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SELECTED SOCIAL ASPECTS OF CORPORATE ADAPTATION TO CLIMATE CHANGE

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Abstract:
While there is a recognized need to adapt to changing climatic conditions, there is an emerging discourse of determinants to such adaptation. The article discusses selected, social factors conditioning corporate adaptation to climate change. In particular, the paper focuses on values, organizational culture, and employee awareness. The results showed that environmental values are important determinants of willingness to accept climate change adaptation measures, whereas insufficient knowledge and inappropriate organizational culture significantly hinder the process.

Keywords: climate change, adaptation, social barriers

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1.   INTRODUCTION

Individual and societal adaptation to climate is nothing new. The changeability of climate has, over the centuries, repeatedly necessitated introducing changes to accommodate new weather conditions. This was particularly evident in the so called Little Ice Age and the Medieval Climate Optimum. Currently, the problem of adaptation is no longer limited to the context of extreme weather phenomena, the discussion extends to global changes of continuous character. Adaptation to climate change has now become part of the contemporary discourse about the politics and economics of global climate change. It has been enshrined in the policy debate through its appearance in Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC), where the ultimate objective of the Convention concedes that adaptation to climate change in relation to food production, ecosystem health and economic development can and will occur. Although much of the earlier international climate policy debate in the 1990s and early 2000s was pre-occupied with mitigation, the past decade has seen a growing attention given to adaptation— both its practice and its politics (Pielke & Prins & Rayner & Sarewitz, 2007).

As defined by the IPPC report, the notion of adaptation is understood as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation (IPCC, 2001). The following article will focus on organizational adaptation to changing climatic conditions. Organizations can adapt to climate change in three main ways: (1) anticipatory adaptation, which takes place before climate change impacts are observed; (2) autonomous adaptation, which does not constitute a conscious response to climatic change effects but is triggered by changes in natural and human systems; (3) planned adaptation, which is the result of a policy decision. The necessity to take adaptive action is mainly the result of regulatory requirements. In particular, the EU environment protection law enforces the implementation of certain measures, e.g. through the introduction of technical standards. Moreover, a number of organizations operating in areas most threatened by climate turbulence have been working to introduce appropriate preventive measures. These are intended to secure corporate assets against the consequences of extreme weather conditions. In this context, one may raise the question of the determinants and limits to such adaptive measures.

The discourse around limits to adaptation is frequently constructed around three dimensions—physical limits, economic limits, and technological limits. These dimensions offer various analytical capabilities for investigating adaptation to climate change and allowing adaptation to be present in various forms of policy assessment. Attention to ecological or physical limits to adaptation offers the prospect of investigating of such limits through physical modeling of, for example, agriculture and biodiversity under changing climates. Consideration of economic limits to adaptation lends itself to investigation through the use of cost-effectiveness analysis or cost–benefit analysis. Approaching limits to adaptation through an appreciation of technology suggests value in various types of technology. The mentioned limits are of internal character and may be measurably identified. E.g. economic limits are directly related to the costs of adaptive measures, biological limits to species resilience, etc. Contrary to the above, social barriers are of a subjective, mutable character. Adger observes that social and individual characteristics may potentially constitute a formidable barrier for adaptive measures (Adger et al., 2009). The following article will approach the problems of several selected social aspects of the process of adaptation to climate change. The following factors will be considered: the level of knowledge, recognition of values, and organizational culture. We analysis these factors on the example of polish organizations.

2.   VALUES

Values can be defined in many ways: the term has been used to refer to a wide variety of concepts including likes, preferences, moral obligations, desires, wants, goals. Values are generally considered to be core conceptions of the desirable within every individual and society. Rokeach argues that they serve as standards or criteria to guide not only action but also judgment, choice, attitude, evaluation, argument, rationalization, attribution of causality (Rokeach; 2000). When making a distinction between personal and social value structures, Rohan address some important issues. Firstly, both personal and social value systems are intra-psychic cognitive structures, not descriptions of groups value systems (Rohan; 2000). Secondly, since social value priorities are conceptions of others' judgments of the best

