

**Alternative reactions to climate change: construct dikes or erect windmills?
A synthesis of *Cultural Theory* and *New Institutional Economics* perspectives.**

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Climate change affects the entire globe. However, its effects are influenced by local geographic conditions and unevenly spread social adaptation capacities. Different levels of social vulnerability can be observed which are explained by distinct levels of wealth – so the general explanation goes. Such correlations cannot be neglected and are quite trivial: assuming similar geographical conditions, The Netherlands are better prepared to raise dikes against flooding than Bangladesh.

But what about different coping capacities occurring despite of comparable levels of wealth? Why is it that the Mississippi delta was devastated by hurricane Katrina whereas the Rhine-Meuse delta has remained almost unaffected up to now? What accounts for the fact that Texas, not really renowned for caring much for environmental niceties, has set up more windmills than California and is close to outpacing Denmark and Germany? How come that Texas nevertheless rejects any environmental political guidelines from Washington?

Our analysis will shed some light on the question of how different approaches and coping capacities with regard to climate change can be explained. Our analysis will focus on the intricate interaction of ideology, institutions and technology (cf. figure 1). By taking these analytical pillars as vantage points for our analysis, we refer to arguments presented by Schwarz and Thompson (1990), Mamadouh (1999), and Dryzek (2008), who claim a correlation between cultural frames, socio-economic institutions and environmental politics. We will try to elaborate and systematize these arguments and apply them to strategies laid out to primarily cope with climate change.

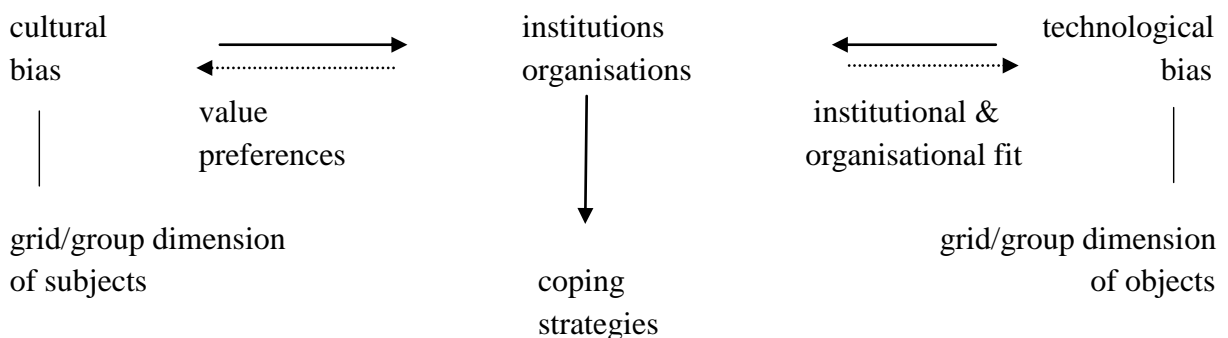


Figure 1

Looking at specific coping measures and technologies like raising levees or installing wind turbines in Texas and The Netherlands, we will search for the underlying institutional structures which make specific technologies blossom or wither within a given societal environment. For this purpose, we take arguments from Cultural Theory on Risks (CTR) and

from New Institutional Economics (NIE) and synthesize them in a new framework. Admittedly, this combination is rather unconventional. However, we will show that these theoretical currents lend themselves for our research question. Although neither the CTR nor the NIE approaches have taken much notice of one another so far, they present many parallels which deserve elaboration. As will be shown further down, some of the main blind spots in both theoretical currents can be softened by combining them to a coherent approach.

The rationality behind this conjunction is that societies which are rather coined by collective principles like The Netherlands are better prepared to cope with cooperative tasks like district heating or building dikes whereas liberal institutions, which are predominant like, let us say in Texas, support and allow for individual coping strategies like wind turbines or air condition installation. Here, New Institutional Economics come into play in order to analyse the interrelations between technologies, their positive or negative externalities in their context with different types of institutions and organisations.

Beyond the contrast of collectivism and individualism yet another difference seems to be central: whereas conventionalism relies on established conceptions, facts and coping strategies (like e.g. building dikes), innovativeness allows for speculation, conceiving novel risks and inventing new technologies. Thus we claim a good match of open-mindedness and the embracement of new risks and novel abatement technologies and of conventionalism with tight control and mastering of established technologies.

Before going into detail, a short retrospect may help to understand the match or mismatch of ideologies and technologies. In the past, egalitarian social democratic attitudes and environmental protection were perceived as two contradictory agendas. The public perceived a conflict of objectives between economic growth and environmental protection, politicians often found themselves in the dilemma of either being able to finance social welfare or environmental measurements, and labour unions, too, played the card of jobs versus environmentalism.

What can be observed in contrast to these conflicts of interests is a new perspective in which environmental and social democratic attitudes seem to go hand in hand, at least in Europe. In this respect, environmental protection and respective services and technologies are even seen as the novel driving forces of economic growth over the next decades. “Ecological modernisation” is the new charm to secure high rates of employment, social justice (even on a global scale) and environmental protection. In this context, Dryzek (2008) claims that nation states which are rather coined by egalitarian principles should be better prepared to cope with environmental challenges like droughts or flooding than their liberal counterparts. Looking at the progress of the latest negotiations on climate change in Copenhagen, these observations seem to be confirmed at a first glance. Following the public discourse, we could now happily join in singing the song of morally good Europe and bad North America – but we will refrain from doing so. The picture we will draw is much more complex and intricate. Taking externalities into account, we will highlight some cases in which liberal economies like the United States highly contribute to climate protection even without the explicit intention of doing so. Coincidentally - or should we say: by benevolent providence - the fossil energy reserves shrink and prices explode parallel to the acceleration of the greenhouse effect. Therefore, decentralised market incentives arise which fit in the logic of liberal market

institutions.

After these preliminary thoughts, we will now present and explain first our modifications of the CTR and the cultural bias thesis (ch. 1) to then sketch out our argument about technological bias from the NIE perspective, first more generally (ch. 2) and then applied to coping with climate change (ch. 3). We will then apply the entire theory in the form of two case studies which compare coping strategies in The Netherlands and in the South of the United States - one about the protection of river deltas, the other on the erection of wind turbines (ch. 4). Finally (ch. 5) we will try to reformulate the theory again in a short and incisive way and will give a short outlook on political prospects.

