

THE PRINCIPLES AND PRACTICE OF SUSTAINABLE ECONOMIC DEVELOPMENT: OVERVIEW AND SYNTHESIS

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1.1 INTRODUCTION

The past half-century has seen historically rapid growth and development in many parts of the world. Both the pace of economic growth and poverty reduction have never been faster during this period than in comparable periods of economic history. Yet, the sustainability of economic development has never been more intensely questioned. The questions have gone beyond the threat to environmental resources to include increasing vulnerability to climate change and biodiversity loss.

Good policy-making founded on scientifically sound and practical research can go a long way in sustaining economic development. This volume aims to contribute in this respect. Cognizant of the gap between the demands for sustainable development policy analysis (e.g., as articulated in Rio + 20) and the operational utility of the narrow sustainability concepts, this volume starts with the core model of how to balance the management of produced and natural capital and then adds features of development, policy and institutions, uncertainty, and political economy. We discuss public policy

in the context of sustainable development in the broadest sense, incorporating resource management, institutional governance, and poverty reduction.

This chapter provides a summary to this volume, which pays tribute to the work of James Roumasset in the areas of economic development policy, behavior and organization in agriculture, and environmental resources such as energy and water. The authors in this volume are either his longtime collaborators and colleagues or his former students and associates, many of whom are making their own contributions in applying sound economic principles toward understanding problems of development, agriculture, environment, and governance.

Section I sets the tone of the book. Chapter 1 presents the volume overview and synthesis by introducing the principles and practice of sustainable economic development. Chapter 2 by Roumasset focuses on the foundations of development policy analysis. He discusses issues with misplaced exogeneity and incomplete conceptual mechanisms and prescribes fundamental analysis of the behavioral and organizational foundations of agricultural and rural development. This assessment points to promising avenues for future research, including *black hole economics* and the coevolution of specialization and economic development. The focus on agricultural development also provides a preview to Sections V and VII.

1.2 RESOURCE MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Long before the 1987 Brundtland Report “Our Common Future” from the World Commission on Environment and Development (WCED), there was “Scarcity and Growth” (Barnett and Morse, 1963). The latter may be the earliest formal articulation of sustainability and concerns about the environment. The ensuing decades saw the continued escalation of concerns about the sustainability of economic growth in the face of natural resource depletion and environmental pollution. In the 1980s, the World Conservation Strategy (WCS) was formed with the objective of integrating economic and environmental management. However, WCS was unsuccessful in conveying either how poor economic policies would degrade the environment or how conservation requires coordinated economic policies (Pearce et al., 1989). The United Nations responded and formed the Brundtland Commission in 1983, enjoined to investigate the interrelationship between human activity and the environment and their implications for economic and environmental policy.

It was the Brundtland Report (WCED, 1987) that successfully established sustainability as a critical part of economic development policy. The Commission defined sustainability as “. . . development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” This rather vague definition has been the source of considerable contention (see Ravago et al., 2010 for the various references cited therein and Chapter 3, of this text). Nonetheless, the Brundtland report has increased the awareness of the importance of the interlinkages between the economy and its dependence on natural resource systems as well as a sense of stewardship for the future and the environment.

In the field of economics, a consensus regarding *sustainable growth* has also been elusive. Arrow et al. (2004) have espoused an expanded version of the *weak sustainability* criterion, specifically that the wealth of a society, including human capital, knowledge capital, and natural capital

(as well as produced capital), does not decline over time. On the other hand, Barbier (2007) and others maintain that *strong sustainability*—nondepletion of essential stocks of natural resources—may be more suitable. This lack of consensus presents a challenge to the emerging transdisciplinary field of *sustainability science*, which began in the early 2000s. Sustainability science arises from the recognition that appropriate science and technology must be utilized in pursuit of sustainable development (Clark and Dickson, 2003; Roumasset et al., 2010). This discipline is being espoused by a number of international scientific organizations, chief among them are the U.S. National Academy of Sciences (NAS), The American Association for the Advancement of Science (AAAS), and the National Science Foundation (NSF).