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possible living or functioning, they organize people's perceptions of others. Thirdly, if people's personal value structures are universal, then the perception of others' value priorities should also be organized according to this universal structure. Finally, if we accept that both personal and social value priorities exist, then attitudes and behavior may be traced to either system. Values translate into action because they frame how societies develop rules and institutions to govern risk, and to manage social change and the allocation of scarce resources (Ostrom, 2005). Values are interior and subjective dimension of adaptation. Unlike systems and behaviors which can be objectively measured, values are inherently subjective. The analysis of climate change in the context of values is important for 2 reasons. Firstly, the subjective human ability to adapt can be very different from the respective objective ability. The discrepancy can easily lead to underestimation or overestimation of adaptive capacity. Secondly, adaptive action may affect values of individuals or groups. In this paper we posit that any adaptation measures depend on values. This proposition on the centrality of values demonstrates that activities are defined by ethical principles.

It is widely recognized that values differ between individuals, groups, institutions, cultures. Personal or social value systems can be used to select objects and actions, resolve conflicts, invoke social sanctions, and cope with needs or claims for social and psychological defenses of choices that are either made or proposed. Personal value system or judgments of the capacity of entities to enable best possible living are distinguished from social value systems, which reflect people's perceptions of other's judgments about value priorities. In the context of particular national values, people of various descent may harbor certain different expectations in terms of both the formal structures of companies and the informal patterns of behavior. On the other hand, Schwartz identifies ten types of universal values that are found in all cultures (tab. 1). According to another classification, values can be divided into two groups (Rokeach, 1973): instrumental values (honesty, courage, politeness, responsibility) and terminal values (respect, equality, freedom).

Table 1. Types of values

Openness to change	Self-transcendence	Conservation	Self-enhancement
Stimulation Creativity	Social justice Helpfulness	Conformity Tradition Security	Power Achievement

Source: Schwartz, 2006

The three key systems of values are traditional, modern, and postmodern. The traditional system of values prioritizes local knowledge, preserves cultural icons and identities. Values associated with traditional worldviews include an emphasis on family, equality, belonging to a local community, identity and security. The agricultural landscape in particular provides a sense of stability, historical connection, identity. Modernity emphasis on individualism, materialism and the role of private sector. The modern social welfare system has placed a greater focus on market and voluntary organizations. Modern values prioritize adaptations that reduce climatic threats to economic modernization through rational, scientifically based technological adaptations based on cost-benefit analyses and quantified scenarios of future climate change. Postmodern values emphasize self-expression and self-realization, pluralism, integration. They promote justice with attention to the poor and marginalized, future generations and the role of ecosystem services.

From the perspective of the universal system of values, adaptation to climate change relies particularly on values associated with the postmodern system. It should address not only human needs but the needs of different species, as well as ecosystem functions and services. Climate change adaptations should aim to preserve values like universalism, altruism, biospheric values. These values may dominate in future generations, if material needs and survival values are satisfied. Such values are not unique to postmodern worldviews and instead may have a strong basis in some traditional views.

The value system of Polish managers in the context of adaptation to climate change
Although Polish identity is closely linked to traditional values, there is at the same time an increasing emphasis on modern values: economic development, material wealth, technological progress. Research conducted in Polish enterprises[1] indicates that the prevalent values include: task oriented approach, collectivism, high degree of uncertainty avoidance, inner locus of control, reliance on material reality, passive approach, treatment of human nature as something good and possible to

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[1] The study surveyed 753 managers in 30 companies.

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change (Sitko-Lutek, 2004). Over 60% of the managers surveyed declared that the style prevalent in their companies is task oriented, where responsibility for results and initiation of activities are attributed to the managerial staff. Half of the respondents emphasized establishing long-term relationships, with the number of advocates of this approach amounting to over 80%. Polish enterprises are dominated by characteristically male value patterns: ambition, need of accomplishment, competitiveness. The same does not favor voluntary initiatives in terms of adaptation to climate change. Consequently, the value systems of managers may indeed constitute a barrier to adaptive action.

