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Ecological Economics: Principles and Applications

Author: Herman E. Daly and Joshua Farley (2007)'s

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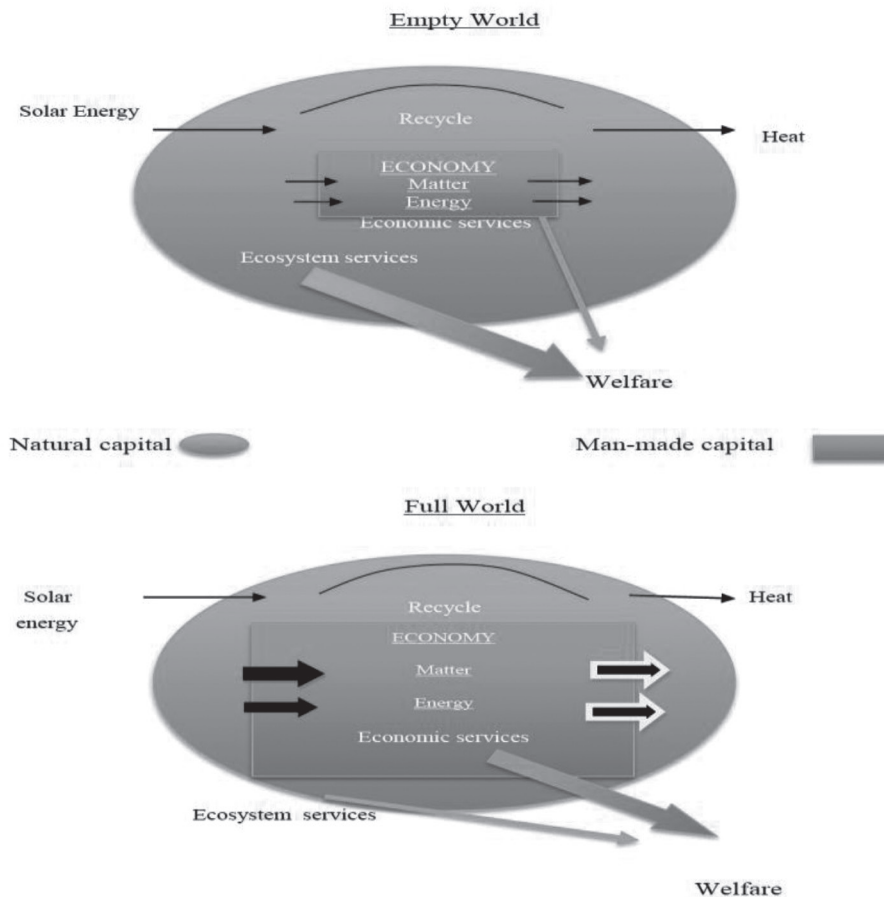
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The book under review is a timely contribution to the field of Ecological Economics at a time when it has been trying to establish its transdisciplinarity from biology, physics, and social sciences. One of the two authors, Herman E. Daly, is the co-founder of the International Society for Ecological Economists (ISEE). Theories are explained through examples and images. In each chapter authors have raised some questions under the banner of "THINK ABOUT IT!" to help readers think practically. The book is divided into six parts. These six parts are distributed among 23 chapters: 3 chapters in Part I, 4 chapters in part II, 5 chapters in part III, 4 chapters in part IV, 3 chapters in part V and 4 chapters in part VI.

Part-I

Part I introduce the concept of ecological economics and is actually a detailed study about the relationship between ecology and economics. The authors have described that ecological economics has evolved from the neoclassical school of thought which has been subjugated in the academic fields since long time. So, in Chapter 1, the purpose of the book is thoroughly explained.

Chapter 2 describes the basics of ecological economics and emphasizes that the global ecosystem is the 'whole' which involves the economic system in it as a 'part'. This view is against the neoclassical school of thought according to which the economy is the 'whole', environment is a 'part' of it, which, in turn, serves as a source of raw material for economic activities and a sink to throw waste emanating out of such activities. The authors have discussed about *empty* world and *full* world, with the help of a very thought provoking diagram (Figure 2.1, page no. 18) to explain what optimal scale is in terms of natural capital and what is "uneconomic growth". They took the help of laws of Thermodynamics of Georgescu-Roegen to explain the laws of nature. The figure is given below.



Source: (Daly and Farley, 2007)

Figure 1. Empty world-Full world

Chapter 3 focuses on the relationship between end, means and policy spectrum, as means (resources available) and ends (desired outcomes) are necessary to know a system better. The authors have described ecological economics as a mechanism to connect the scarce natural capital (means) to alternative outcomes (ends). In this chapter, the authors have tried to answer two questions partially:

1. What are the available means and of what the ultimate means of human kinds consists?
2. For what ultimate purpose/end, should these means be employed?

