

Global warming and the case of sea-level rise in New Orleans and The Netherlands: Social reaction- and adaptation-capabilities to be explained by Cultural Theory and Varieties of Capitalism approach

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Abstract

This paper tries to identify cultural and institutional variables apart from monetary resources to explain different patterns of response to sea-level rise due to global warming. It will make use of a theoretical approach of vulnerability in which the relevance of entitlements and cultural frames of interpretation take center stage. It shall be argued that varying cultural and institutional characteristics like predominant myths of nature or different welfare regimes have a great effect on coping- and recovering-capacities - and not only the sheer (non-)availability of monetary resources, as the predominant discourse claims. With a theoretical background that aims at combining the general theses of the Cultural Theory with the institutional specifications of the Varieties of Capitalism approach, New Orleans and the Mississippi-delta will serve as a social space characterised by the properties of liberal market economies, including corresponding ideals of nature and welfare institutions, whereas The Netherlands and the delta of Rhine and Meuse represent a social space characterised by the properties of coordinated market economies. The working hypothesis implies that collective action and the principle of precaution can be seen as typical of coordinated market economies, whereas individual action and the principle of wait-and-see is dominant in liberal market economies – and both carry their own fallacies. For example, there are critical voices that argue that sooner or later, The Netherlands won't be able to sustain their principle of precaution. Finally, this paper concludes that combining the Cultural Theory and the Varieties of Capitalism approach might be a promising path to interesting and counterintuitive insights. The case studies present the surprising result that, although the objective level of vulnerability seems to be higher in New Orleans than in The Netherlands, the subjectively perceived vulnerability in New Orleans can be seen to be lower.

1 Introduction

Although many questions about the specific properties of climate change have not been explored yet, man made climate change is considered as a fact among most economic, political and scientific observers today (IPCC 2007). Instead of the scientific reasoning about whether or not climate change is driven by anthropogenic factors, that has been dominating the debate for at least three decades, the present discourse about climate change is coined by the questions of

mitigation and adaptation. This paper will focus on adaptation: the question of how societies as a whole or inhabitants of geographically exposed regions can adapt to or deal with ecological challenges like sea-level rise, drought and intense rain is centre stage. Are there social determinants influencing and producing specific types and patterns of social adaptation capacity? How can these differences be explained?

In the dominant discourse – as represented by the World Bank – these questions are often answered by a statistical comparison of gross national product (GNP) and per capita economic wealth. The simple argument goes like this: the higher the GNP in a given state, the higher (and consequently better) the adaptation capacity. Following this argumentation, spending money on technical solutions like dikes and pumping stations or genetically modified and drought resistant seeds is seen as an indicator of high adaptation capacities and little social vulnerability. In contrast, no investments in technical solutions but wading through water, as e.g. most Bangladesh citizen have to do twice a year due to seasonal rainfalls caused by monsoon, or leaving their place of residence due to flooding or drought is seen as an indicator of a low adaptation capacity and high social vulnerability.

However, inspired by alternative approaches to the field of vulnerability- and capability-research (Sen 1999, Adger/Kelly 1999, Bohle/Downing/Watt 1994), it will be argued here that the extent of adaptation capacity cannot be reduced to the sheer (non-)availability of monetary resources only. Security cannot be achieved by natural resources and wealth in themselves. There also have to be non-material resources, e.g. social and human capital – that is social resources and entitlements in the broadest sense – which allow individuals or groups to actually make use of their wealth or natural resources (Sen 1999, Bourdieu 1992). Furtheron, it could be objected that what is understood by “adaptation” substantially varies from one cultural context to another. The same could be said of the concept of “vulnerability”. What is assumed here is that varying cultural and institutional characteristics like predominant myths of nature or different welfare regimes could have a greater effect on social adaptation capabilities and the perception of vulnerability than the (non-)availability of monetary resources. In other words: even if the inhabitants of two different regions, e.g. New Orleans and The Netherlands, have similar access to material resources and are both exposed to sea-level rise, one can observe different ways this specific problem is dealt with. Accordingly, this paper tries to identify societal determinants that could explain different adaptive approaches to climate change and different perceptions of vulnerability by focusing on the specific and culturally embedded “interior” properties of institutional structures, nature and their interpretation. From this point of view, an objective and absolute dimension of adaptation capacity or social vulnerability does not exist and does not make sense. On the contrary, what does make sense is to develop and make use of a rather context-specific and relational concept of adaptation capacity and social vulnerability. Admittedly, this is an ambitious endeavour, but nevertheless, it will be tried to elaborate its main features. Thereby, the holistic approaches to social vulnerability as proposed by Adger and Kelly (1999) will be further elaborated and operationalised by the theoretical currents of Cultural Theory (Mamadouh 1999, Schwarz/Thomson 1990) and the Varieties of Capitalism (Hall/Soskice 2001, Schröder 2009, Esping-Andersen 1998, Gough 2008).