1. Cultural bias and Climate Change - a revision of the *Cultural Theory on Risks*

The Cultural Theory on risks, as developed by Mary Douglas and Aaron Wildavsky in their seminal book "Risk and Culture" (1982), is one of the path breaking works in environmental sociology. The main idea is that different milieus in modern societies develop different world views, and based on these world views different conceptions of risk. It is maintained that cognitive perceptions of societal dangers have the function to maintain and reinforce social order and social institutions. The respective milieu tends to associate harm - from sickness to famine to man-made disasters - with conduct that transgresses its societal norms: milieus imbue their members with aversions to subversive behavior and focus resentment on the deviators. Douglas sees the different milieus and their world views - i.e. their "cultural bias" - as constituted by two dimensions which she calls "group" and "grid". A "high group" way of life exhibits a high degree of social cohesion and is put in opposition to "low group" which gives room for individual liberty and self-sufficiency. A "high grid" way of life is characterized by strong cognitive conventions and formalisation, whereas "low grid" allows for new ideas, subjectivity and the ambiguities and uncertainties which emerge here.¹

Michiel Schwarz and Michael Thompson also used the resulting typology to envision different conceptions of nature attributed to the respective milieus (figure 2).

¹ With this definition we follow Douglas 1974: 87. As has often been noticed, the connotations of "grid" may shift in the publications from CTR authors.

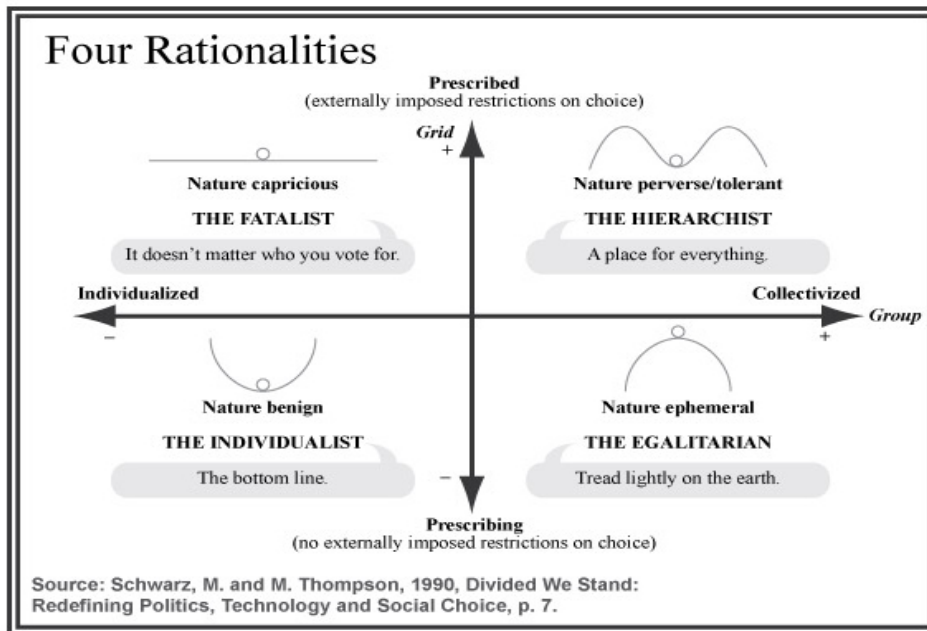


Figure 2

The Cultural Theory on Risks met with quite a lot of positive resonance as well as critique (Boholm 1996). In our view, some major modifications must be made to allow working with this theory in a more plausible way and with higher compatibility to New Institutional Economics. Thus the theory may - hopefully - also be better corroborated empirically! The three major revisions are as follows:

- to take into account the fact of functional differentiation
- to apply to the market the right classification
- to redefine the concept of "nature".

From her early academic training and throughout most of her life, Douglas worked as a social anthropologist with pre-modern communities. On this basis she developed her grid-group scheme as a device to typologise whole "cultures". Later on, and especially with the above mentioned work "Risk and Culture", she universalized the scheme, applying it also to modern, functionally differentiated societies, but - as far as we know - without discussing the fact that there is a strong analytical contrast between "mechanic" and "organic solidarity", to use Emile Durkheim's words. This may explain the rather undifferentiated conception that, in the rhetoric of Cultural Theory, individuals, social structures, milieus, institutions and whole societies are often conflated (Keller/Poferl 1998). But modern "organic" societies develop functionally differentiated spheres with the result that not the whole cognition and self-conception of the individual but only the role script has to be supportive for the respective institutions. As a result of ongoing functional differentiation, modern individuals shift between roles throughout their days and throughout their lifetime, playing their roles only with semi-attention, called "practical consciousness" by Anthony Giddens. Only in the retrospect of biographical narrations, sociological interviews, and psychological laboratory experiments, the contradictions and ambivalence in and between everyday practices are smoothed and eradicated with the aim to construct a consistent "self" and a stringent "life

course" (Gill 2003: 107ff.). This may explain the fact that, with methodological individualism and standardised interviews, the empirical corroboration for the Cultural Theory is not very strong (Marris et al. 1998). It also may explain that the CTR explanations often sound implausible when applied to everyday experience. For example "environmentalism" is not just an invention of "egalitarian sects", as held by Douglas and Wildavsky, but a mainstream phenomenon in modern societies. In consequence we would propose to conceive the grid/group-typology mainly as a difference between functional spheres with their discourses and practices, and only secondarily as a cultural bias of individuals or national societies². Implementing Jürgen Habermas' (1997) distinction between "System" und "Lebenswelt" within the grid dimension³, the "system" with its instrumental, anonymous and wide reaching coordination media "money" and "power" is embodied by the high grid fields of "market" and "bureaucracy" whereas the "lifeworld" corresponds to the "low grid" of less formalised, more personalised and more consensus-based communication in the modern family, education, science and the democratic public. Based on these deliberations, we suggest the following set of institutions:

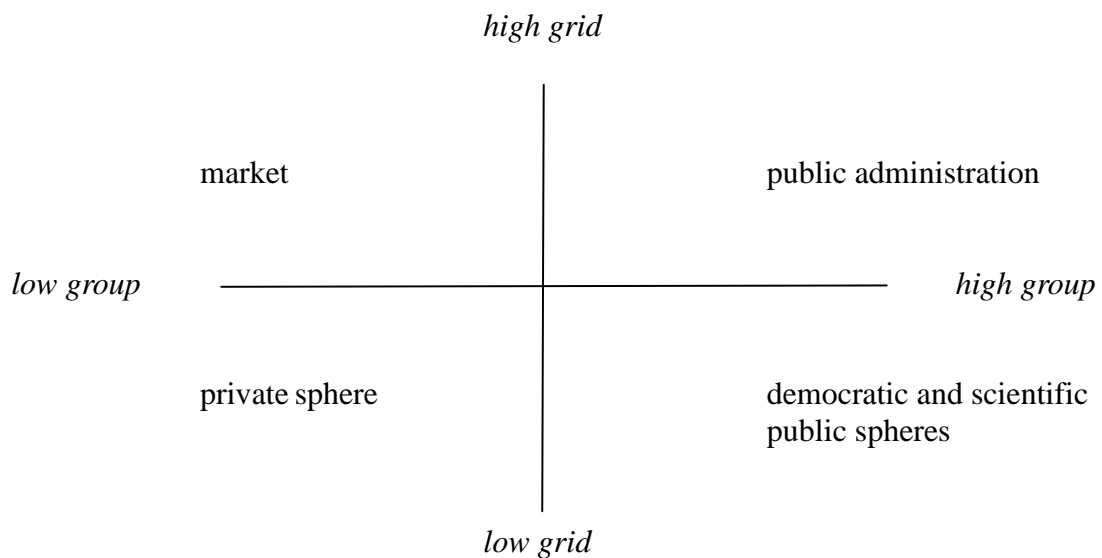


Figure 3

- Public administration is based on strict formal rules as well as on strong collective solidarity - here we follow CTR.
- Scientific and democratic arenas are based on the institutionalisation of what Jürgen Habermas calls the assumption of absence of power ("*herrschaftsfreier Diskurs*"). Open to deal with new phenomena, new challenges and new conflicts, they are "low grid". "High group" is necessary to keep on discussing, to come to consent, and to avoid schism. In this sense they may be paraphrased as "egalitarian" but in contrast to the anti-environmentalist polemic in "Risk and Culture", it becomes clear that this egalitarianism is neither marginal

² To avoid "cognitive dissonance" and to decide role conflicts, individuals may identify with a main role - their vocation or their family and gender role. Nations may - according to *Varieties of Capitalism and Welfare Regime* theories - specialise their production on the world market and therefore develop a cultural bias within their social institutions. But both are only possible to a certain extent.

³ But without Habermas' often criticised dichotomisation!

nor avoidable in modern societies. But based on the contradiction of "low grid" and "high group" it is clear that the institutionalisation of the sphere keeps being always a bit precarious. Thus, recourse to moral alarmism is quite common and understandable.

- As to market, we made the decision to move it into another quadrant! We see it as a misconception of CTR to describe the market in modern societies as "low grid". This misconception may be taken from classical and neoclassical economic theories with their ideological or naive stance that markets would emerge spontaneously and "naturally" in all societies and in all historical times if only they were not artificially restricted (for critique see Polanyi 1971). But modern markets are only conceivable on the basis of property rights, contract law, standards and conventions to be enforced and guaranteed by the Leviathan (North 1988), and therefore clearly classify for "high grid". With the contradiction of "low group" and "high grid", the market, too, is a precarious sphere which cannot be upheld on its own principles but is dependent on external support. This, in parallel, may explain frenetic liberal rhetorics - if the market was "natural", counterfactual rhetorics would not be necessary.
- The private sphere is obviously "low group"; and "low grid" since it allows for subjectivity and cognitive idiosyncracies. In this sense, the private sphere only exists in modern individualistic societies where cognition, values and emotions are no longer governed by traditions (cf. Beck 1986). In contrast to the other three spheres, the private sphere may allow for temporary retreat from social exchange, but nevertheless it may be productive for the neighboring spheres, be it that individuals may develop new aims and arguments for scientific and public discourse, or be it that they actually develop really new products for the market. In the latter sense, entrepreneurs may qualify for "low grid" (as envisioned by conventional CTR), but only if we think of them as hackers in a garage - the young Bill Gates and the young Steve Jobs for example - and not as CEOs in big companies with meanwhile conventionalised products and strongly established organisations.

These functional spheres co-construct risks in a process that we would call the "modern risk cycle":

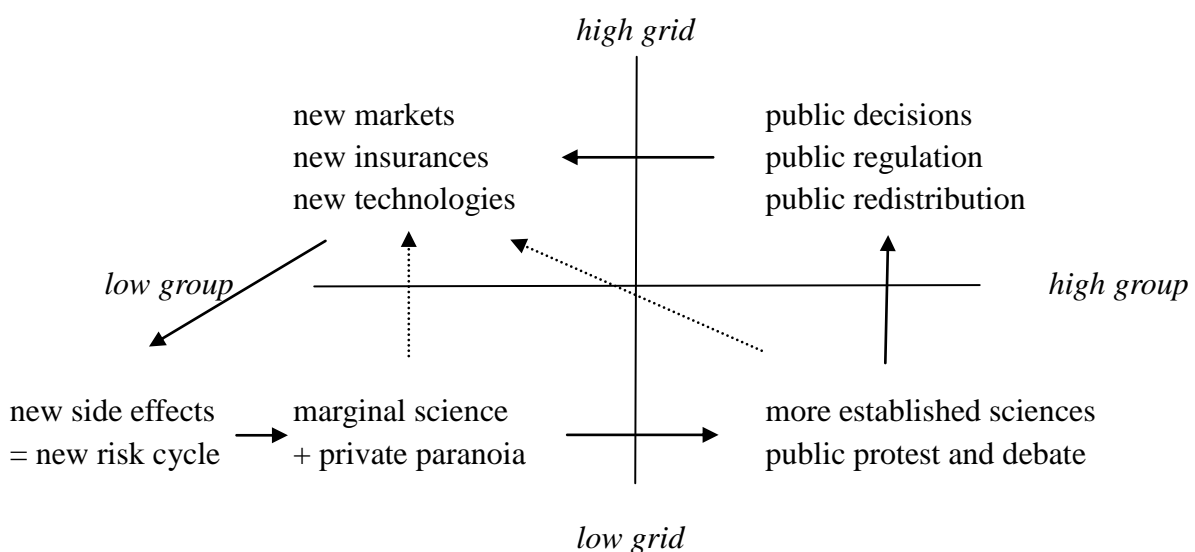


Figure 4

New risks are usually detected by marginal science and individual idiosyncrasies. To emerge out of the mist of private paranoia, NGOs have to be established and arguments have to be communicated to a wider public. Once campaigns prove to be successful, more established science - "normal science" in the sense of Thomas Kuhn (1967) – will test and eventually corroborate and objectify the arguments. On the basis of "higher grid", i.e. stronger and more formalised consent, public decisions may be taken, public regulations issued and new instruments for redistribution installed. Parallel to this and in expectation of the political outcome new markets arise for new abatement technologies and for new forms of private insurances. New industries will be developed with seemingly "pro-environmental" concerns and the political rhetoric of new occupation opportunities to be installed - called the emergence of "helper interests" by Volker von Prittwitz (1990). The risk of climate change is currently in the phase that the idea is now taken seriously by more established organisations and by more nation states. In consequence of the new technologies, new side effects may originate and start a new risk cycle - e.g. if we resort to geoengineering to cope with climate change⁴.

