



Harvesting Health and Wealth

Nature-Based Solutions for Health and Prosperity

EDITED BY

Wardah Naqvi, Ahras Rashid, & Sami Ullah



Harvesting Health and Wealth: Nature-Based Solutions for Health and Prosperity

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FOREWORD

Good health is the greatest and most precious resource in life. Agriculture, food security, biodiversity, health, and economic development are too often treated as separate policy domains. With its own experts, institutions, programmes, and funding streams. This fragmentation is understandable from an administrative perspective, but it increasingly makes little sense in the face of the complex challenges confronting developing countries in general and particularly for Pakistan. In fact experienced shared by households, farmers, communities, and ecosystems do not follow the boundaries drawn between government departments or academic disciplines. A drought has multi-dimensional and faces impacts i.e. reduction in crop yields can simultaneously threaten livestock and dairy incomes, increase food prices, strain household budgets, deepen rural poverty, place additional pressure on forests, rangelands, and other natural resources. Resulting in biodiversity losses and conservation. There is a dire need of search for alternative sources of livelihood. Likewise, the loss of biodiversity is not simply an environmental concern. Declining pollinator populations can affect agricultural productivity; degraded soils can undermine long-term food production; depleted water resources can constrain both economic activity and household welfare; and the degradation of natural landscapes can reduce the resilience of communities to floods, droughts, heat, and other shocks.

The problems are interconnected. There are forward and backward linkages. Physical and mental well-being is one of the most valuable assets, far more important than money or material. Rich person often lives in safer neighborhoods, have access to nutritious food, and enjoy more leisure time for physical activity Too often; however, our responses are not accordingly.

This volume, “Harvesting Health and Wealth: Nature-Based Solutions for Health and Prosperity”, takes on the difficult but necessary task of thinking across these boundaries. Its central premise is both simple and profound: lasting prosperity cannot be separated from the health of the natural systems upon which human societies and economies depend. Rather than viewing food systems, dairy economics, legume production, biodiversity conservation, ecotourism, green finance, household energy, and rural livelihoods as isolated subjects. The volume brings them together as interconnected dimensions of a much larger development challenge. The question running through these contributions is therefore not merely how to produce more, earn more, or conserve more, but how these objectives can be pursued together in an integrational way.

This is an especially important question for developing economies, where the relationship between natural resources and human welfare is often immediate and highly visible. For millions of rural households, land, water, livestock, forests, rangelands, biodiversity, and agricultural ecosystems are not abstract environmental assets. They are sources of food, income, employment, energy, cultural identity, and security. When these systems deteriorate, the consequences are felt directly through declining productivity, rising costs, reduced livelihood opportunities, and greater vulnerability to shocks and increasing poverty. Conversely, when ecosystems are restored and managed sustainably, they can contribute simultaneously to agricultural productivity, livelihood diversification, nutrition, climate resilience, and economic opportunity.

This integrated perspective is consistent with the broader understanding of nature-based solutions as approaches that protect, sustainably manage, or restore ecosystems while addressing societal challenges and generating benefits for both human well-being and biodiversity. In agriculture and rural development, such approaches can link natural resource management with food and livelihood security rather than treating ecological conservation as an objective external to economic development.

The significance of this perspective is particularly evident in the Pakistani context. Agriculture remains deeply connected to rural livelihoods, food security, water use, and national economic activity. Whereas, climate-related pressures increasingly expose the vulnerabilities of existing production systems. Pakistan's policy frameworks have increasingly recognized the need to connect food security, climate resilience, biodiversity conservation, and sustainable natural resource management. The country's “National Biodiversity Strategy and Action Plan”, for example, explicitly emphasizes mainstreaming biodiversity across sectors and recognizes the links between biodiversity, agriculture, poverty reduction,

climate change, economic growth, and human well-being. Similarly, national adaptation planning has emphasized climate-smart agriculture and more responsible management of water, soil, and biodiversity.

Yet recognizing these connections in policy documents is only the beginning. The more difficult challenge is translating an integrated vision into practical decisions, investments, institutions, and incentives. Nature-based approaches may generate substantial environmental and social benefits, but these benefits are rarely automatic. Their success depends on governance arrangements, local participation, access to finance, appropriate technologies, secure resource rights, effective institutions, functioning markets, and policies capable of looking beyond short-term sectoral gains.