The case studies, namely the deltas of the Mississippi river (New Orleans) and the rivers Rhine and Maas (The Netherlands) lend themselves to this research idea for different

geographical and societal reasons. From a physical-geographic perspective, all deltas are affected by climate change in a similar way: they are increasingly exposed to floodings, both from the sea side and the land side. That is because of the combined effects of sea-level rise and storms occurring more frequently in combination with high river stages triggered by extreme weather events like intense rain, sudden snowmelt and sealed surfaces along the upper reaches. Moreover, anthropogenic changes in the deltaic ecosystems, e.g. embankments and canalisation, result in subsidence of the whole delta and in losses of deltaic wetlands which formerly served as natural wave breakers (compare IPCC 2007). From a socio-geographic perspective, deltas and coastal regions in general represent the most densely populated and economically used regions worldwide. Therefore, deltas can be described as regions where dynamics of mutual interaction between natural¹ and social phenomena can easily be observed. “It is possible to say with a high level of confidence that sustainable development in some densely populated megadeltas of the world will be challenged by climate change, not only in developing countries but in developed countries also” (IPCC 2007: 377). From a sociological point of view, these rather similar geographic regions are overlaid by different social spaces. Whereas New Orleans serves as a social space characterised by the properties of liberal market economies, The Netherlands represent a social space characterised by the properties of coordinated market economies. In the case of New Orleans, the flooding caused by hurricane Katrina (August 2005) will be focused exemplarily. Due to the fact that both regions are exposed to sea-level rise and possess (on a global scale) relatively high GNPs but are superimposed by different social spaces, these case studies seem to be a promising starting point in the search of variables able to explain different types and perceptions of social vulnerability, adaptation measures and coping capacities.

Thereby, and loosely following Giddens’ theory of structuration (Giddens 1988), social space could be conceptualised as a specific body of structures, rules and frames of interpretation that provides social actors with solutions to given problems in everyday routines. With regard to the Varieties of Capitalism approach, it could be argued that every national economy (including its corresponding welfare regime and ideals of nature) provides a specific bundle of hegemonial and socially accepted structures, rules, sense and meaning that social actors employ when assessing their vulnerability or defining their approach of adaptation. For that reason, it is important to have in mind that this paper does not aim at making a difference between “good” or “bad” coping capacities, strategies or perceptions of vulnerability in a normative way. Instead, this paper tries to figure out how different institutional properties result in different perceptions of vulnerability and patterns of adaptation.

Intuitively, there are three reasons to choose the variables of “market regime” and “perceptions of nature” to study their influence on different approaches to adaptation and social vulnerability. First, it can be argued that market economies and their corresponding welfare regimes reflect basic social beliefs as to the significance of solidarity and regulation. It is assumed that there is a positive correlation between solidarity and the general acceptance of regulation on the one hand and adaptation capacity on the other hand. Second, as hurricane Katrina and the flooding of New Orleans shows, there is a negative correlation between existing social inequalities and the ability to cope with and recover from natural hazards (compare

¹ Natural in the sense of physical, even if manmade.

Kraemer 2008 and Adger/Kelly 1999 and their findings about the relation between entitlements, social inequality and the possibility of capitalising on natural resources). Third, according to the Cultural Theory and Ian Gough (2008), predominant myths and perceptions of nature and their corresponding belief systems as to ecological viability and solidarity result in different institutional and political environments which in turn produce varying approaches to adaptation or social vulnerability (including the possibility of ignoring these issues altogether).

Summing up, a possible working hypothesis could imply that the principle of precaution can be seen as typical of coordinated market economies, whereas the principle of ad-hoc reactions (and maintenance) is dominant in liberal market economies – and both can be traced back to specific concepts of nature, solidarity and regulation. In the following, the rather bulky terms of “coping capacity” and “vulnerability” will be dealt with. Next, an analytical framework in which the concept of capacity and vulnerability will be operationalised by the theoretical currents of the Cultural Theory and the Varieties of Capitalism will be developed. Empirical data referring to the case studies mentioned above will be used to exemplify the theoretical line of argumentation.

2 Concepts of vulnerability

As outlined above, this paper aims at conceptualising adaptation capacity and vulnerability in a holistic way. According to Kraemer (2008), focusing on how humans make use of and capitalise on natural resources seems to be a promising vantage point. According to Adger and Kelly, adaptation capacity and vulnerability of any individual or group “is determined by the availability of resources and, crucially, by the entitlement of individuals or groups to call on these resources” (Adger/Kelly 1999: 253). Thereby, capacity and vulnerability are treated as two extreme characteristics of one and the same phenomenon. Although there are different approaches to define capacity and vulnerability, there seem to be two main components these terms rest on: a) physical exposure to hazards like sea-level rise and b) socio-economic resources – in short: entitlements – individuals and groups can make use of to cope with and recover from threatening physical exposures (capacity) (Adger/Kelly 1999, Bohle/Downing/Watts 1994).

