Chapter 4
Reflections on Mode 3, the Co-Evolution of Knowledge and Innovation Systems and How it Relates to Sustainable Development:
Conceptual Framework for "Epistemic Governance"

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ABSTRACT

This paper is interested in raising the question to which extent the epistemological implications of the Mode 3 concept coincide with the respective knowledge understanding. The argumentation focuses on the article from David F. J. Campbell and Elias G. "Mode 3" and "Quadruple Helix": Toward a 21st Century Fractal Innovation Ecosystem (2009) and aims to illuminate it from a theoretical perspective. The starting point is the elaborated basic understanding of knowledge as well as the interpretation of knowledge production.

INTRODUCTION: RELATING MODE 3 TO THEORETICAL REFLECTIONS ON KNOWLEDGE

Concepts of knowledge and knowledge production are necessary for understanding ongoing social processes, political regulations, economic valorization and cultural symbolism. They imply the question as to the significance of university research and the "academic firm" against the backdrop of the slogan of the knowledge society, which is spreading like an epidemic. The increasing relevance of this sociological category already indicates that a change seems to be taking place towards a form of society in which knowledge represents the constitutive element.

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The central assumption here is that post-industrial societies are no longer characterized by work and property, but by knowledge. The knowledge we create and reproduce enables not only innovation, but changes the modes of interaction, not only regarding societal systems, but also in respect of the natural environment. It affects the very basic interface between human and nature and raises the question to which extend the organization of knowledge might improve life and -moreover- to what extend it might attribute to sustainable development. But where does this knowledge come from? Who are its bearers and how does it create innovation?

David F. J. Campbell and Elias G. Carayannis join this ongoing debate and present a comprehensive approach to answering the question as to the constitution and normative implications of knowledge systems as the interconnections between different knowledge and innovation paradigms. In their article *Mode 3 and Quadruple Helix: Toward a 21st Century Fractal Innovation Ecosystem* (Carayannis & Campbell, 2009) they show to what extent different knowledge and innovation paradigms co-exist and co-evolve and how this relates to the competitiveness and superiority of a knowledge system. In order to deal with the issue of the rational element informing innovation, they introduce the concept of *Mode 3*.

Following the knowledge concept of the article, this commentary will illuminate the link between innovation and the organization of knowledge. From an epistemological and theoretical perspective, it will problematize the premise that an intensification and optimization of the structures of *building blocks* organizes knowledge, "creating" innovation and thus enabling sustainable development. The conceptual framework of "epistemic governance"[1] will be introduced in order to grasp the interrelation between policy-making and the production of scientific knowledge in defining and addressing socio-ecological problems.

The starting point is the elaborated basic understanding of knowledge as well as the interpretation of knowledge production. I challenge the usability of Thomas Kuhn's approach, referring to Paul Feyerabend. It represents an experiment and pursues issues that were not necessarily at the heart of the authors' intentions. I pose these questions in order to shake the *Mode 3* model and consolidate it at the same time. The considerations are intended to lay the foundation stone for a challenging intellectual game and to demonstrate that the attempt to link knowledge and democracy has hung on a silken thread since the times of Plato.

QUESTIONING THE RATIONALE OF THE MODE 3 SYSTEM

From the analytical perspective, knowledge is defined as justified true beliefs (Roderick, 1987). It goes beyond the mere storage of information and data (Dretske, 1992). That works as common sense (Stehr, 2003, p. 47). Unlike information, knowledge implies the recognition of contexts and enables, to use Saussure's terms, insight into the linkages between signs and meaning. This is both conscious and subconscious and complicates the organization and regulation of knowledge. Knowledge is the key to coping with the world and to optimally utilizing the resources of this world, i.e., to innovation and moreover sustainable development.

David F. J. Campbell and Elias G. Carayannis developed the concepts of *the new production of knowledge* (Gibbons et al., 1994) and *Mode 2* (Nowotny et al., 2003) and the *Triple Helix Model* (Etzkowitz & Leydesdorff, 2000) and introduced their notion of *Mode 3* (Carayannis & Campbell, 2006, 2007). The main idea *Mode 3 and Quadruple Helix* is that innovation is closely tied to the organization of knowledge. Besides knowledge clusters, innovation is here a component of the *Mode 3* system. This premise raises the following questions:

- Does *Mode 3* merely consist of a sum of principles surrounding knowledge creation, diffusion and employment like a