This is one of the important strengths of the present volume. The chapters do not romanticize nature-based solutions or present them as universal remedies. Instead, they ask a more useful and demanding question: under what conditions can nature-based approaches improve human well-being while maintaining or restoring ecological systems? This distinction matters. A solution is not genuinely sustainable merely because it is labelled “green,” just as an intervention is not necessarily successful because it produces short-term economic returns. What matters is whether environmental, social, and economic outcomes can be sustained over time and distributed fairly among the people who depend upon the underlying resource base. Food security consists of food availability, food accessibility, and food affordably.

The contributions assembled in this volume demonstrate why such an approach requires interdisciplinary thinking. Food systems cannot be understood through agricultural production alone. Agricultural economics cannot be separated from environmental change. Dairy and livestock systems are connected to feed resources, land management, household incomes, nutrition, and markets. Legume-based farming has implications not only for crop diversification and farm profitability but also for soil health, dietary quality, and resilience. Biodiversity conservation can create ecological benefits while also supporting tourism, livelihoods, ecosystem services, and local economic activity. Green finance can potentially mobilize resources for environmental restoration and climate resilience, but its effectiveness depends on institutional design and incentives. Household energy choices can influence health, expenditure, environmental pressure, and livelihood opportunities simultaneously.

The value of bringing these themes together is therefore not simply that it creates a broader collection of topics. Its greater contribution lies in revealing relationships that become invisible when each subject is examined in isolation.

Consider, for example, the relationship between agricultural productivity and biodiversity. Conventional development thinking may frame biodiversity conservation as a potential limitation on agricultural expansion. An integrated perspective asks a different question: how can biodiversity itself contribute to the productivity and resilience of agricultural landscapes? Similarly, rather than viewing forests and rangelands only as competing land uses, we can examine their contributions to ecosystem services, livestock production, water regulation, tourism, household livelihoods, and climate resilience. Rather than treating conservation expenditure solely as a public cost, green finance asks whether financial mechanisms can capture and reward the economic and social value generated by healthy ecosystems.

This way of thinking also changes how we understand economic development. Development cannot be measured solely by immediate increases in production or income if those gains are achieved by degrading the ecological assets required to sustain future production. A farm may generate higher returns today through intensive extraction of groundwater, excessive chemical use, or unsustainable land management, but if the resulting degradation reduces future productivity and increases vulnerability, the apparent economic gain may be temporary. In it is natural resources mining and destruction. Sustainable prosperity therefore requires a longer horizon—one in which natural capital, human capital, social institutions, and financial capital are considered complementary rather than competing assets.

The chapters in this volume contribute to this broader conversation by bringing empirical evidence and context-specific analysis to the question of how nature can become an integral part of development strategy. Their emphasis on Pakistan is particularly valuable because it grounds the discussion in the realities of a developing country where ecological pressures and economic vulnerabilities frequently intersect. Pakistan's current policy direction increasingly recognizes the importance of resilient food

systems, sustainable agriculture, biodiversity protection, and nature-based approaches, but translating these ambitions into durable outcomes requires stronger coordination across institutions and sectors.

Importantly, the volume also recognizes that environmental sustainability is ultimately a question of people. Nature-based solutions cannot be considered successful if they protect ecosystems while excluding the communities that depend upon them, shifting costs onto poor households, or restricting livelihood opportunities without providing viable alternatives. Equity, participation, and local knowledge are therefore essential dimensions of sustainable resource management. Conservation and development should not be positioned as opposing objectives when properly designed institutions can enable communities to become active partners in protecting and benefiting from natural resources.

For students, this book provides a valuable model of interdisciplinary synthesis. It demonstrates that some of the most important development questions cannot be adequately answered within the boundaries of a single discipline. For researchers, the volume identifies opportunities for further empirical work, particularly on the measurement of ecosystem benefits, the distribution of costs and benefits, the effectiveness of financial incentives, institutional coordination, and the long-term impacts of nature-based interventions. For policymakers and development practitioners, it provides grounded and context-sensitive analysis rather than generic prescriptions. It encourages decision-makers to ask not only whether an intervention is economically viable or environmentally desirable, but whether it creates mutually reinforcing benefits across sectors and generations.

The broader message of the volume is therefore one of integration. Agriculture should not be separated from ecology. Food security should not be separated from nutrition and livelihoods. Biodiversity should not be separated from economic opportunities. Climate resilience should not be separated from development planning. And economic prosperity should not be measured without considering the natural capital that makes that prosperity possible.