However, what will be argued here is that adaptation capacity and vulnerability cannot sufficiently be described without being considered within the specific cultural context the individuals or groups belong to. Therefore, the constellation of physical exposure and social resources as presented by Adger and Kelly will be complemented and overlaid by a fourth dimension that aims at integrating culturally different norms, values and frames of interpretation with regard to the perception of nature (Kraemer 2008: 155 ff). In this context, Kraemer’s argument goes like this: nature does not fulfill any societal function² per se. The social utility that is derived from nature depends on (contingent) social resources to capitalize on natural resources, e.g. economic or military power and technology. Furtheron, the mutual relationship between material and social resources is embedded in different cultural contexts which serve as cultural filters as to the perception of nature. These filters are made up of widely accepted and

² Kraemer takes Dunlap’s naturalistic analysis of the societal functions of nature, namely “supply depot”, “waste repository” and “living space”, as a starting point and tries to integrate it into a rather constructivist approach (Kraemer 2008).

hegemonic frames of interpretation, giving an answer to the question of how to legitimately make use of nature and how to define risks. Moreover, these filters also define which natural properties become valuable resources, e.g. using a forest as a recreation area or exploiting it economically, and how social impacts on nature are perceived. For example, fuming chimneys can both be perceived as a symbol of environmental pollution or as a symbol of economic development, growth and wealth.

What is the scientific benefit of this approach? The main advantage of this approach can be seen in the fact that differences between specific groups or global regions as to adaptation capacity and vulnerability no longer have to be traced back to economic (under-)development or a disadvantageous provision of natural resources only. That would (normatively) imply that the western model of development, including its narratives as to what coping capacity and vulnerability should look like, should serve as a global model. In contrast, the approach described here allows to recognise and take into consideration the important role cultural filters as described above take by defining what is perceived as hazards, as resources or as “good” coping capacity. Now, different forms of adaptation capacity or vulnerability not necessarily have to be traced back to economic (under-)development and poverty but can also be explained within their own frames of interpretation. The straightedge for evaluating the coping capacity of a given group that is exposed to physical stress is no longer attributed from outside, but is derived from the very own cultural frames of the particular group.

In short, the combination of the three dimensions of vulnerability (physical exposure, capacity and cultural frames of interpretation referring to nature) results in a specific straightedge measuring the adaptation capacity and vulnerability of individuals and groups. Since the physical threat of sea-level rise to humans (exposure) in deltaic areas has been dealt with at length, this paper will focus on a) the strong influence entitlements exert over coping capacity and potentiality and b) the more intricate and less direct way hegemonic frames of interpretation regarding the use of nature affect the mutual relationship between physical exposure and entitlements (and thus result in specific adaptation capacities and vulnerabilities).

In the broadest sense, entitlements can be described as a bundle of social rights individuals and groups can make use of and hence affect their degree of coping capacity and potentiality. “The use of the term entitlements to define the material and social aspects of resource use is itself based on the premise that the institutions of the state are dominant in determining access to resources. (...) In other words, most, but not all, entitlements to material assets are legitimised by government and formal laws” (Adger/Kelly 1999: 257). At this point, the paper will extend and deepen the idea about the crucial role of entitlements by the Varieties of Capitalism approach – an approach which (directly and indirectly) has specialized on socio-economic entitlements.

3 Varieties of Capitalism – Varieties of Entitlements

The Varieties of Capitalism approach is an established theoretical current that roots in social-economic research and has not dealt with environmental issues, adaptation capacity or vulnerability yet. It takes the nation state as its point of reference. First and foremost, the Varieties of Capitalism approach deals with the question of how different developments of

capitalist economies can be explained. Thereby and in contrast to neoclassical economics, much emphasis is laid on the mode of governance with regard to the organisation of the welfare state and on the role actors like labour unions, single companies or business associations take. One of its main objectives is to show that non-liberal but regulated and coordinated economies, e.g. Sweden or The Netherlands, function differently but just as well as deregulated and liberal economies, like e.g. the United States. Depending on the specific circumstances in which production takes place in a given national economy, this economy is placed on a continuum between the two ideal types of either liberal or coordinated market economies (Hall/Soskice 2001). The actual rank an economy holds within this continuum depends on the combined nature of the following institutional fields (compare Hall/Soskice 2001: 6 ff): industrial relations, vocational training and education, corporate governance (including corporate financing), inter-firm relations and the relations firms have with their employees. By studying the mode in which single companies handle the problems of coordination as to the institutional fields listed above, national economies can be compared and classified. “Whereas the allocative efficiency of the market is the all-pervasive advantage of the liberal regime type, the capacity to coordinate production strategically is the advantage of coordinated market economies” (Schröder 2008: 20). In other words, the most outstanding characteristics of liberal market economies as to coordination are hierarchies and competition, whereas coordinated economies can rather be characterised by using coordination procedures that significantly deviate from pure (competitive) market mechanisms and emphasise non-market forms of coordination and regulation. As a result, for example, the inter-firm relations and the relationship between the employers and their workforce is either coined by strict hierarchies and strategic interaction in liberal economies or by “relational or incomplete contracting, network monitoring based on the exchange of private information inside networks, and more reliance on collaborative (...) relationships” (Hall/Soskice 2001: 8) in coordinated economies.