3.   LEVEL OF KNOWLEDGE

Climatic knowledge can be defined as a knowledge of facts, concepts, and relationships concerning the climate change and global warming. Thus, in simple terms, climatic knowledge involves what people know about the climate, key relationships leading to impacts on air, and collective responsibilities necessary for quality of air. A closely related concept is "environmental literacy". However, as currently used this term carries rather strong normative implications – even embracing deeper spiritual elements. Given that managers greatly influence the consumption and condition of natural capital, the elevation of climatic knowledge among managers and, by implication their ability to process such information, would appear to be inherently desirable (Kaplan, 2000). As Ashford stated, "The key to success in pollution prevention is to influence managerial knowledge of and attitudes toward both technological change and environmental concern" (Ashford, 1993).

The relevance and validity of local knowledge in climate change studies have been demonstrated by a number of studies (Orlove & Chiang, 2000). The process of absorbing climate knowledge can be considered an essential condition for any organizational adaptation to climate change-related disruptions in the natural environment. As climate change was acknowledged as a business issue rather recently, firms do not yet possess much knowledge of how steady changes of mean temperatures and increasing frequency and intensity of extreme weather events will affect their business. Ability to respond to such disruptions in the natural environment requires specific knowledge, which is significantly different to knowledge about changes in the general organizational environment to due to the following three reasons. First, disruptions in the natural environment may not emerge in a continuous and predictable manner. Second, specific knowledge of these uncertainties in an organizational context is difficult due to the problem of chaos and complexity. Third, social change related to climate change (e.g. climate regulations, preferences of green customers, social environmental awareness) are forming in the general environment of organizations, therefore, climatic knowledge is acquired externally by absorption. Within the further adaptation process, the companies utilize information in two ways: (1) to determine the probability that existing and planned operation facilities and other areas of the value chain will be affected; (2) to analyze the potential impacts on them (Busch, 2011).

Processes of adaptation cannot be separated from the nature, status and legitimacy of knowledge claims about the future. Knowledge about many areas of future development is relevant. It pertains to the anticipation of weather fluctuations as well as technological advances, expected developments of legislation, or changes in customer preference. Central to an understanding of how scenarios of future climate are used in adaptation decision-making is to appreciate the ways in which they characterize uncertainty. Scenarios constructed from predictive scientific models of the climate system may be contested on epistemological grounds — scientific predictions as socially constructed simulations. But even where an epistemology is shared, resulting scientific uncertainties may limit their usefulness for adaptation decision making. Thus different approaches to characterizing such uncertainty — narratives, quantitative alternative scenarios or probabilistic descriptions — can have quite different effects on the types of adaptation decisions (Dessai & Hulme, 2004). Differences in climatic knowledge can therefore lead to contrasting types of adaptation decision-making, or indeed can determine whether or not adaptation occurs.

Level of knowledge in the context of adaptation to climate change
No study on climate knowledge targeted specifically at managerial personnel has been conducted in Poland to date. For that reason, the quoted findings pertain to general social studies conducted in this respect. Among the main phenomena and threats related to civilisational development, Poles most commonly list the problem of environmental pollution (69%). Just over half of the respondents (51.2%) mention socio-economic consequences of civilisational advancement – poverty and deprivation, while 39% indicate climate change. The general level of knowledge on climate issues among Polish citizens

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is unsatisfactory. Particularly noteworthy is the respondents' fragmentary awareness and insufficient knowledge in terms of innovative clean coal technologies such as carbon dioxide capture and underground storage (CCS), geothermal energy, or bio-fuel technology. The reasons for this include both the relatively low practical popularity of these solutions and the shortage of readily available information on said technologies in the respondents' immediate environment (Gwiazda & Kolbowska; 2009). Although the total of well informed individuals amounts to 52% of respondents (47.4% - quite well, 4.6% - very well), simultaneously one in three respondents (31.2%) feels underinformed, and one in seven (13.6%) declares to have no grasp on the matter whatsoever. A vast majority of the respondents (82.8%) believe that simple, everyday choices can constitute a real contribution to the prevention and mitigation of climatic change. The actual actions taken by the respondents as an effort to contribute to environmental protection are fairly consistent with their assessment of the particular measures' viability. Although in nearly all cases the percentage of respondents aware of the proper methods of preventing climate change exceeds the percentage of those actually putting said methods into action, the difference between the indexes of "what should be done" and "what is being done" remains relatively constant. Nearly all respondents (96.7%) believe that the most effective method of preventing climate change would be the extension of forested areas, while 70.8% declare that they care for green areas and plant trees themselves. A prevalent belief is that waste segregation helps prevent climate change (95.1%) while only less than three fourths of the respondents (69.8%) declare attempts to reduce the use of plastic bottles and disposable bags in favor of ones that can be reused multiple times. Over three quarters of the respondents (76.6%) mention limiting car usage as a viable method of preventing climate change while in reality, only slightly over half of them (56%) actually decide to abstain from using a personal vehicle.