Ultimately, *Harvesting Health and Wealth* invite us to reconsider what we mean by development itself. The objective is not simply to harvest more from nature, but to build systems in which nature continues to provide the foundations for human well-being. The challenge is to move from extraction toward stewardship, from isolated interventions toward integrated strategies, and from short-term gains toward durable prosperity.

The task is undoubtedly difficult. Institutional silos are deeply embedded, financial incentives often reward short-term returns, and the benefits of ecosystem restoration may take years to become visible. Yet the cost of continuing to treat interconnected problems separately is likely to be even greater. The future demands approach capable of recognizing that ecological health, human health, food security, and economic prosperity are mutually dependent.

I commend the editors and contributors for bringing these diverse perspectives together and for addressing a subject that is both intellectually challenging and practically urgent. Their work demonstrates that nature-based solutions should not be viewed as an environmental add-on to development policy. They should be considered part of the foundation upon which resilient food systems, sustainable livelihoods, healthy communities, and prosperous economies are built.

I hope this volume stimulates researchers to cross disciplinary boundaries, encourages policymakers to move beyond institutional silos, and inspires practitioners to design interventions that deliver benefits for both people and nature. Above all, I hope it prompts every reader to reconsider a fundamental question: if our economies ultimately depend upon healthy ecosystems, can we really call development successful when the natural foundations of that development are being depleted?

The answer will shape not only the future of agriculture and food systems, but the future of prosperity itself.

Nature is not a constraint on prosperity; it is the foundation of it. For generations, traditional economic models treated nature as an externality: a limitless resource to extract or a constraint to work around. Whereas, in reality, true prosperity is entirely dependent on the health of our natural systems, often referred to as natural capital.

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P R E F A C E

This book was conceived out of a recurring observation: research, policy, and practice concerning food security, agricultural sustainability, biodiversity, nutrition, natural capital, and green finance are frequently developed within separate disciplinary and institutional silos, even when the underlying problems are deeply interconnected. Academic disciplines have understandably developed specialized tools and bodies of knowledge, while governments and development organizations have organized their mandates around sectors and administrative responsibilities. Yet the challenges faced by households, farmers, communities, and ecosystems rarely conform to these boundaries.

A dairy farmer's decision about herd size, feed use, or investment in improved livestock; a farming household's decision to diversify into legume production; a community's decision to conserve a forest or develop ecotourism rather than convert land to agriculture; a financial institution's decision to support a green investment; and a household's decision to adopt solar energy may initially appear to belong to entirely different fields of inquiry. At a deeper level, however, each involves decisions about how people use, conserve, invest in, and derive value from natural, financial, physical, and human capital under conditions of economic constraint and uncertainty. These decisions are connected through markets, institutions, incentives, livelihoods, ecosystems, and household welfare. Yet the literature examining them have too rarely been brought into sustained conversation with one another.

Harvesting Health and Wealth: Nature-Based Solutions for Health and Prosperity responds to this fragmentation by bringing together, within a single volume, empirical and conceptual work spanning staple food production, food systems and nutrition, dairy farm economics, legume cropping, biodiversity conservation, ecosystem services, ecotourism, green finance and natural capital investment, and household renewable energy adoption. These themes are deliberately diverse. Their inclusion in the same volume is not intended to suggest that they are identical problems or that they can be addressed through a single intervention. Rather, the purpose is to examine the relationships among them and to explore how decisions in one domain can generate consequences, positive or negative, in others.

The volume consists of nine substantive chapters, each addressing a distinct dimension of the broader relationship between natural systems, human well-being, and economic prosperity. Each chapter is a self-contained contribution, grounded in its own literature, analytical approach, and, in most cases, Pakistan-specific evidence. The chapters examine different manifestations of the central challenge from agricultural production and food systems to dairy economics, legume-based production, biodiversity and ecosystem services, nature-based enterprise, ecotourism, green finance, natural capital investment, and household renewable energy. Considered individually, these chapters provide focused analyses of specific problems. Read collectively, however, they reveal a much broader and more interconnected development story.

The intention of bringing these nine chapters together is therefore not simply to create a multidisciplinary collection. It is to encourage readers to look beyond the boundaries of individual sectors and disciplines and to recognize the relationships among production, consumption, livelihoods, ecosystems, finance, and human welfare. A change in one component of this system can have consequences elsewhere. Agricultural intensification can influence soil quality, water resources, biodiversity, and household income. Biodiversity conservation can generate ecosystem services and livelihood opportunities. Renewable energy adoption can affect household expenditure, energy security, environmental pressure, and welfare. Green finance can create opportunities for sustainable investment, but its effectiveness depends on institutions, incentives, information, and implementation capacity.