Referring to Esping-Andersen’s typology of welfare states (Esping-Andersen 1998), Schröder (2008) points out that welfare arrangements and production systems are closely related, both theoretically and empirically. “Whereas VOC [Varieties of Capitalism] wants to understand how firms deal with institutional environments that vary between production systems of different countries, Esping-Andersen analyses modes according to which welfare is distributed based on rights and duties of individuals *vis-à-vis* the state” (Schröder 2008: 21). This is where a link to the importance of entitlements as to adaptation capacity and vulnerability can be established. Without going into detail, the main criterion to be discussed here in order to distinguish between liberal and coordinated welfare regimes is the degree of decommodification a welfare regime provides (compare Esping-Andersen 1998: 36 ff). The term ‘decommodification’ aims at describing in how far social security depends on gainful employment. The higher the degree of decommodification, the lower the dependency on gainful employment. Typical aspects that accompany high or low degrees of decommodification are the different shapes and conditions of e.g. minimum wages, benefit payments, dismissal protection, continued pay (in the case of inability to work) or the properties of the health system and pension schemes. Liberal welfare regimes like the United States are coined by a low degree of decommodification which means that social security is allocated via market mechanisms. It depends on and is ascribed to individually achieved success or failure. For example, retirement arrangements have to be met

individually to a great degree. Coordinated welfare regimes, instead, can be characterised by a high degree of decommodification. In other words, individual social welfare does not only result from individual efforts, but also from all kinds of redistribution payments that follow the principle of solidarity. Against this background it could be assumed that the bundle of institutional entitlements individuals or groups can employ in order to cope with physical exposures in coordinated welfare regimes seem to be much broader than in liberal economies.

Summarizing and from a higher level of abstraction, one can argue that both types of market economies and welfare regimes represent different shapes and approaches to solidarity. Where the principle of solidarity referring to coordination and social security is only little emphasised, there is a great need for functional equivalents like contracts and individual precaution, e.g. with regard to social welfare. The allocative efficiency of the market is expected to meet these requirements. It is the other way round with coordinated market economies and welfare regimes. Here, the faith in market mechanisms is definitely less; with respect to social security, market forces are even perceived as threatening and have to be met with social cohesion and solidarity. Consequently, it can be argued that coordinated market economies and welfare regimes represent social spaces of non-fragmentary solidarity whereas liberal market economies and welfare regimes can be characterised as social spaces of fragmented solidarity.

As tentatively argued above, every social space provides a specific bundle of hegemonial and socially accepted structures, rules and frames of interpretation social actors make use of. Accordingly, what has to be considered next is whether or not social spaces coined by (non-)fragmentary solidarity provide different forms or “amounts” of entitlements which result in divergent coping capacities. It is expected that the degree of regulation and coordination, the characteristics of property relationships and the scale of institutionalised solidarity provided by the state take a decisive role.

First, a crucial condition of preventive flood protection is a political environment which allows both direct and indirect forms of disappropriation, e.g. the direct disappropriation of individual land owners to create spatial room for flooding or the rather indirect interventions that come in form of regulations like taxes, laws or administrative demands. Due to the fact that the allocative efficiency of the market is seen as the best possible mechanism of problem solving, such public interventions are rather unusual and do not become operative in liberal market economies. In contrast, and as the comparison of liberal and coordinated welfare regimes shows, intervention and regulation are generally accepted and appreciated in coordinated market economies (compare Roth/Winnubst 2009). As Adger and Kelly have shown in their empirical field study in northern coastal Vietnam, Xuan Thuy (Red River delta), this thesis can empirically be seen as well supported. Evaluating the consequences of market liberalisation and land privatisation as to coping capacity, they come to the conclusion that these governmental actions have become constraints since they have undermined the opportunities and resources for collective action, e.g. dike maintenance, and hence fostered social vulnerability. “Vietnam has undertaken fundamental social and political changes over the past decade such that ownership and control of assets have been privatised and institutions of the state, particularly those associated with the agricultural economy in rural areas, have been irrevocably weakened. In this context, vulnerability to climate variability, specifically the present-day impacts of landfall typhoons, can be shown to be changing in its nature. In general, the population exhibits

resilience through its use of available natural resources, but the liberalisation process has had, at best, an ambivalent impact on vulnerability as a whole by undermining some institutional practices which acted as security and coping mechanisms in times of stress” (Adger/Kelly 1999: 263 ff).

Second, different adaptation capacities also result from existing social divides due to social inequality (Kraemer 2008: 182). In other words, there is a relation between existing social inequalities like poverty and the entitlements particular individuals or groups can hark back to when exposed to physical stress like flooding. “Poverty is, therefore, an important indicator of individual vulnerability to climate extremes and to climate change because it can be directly related to marginalisation and lack of access to resources which are critical when faced with the risk of hazards and the resultant stress on livelihoods. (...) It also affects the coping and recovery from extreme events through directly constraining opportunities for coping and reducing the resilience to impacts” (Adger/Kelly 1999: 260). Whereas coordinated welfare regimes take great efforts in levelling social inequalities, they become quite evident in liberal welfare regimes. But what does this mean with reference to possible differences in adaptation capacities between liberal and coordinated welfare regimes? As shown above, coordinated welfare regimes are guided by the principles of solidarity, decommodification and prevention. Liberal welfare regimes, in contrast, can be characterised by “the narrative of bootstrap individualism” (Dyson 2006) – the burden of individually taking responsibility and risk and to pull oneself up by one's own bootstraps in the case of trouble. Individual efforts seem to be the only possible loophole to escape any calamity.