The conducted study on social environmental awareness and knowledge indicated an unsatisfactory level of knowledge about climate related issues.

4.   ORGANIZATIONAL CULTURE

Organizational culture is a multifaceted construct and has been defined as encompassing the assumptions, beliefs, goals, knowledge and values shared by organizational members (Schein; 1992). Despite the variety of interpretations and cultural dimensions, a number of common themes and similarities can be identified in organizational culture research. First, concepts used to identify and define organizational culture tend to overlap between studies; consequently, several scholars have attempted to develop frameworks to categorize important dimensions and to provide a conceptual foundation for the study of organizational culture (e.g., Hofstede, 1981; House, Javidan, Hanges, & Dorfman, 2002; Schein, 2004; Quinn, 1988). Second, values, ideologies and beliefs are considered to be particularly important for understanding an organization's culture and have been viewed as a reliable representation (Howard, 1998; Ott, 1989). The assessment and measurement of organizational culture has therefore typically focused on organizational values. A third and important aspect of cultural research has been the role of an organization's culture (and its underlying values and ideology of management) in hindering or fostering the implementation of managerial innovations (e.g., reengineering, total quality management) or technological innovations (e.g., flexible manufacturing technologies, enterprise resource planning systems) (Zammuto, Gifford, & Goodman, 2000). According to literature, cultural orientation reflects complex interactions between values, attitudes and behaviors (Hofstede; 1998). The process relies on the fact that individuals express culture through values. In turn, values influence the attitudes which shape norms of behavior perceived as the most appropriate and viable in a given situation. The ever-changing patterns of individual and collective behavior ultimately shape organizational culture. Various typologies of organizational culture have been identified, the most often-cited being those of Hofstede (2000), Sathe (1984) and Cameron and Quinn (1999). Cameron and Quinn proposed four types of culture, which are distinguished for audit and comparison purposes: the clan culture (family-type organizations, commitment to employees, participation and teamwork); the adhocracy culture (dynamic and entrepreneur organizations, cutting-edge output, innovation); the market culture (competitive organizations, increasing market share, productivity); and the hierarchical culture (formalized and structured organizations, smooth functioning, stability). Theoretically, these four cultural typologies exist simultaneously in all organizations. Hofstede distinguished the following cultural dimensions: 1) the distance of power, 2) collectivism – individualism, 3) femininity – masculinity, 4) avoidance of uncertainty, 5) Confucian dynamism.

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By reference to the theory of CVF (competing values framework), adaptation to climate change closely corresponds with the culture of Open Systems Model. It highlights the importance of the external environment in affecting the behavior, structure and life changes of organizations. Underlying themes are evolutionary learning and adaptation. Organizations dominated by an open systems culture will place greater emphasis on innovation for achieving ecological aims in their pursuit of corporate sustainability. The understanding behind adaptation to climate change is based on the assumption that organizations are not separate from the natural environment, but are located and operate within it. Organizational activities can have significant negative impacts on the quality of air, for instance through pollutant emissions. The culture of Open Systems Model stimulates the implementation of measures alleviating this adverse corporate impingement.