Against the concept by Schwarz and Thompson (see above, figure 2) it has to be clarified that only in the regions of "low grid" nature is conceptualised in the modern (romantic) sense as something opposed to society - i.e. the "wild" and "free" nature of nature conservationism. In the regions of "high grid", nobody directly speaks out for nature in that sense: market actors care only for their investments, state actors care for the social order – be it that they are disturbed by environmental protests or undermined by the consequences of physical change. The outcome may be the same as in the picture drawn by Schwarz and Thompson - with strong concerns for environmentalism in the public arena, some concern in the public administration and no concern in the market, and with the private sphere not articulated enough so that it may resemble "fatalism". But the rationale behind all this is a different one: the market and the state as functional spheres take into account only processes which follow their own logic, and as long as nature is "out there" and has not yet been "socialised", it is neither relevant for investments nor for societal stability (cf. Luhmann 1986, 1991).

So far, we have described "grid" and "group" cultural bias as primarily inherent in institutions and organisational role scripts. Here we can expect the strongest effects from cultural bias since organisations specialise according to their functional goals - of course an oil drilling company and an environmentalist NGO see climate change in rather different ways. Only secondarily, as already mentioned, but nevertheless: also the self-concept and the externally attributed image of individuals may be classified according to this scheme, with persons being characterised rather as "collectivistic team players" or "individualistic competitors" in the group dimension, and rather as "conventionalist Babbitts" or "innovative Freaks" in the dimension of grid. But individuals have to balance out the biases of many different role scripts - this is one of the explanations why environmental attitudes (i.e. self concepts) are only of faint influence on everyday action, with the result that we can find only very few people who really act consequentially - in that they do not drive cars, do not fly to

⁴ Historically we can observe that near and imminent risks are superseded by more global and more uncertain risks (Gill 1999).

conferences, do not eat meat and do not live in large suburban residences. Third, also nations or other political bodies may classify for cultural or ideological bias which in the group-dimension are either more "individualistic", i.e. "liberal", or more collectivistic, i.e. "coordinated" or "social". The grid-dimension may then be translated into conservative (high grid) versus progressive (low grid) in the sense that conservatism sticks strongly to *existing* conventions whereas progressivism tries to be more open towards new developments and to invest its energy to embrace social and technological innovations. The usual three or four traditions of modern political theory (Heidenreich 2002) may then be arranged in the following way - admittedly implying the contention that we see the market liberals' claim for "progressiveness" as misleading:

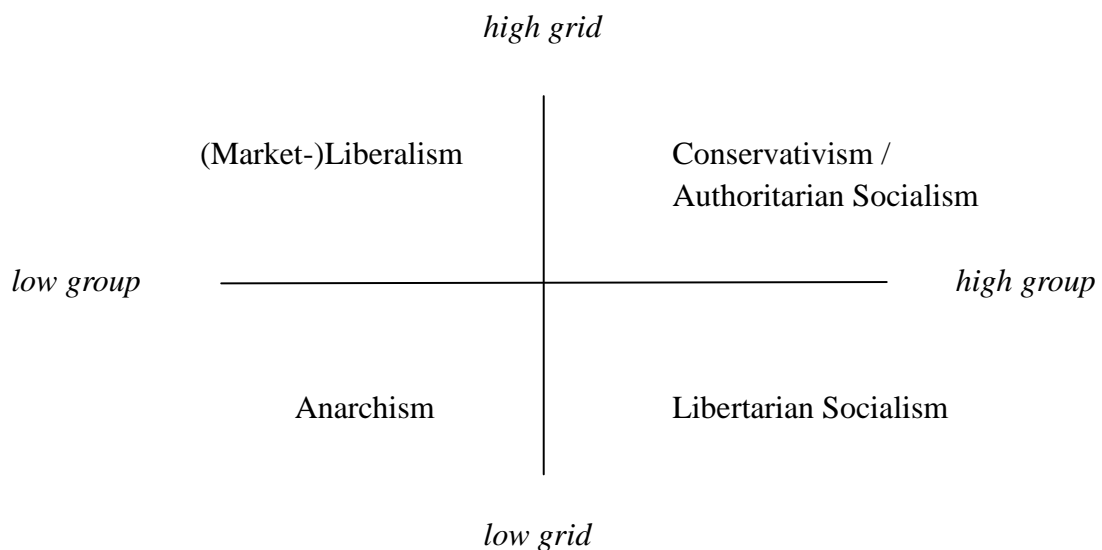


Figure 5

The presently prominent comparative approaches of Varieties of Capitalism (Hall/Soskice 2001), National Systems of Innovation (Malerba 2004), and Welfare Regimes Paths (Esping-Andersen 1991) may be understood accordingly.

2. Natural and technological coping necessities - grid/group from the perspective of *New Institutional Economics*

Up to now, we have only asked what organisations, individuals and national societies "want" according to their worldviews and values, but not what the functional necessities are which may also determine coping reactions. What we try to develop now are parallels to be found in New Institutional Economics of functional determinations which rather easily fit in the group/grid typology (Mamadouh 1999). In the fifth section we try to explain why these parallels are perhaps not coincidental, but a consequence of co-evolution of attitudes and functions in different technological and economic environments. In short, our contention is that environmental behaviour is founded on institutions, and that these institutions in turn are based not only on cultural bias but also on physical necessities with which organisations and

national societies may be confronted.

To illustrate our point we should start with Karl August Wittfogel's (1957: 109 ff., 204 ff.) famous account of "Oriental Despotism". The Orient was the first place for "hydraulic societies" to emerge, like in ancient China, with institutions closely linked to the development and control of agricultural systems of irrigation and flood control. Irrigation and flood control only work under highly coordinated conditions, giving rise to a centralized and knowledgeable bureaucracy. Whereas irrigation agriculture settles in fertile river valleys, pastoralists roam the more marginal semi-arid regions, forming only loose groups since, for ecological reasons, they have to disperse their herds more or less over the land. On this contrast Wittfogel establishes his law of changing returns of government action, with, on the one side *increasing returns* where the conditions for hydraulic settlements are given: here intense administrative controls of the irrigation system, the population and work force numbers, the crops used, and the amount and frequency of water flow induce high material wealth and strong military power. This is obviously the situation of high grid - with strong conventions, strong and coherent controls, large investments into objectivist science and technology, with intense manipulation of nature - and high group - with strong coherence and dependency (cf. North 1988: 23 ff.). *Diminishing returns* to administrative effort on the other side are due to nomadic situations where the taxable value in balance for the costs of control in a wide territory is not great enough, and where control of key points and routes, with occasional punitive expeditions, is more effective than complete integration and subordination. And again, put in words of the Cultural Theory, with instable and ephermal communities, this is a situation of low group; and in consequence of the loose and extensive use and mostly passive control of the natural and social environment it has to be classified as low grid.