In short, whereas coordinated economies institutionally are prepared for exposures like sea-level rise in a twofold way, liberal regimes institutionally appear to be unprepared in a twofold way. First and due to the principle of prevention, the general likelihood of being flooded is minimised in coordinated welfare regimes. Second, if it comes to flooding nevertheless, the (historically cumulative) effects of non-fragmentary solidarity result in a situation in which individuals and groups can rely on a rather homogeneous and objectively high level of capacity to cope with and recover from flooding. Hence, a high level of coping and recovering capacity can be ascribed to individuals and groups. In The Netherlands, for example, the principle of non-fragmentary solidarity becomes manifest in collective precautionary regulations and arrangements like specific taxes to finance flood protection or emergency plans to allow efficient action in the case of actual flooding. (Lazaroms/Poos 2004, Roth/Winnubst 2004).

It is the other way round in liberal economies: here, a rather low level of prevention results in a situation in which flooding becomes more likely to happen in general. In addition and due to existing social inequalities like poverty, the allocation of the ability to cope with and recover from flooding among individuals and groups is rather unequally distributed. In the case of hurricane Katrina and the flooding of New Orleans in August 2005, there was no twofold precautionary net like in coordinated economies. As shown above, liberal market economies and welfare regimes in general rather tend to minimalistically engage in preventive measures. Of course, there are dikes and pumping stations to protect New Orleans from flooding. However, studying the literature on the intricate back and forth referring to the well-known and even planned necessity to repair and modernise the dikes protecting New Orleans (Bergal et al. 2007, Dyson 2006), it becomes obvious that prevention was not a priority on the political agenda prior

to Katrina. This alone resulted in a situation in which New Orleans was relatively more likely to be flooded. On top and in the case of actual flooding, individual actors were assigned unequal social positions or starting points in the race for the best possible adaptation to flooding (Bates/Swan 2007, Dyson, 2006, Bergal et al. 2007). In other words, all citizens were equal in so far as they individually had to make precautionary arrangements, e.g. spontaneous neighbourly help or escape. However, their positions to take action were coined by existing social inequalities. As the aftermath of hurricane Katrina shows, natural hazards seem to boost the impact of social inequality (Adger/Kelly 1999, Kraemer 2008: 185). Whereas the members of the white and wealthy middleclass were able to individually leave the city (coping capacity) and to rebuild their homes pretty soon (potentiality to recover), a marginalised class of mostly black citizens could not leave town – partly just because they did not have a car (Dyson 2006). The state authorities acted only when it became obvious that the whole situation had turned into a humanitarian catastrophe. From this perspective, it becomes clear that the existing level of social inequality substantially affected the capacity to cope with and recover from Katrina.

Summing up, what these different political and institutional environments result in are different answers, attitudes and starting positions with reference to the handling of potential and actual floodings by following different ideologies and hence providing different bundles of entitlements. Whereas coordinated market economies are coined by the principles of non-fragmentary solidarity, prevention and precaution, liberal market economies could be characterised by emphasising the market principle, aftercare and maintenance. However, as discussed above, the particular level of coping capacity does not only result from institutional characteristics as presented by and derived from the Varieties of Capitalism approach, but also from the cultural context and predominant frames of interpretations. They will be dealt with next.

4 Liberal and coordinated economies and their myths of nature

In 2008, John Dryzek made the case that “social democratic welfare states and what Hall and Soskice call coordinated market economies (the two categories overlap substantially) are better placed to handle the intersection of social policy and CC [climate change] than the more liberal market economies with more rudimentary welfare states” (Gough et al. 2008: 330). Although Dryzek admits that his thesis is a speculative one, he reasons that “coordinated market economies with social democratic welfare states that have adopted a discourse which sees economic and ecological values as mutually reinforcing are best placed to navigate the challenges presented by CC to social policy” (Gough et al. 2008: 334). What becomes obvious here is that not only welfare arrangements are closely related to production systems, but that there might also be a close relation between production systems and basic convictions and frames of interpretation regarding the question of how to use nature. Following the line of argumentation of the Cultural Theory as presented by Schwarz and Thompson (1990) it will be

shown how different social environments are accompanied by specific “myths of nature“ and how these myths influence legitimate ways of capitalizing on nature and its resources³.