The weak and strong sustainability criteria have been dubbed as *negative sustainability* (Ravago et al., 2010) inasmuch as they only proscribe limits on natural resource exploitation. They do not offer any guidance on what should be the optimal conservation patterns of natural capital nor the optimal buildup of human and produced capital. *Positive sustainability* (see Chapter 3; Endress et al., 2005; Ravago et al., 2010) fills this lacuna by maximizing intertemporal welfare while incorporating system linkages, dynamic efficiency, and intertemporal equity. The requirements for positive sustainability, reviewed in Chapter 3, provide for a solution that is optimal as well as sustainable.

The view of economic development in this volume includes sustainable development. Accordingly, Section II expands the conventional view of the economy to the *enviromony*—the integrated economic and environmental resource system. Chapters in Section II expound and expand the basic principles of natural resource management and the links between environmental resource management and sustainable development. They also provide specific examples of sustainable development. Chapter 3 by Endress not only reviews the principles but suggests how sustainability can be extended to specific sectoral issues such as the management of renewable energy. The rest of the chapters in Section II discuss more specific resource management issues and highlight policies that move markets and resource-use patterns toward sustainable development.

Chakravorty and Gong's Chapter 4 discusses the economics of fossil fuels and pollution. They focus on pollution coming from coal, oil, and gas. These resources are nonrenewable in the sense that their use subtracts from their future availability. Limiting pollution from these low-cost sources of energy requires economic policies that make them more expensive and that induce new energy efficient technologies and the substitution of renewable energy sources such as solar and wind power.

Roumasset and Wada's Chapter 5 reviews the principles of groundwater management, including their extension to the optimal coordination of multiple aquifers, groundwater substitutes such as desalination and wastewater recycling, and investments in watershed conservation. By providing principles of pricing and finance, they show how sustainable development can be extended to the management of resource systems instead of a single resource. Chapter 6 by Burnett et al. applies the principles of coordinated resource management to the specific example of managing an invasive tree species that interferes with groundwater recharge. At the optimum, the marginal cost of increasing recharge via watershed conservation should be equal to the shadow value of groundwater in consumption.

Policies that move markets and resource-use patterns toward optimal and sustainable outcomes are exemplified by Pongkijvorasin and Teerasuwannajak in Chapter 7. Green subsidies and coordinated irrigation development are offered as a win-win solution to the problem of maize farming and rapid deforestation in the province of Nan in northern Thailand.

1.3 INSTITUTIONS, GOVERNANCE, AND POLITICAL ECONOMY

Sustainable economic development incorporates sustainable growth and dynamically efficient development patterns. In addition, sustainable development must take into account the lessons from development theory, including how optimal patterns of production, consumption, and trade change with standards of living. While science and technology are commonly employed in the pursuit of sustainability, other factors such as institutions, governance, and political economy are also critical dimensions of sustainable development. This is the focus of Section III: the political, institutional, and policy dimensions of sustainable development.

Deficient institutions, governance, and political economy are typical pathways to unsustainable development. Section III considers the coevolution of institutional arrangements and the environment. Tarui's Chapter 8 reviews the literature on managing natural resources under different institutional arrangements and provides a model of resource governance that allows for the optimal transition between open access, common property management, and private property, given the transaction cost properties of those institutions. The rest of the chapters in Section II take on specific country experiences in Africa, Asia, and the Pacific.

Chapter 9 by Ravago and Roumasset continues the theme of institutions and resource management by examining the resource curse but generalizing the phenomenon to include other foreign exchange booms that may lead to distortionary policies, using the Philippines as an illustrative example. The focus is on two specific curses of abundance—contraction of the sector with the most growth externalities and the increase in unproductive rent-seeking. The lessons from this chapter are revisited in Chapter 21.