Building on this, we could now go through a range of theories mainly from New Institutional Economics to show parallels, namely to

- Transaction Cost Theory (North, Williamson)
- Public Good Theory (Samuelson, Coase)
- Diminishing vs. Increasing Returns to Scale and Scope
- Negative Externalities (Pigou, Coase)

But to cut a long story short, we rather directly present our synthesis from these theories in form of a group/grid property and contract theory. In the group dimension we would pose the contrast between dispersed versus connected production, consumption and environmental risk control (the latter is skipped here since we go into that below, ch. 3, in more detail). Low group is functional and more efficient, where the means of production are divisible and where consumption is rival, whereas high group applies to the opposite. Herds in the former example are divisible whereas flood control and irrigation downstream are dependent on enough flood control and adequate irrigation upstream. Consumption is more or less rival where goods and services are produced with proportional or increasing effort per quantity, or in other words, where the production - including household production - is governed by the mechanism of diminishing returns. This is the case, e.g. when the herd gives only enough milk to feed a small clan and when more goats would destroy the grazing land. And it is non-rival in those circumstances where strong economies of scale are given and the average per quantum

production effort decreases with more quantities consumed⁵. The effort to build and maintain the irrigation system is high, irrespective of whether the system is used to produce a small or a large amount of rice. That given, the average effort for a quantity of rice decreases. The mechanism of increasing returns generally applies to industrial - in contrast to craftsmanship - production, and particularly to knowledge and information goods where the production effort for an additional copy is close to zero. Under the condition of non-rivalry it is efficient to enlarge the groups of consumers. Or, to put it in the perspective of Varieties of Capitalism approach: under the conditions of closely connected production systems with increasing returns it may prove economically favorable to have cooperative rules for industrial relations and a social welfare system to increase the demand for industrially produced goods even if this may give room for some laziness which may be avoided under a stricter and more comprehensive application of the market rule with its disciplining effect of the "hunger whip".

In the grid dimension we would contrast effective and loose control of production, distribution and environmental risk (the latter is elaborated, again not here, but in ch. 3). Strong control in production means firmly established property rights as well as complete and easily enforceable contracts. In market exchange, strong grid means not only excludability, but also clear *ex ante* transparency of quantity, quality and price. This does not necessarily constitute a contrast between strong control by private property rights and loose control of collective commons, as liberal economists and philosophers have insinuated (Hardin 1968, Olson 1965, for a critique see Ostrom 1999). On the contrary, we would argue that effective property rights and contract controls in competitive (i.e. individualist) market settings are always derivated from collective power since for the legitimation, the internalisation and the enforcement of rules and laws there exist strong economies of scale⁶ - whereas more or less isolated and decentralised attempts of production and exchange, as imagined in Wild West movies and given in premodern history or non-developing countries, usually result in a wide range of piracy and low economic productivity⁷.

⁵ The more usual textbook examples of rivalry and non-rivalry in consumption, e.g. bread versus light-houses (Coase 1974), in our view are only a special and more dichotomous case of this more general and more gradual formula.

⁶ At least up to a certain extent which is given with the "imperial overstretch" (cf. Kennedy 1987)

⁷ But of course, Mancur Olson is right and Elinor Ostrom would consent that group control is only possible on the basis of binding and reliable group-intern relationships - i.e. high scores in the group dimension.

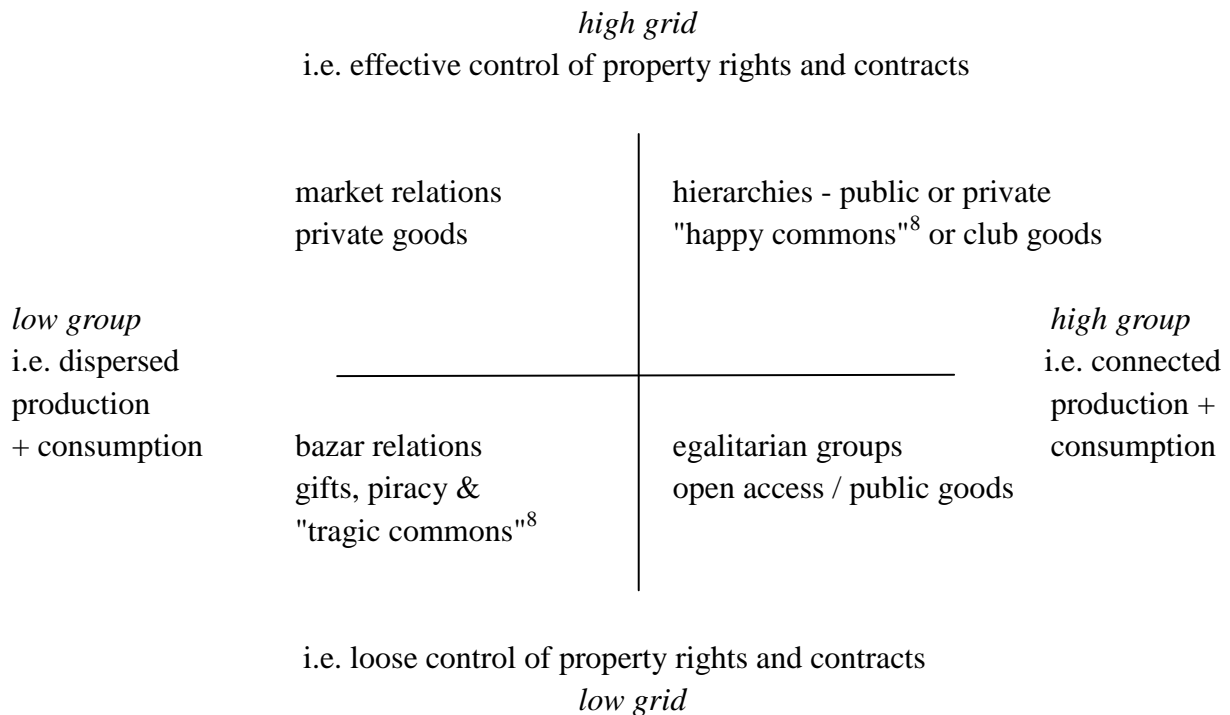


Figure 6

To fully understand the high grid position of the modern market, one has to contrast it to the bazar (Geertz 1978) and the other exchange relations in premodern cultures (cf. figure 6). "Barter", which Adam Smith as the founding father of the liberals stylised as "natural", in the premodern context means a wildly mixed set of exchange relationships which ranges from gifts to establish clientele binding to tedious information search and long haggling, since quantities, qualities and prices are neither available nor comparable on the spot and prone to discrimination and treachery (Geertz 1978). Whereas agricultural goods are distributed on the basis of reciprocity and power relations, long distance trade involves the robbery of caravans, protection money extortion and warlordism (Polanyi 2001, Sahlins 1971, North 1991). Only in modern settings property rights and exchange standards - e.g. ex ante visibility of the price, administrative calibrating of weights, reliable quality labels - can be taken for granted. And as the New Economic Sociology shows, even there they are only guaranteed to a certain extent, especially if we look to quality goods, professional services, labor contracts, and financial markets (e.g. Podolny 1993).