Part-II

Part-II is all about the '*whole*', i.e. the Earth and its atmosphere. In this section, the authors have successfully tried to make the readers realize how the human activities depend on nature. The Earth, the *whole* provides raw materials as a source and absorbs the disposed wastes as a sink. Chapter 4 summarizes a brief history of Thermodynamics and explains how the entry is related to human life and economics. The authors have listed eight goods and services of the Earth which

have made life possible on it. According to the authors, entropy should be the ultimate end of using means.

Chapter 5 addresses the abiotic resources and their market based features. Again Chapter 6 deals with the quality of biotic natural assets. It also cites some interesting examples from forests and about 'stock' and 'flow' of resources. Chapter 7 explains, how in the past, the earth was endowed with many natural resources with very less number of consumers (people). That situation is called 'empty' world. Now it is turning towards a situation where continued physical expansion of the economy has increased cost. Historically, people have been more concerned about the 'source' problem. The authors explain that global sink is becoming major concern today. So the world is becoming 'full'.

Part-III

The main focus of the book, actually, begins from here. This part is about micro economy. The authors have tried to analyze the ecology included in the economic equations. In Chapter 8, by applying market equations and equi-marginal principles of maximization, the authors have successfully placed the principles of substitution. They have commented that commodities are not always associated as substitutes. Complementarity is another relationship between them; and these two relationships play very important roles in ecological economics.

In Chapter 9, with the help of some basic economic theories, Daly and Farley have established that natural resources and man-made commodities are complementary. The pattern of scarcity for resources has changed. So the identity of limiting factors has also changed. Neoclassical economic school of thought ignores the complementarity among goods and services. Chapters 8 and 9, too, elucidate the process of addressing some ecological economics issues by modifying some microeconomic theories prevailing in neoclassical school of thought.

Chapter 10 analyzes the reasons of failure of markets. Several justifications for market failures of natural resources have been provided in this chapter. The reasons are listed below-

- The absence of competitions;
- Some inherent characteristics of certain resources as excludability, rivalness, open access regional externalities; and
- No institution to clearly define property rights of public goods

Chapters 11 and 12 link the market failure with abiotic and biotic resources respectively. The characteristics of some natural resources, like rivalness, excludability of fossil fuels, minerals etc., lead to failure of market. The authors treat the destruction of ecosystem services as negative externalities.

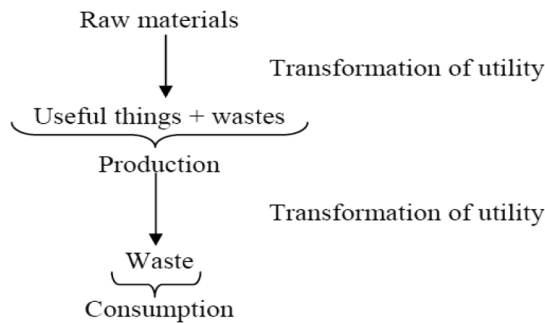
Part-IV

The authors have turned to macroeconomic concepts in this part. Macroeconomics looks into the economy as a whole and so it does not believe in limitation to growth. On the other hand, ecological economics emphasizes on optimality of scale as an objective, rather than growth. It also does recognise the importance of fairness of distribution. Ecological economics show that markets are not always adequate to allocate many scarce resources. Policy intervention and traditional policies are required in many cases. From Chapters 13 to 16, the authors have provided brief introduction to some macroeconomic concepts, concerns and guiding principles and applied those to the strategy of ecological economics. The authors have established that growth and

development are not the same. Growth is quantitative, which is represented with the help of Gross National Product (GNP). On the other hand, development is very much related to welfare, which is qualitative.

In Chapter 13, ecological economics is challenging today's growth concept which is treated as a solution to poverty, unemployment and inequality. The chapter critically discusses the optimal scale of an economic subsystem.

The authors bring 'physics' into the basic concepts of circular form of the economy which is termed as 'production' or 'consumption' in an economy, is actually a 'transformation' of raw materials.



The chapter also discusses the uneconomic growth.

Chapter 14 focuses on money, with the help of "the Diamonds-water paradox" of Aristotle. Growth in terms of money is meaningless without an increase in real wealth. Money can be created or destroyed, so do not obey the rules of Thermodynamics. Chapter 15 explains about the distribution and its fairness. Ecological economics regards the intergenerational distribution of resources as an ethical issue. Preserving an adequate amount of resources is a responsibility of the current generation, the authors demand. However it is not clear in this book as to what is this adequate amount? How to calculate it?