In contrast to the Varieties of Capitalism approach, the theoretical currents that are bundled under the label “Cultural Theory” can be described as rather abstract and diverse. Hence, it takes a much greater effort to operationalise it. Its point of reference is not the nation state but individuals or specific social environments. However, within the scope of this paper, it will be tried to transfer the findings of the Cultural Theory from the rather micro-sociological level of individuals and groups to the rather macro-sociological level of the nation state. It is a culturalist approach that can be used for understanding both modern and premodern societies from an anthropological perspective. Its basic distinction is the distinction between two dimensions of sociality, namely “grid” and “group” which are supposed to grasp the most basic aspects and questions of sociality: “Who am I and how should I behave?” Depending on the specific characteristics as to the combination of grid and group, individuals or groups are ascribed an ideal typical social position within the “cultural map” that is produced by the four possible combinations of grid and group (Schwarz/Thompson 1990: 7). The dimension of group represents the incorporation of individuals into a bounded group, e.g. clan or community. A pronounced group-factor (that is strong incorporation) points to a situation in which the individual is a member of one corporate group. A weak group-factor in turn points to a situation in which individuals do not belong to such a group. The dimension of grid focuses on the bundle of rules which regulates social interaction and cooperation. Whereas a pronounced grid-factor indicates that social interaction is guided by strong formal rules and rituals, a low grid-factor points to little formalisation to which individuals are subject in their course of interaction. Depending on the specific combinations, individuals or groups can be characterised as fatalist, hierarchist, egalitarian or individualist. Within the scope of this paper and without going into detail, the rationalities of hierarchist and individualist are especially interesting.

The individualist rationality results from a combination in which grid and group both are rather low (weak group incorporation and weak regulation). “The individual is free to enter transactions with others as (s)he wishes, as in markets. Boundaries are provisional. They are subject to negotiation. Individuals are relatively free of control by others but their ability to control others is a measure of their position in the network. This pattern is justified by the pursuit of personal rewards in a competitive environment. Fairness consists of equality of opportunity. Blame is put on personal failure (or lack of competition). This way of organising is vulnerable to the lack of co-operation” (Mamadough 1999: 400). Looking back at the properties of liberal economies and welfare regimes as elaborated above, this description sounds quite familiar: (market) competition and (bootstrap) individualism serve as fundamental frames of interpretation and basic principles in organising social interaction.

In contrast, the hierarchist rationality unfolds from the combination of both a high grid and group factor. It can be characterised by “strong group boundaries and binding prescriptions. These prescriptions are justified by the importance of the whole over the parts, the collective over the individuals. Consequently division of labour, differentiated roles, hierachical social relations are typical of these nested groups. Fairness consists of equality before law. Blame is put

³ Due to the fact that the Cultural Theory is a very broad and diverse approach, it can not be discussed in its whole depth within the scope of this paper.

on deviants who do not endorse the established procedures. This way of organising is vulnerable to misplaced trust in authority and expertise” (Mamadough 1999: 400). Here, noteworthy parallels with regard to the properties of coordinated economies and welfare regimes appear. What is understood as collectivism and hierarchy reminds of the predominant principles of non-fragmentary solidarity and prevention which have been discussed as being typical of coordinated economies and welfare regimes.

Although the theoretical currents of the Varieties of Capitalism approach and the Cultural Theory have separately been developed in order to observe and explain very different social phenomena, it can be argued that both approaches share fundamental assumptions, namely the crucial roles of solidarity and regulation. However, up to this point the introduction of the Cultural Theory has not resulted in deeper insights referring to the question of how different coping and recovering capacities between coordinated and liberal economies could be explained. It will be argued that the basic similarities between these theoretical currents can be used for theoretic widenings of both approaches, e.g. the possibility of opening the Varieties of Capitalism approach for questions related to environmental sociology and vice versa. Again, the aim is to supplement the Varieties of Capitalism approach by the Cultural Theory in order to make it applicable to frames of interpretation with regard to the mutual relationship between nature and society and which – according to Kraemer – give answers to the questions of how to legitimately make use of nature, how to define risks and which natural properties become valuable resources.

Within the terminology of the Cultural Theory, these different frames of interpretation with regard to nature are referred to as “myths of nature” (Schwarz/Thompson 1990: 4)⁴. There are four myths of nature (nature benign, ephemeral, perverse/tolerant or capricious) which fit the four rationalities of the cultural map. In other words, each typology of social relationships that can be found on the cultural map can be supplemented by corresponding myths of nature. Consequently, coordinated and liberal economies and welfare regimes can also be ascribed typical frames of interpretation referring to nature. Thereby, the myths of nature being benign and perverse or tolerant are most relevant.

Following this line of argumentation, the myth that maps onto liberal economies would describe nature as being benign. Here, nature is perceived as being stable and ‘wonderfully forgiving’. No matter what humans do – nature will always recover and stabilize in its natural equilibrium. Living in this world, nature is perceived as an inexhaustable treasure box. The concepts of overexploitation or limited global carrying capacity just do not exist. The basic principle guiding the capitalization of nature can be described as *laissez-faire*. “As long as we all do our individualistic, exuberant things, a ‘hidden hand’ (...) will lead us to the best possible outcome. Since restrictions on individual freedom, and therefore on experimentation, would impede the attainment of this outcome, the myth of a benign nature furnishes a powerful moral justification for these particular modes of acting and learning. If we take, for example, the topical issue of hazardous waste management, nature benign would indicate that a sharpening of market incentives (...) is the way to go” (Schwarz/Thompson 1990: 8ff).