Governance and institutions evolve together. In Chapter 10, Uy considers the opportunity presented by vast amounts of fallow land in Africa and the difficulties of governing foreign investment to promote economic development and food security. Uy discusses mechanisms to coordinate interdependent private and public investments with local interests and knowledge to provide a win-win outcome for investors and communities. Uy also explores ideas for using private investors as sources of improved infrastructure and “governance beyond government.”

Relatedly, land policy has been argued to be a critical ingredient of strong economic growth, e.g., land reforms in East Asia. La Croix's Chapter 11 reviews the history of large-scale land confiscations in early modern Europe, the United States, and Hawai'i to provide a foundation for understanding the nature of modern land reform policies. The takeaway from this chapter is the recognition that East Asian states after World War II were *limited access orders* (as opposed to the more democratic *open access orders*) in which the strategy of the new government is to confiscate and redistribute property to strengthen their coalition's position.

Economies that have undergone civil wars and conflicts are also likely to be limited access orders. These economies require a particular set of policy and institutional reforms that contribute to nation-rebuilding. Another strategy is the integration of these economies within a region to help facilitate nation-building. Integrating fragile nations, however, may promote illicit sectors of the economy. Fujimura's Chapter 12 investigates the political economy of narco-nations in the context of Afghanistan and Myanmar, the two largest sources of illicit drugs in Asia. Chapter 12 sets out requirements for benefit-cost analysis of imperfect prohibition and enforcement policies versus regulated legalization.

Philippines, respectively. Thailand established a Paddy Mortgage Scheme (PMS) in 2011, meant to stockpile rice exports in order to increase world prices. Setboonsarng's Chapter 18 demonstrates that the PMS has been successful in transferring income to rice growers, temporarily increasing world prices, and stabilizing farm gate prices. However, the negative impacts of PMS include a huge budgetary loss incurred by the government, the near collapse of market mechanisms in guiding efficient resource allocation, and the decline of rice quality and diversity. On the other hand, the Philippines is implementing its Food Self-Sufficiency Program, which, among other objectives, aims to make the country self-sufficient in rice. Having missed its first deadline of 2013, the country is now aiming for rice self-sufficiency by 2016. As the 2016 deadline approaches, the Philippines has restricted rice imports, supported *palay* prices, and has invested billions of pesos largely in irrigation facilities. In Chapter 19, Clarete describes and suggests possible rationales for the program, discusses its pitfalls, and suggests appropriate reforms.

Wickramasinghe's Chapter 20 explores the link between production specialization and market participation by small-farm households. The key premise of this chapter is that transaction costs play a fundamental role in specialization, which in turn affects household decisions regarding the extent of market participation. Based on the evidence shown for the different market environments, the chapter recommends adapting policy tools to specific environments in order to promote market participation.

1.5 DEVELOPMENT, VULNERABILITY, AND POVERTY REDUCTION

Section V addresses poverty, development, risks, and vulnerability from the perspective of specific countries. Chapter 21 by de Dios and Williamson zeros in on development lessons from the Philippine experience. Examining a century of the country's deviant behavior in industrialization sheds light on the various antidevelopment forces, including institutions, liberalization policies, labor emigration, and Dutch disease that brought down the growth trajectory of the country. Understanding the past avenues of unsustainable development helps prevent history from repeating itself and promotes sustainable development and poverty reduction. Disaster management has emerged as a major issue in recent years, both in developed and developing countries. Given the increased damage from natural disasters, economists have increasingly started to focus their attention in that direction. Farmers' vulnerability to weather shocks such as drought will remain central to global poverty concerns. In Chapter 22, Lybbert and Carter investigate the proper bundling of two innovations, drought tolerant crops and drought index insurance, and how to leverage the complementarities between them. They calibrate such a package for Ecuador to illustrate alternative policy options.

