strategy). It will certainly help the Government to formulate sound policies and implement realistic plans. It will help identify priority areas for interventions and assist in examining tradeoffs among different investment decisions.

Kenya needs to continue building partnerships within government institutions for better poverty-environment analyses. Only through such partnerships can the country build the necessary technical capacity to analyze and compile maps that document the extent of major ecosystems, the location of key supply areas of ecosystem services and their use, and the spatial distribution of poverty. We therefore support cross-sectoral units such as the Poverty Analysis and Research Unit at the Central Bureau of Statistics in the Ministry of Planning and National Development, the Geoinformation Section at the Department of Resource Surveys and Remote Sensing in the Ministry of Environment and Natural Resources, and the Arid Lands Resource Management Project in their current roles. In fact, we would like to see widening roles for these institutions, and, in terms of timeliness and countrywide coverage, expanded geospatial information. Such efforts will help target poverty reduction strategically and will help us to manage ecosystems in a more integrated way.

Nature's Benefits in Kenya required collaboration and contributions from national and international institutions covering various sectors and specialties. We believe that these working relationships and the experience gained in producing this atlas can become the foundation for developing more specific and more accurate tools and analyses, which we envision policymakers and other decision-makers in Kenya will request.

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Preface

Nature's Benefits in Kenya: An Atlas of Ecosystems and Human Well-Being represents a step forward in the analysis of poverty in Kenya and its relation to the natural environment. It is the result of a partnership of national and international organizations, some of which were involved in preparing the first high-resolution poverty maps of Kenya. This publication springs from an effort among these partners to overlay the newly created poverty maps with environmental resource maps based on surveys and remote sensing data. The intent is to show the location and status of key environmental resources that are likely to have significant links with poverty. In creating this report, we worked with several purposes and audiences in mind.

One key purpose has been to build the information and analytical base for implementing Kenya's *Economic Recovery Strategy* and other national strategies. The maps highlight the benefits nature provides to people and the connections between poverty and ecosystem services. Our aim is to demonstrate how map-based analysis of poverty-ecosystem relationships can make a difference in policy development and implementation.

Secondly, we hope to encourage the private sector to give greater consideration to the role of environmental resources in alleviating poverty, with particular reference to the potential contribution of improved environmental management and investments in ecosystem restoration and enhancement. Likewise, we wish to assist environmental specialists in undertaking analyses that can shape anti-poverty policies.

The third purpose has been to conduct a multisectoral analysis of poverty-environment linkages. In Chapter 8, we analyze competing demands for diverse ecosystem services—including food crops, drinking water, irrigation water, and wood—across an entire region (the Upper Tana River watershed). We hope that this multidimensional geospatial analysis will inspire comparable studies involving additional environmental resources and other geographic regions of the country. Such an integrated look at poverty-environment relationships, we hope, will encourage increasing collaboration between institutions both inside and outside government.

We believe that now is the right time to put together an atlas that explores poverty through an ecosystem lens. There is a growing demand for integrated data and mapping of environmental resources, poverty, and the complex web of relationships between environment and livelihoods. The Kenyan Government has committed to several national plans, strategies, and international agreements requiring action toward achieving goals for development that are economically, socially, and environmentally sustainable.

Efforts are under way to include environment in poverty-reduction programs, such as the Poverty-Environment Initiative—a joint effort of the United Nations Development Programme, the United Nations Environment Programme, the Government of Kenya, and other national stakeholders. Various agencies, including the Kenyan Ministries of Finance and Planning as well as the Poverty Analysis and Research Unit at the Central Bureau of Statistics, have expressed interest in environmental profiles of high poverty areas. Following Kenya's *State of the Environment Report 2003* and *2004*, the National Environment Management Authority is exploring ways to use its environmental reporting data and expertise to inform national poverty-reduction efforts.

Another significant development is the growing interest of the media and the public in examining resource conflicts and competing demands for ecosystem services. Conflicts between wildlife conservation and cultivation of agricultural crops, competing demands for water resources by upstream and downstream users, and the conversion of public forests to other land uses are issues of particular concern.

