

## Chapter 5

# Additional Challenges for CEMIS Due to Impacts Caused by Climate Change

**Irene Antoni-Komar**

*Carl von Ossietzky University Oldenburg, Germany*

**Marina Beermann**

*Carl von Ossietzky University Oldenburg, Germany*

**Hedda Schattke**

*Carl von Ossietzky University Oldenburg, Germany*

### ABSTRACT

*The aim of this paper is to evaluate how CEMIS could be enhanced to cope with impacts caused by climate change. In our time, firms have to deal with the resulting challenges such as increasing complexity and dynamics of the environment. By developing cultural competences, firms will be empowered to handle these new challenges appropriately. CEMIS itself as a managerial tool has an excellent potential to increase organizational resilience against vulnerabilities due to impacts caused by climate change. CEMIS could provide climate change scenarios for different impacts in global and regional dimensions. Scenarios as alternative images of how the future might unfold are an appropriate tool to analyze how driving forces may influence future emission outcomes and to assess the associated uncertainties and risks. They assist in climate change analysis, including climate modeling and the assessment of impacts, adaptation and mitigation. Theoretical enlargements of the CEMIS concept will be discussed by resilience thinking, which is promising for CEMIS because of its turning away from the equilibrium assumption, its widespread comprehension of the environment and its influences, its assumption of flexibility and adaptiveness through the adaptive capacity. The discussion will be exemplified by firms from the food industry, which are highly vulnerable towards direct and also indirect impacts caused by climate change along certain supply chains. Changing qualities and quantities of resources, temporary shortage of resources or conflicts between energy and food can all have drastic effects on firms in the food industry. Supported by CEMIS as a critical information system, emerging conflicts due to changing societal and cultural processes can be recognized sensitively, reflected critically, and reconfigured creatively to the aim of sustainable strategic management. Based on the theory of social practice and*

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*the competence theory of the firm, the development of cultural competences, as an integral part of the practical intelligibility of firms and as a learning concept for adaptive capacity, enables firms to handle these new challenges in times of expanding uncertainty and risk appropriately.*

## **INTRODUCTION**

The idea of a Corporate Environmental Management Information System (CEMIS) stands for the ecological goal of reducing environmental impacts to ensure the viability of the firm (cf. Lang, 2007; Marx Gómez et al., 2007). Due to the need for encompassing information along the supply chain, environmental management systems in general track different steps: the identification of impacts or risks, the process of assessment, supervision and controlling. During all these steps, similar problems have to be considered. On the one hand, detailed and encompassing information is required. On the other hand, this involves increasing complexity and the need for evaluating information concerning its importance and correctness. Furthermore, diverse spatial and time scales have to be considered. Consequently, CEMIS relies on a continuous exchange and comparison of information concerning environmental and societal changes in order to supply the firm with sufficiently updated and relevant information.

Climate change and its potential environmental, social and cultural impacts highlight a new and additional challenge for individuals and organizations. The increasing complexity and dynamics of the environmental system have to be considered for further conceptual and theoretical development of CEMIS. CEMIS as a *managerial tool* and *critical information system* has the potential to support firms in the learning process of building adaptive capacity concerning new challenges caused by climate change (cf. Berkhout, 2006).

Climate change caused challenges appear above all as societal and cultural challenges, because on the one hand climate change influences societal and cultural processes, and on the other hand climate change is intensified by societal

and cultural processes. The cultural dimension implies that actual and future tasks have to be considered at an early stage. For this purpose, cultural processes and path dependencies in society and the reactions to the market have to be considered in strategic management. Impacts caused by climate change can reinforce the need for an interactional and recursive view of firms, concerning the importance of building capacities for adaptation and mitigation while catching up with cultural processes like technological formations of society, specialization of production, and social acceleration.

In this context, the idea of resilience is a fitting and promising concept. By developing *cultural competences* as an element of strategic management, firms will be empowered to handle these new challenges appropriately and to become resilient to both varied and complex vulnerabilities.

## **THE IDEA OF RESILIENCE**

The resilience concept originates from ecosystem science. The ecologists Eugene P. Odum (cf. Odum, 1971) and C.S. Holling described how ecosystems by means of homeostatic mechanisms organize themselves in order to reach an ecological balance. Holling (1973) developed a model that was designed to interpret the dynamics and resilience of complex ecosystems, which are thought to go through phases of an “adaptive cycle”. The model is based on two dimensions, connectedness and accumulated capital, which determine the growth, conservation, release and reorganization phases of ecosystems.

It can be assumed that complex ecosystems move from rapid growth to a mature phase designated conservation. While developing this phase,

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