Thus the governance kernel of functionally differentiated societies is bureaucracy, modernized and depersonalized by formal rule binding, written transactions and bookkeeping, recruiting on the basis of expert knowledge, separation from private households, and with only little difference between public state and private company administration (Weber 1968). With

⁸ "Happy" are well governed as opposed to "tragic" commons, where the "tragedy of the commons" (Hardin 1968) really applies - the distinction (not in this wording) was established by Ostrom and colleagues, and a rather complex model of empirical indicators was given there to predict the happy or tragic outcome (Poteete et al. 2010). In our framework we would propose that with increasing return to scale, i.e. with the tendency to non-rivalry, exclusion becomes profitable, all the more so if exclusion costs, too, tend to be diminishing with the scale of the common pool resource concerned.

industrialisation, companies have become ever larger and states ever stronger through the development of economies of scale and scope in military control, administration and industrial production. The increasing return to collective efforts may be explained by transaction cost theory, i.e. on the one side by the asset specificity and indivisibility of many technologies, and on the other side by the fact that reliable long term relationships support mutual trust and intrinsic engagement as a functional equivalent to transparency and formal contract control in technological and organisational contexts where no *ex ante* and sometimes even no *ex post* measurements are really available (Williamson 1981). Therefore the large bureaucracies of company and state administration "reside" in the high grid/high group field.

But hierarchic control has to be less tight in situations where new knowledge, intrinsic motivations and self-determination are required, i.e. particularly in innovative organisational fields and in volatile environments (Burns/Stalker 1994, Osterloh/Frey 2000). And since modern democratic societies are based on the idea and practice of institutionalised scepticism, critique, and innovation, they create generalized volatility with the consequence that modern school curricula are trying to implant self-determination, curiosity, and creativity which is only possible in non-repressive social environments (Sargent 2006, Parsons/White 1968), i.e. under the somewhat paradox conditions of high group and low grid. But with increasing returns to scale and general wealth, scarcity is no more an obsession with the consequence that low grid not necessarily ends in opportunism and piracy but may also allow for voluntary engagement and group association. Whether or not goods which tend to non-rivalry are then distributed on the basis of market prices, administrative fees, or for free as in the case of open access, sometimes depends on exclusion possibilities and costs, but often is rather a question of cultural bias and loud debate, all the more so since functional necessities are less obvious.

3. Risk exposure, mitigation and adaptation strategies from a functional grid/group perspective

As already mentioned in the preceding chapter, also risks can be analysed from the perspective of whether they are dispersed or connected and whether we can observe economies or diseconomies of scale in the coping strategies - this would give rise to the distinction between low or high group. In the grid dimension we can distinguish between calculable and well understood risks with well focused coping strategies on the one side, and barely understood risks with more diffuse reactions on the other side of the scale.

a) different risk expositions

First we shall have a look at the geo-physical "nature" of the threat, i.e. at risk exposition. We can see on the one side dispersed and isolated negative events which may hit the individual on a coincidental and individual basis - thunderbolts, car accidents, heart-attacks may serve as examples. On the other side of the group scale we see hazards that hit the whole community as connected events, such as floods, epidemics and thunderstorms. But perhaps the inquiry into the "nature of the risk" is too diffuse and we should instead ask how "guilt" is usually attributed. On the low group side we see self incurred risks (including damage to be attributed

to weak prevention efforts), and we put on the high group side risks which are conceived as a consequence of political decisions (or their absence). Coincidental risks are somewhere in between - nobody is guilty, but nevertheless everybody hit may expect some empathy and solidarity.

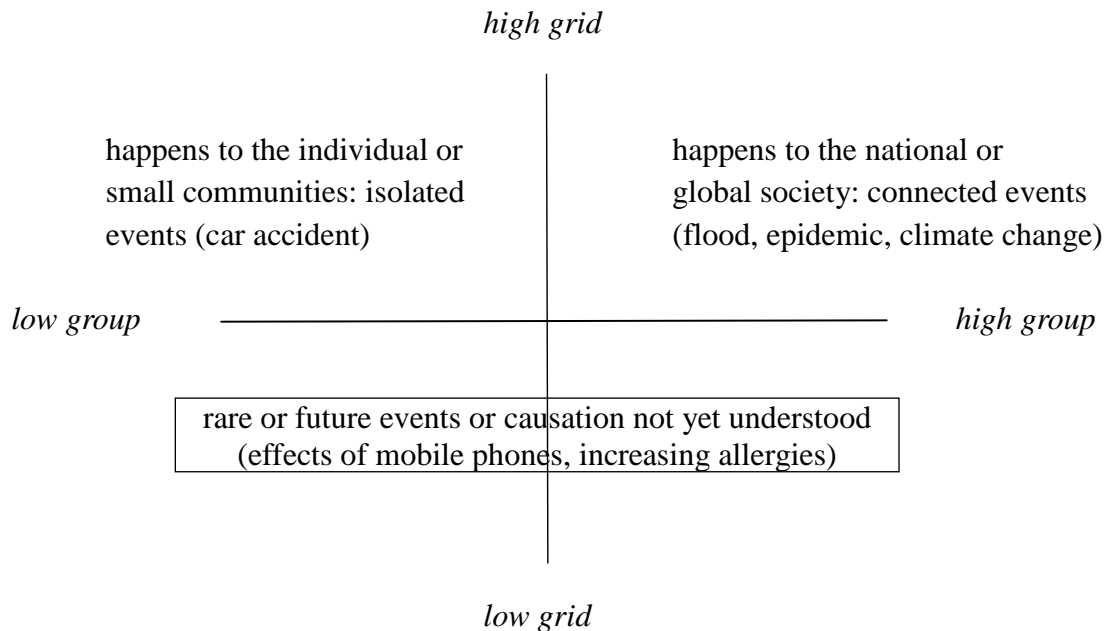


Figure 7

Nowadays, the above mentioned examples of risks are rather well understood and also calculable to a certain extent - which would qualify them for "high grid" and which makes them insurable, at least concerning their individual consequences and if "moral hazard" can be excluded (Ewald 1993, Bonß 1995, Beck 1986). On the other end of the grid scale we speculate about future events which may or may not occur like e.g. negative side effects of the use of cell phones. Or we can observe trends such as the increasing occurrence of allergies which optionally may be attributed to too much or too little dirt, to too many or too few chemicals; perhaps we should better say that we do not know for sure yet. In the case of relative ignorance we would often have difficulties in attributing the group dimension: if the number of brain tumours was to increase with the frequent use of cell phones these would be more or less self-incurred and more or less dispersed damages among coincidentally vulnerable individuals. If the number of tumours was to increase around transmitter stations it would better qualify as a group event. Quite understandably, low grid risks are publicly debated over a long time and with shifting results since institutional responses have not yet been established (cf. Evers/Nowotny 1987). That should not mean that high grid risks would never be debated, but here the question of whether they should be attributed rather to the individual or rather to the collective side is usually quickly closed by a routine decision.