We anticipate that the information presented in this atlas will be of value to various national and community-level groups. Kenya's policymakers form one core audience, encompassing national and District decision-makers and the analysts working with them in government, civil society, and the private sector. Other users include policymakers and analysts in international organizations who collaborate with Kenyan decision-makers. We hope that Kenya's students and teachers will use this study to enrich curricula in geography, environmental science, economics, and other disciplines and that the lessons learned in Kenya can be usefully applied to other countries and regions.

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A Reader's Guide

This publication is not a traditional atlas. Rather, it combines traditional map elements with text-based policy analysis. In other words, it is an atlas with elements of a book. Readers can either use it as an atlas, paging through the maps and captions that interest them, or as a book, reading chapter by chapter.

For readers with specialized interests or limited time, we offer the following guide to this publication:

- *Local decision-makers interested in a specific region such as a District, large drainage area, or a Constituency.* A Member of Parliament or a District planner may be interested in looking at a set of maps for their respective areas and can use the map and the map captions to start their review. They may find the specific analysis for Chapter 8—looking at the upper Tana region—useful in helping them develop ideas on how to conduct a similar analysis for their location.
- *National or international decision-makers or analysts.* The box that links the maps to policymaking (Chapters 3 to 7) provides a natural entry point for these users. These boxes refer to broad national strategies and plans (such as the *Economic Recovery Strategy*) or address specific issues (such as wildlife management or charcoal production).
- *Planners at local and national levels and other decision-makers dealing with cross-cutting issues.* These users may want to familiarize themselves with the framework of ecosystem services (Chapter 1), which could be adapted to land use planning. Chapter 8 may provide ideas on how to examine various poverty and ecosystem indicators simultaneously. Finally, users could draw important conclusions based on the limitations in the presented data and identify priorities for future data collection: Are all relevant regions of Kenya mapped? Do District and national planners need to invest in more up-to-date data? Does the country need to collect information on other ecosystem services (e.g., hydrological flows or use of ecosystems for food security) because they are important for the economy and livelihoods? We intend to make the underlying data behind these maps available. They can then be used to create online tools and other decision-support products.
- *Specialists working on issues related to water, food, biodiversity, tourism, and wood.* These specialists will most likely turn first to the chapter dealing with their topic. In most cases, they will have a much more thorough understanding of the issues than provided by the introductory text. However, even these experts will find some new material. For example, the following maps are being published here for the first time: predominant drinking water sources for small administrative areas in Chapter 3; predominant livelihood systems, share of food crops, and number of crops in Chapter 4; wildlife density numbers in the 1970s and 1990s in Chapter 5; spatial distribution of selected charismatic species and coastal ecosystem assets in Chapter 6; woodlots in croplands, and importance of firewood collection and charcoal making for cash income in Chapter 7.
- *Information specialists and policymakers responsible for strengthening Kenya's data infrastructure and capacity for improved poverty-environment analysis.* The conclusions and recommendations would be the starting point for these users.
- *Journalists, speechwriters, students, and analysts in search of facts, maps, and other reference material.* Scanning the list of maps at the beginning of each chapter, the boxes with the poverty and demographic profiles, and the bullets in the 'Summing Up' section can provide a quick overview of what topics and indicators are covered. We plan to release a separate online product that will include all the maps and associated map captions in presentation format.
- *Educators.* They may use the publication to identify specific maps, concepts, or ideas that can enrich curricula or teaching materials. The underlying spatial data should be useful for GIS training and student projects.

All readers should be aware that Chapters 3–7 conclude with two text boxes of particular note:

- *Linking the maps to policymaking.* This box—highlighted in beige—illustrates how the presented maps could be used for more specific policy analysis or targeting of programs. In some chapters, the box uses broad national strategies and plans as an entry point (chapters on water, food, and tourism). Other chapters address important issues such as wildlife management, preservation of biodiversity, or the charcoal industry.
- *Creating a demographic and poverty profile for new geographic units.* This box—highlighted in green—emphasizes that the underlying spatial data behind the maps can be used to create demographic and poverty indicators for new units of analysis. For example, we calculated the number of people and the number of poor for the upper watersheds of Kenya's 'water towers,' the communities within 25 kilometers of the most visited national parks, and croplands with high shares of food crops or woodlots in five Provinces. These boxes also examine—in a first rough analysis—certain relationships between poverty and the environment.

