


Chapter 4


Environmental Control: Types, Forms, and Methods of Enforcement

Luminita Diaconu

 <https://orcid.org/0000-0002-6736-6344>

Academy of Economic Studies of Moldova, Moldova

Yassine Mouniane

 <https://orcid.org/0000-0002-6037-5301>

Faculty of Sciences, Ibn Tofail University, Morocco

ABSTRACT

This chapter focuses on ecological control methods as critical instruments to enforce legal compliance with environmental standards, and for sustainable management of our natural resources. Primary mechanisms of compliance such as regulatory sanctions, market instruments, technological monitoring and voluntary compliance. Various methodological approaches are also discussed and these include scientific and analytical methods. Six types of control are addressed - inspection, investigation, administrative supervision, monitoring, environmental assessment and audit, the last of which is presented as the most comprehensive method. Similarly there is attention in the chapter to the preparatory phase of control which includes information collection and analysis, comparison of data to find anomalies which directs the planning of verification actions. General controls aim to guarantee the legality, effectiveness, efficiency and transparency of environmental action, while detecting any malfunctions or abuses that may ultimately be necessary to protect the environment.

DOI: 10.4018/979-8-3693-9132-7.ch004

1. INTRODUCTION

The rapid decline in ecosystems, the worrisome loss of biodiversity, and the growing evidence of climate change have all led the world to the pressing need to protect natural resources and achieve sustainability (Wang et al., 2024; Nimma et al., 2025). The combined effects of a range of human activities, including industrial pollution, deforestation, overconsumption, and unplanned urbanization have caused significant stress to the earth's ecological balance in recent decades (Tazerji et al., 2022; Nair et al., 2023). These realities have revealed the inefficiencies of traditional approaches to environmental management, leading to the growth of more integrated and scientifically based approaches to address complex and moving environment issues (Chopra et al., 2024; Pasupuleti et al., 2024). Under this umbrella, a significant strategy that has emerged within the last decade that addresses the disparity between environmental laws and their implementation has been ecological control (Deguine et al., 2021). Ecological control goes beyond enforcement or monitoring, and is multi-dimensional, and integrated in its consideration of how humans interact with the environment (Qu et al., 2024). Ecological control serves as an important tool within the wider framework of environmental governance that focuses on transparency, accountability, and always changing plans for improvement across sectors and levels of intervention (Muccitelli et al., 2023). Essentially, ecological control seeks to achieve that human actions/conducts comply with legal regulations and environmental standards while advancing practices that foster long-term sustainability of ecosystems (Khanam et al., 2023). It is not static nor punitive, but rather a dynamic, adaptive, participatory process that draws on stakeholder feedback and evidence-based decision-making. This contemporary view of ecological control is consistent with how we think about sustainable development, where a comprehensive monitoring and regulatory framework brings together the social, economic, and ecological aspects of sustainability (Ruggerio, 2021; Zhang et al., 2022).

This chapter will provide a deeper examination of the concept, spatial and temporal scope, and method of application of ecological control. The main goal of the chapter is to articulate the meaning of ecological control, and articulate the roles it plays, the value of ecological control today, and its various applications in environmental contexts. Through this lens, the chapter is intended to build on the conceptual and operational treatment of ecological control to offer environmental professionals, policy makers, and researchers a comprehensive, but practical, conceptual underpinnings of ecological control that will guide their work and their efficacy in accomplishing positive environmental outcomes.

This chapter is organized around a few specific goals. It first defines ecological control in its broadest sense, distinguishing it from other forms of environmental oversight, including administrative inspection or judicial enforcement. The chap-

30 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/environmental-control/386123

Related Content

On the System Algebra Foundations for Granular Computing

Yingxu Wang, Lotfi A. Zadehand Yiyu Yao (2009). *International Journal of Software Science and Computational Intelligence* (pp. 64-86).

www.irma-international.org/article/system-algebra-foundations-granular-computing/2786

Neural Architecture Search Network for the Diagnosis of COVID From the Radiographic Images

Sasikaladevi N.and Revathi A. (2022). *Applications of Computational Science in Artificial Intelligence* (pp. 60-73).

www.irma-international.org/chapter/neural-architecture-search-network-for-the-diagnosis-of-covid-from-the-radiographic-images/302062

Adaptive 1-D CNN Using LSelect Feature Selection for Predicting Software Faults

Tamanna Mishraand Sanjay Misra (2026). *International Journal of Software Science and Computational Intelligence* (pp. 1-23).

www.irma-international.org/article/adaptive-1-d-cnn-using-lselect-feature-selection-for-predicting-software-faults/399476

Modern Approaches to Software Engineering in the Compositional Era

Ali Dogru, Pinar Senkuland Ozgur Kaya (2012). *Machine Learning: Concepts, Methodologies, Tools and Applications* (pp. 1903-1923).

www.irma-international.org/chapter/modern-approaches-software-engineering-compositional/56233

A Dualism Based Semantics Formalization Mechanism for Model Driven Engineering

Yucong Duan (2009). *International Journal of Software Science and Computational Intelligence* (pp. 90-110).

www.irma-international.org/article/dualism-based-semantics-formalization-mechanism/37490