Connected with the question of guilt is the demand for responsibilities with respect to prevention and reaction. But this brings us back to "nature", i.e. the characteristics of technologies as sketched out in the previous chapter (ch. 2). Thus the question of responsibilities is a bit ambivalent, since it asks not only who is obliged to, but also who is

able to do something. Here we may meet with sibylline complexities since able actors will propagate their risk definitions which - just by coincidence? – will fit in their technological and organisational abilities. Or, to put it shorter: the crisis is the chance for competing helpers.

b) proactive technologies (mitigating climate change)

As we apply this consideration in the context of climate change, now, we can see that guilt is seldom debated in high grid official arenas, at least not by the guilty, i.e. by the early industrialised nations in Europe and North America. Instead, what we can observe is some enthusiasm when propagated technologies fit into the established institutional structures. Hence we see many wind turbines decentrally installed in Texas, flourishing on federal subsidies and regulations for regenerative energy (cf. “Renewable Portfolio Standard” (RPS)⁹) which make them rather profitable (Langniss/Wiser 2003, Wiser/Barbose 2008, Menz/Vachon 2006). Interestingly enough, climate change is seldom mentioned as a motive for the subsidies, but striving for independence of Arab oil (which is thought to fuel terrorism) and the shrinking oil supplies in general. More or less by coincidence, the shrinking fossil energy reserves and expectations of rising prices give decentral incentives for preventive action, even if the high group actors fail to concert coordination and redistribution on a global scale as observed from Kyoto to Copenhagen (Ostrom 2009). But of course, on national or local levels, many possibilities for high group action are given, be it in the realm of regulation and subsidies, or be it in the realm of infrastructure which, for technical reasons, may be more effectively managed in monopolistic than in competitive ways (whether the monopoly is called public or private does *not* make the difference here!).

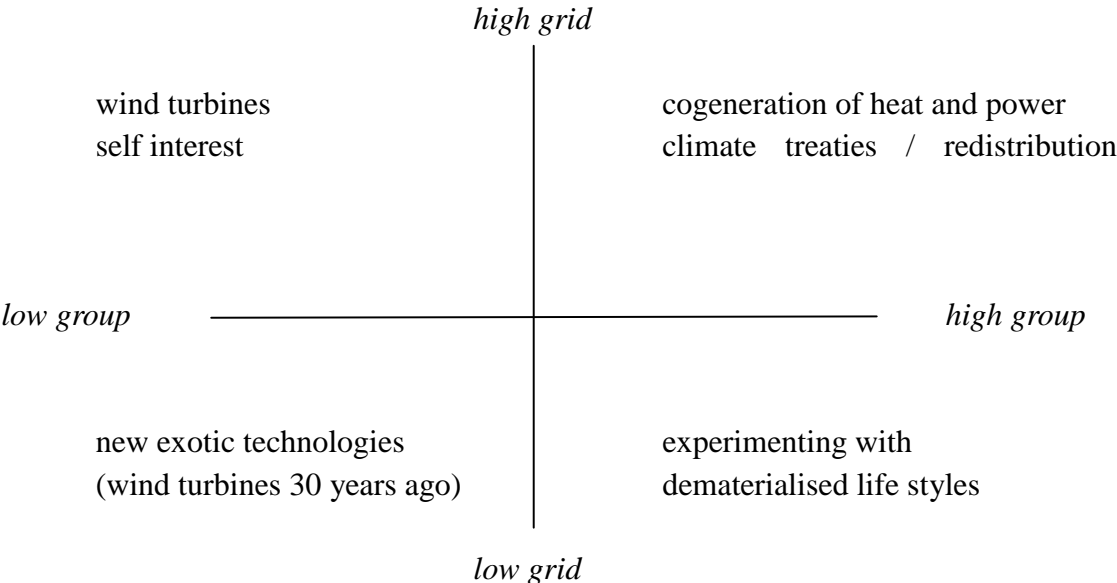


Figure 8

⁹ The RPS can be described as a market-driven regulation policy that requires an increasing production of renewable energy. It binds electricity suppliers to provide a specific proportion of electricity from renewable resources like wind, solar or biomass.

Since climate change is an established concern nowadays, it no more ranges in the realms of high grid, but in the backyards of low grid. There, new exotic technologies may flourish , such as wind turbines did thirty years ago when they had been propagated and installed in hippie camps of the so-called "alternative" subculture. And out there also looms the still unresolved but pressing question of how we can voluntarily dematerialise our life styles since the planet could never carry an estimated 12 billion people with their westernized hunger for material resources (Schauer 2002).

c) reactive strategies (adapting to climate change)

But as we all know, climate change already happens - when writing this article in August 2010, we hear all the while the news of the centenary floods in Pakistan and the heat in Russia. So prevention is no more possible and beyond mitigation we have to adapt to climate change. The market individualists again would propagate self-help with decentralized and well established technologies, e.g. air condition, whereas the public administration would be needed for collective and repressive measures such as building dikes, the redistribution of resources to more vulnerable parts of society or the evacuation of people. What collectivist low grid reactions are to be expected? Perhaps not so much protest because the story is now objectified as mainstream and therefore no more thrilling. And the actual catastrophe is always the hour of emergency rule and the staging of repressive leaders (cf. Carl Schmitt 1921). But we can subsume some other reactions here which can be observed in this respect. Whereas flood regulation after the Second World War was based on forcing rivers into ever higher and narrower dikes to win and protect as much land and real estate as possible, we can observe a renaturation of water flows during the last twenty years. That is so because engineers have learned that high and narrow dikes upstream precipitate stronger and faster deluges downstream. This means that the direct and nearby control of river banks was reduced in favor of increasing the indirect but more overall control of the whole river system - what at first sight might seem as lower grid, at second sight means more coordination between the downstream and upstream regions, i.e. tighter regulation. A better fitting example may be the immediately and more or less spontaneously organised help measures when floods occur, like stacking up sand bags, or help for the weaker members of the community. Regardless of whether low or high grid – once group measures fail, people individually resort to low group and low grid reactions: unorganised escape, the rich in their cars, the poor on foot, others plundering, and again others clinging to the roofs of their houses, singing prayers and expecting to drown - these were the pictures from hurricane Katrina (cf. chap. 4).