In chapter 16, the basic macroeconomic IS-LM model is discussed and adapted this model to ecological economics. The authors of this book have argued that ecological restriction should be imposed to limit the economic throughput.

Part-V

Part V consists of 3 chapters addressing the international trade. Chapter 17 deals with the theories of international trade and the problems of globalization. Chapter 18 is entirely on globalization. This is important because many of the present day's environmental problems are related with globalization. In this chapter, the authors look at the consequences of globalization in terms of three basic objectives of ecological economics—efficiency in allocation of resources, fairness in distribution and sustainability of scale. The authors have summarized in this chapter that internalization is a better option in which countries are free to act on their local problems of scale and distribution in a culturally sensitive way.

Chapter 19 is also about influence of globalization. Today any nation's welfare is seen to be governed by the laws of globalization. This should not happen. In Chapter 19, the authors cited the reference of the International Monetary Fund (IMF), where it is claimed that a nation should address its distribution and welfare issues, rather than others. Balance of payment, exchange rates, capital mobility, and economic stability are discussed in this chapter.

Part-VI

Part-VI focuses on policy tools to attain the basic objectives of ecological economics—efficiency in allocation of resources, fairness in distribution and sustainability of scale.

Chapter 20 enlists six design principles to arrive at such an economy which has a balance between sustainability, fairness and efficiency. These principles are:

- (i) should have alternative goals. One goal-one instrument;
- (ii) should conquer macro level control so that the micro level choice and inconsistency forgo at a minimized rate;
- (iii) should be a safe periphery between demand for and supply of ecosystem services; and
- (iv) must recognise the historical conditions;
- (v) should be adaptable to the malformed state of affairs; and
- (vi) should take care of the causal effects of a problem.

In Chapter 21, policies to arrive at a sustainable scale are discussed—direct regulation, Pigouvian taxes, Pigouvian subsidies and tradable permits. These effect scales and their implications in ecological economics.

Chapter 22 is about policies for just distribution. According to the authors, the distribution of wealth and income are crucially important because of following four reasons:

- (a) Poor people do not care about sustainability;
- (b) Rich people consume large amount of finite resources, which is against intergenerational sustainability;
- (c) Caring about sustainability implies caring about intergenerational distribution; and
- (d) Redistribution of wealth is necessary

The authors then have given policies for just distribution and have cited some examples too.

Chapter 23 reviews policies for allocation. The issues discussed in this chapter are:

- (i) pricing and valuing such services of the ecosystem which do not have market values.
- (ii) macro-allocation of resources between private and public goods.
- (iii) problems of allotment of public resources beneath control of local as well as national autonomy.
- (iv) redefining efficiency which is well-matched with the objectives of ecological economics.

The book is mainly persistent on three main agendas— resource allocation, income distribution and the extent of economic activities in relation to the ecosystem. Depletion and pollution are costs of growth. Policies should guarantee sustainable scale and a just distribution of income. From the

book, it is clear that for ecological economics, market is only one mechanism to solve the problems of allocation, distribution and scale.

The authors have argued in this book that in a finite earth, growth is not limitless. They have cited a very good example of “fishing boats”. The annual catching of fish is not restricted by the fishing instruments, like boats which are constructed by man, but by the declining fishing population in the sea. We are moving from a world, abundant in natural resources, to a world which has scarcity of such resources. So, nature of the environmental goods and services are to be studied.

So, ecological economics assumes natural capital and manmade capital to be complementary, not substitutable.

As the book has nicely established, ecological economics is a transdisciplinary field which investigates the fundamental doctrine, flows of energy and matter, structures and functions of ecosystem which govern and integrate economics with ecology. The book has insisted on policy issues too to move on to a sustainably developed society.

Much to its credit, this book has presented the complexity of human-nature interaction in a very simple and easy to understand manner. The book serves as a textbook for the beginners in the field of ecological economics. The authors have brought together valuable chapters against the most important “keywords”, knowledge of which is essential to understand the impact of accelerating human activities on the regenerative capacity of nature. The diversification of ecological economics from the neoclassical economics school of thought is clearly conceptualized through various chapters of this book. To conclude, this book is a significant value addition to the emergent interdisciplinary field of the ecological economics.

Authors' Profile

Bandana Khataniar is a Doctoral student in the Department of Humanities and Social Sciences, IIT Guwahati, Assam, India and is pursuing her Ph.D. in Ecological Economics. Her PhD focuses on an Empirical Assessment of Environmental Consequences of Economic Growth in the Developing Nations of Asia. Her research interests include, globalization-economy-environment linkages, climate change and women and climate change adaptation.