⁴ These myths of nature can be described as managing institutions giving an answer to the question of how to use natural resources like forests, fisheries or grasslands. According to Schwarz and Thompson, these myths go back to empirical findings of ecologists studying managed ecosystems (Schwarz/Thompson 1990: 4).

Looking at the historic development the Mississippi delta underwent during the last two centuries, it is quite obvious that the main principle that guided human action modulating the delta was and still is first and foremost geared by individual and economic interests that were implemented rather abruptly, e.g. by building channels to provide a direct connection between the sea and the city harbour. The idea of sustainable development (in an ecological sense) did not play a role. Today, the unintended affects of humans' interference with the physical properties of the delta are becoming more and more, like for example in the form of accelerated subsidence or in the loss of deltaic wetlands, and cumulate in a situation in which the city is becoming increasingly vulnerable in terms of its physical-geographic exposure. Still, measures aiming at the renaturation of deltaic wetlands seem to primarily follow the principles of unchallenged belief in technological progress and nature benign (compare Hudson et al. 2008, Bergal et al. 2007).

By contrast, nature perceived as being perverse and tolerant is the predominant frame of interpretation in coordinated economies. Here, it is emphasized that nature is robust but only up to a specific point. There are clear limits of nature's resilience. It is not fully forgiving but also vulnerable. If nature is poorly managed, it is seen as perverse; if it is managed properly, it is seen as tolerant (Pendergraft 1998: 651). Living in this world, frames of interpretation referring to nature circle around basic convictions like the importance of sustainable development or that there is a limited global carrying capacity. "The managing institutions must therefore regulate against unusual occurrences" (Schwarz/Thompson 1990: 5). In other words, strong regulation is required to ensure that nature's resilience is not strained over much. "Therefore this myth justifies the power given to experts as they are the ones who can evaluate the safety zone, it corresponds to the hierarchic viewpoint" (Mamadouh 1999: 402). Consequently, moral authority is derived from complete "knowlledge, certainty and predictability, generated by and for those whose pre-eminent task is to keep each mode of action (...) in its proper place" (Schwarz/Thompson 1990: 10).

Again, looking back at the historic development of the 'man-made lowlands', it becomes clear that, in The Netherlands, flood protection can be described as an incremental and adaptive process that rather follows the idea of nature perverse or tolerant. A significant shift in the way flood protection was discussed and implemented in The Netherlands occurred during the last century. After the disastrous flood of 1953, trust in technological progress and the political will to fully control nature seem to have been the dominant principles coining flood protection measures (like in the Mississippi delta). However, the confidence in purely technical solutions decreased more and more during the 1990s due to high waters along the rivers. People became aware of nature not only being tolerant but also perverse. Consequently, a new type of water management – 'Room for the River' – was developed which both tries to ensure flood protection and environmental sustainability. In addition, the properties of the Deltaworks also suggest that it was tried to combine and reconcile flood protection, environmental protection and economic interests in a sustainable way (Van de Ven 2004, Hudson et al. 2008, Roth/Winnubst 2009). Here, it becomes obvious that the present discussion follows a rather abstract line of argumentation referring to the combination of the Cultural Theory and the Varieties of Capitalism. In the case of The Netherlands, it would make sense to describe them as social space coined by the combination of hierarchic and egalitarian rationalities.

Summing up, it was demonstrated how liberal and coordinated economies deviate from each other with respect to predominant perceptions of nature and how these differences translate into particular approaches to flood protection. But how could they be explained? From a historical perspective and referring to nature, both The Netherlands and New Orleans can be characterised by the outstanding principle of modernity, namely the untroubled belief in technological progress and the full controllability of nature by technological means. However, due to the different (physical-geographic) circumstances in which unintended effects of flood protection occurred, it could be assumed that, in the course of time, flood protection in The Netherlands moved towards more sustainable and integrated modes. Whereas the ideology of ‘the frontier’ and the rather endless amount of natural resources like land or forests allowed to fade out negative unintended effects in the US, land has always been a scarce resource in The Netherlands (and along the tideland in general). Historically, this fact already became obvious in 1362 when huge parts of Northern Frisia were flooded during the “Grote Mandränke”. By digging up and burning peat in order to gain salt in diked-in areas, subsidence was caused so that on the occasion of a powerful storm tide, huge parts of the lowlands of western Northern Frisia were flooded. The consequence was an irreversible loss of land that had been settled before. Since then, Pellworm – formerly terra firma – has been an island (Petersen/Rohde 1977, Beck 1986).

Let us next have a look at how these different perceptions of nature influence the coping and recovering capacities in coordinated and liberal economies.