Introduction

Nature's Benefits in Kenya: An Atlas of Ecosystems and Human Well-Being integrates spatial data on poverty and the environment in Kenya, providing a new approach to examining the links between ecosystem services (the benefits derived from nature) and the poor. This publication focuses on the environmental resources most Kenyans rely on to earn their livelihoods, such as soil, water, forest, rangeland, livestock, and wildlife. The atlas overlays georeferenced statistical information on population and household expenditures with spatial data on ecosystems and their services (water availability, wood supply, wildlife populations, and the like) to yield a picture of how land, people, and prosperity are related in Kenya.

RATIONALE

Maps—and the geographic information systems (GIS) that underlie them—are powerful tools for integrating data from various sources and are becoming increasingly important for investigating poverty-environment interactions. Policymakers need spatial information to help them identify areas where development lags and environmental resources are at risk of degradation. Spatial information is also essential to help target areas where investment in physical infrastructure, improved health and education services, and better ecosystem management could have the greatest impact. Maps are also powerful tools for communicating information and findings to experts in multiple disciplines as well as to the public. Both specialists and non-specialists can examine mapped data to identify patterns, trends, and clusters.

Analyses that integrate geospatial data on poverty and the environment can shed light on many important questions: How does the location of poverty compare to the distribution of key environmental resources and services? Which areas provide critically important ecosystem services? How do the supply areas for various services overlap? Who has access to environmental resources and benefits from their use? Who bears the cost of alterations to ecosystems that affect their capacity to supply services?

Moreover, better and more detailed spatial analyses of poverty-ecosystem relationships can be used to put government priorities in perspective: Do current policies target the crucial issues and localities? Are these policies based on sustainable use of environmental resources and services?

Access to improved spatial information can help empower the public to question government priorities, advocate for alternative policies, and exert pressure for better decision-making. Over time, public access to policy-relevant information and analysis will tend to increase the transparency and accountability of government decision-making related to poverty and the environment. This will enhance the likelihood that pro-poor policies and interventions that target and fully integrate the environment's contribution to poverty reduction can germinate and take root.

However, a map-based approach such as that used here does have some limitations. Not all ecosystem services and social processes relevant to poverty are easily mapped. In addition, the ability to show spatial relationships between ecosystem services and poverty depends greatly on the availability of high-resolution georeferenced data. Even when the required data are available, the analysis may reveal little about the causes of poverty, or changes in the underlying processes and functions of natural environmental systems. Nonetheless, such a visual and geographic approach may let policymakers "see" Kenya's natural systems in a new light, helping them to visualize ways to use those systems to alleviate poverty.

SEIZING THE MOMENT

The advent of new datasets (and the growing popularity of web-based geospatial communication tools) makes this an opportune time to create a specialized atlas linking poverty and environment. An extensive supply of geospatial data and expertise on Kenya's environmental resources has been assembled in various national and international agencies in recent years. Examples include aerial surveys of wildlife, livestock, crops, and forests; maps of coastal resources and irrigation infrastructure; and a new high-resolution land cover map.

At the same time, high-resolution poverty maps for Kenya have recently come into use in several national agencies. Within the Central Bureau of Statistics, the Poverty Research and Analysis Unit is now producing and distributing an array of tools, analyses, data, and publications on poverty.

For the most part, this new trove of environmental data has yet to be integrated across different environmental sectors (such as agriculture, wildlife, water, forestry, energy, climate change, etc.), or to be integrated with spatial data on poverty. Encouraging such integration is one of the main goals of this atlas.

ABOUT THE ATLAS

The atlas begins with a brief overview of key concepts related to ecosystems, their contributions to human well-being, and their potential to contribute to poverty reduction and economic development. Chapter 2 presents the most comprehensive, up-to-date maps and other spatial information on the extent and location of poverty in Kenya. Chapters 3 through 7 present maps and analyses on specific environmental resources and ecosystem services, including water, food, biodiversity, tourism, and wood.

Chapter 8 takes a more cross-cutting look at poverty-environment relationships. This chapter examines competing demands for ecosystem services in a single region—the area surrounding the headwaters of the Tana River—and compares these with spatial patterns of poverty in this area.

The final section provides general findings about the use of the introduced maps for sociogeographic analysis. It concludes with four recommendations that are expected to advance a more comprehensive accounting of ecosystem services and to improve the understanding of poverty-environment relationships in Kenya.