Organizational culture in the context of adaptation to climate change

A targeted study of organizational culture in the context of climate change has not been comprehensively conducted to date. Through reference to Hofstede's types of culture, one may venture the claim that the dominant cultural feature in terms of facilitating the adaptation to climate change will be the care for the quality of life and social welfare as well as respect for tradition. Such culture will respect social obligations regardless of the cost, which in turn will result in implementation of preventive programs and mitigation of the consequences of climatic change. Research into these issues, based on the division to culture oriented on transcendence and enhancement, was conducted by Nilson[2]. He confirmed the occurrence of a negative relation between enhancement culture and willingness to accept adaptation measures imposed by regulations. Furthermore, the relation between culture oriented on transcendent (universalism) and willingness to accept policy measures are weak and not significant. The cultures which accounted for environmental values were strongly associated with norms and external goals, while internal goals were related to culture based on power and achievement. Transcendent culture seem to play an important role in supporting moral norms. These are norms that attune us to what we ought to do, and even accept sacrifices, rather than adjust to internal goals and individual consequences. At the same time, the absence of a relationship between culture oriented on enhancement and adaptation measures signifies that moral norms are more likely to be shaped by transcendent than by enhancement values. Thus, enhancement values target behaviors that seek to maximize personal rather than collective interests. It is also in accordance with the idea that pro-environmental behavior resides in the moral sphere. Among possible types of culture, adaptive action is only facilitated by those which share a common view about the need for sacrifices in order to protect the environment (Nilsson & Borgstede & Biel, 2004).

5. CONCLUSION

The ability to adapt is determined in part by the availability of technology and the capacity for learning but fundamentally by the ethics of the treatment of vulnerable people and places within societal decision-making structures (Adger et al., 2009). Adaptation to climate change is limited by the values, perceptions, processes and power structures within organization. In this article we focus on some social aspects of adaptation: values, knowledge, culture. Value systems can be considered to play an important role in responding to climate change, both in terms of mitigation of GHG emissions and adaptation. It has been suggested that values centered on pro-environmental, ecocentric and altruistic orientations can and do give rise to adaptation actions. However, the values prevalent in the analyzed Polish organizations were typical of the male cultural dimension: orientation on achievement, competition and profit. A first step toward enabling more organizations to adapt could be to make explicit the underlying values shaping preferences and decisions. On a value level, the adaptation to climate change involves changes in employees' values and beliefs towards more ethical and more responsible values.

Lack of knowledge about future climate impacts is often cited as a reason for delaying adaptation actions. It becomes a limit in itself, whereas we argue that greater foresight will not facilitate adaptation. With respect to further value chain aspects, climate knowledge absorption could be interpreted as the necessary precondition for the adaptation process beyond corporate boundaries. From the information uncertainty approach, managers may lack information about the nature of legislation pertaining to climate protection or about how changes in the legislative context will affect

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[2] While transcendent culture emphasizes acceptance of others as equals and concern for their welfare and for society at large, enhancement culture emphasizes the pursuit of one's own relative success and dominance over others.

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their organizations, amongst other things. Historic and current adaptation is and continues to be informed by perceptions and local knowledge based on previous experience of weather and climate (Vedwan & Rhoades; 2001). While adaptation activities are inherently local and are necessarily based on contextual knowledge, it is unclear how insights from the past could serve managers in the face of future climate changes.

In recent years, many organizations have introduced or changed products and/ or processes to address pollution. Several scholars, however, maintain that these changes are insufficient as they are only superficial (Senge & Carstedt, 2001). They argue that in order to fully respond to environmental needs organizations will have to undergo significant cultural change and transformation. The central idea is that organizations will have to develop an environmental-oriented organizational culture. The dynamic nature of culture does not discount the value of a particular culture, especially when change is involuntary and, as in the case of climate change, results from anthropogenic emissions for which others are largely responsible. The research showed that for managers, environmental values are important determinants of willingness to accept climate change adaptation measures. These effects are mediated by norms. Adaptation to climate change is facilitated by transcendent culture based on values, i.e. acceptance of others as equals, concern for welfare. Enhancement culture, accentuating the pursuit of one's own relative success over others, is concerned with environmental issues to a significantly lesser extent. Therefore, only certain types of organizational culture facilitate voluntary adaptive action.

We observe that certain social factors such as knowledge, norms, or values may indeed constitute barriers to the process of adaptation to climate change. An unfavorable social configuration may hinder the realization of grassroots initiatives aimed at climate protection, distort implementation processes or delay the decision to begin the same. In order to realize adaptation measures, it appears that leaders have to abandon a purely economically driven paradigm and achieve a more environmentally responsible values.

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