5 Myths of nature and the perception of risk and vulnerability

What phenomena are perceived as potential risks within the particular myth of nature? Although it is not an easy task to operationalise subjective vulnerability and there is no empirical data directly supporting the following thoughts, the theoretical line of argumentation as presented above suggests that within the myth of nature benign, it could be argued that there actually is no or only little awareness as to vulnerabilities resulting from natural physical stress. Of course, individuals and groups are aware of the possibility of forest fires, floodings or droughts – but that does not mean that they automatically perceive themselves as vulnerable through these potential threats. Nature is benign, it can be modulated in order to fit human needs without causing negative unintended effects. Applying the principle of trial and error, there is a technical solution to any problem: fire fighters can be equipped with bigger fire trucks and helicopters, rivers and costal areas can be embanked and droughts can be met with genetically modified and drought-resistant seeds. In the unlikely case that technical solutions do not have the desired effect, e.g. flood protection, the ideologies of “frontier”, “individualism” and “self-made man” open up new horizons in which the crisis is redefined as a chance for a new beginning and an impulse to develop “better” technological solutions. Furthermore, the allocative efficiency of the market is trusted to come up with new solutions, like for example a service company providing additional protection in the case of flooding for those who can afford it, e.g. by providing shelter, energy or medical care in times of stress. In a nutshell, the myth of a benign nature results in a situation in which the topic of vulnerability as to natural physical exposure and stress is rather an unnoticed one just because it is not perceived as being risky. Since nature is

benign and technological solutions are at hand, there is no need to worry. Consequently, there is only little stimulation and legitimation to take preventative action.

Within the myth of nature perverse or tolerant, in contrast, nature itself is perceived as being vulnerable to human action. If nature's resilience is strained over much, it will strike back at its suppressors. Hence, ecological crises are perceived as social crises, which in the worst case threaten the survival of the human species. Therefore, any possible effects human action could have on nature have to be considered in its eventual consequences before put into practice. The conviction is that specific interferences with nature cannot be made undone but will harm humans for ever. For example, whereas genetically modified crops are released into nature and the food chain in liberal economies without great concern, e.g. in Canada and the United States, possible side-effects have to be anticipated and evaluated in advance in most coordinated economies, like e.g. in Germany. Rather than the principles of trial and error and maintenance, here the principle of precaution is predominant within the myth of nature perverse or tolerant. Consequently, one of the supreme imperatives regulating how to use nature is the imperative of sustainability. Against this background, it becomes clear that there is a high level of awareness as to vulnerabilities resulting from natural physical exposure or stress. Due to this high level of sensibilisation, legitimation, expectancy and acceptance to take preventive action is rather high in coordinated economies.

Summing up, these considerations lead to a rather counterintuitive conclusion. As has been demonstrated above, there are rather few entitlements individuals and groups living in New Orleans can hark to in times of stress from an objective perspective. Consequently, and according to Adger and Kelly, the vulnerability of these particular individuals and groups should be fairly high. However, taking their cultural frames of interpretation referring to solidarity (ideology of boot-strap individualism) and nature (perceived as being benign) into consideration, the topic of vulnerability becomes less and less important. Of course, there still are physical threats – but so what? That is just the way life goes. In The Netherlands it is the other way round: although there is (from an objective perspective) a sophisticated bundle of entitlements individuals and groups can rely on, their vulnerability as perceived subjectively, is quite high.

6. Conclusion

Discussing the initial question, namely how societies as a whole or inhabitants of geographically exposed regions can adapt to and deal with ecological challenges like sea-level rise, this paper tries to distinguish itself from approaches which simply equate GNP and adaptation capacity. Taking the concept of vulnerability as presented by Adger and Kelly (1999) as a starting point, this paper develops a more and more subjective and intricate image of adaptation capacity. Thereby, and using the Cultural Theory and the Varieties of Capitalism approach, it could be shown that the level of adaptation capacity not only depends on monetary resources but much more on varying cultural and institutional characteristics like predominant myths of nature, different welfare regimes and their corresponding frames of interpretation.

As elaborated in the last paragraph, objective vulnerabilities or risks do not exist. Physical exposures like flooding or drought, of course, are objective in that they can be measured, but

they do not become threats per se. To become threats, these physical exposures have to be put into the particular cultural context in which they occur and against which they are evaluated and perceived as threats. To be more precise and with reference to the case studies, it could be shown that objective vulnerability or coping capacity respectively in terms of access to entitlements does not automatically and directly translate into subjective vulnerabilities since cultural frames of interpretation decide what is actually perceived as vulnerability. Depending on the particular myth of nature and the predominant character of solidarity, the predominant level of sensibilisation as to vulnerability ranges from rather low in liberal economies to constant alertness in coordinated economies. From that perspective, different approaches to climate change as observed between the United States and Europe do not – as is often alleged – result from irrationality but from different cultural filters and frames of interpretation through which the world is explained and interpreted (and which are perfectly rational within their particular cultural context).

The conclusions drawn from this paper suggest that combining the Cultural Theory and the Varieties of Capitalism approach to explain the existence of different adaptation capacities is a promising approach leading to interesting and counterintuitive insights. Yet, more issues will have to be dealt with: the problem of how to operationalise subjective forms of adaptation capacity and the question of how to approach the lack of comparability. Consequently, more empirical research has to be done before these findings and arguments can be ranked as trusted knowledge.

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