Chapter 23 by Gaiha et al. identifies factors associated with the frequency of natural disasters and the resulting impacts on mortality. This chapter concludes that the payoff from learning from the experience of natural disasters is high; even moderate learning from responding to it can save a large number of lives. More rapid economic growth can also help avert deaths by providing resources for disaster prevention and mitigation. A challenge for development assistance is to combine accelerated growth with better disaster forecasting, rapid response, and speedy relief in order to reduce vulnerability to natural disasters.

In Chapter 24, Balisacan brings the reader back to the Philippines. While the Philippine experience illustrates the various sources of unsustainable development (see Chapters 9, 19, and 21),

history also shows that the country has had episodes of substantial growth (Balisacan and Hill, 2003; Canlas et al., 2011). The subsequent question is whether these spurts of growth helped in lifting the poor out of poverty. Using the Alkire–Foster aggregation methodology, which preserves the “dashboard” of poverty dimensions, to systematically assess the magnitude, intensity, and sources of multidimensional poverty over the past two decades and across subpopulation groups, Balisacan finds that poverty did actually decline. While income-based poverty remained largely unaffected by economic growth during the past decade, the multidimensional metric of poverty has decreased. From a policy perspective, this result reinforces the view that economic growth, even in the short term, is required to reduce poverty.

The last but certainly not the least chapter in this volume, by Warr, has taken the discussion of structural transformation (see Chapter 21) and measures of poverty reduction (see Chapter 24) to the Mekong economies consisting of Cambodia, Laos, Myanmar (Burma), Thailand, and Vietnam and including two provinces of China: Guangxi and Yunnan. Lessons from this study strengthen the view highlighted in Chapters 8 and 9 that poverty reduction is strongly related to growth of real gross domestic product per person but that the sectoral composition of this growth also matters.

1.6 CONCLUSION

As demonstrated in this volume, recent research has enriched our understanding of the nature, causes, and consequences of policy responses to the development challenges of our time. The examples provided for certain agricultural, resource, and environmental policy concerns have shown the richness of incorporating transaction costs, risks, institutions, and political economy into traditional models of economy–society–environment interactions. Yet, the efforts to unravel fundamental explanations to many recent and emergent development patterns have only just begun. For students of development, the field is fertile for research, both at the theoretical and empirical levels. For example, the link between security and sustainability through the concept of risk is yet to be analytically clarified. Clarifying the concepts of and interrelationship among disaster management, risk, hazard, vulnerability, resilience, and sustainability would contribute greatly in our understanding of the economics of disaster.

The role of institutions in natural resource use can be further explored to include transitions across different forms of institutions, the role of government and its interaction with resource users, and economic development. It is useful, for example, to explore how certain political economy models of rent-seeking and citizen voting can affect resource use outcomes and the sustainability of economic development. Development of theoretical foundations of “learning-by-lobbying” would be likewise useful in shedding light on the transmission effects of the use of resources and the potential for a resource curse.

From a policy perspective, advancing the search for fundamental explanations will go a long way toward informing what works and what does not in efforts to achieve sustainable economic development. For one, we hope to mitigate the tyranny of fads, fancies, and myths over concrete and logically thought-out proposals to achieve sustainable development. For another, a clear understanding of the nature, causes, and consequences of policy helps inform the deployment of appropriate metrics for monitoring and evaluating progress—or the lack of it—in achieving sustainable development.

There is much room for improving the methods for measuring various capital stocks, shadow prices, rates of depreciation and depletion, and rates of investment as the different economies move forward to green accounting—inclusion of environment and natural resource considerations in, say, the National Income Accounts.

The framework of nonrenewable resource and a ceiling on the stock of pollution can also be used in the evaluation of regulatory policies, such as in modeling the impacts of the Keystone Pipeline System in Canada and the United States as well as the discovery of shale gas reserves in China and the United States. Complementing the formal models of institutional development and natural resource management with empirical studies will further increase the value of these tools toward a more fully comprehensive approach to sustainable development.

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