Read together, the nine chapters advance a shared argument, articulated in Chapter 1 as the Harvesting Health and Wealth Framework: natural capital, sustainable production, food systems, human development, and economic prosperity are linked in a regenerative feedback loop, such that improvements in one domain can reinforce outcomes in others, while degradation in one domain can undermine the rest.

The framework provides a conceptual foundation for understanding the diverse evidence presented throughout the book. It emphasizes that natural capital should not be treated merely as an environmental asset external to the economy. Land, soil, water, forests, biodiversity, ecosystems, and other natural resources constitute productive assets that support livelihoods, food production, health, resilience, and

economic activity. When these assets are conserved and managed sustainably, they can generate benefits that extend across generations. When they are degraded, the costs may emerge through declining productivity, increased vulnerability, reduced livelihood opportunities, higher household expenditures, and diminished resilience to environmental and economic shocks.

At the same time, the relationship between nature and prosperity is neither automatic nor uniformly positive. Economic pressures can encourage households and producers to exploit natural resources beyond sustainable levels. Short-term increases in production may sometimes be achieved at the expense of long-term ecological productivity. Similarly, investments labelled as “green” or “sustainable” may not deliver their intended outcomes without appropriate institutional arrangements, monitoring mechanisms, incentives, and accountability. Nature-based approaches therefore need to be assessed not simply by their environmental characteristics but by the conditions under which they are implemented and the distribution of their costs and benefits.

This is particularly important in developing countries’ contexts, where natural resources frequently constitute a significant component of household livelihood strategies. For many rural households, land, livestock, forests, rangelands, water, and biodiversity are directly linked to income, food, energy, employment, and social security. When these resources deteriorate, households may respond by intensifying extraction, reducing consumption, migrating, diversifying livelihoods, or adopting new technologies. These responses can, in turn, influence the condition of natural resources. Understanding this feedback is essential for designing policies that simultaneously address poverty, food insecurity, environmental degradation, and vulnerability.

The nine chapters provide different entry points into this interconnected system. Some focus more directly on agricultural production and food security, while others examine biodiversity, ecosystem services, nature-based livelihoods, financial mechanisms, or household energy decisions. Together, they illustrate that sustainable development cannot be achieved through isolated interventions. It requires an understanding of the interactions among ecological systems, economic incentives, household decisions, markets, institutions, and public policy.

A particularly important theme emerging across the volume is the role of governance and institutional capacity. Technology and finance are undoubtedly important, but neither is sufficient on its own. An innovative agricultural technology will have limited impact if farmers lack access to markets, information, credit, extension services, or secure resource rights. Financial resources may be available for green investment, but their developmental impact depends on how projects are selected, monitored, and governed. Biodiversity conservation may create significant social and ecological benefits, but its success can depend on community participation, institutional coordination, property rights, enforcement, and the equitable distribution of benefits.

This emphasis on institutions is consistent with the broader understanding that sustainable agrifood transformation requires coordinated action among governments, farmers, researchers, businesses, communities, and other stakeholders. Effective governance can help reconcile competing objectives, including economic growth, social equity, food security, and sustainable natural resource use. The same principle applies to land, water, forests, biodiversity, and other natural assets: sustainable management requires institutions capable of coordinating interests and supporting long-term stewardship rather than short-term extraction.

The Pakistan-specific evidence assembled in this volume is therefore more than a geographical focus. It provides an opportunity to examine how the concepts of natural capital, sustainability, food security, and nature-based development operate under real economic, social, and institutional conditions. Pakistan offers a particularly relevant context because agricultural livelihoods, food systems, natural resource management, environmental pressures, and household welfare are closely intertwined. At the same time, the questions explored in the book extend well beyond Pakistan. Many developing economies face similar combinations of resource constraints, livelihood dependence on natural systems, climate vulnerability, institutional challenges, and pressure for economic growth.

The book is deliberately oriented. The contributors do not seek to present nature-based solutions as a universal answer to every development challenge. Instead, the chapters examine specific problems,

contexts, decisions, and mechanisms. This approach recognizes that the effectiveness of a nature-based intervention is ultimately context dependent. An approach that generates positive results in one ecological or socioeconomic setting may produce different outcomes elsewhere. Understanding why outcomes differ is therefore as important as identifying successful interventions.

The volume also seeks to bridge the often-substantial distance between academic research and policy practice. Research can generate valuable evidence, but evidence has limited developmental value if it remains disconnected from the decisions faced by policymakers, practitioners, producers, households, and communities. Conversely, policy interventions can benefit from research-informed analysis that recognizes local conditions, trade-offs, unintended consequences, and implementation constraints. The chapters in this volume are therefore intended not only to contribute to academic debate but also to encourage policy-relevant thinking.

The concluding discussion draws together the principal insights emerging from the nine chapters and revisits the guiding questions introduced in Chapter 1. Rather than simply summarizing individual findings, the synthesis seeks to identify the relationships that emerge across the contributions. Attention is given to the conditions under which nature-based approaches can generate simultaneous benefits for economic welfare, food and nutrition security, livelihoods, and ecological sustainability. It also identifies areas where evidence remains limited and where further interdisciplinary research is needed.

Several important research opportunities emerge from this synthesis. These include improved measurement and valuation of ecosystem services; stronger evidence on the long-term economic returns to biodiversity conservation; better understanding of the distribution of costs and benefits associated with green investments; evaluation of institutional mechanisms for sustainable resource governance; assessment of household responses to renewable energy technologies; and greater integration of natural capital considerations into agricultural and development policy. Such questions cannot be adequately addressed by a single discipline. They require collaboration among economists, agricultural scientists, environmental researchers, social scientists, development practitioners, financial experts, and policymakers.

The intended readership of this volume is consequently broad. It is designed for graduate students and researchers in agricultural economics, development economics, environmental economics, natural resource economics, food policy, sustainability studies, and related disciplines. It is also intended for policymakers and practitioners working across agriculture, environment, climate, energy, finance, rural development, and social policy, as well as professionals in development organizations, financial institutions, non-governmental organizations, research institutions, and civil society.

For students, the book offers an opportunity to see how apparently different research questions can be connected through a common conceptual framework. For researchers, it highlights areas where existing evidence remains incomplete and where interdisciplinary approaches can provide new insights. For policymakers and practitioners, it offers context-specific evidence that can inform the design of more integrated interventions. For readers outside these professional communities, it provides an accessible pathway into the broader question of how societies can pursue economic development while maintaining the natural systems on which that development depends.

Because much of the empirical evidence assembled in the volume is drawn from Pakistan, the book also aims to make a focused contribution to the country's literature on food security, sustainable agriculture, biodiversity, rural livelihoods, natural resource management, and sustainable development. Yet the conceptual argument is intentionally broader. The challenge of reconciling economic prosperity with ecological sustainability is not unique to one country. Across regions, societies are confronting questions about how to produce sufficient food, improve livelihoods, generate employment, expand access to energy, conserve biodiversity, and respond to environmental change without undermining the resource base required for future development.

The need for such integrated thinking is becoming increasingly clear. Sustainable food and agriculture require attention to economic, social, and environmental dimensions simultaneously, while policy implementation depends on evidence, institutional capacity, stakeholder participation, and appropriate

financing. The challenge is therefore not simply to identify technically feasible solutions, but to create the institutional and economic conditions that allow those solutions to be adopted, sustained, and scaled.

We are grateful to all contributors for their sustained engagement with this project and for the time, expertise, and intellectual effort devoted to developing their chapters. We are equally grateful to the institutions, colleagues, researchers, field teams, and others whose support made the underlying research possible. Bringing together perspectives from different areas is itself a demanding undertaking, and the contributions of all those involved have been essential to shaping this volume.

We hope that *Harvesting Health and Wealth* will encourage readers to move beyond conventional sectoral boundaries and reconsider the relationships between nature, food, livelihoods, finance, energy, and economic development. More importantly, we hope it contributes to a broader understanding of prosperity, one that recognizes that economic progress cannot be sustained by continuously eroding the ecological assets that make that progress possible.

Ultimately, this volume is an invitation to think of development as a regenerative rather than purely extractive process. The goal is not simply to harvest more from nature, but to create systems in which natural capital, productive activity, human well-being, and economic opportunity reinforce one another. Achieving this will require better evidence, stronger institutions, appropriate incentives, innovative financing, inclusive governance, technological innovation, and, above all, a willingness to think beyond disciplinary and institutional silos.

We hope these nine chapters will contribute to that conversation and provide a useful foundation for further research, policy dialogue, and practical action toward food systems and economies that sustain rather than deplete the ecological foundations on which they depend.

Wardah Naqvi
Ahras Rashid
Sami Ullah

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IPCC (Intergovernmental Panel on Climate Change), 3, 7, 11, 72, 80, 101, 127
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