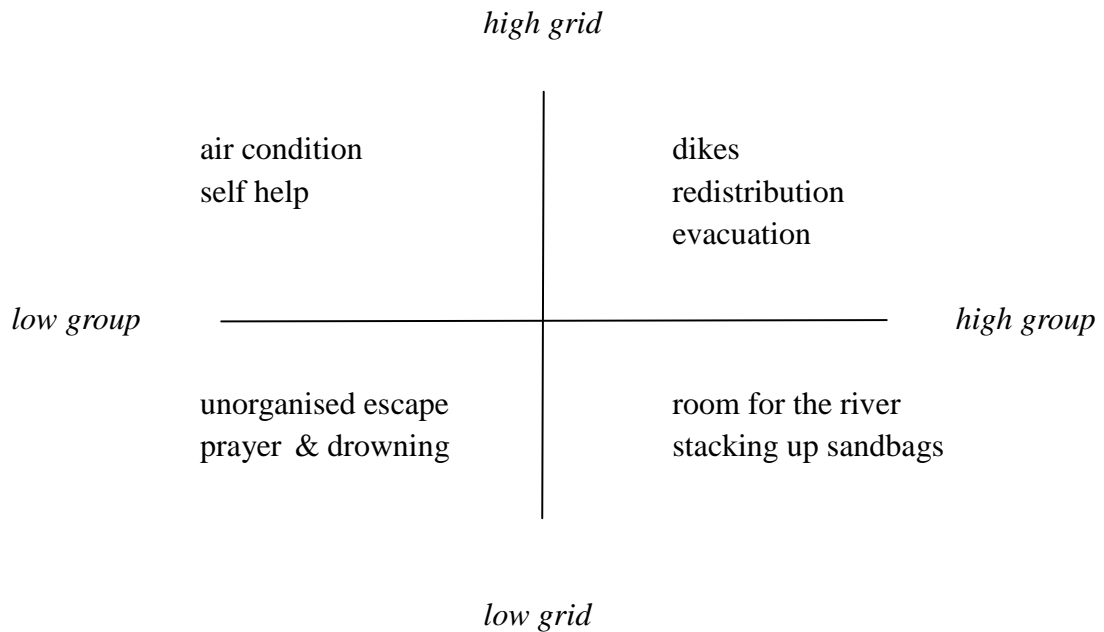


Figure 9

4. Some case studies for illustration

What we are going to do in this chapter is to pick up the main building blocks of our argumentation in order to test its narrative plausibility. Taking grid and group as the central dimensions, we will mainly focus on the historical and current state of building and maintaining dikes in The Netherlands and on the rather new phenomenon of regenerative wind power in Texas. By taking dikes and wind turbines as examples, we account for two crucial considerations: first, for the differentiation between connected and unconnected risks, technologies and their respective institutions; second, for the entanglement between the selected risks, technologies and respective institutions on the one hand and the predominant cultural bias on the other. In this context and with regard to the work of Esping-Andersen (1991), we distinguish between a liberal cultural bias in the case of Texas and a social-democratic one in the case of The Netherlands. Whereas Dryzek (2008) claims that nation states which are coined by social and egalitarian principles should be better prepared to cope with environmental challenges like droughts or flooding than their liberal counterparts, we will show that this may be a premature assumption. Under the influence of the particular cultural bias, specific institutions and technologies matured and specialised on coping with the respective "favourite risk". Taking positive externalities into account, the claimed advantage of the egalitarian bias cannot be taken for granted.

a) grid/group dimensions of flood protection in New Orleans and The Netherlands

The geo-physical preconditions of life social actors are confronted with in low lying areas like deltas greatly differ from those in other regions, e.g. the Alps. Instead of reckoning on avalanches, costal residents have to reckon on the potential risks of storms and flooding. With

regard to climate change and sea-level rise, the IPCC refers to low lying areas as hotspots of social vulnerability (IPCC 2007). According to our previous considerations, floods can be categorized as connected risk. Now, one could be misled (by one's own cultural bias) to claim that the inevitable answer to connected risks is a connected technology like dikes (and therefore high group, too). However, by comparing different approaches to potential storms and floods in New Orleans and The Netherlands¹⁰, one is able to observe how the cultural bias shapes the way in which the risk of flooding is selected and addressed (cf. Schubert 2009).

In the case of New Orleans and hurricane Katrina in 2005, the liberal bias leads to a situation in which the connected risk of flooding is handled in a constellation characterized by low group and iridescent degrees of grid. In other words, the connected risk of flooding is more or less dealt with individually with the market as the main institution for coordination. Of course, New Orleans is protected by dikes, but it cannot be denied that little emphasis was put on precautionary steps like in a situation of high grid and group like in The Netherlands (Dyson 2006, Bergal et al. 2007, Hudson et al. 2008). Totally in line with the liberal bias of market efficiency, individual residents lobbied for better flood protection in order to increase the value of their real estate and whole communities asked for federal subsidies to enhance dikes first and foremost to get more space for housing in order to profit from increasing taxes thanks to more residents (Colten 2006, Colten 2009). But for the same reason - liberal resistance against government intervention - the corresponding actions were weak and uncoordinated.

According to the most central institution – the market – respective ideologies and coping technologies can be observed. Due to a low degree of de-commodification and a rather weak welfare state and the predominant myth of market efficiency, coping technologies go hand in hand with individual wealth and are accompanied by a world view characterized by strong “bootstrap-individualism” and “the self-made man” which are typical of low group. Whereas the rich and mostly white population can afford to build houses on stilts or artificially heightened grounds, have insurances and possess cars in order to escape from storms like Katrina, the poor residents (mostly black) do not have access to these coping technologies. Due to the fact that they are not able to capitalize on the institution of the market, they are left behind and have to hark back on coping strategies within their individual range, e.g. looting and saying prayers, i.e. low grid. Summing up and with regard to the range of government action, it can be argued that the situation in New Orleans is principally coined by low group whereas observable variations in coping technologies have to be explained by different levels of grid: the rich are able to make use of the high grid situation of the market, the poor find themselves in rather anarchic situations of low grid. In this context, the strong religious and charity movements can be discussed as a partial equivalent for modern grid and group institutions (market and bureaucracy). They induce some norms and some solidarity, but only in a particularistic community, not on a national scale.

In contrast to New Orleans, the connected risk of flooding is dealt with in a systematically

¹⁰ Admittedly, it could be argued that there is some kind of spatial incompatibility between The Netherlands and New Orleans, e.g. in comparing a whole country to a poor and mid-size city in a poor state. However, we believe that this comparison is well suited to describe the particular institutional and structural differences between the liberal and the social-democratic cultural bias with regard to flood protection.

organised and connected way in The Netherlands. Here, we can observe that coping technologies for water regulation and the respective institutions historically co-evolved and shaped the constitution of The Netherlands. The emergence of the Dutch “water board”¹¹ can be interpreted as a first democratic institution that addresses the problems of coordination and collective action which are associated with the provision and maintenance of public goods like dikes (Lazaroms/Poos 2004, van de Ven 2004). From a historic perspective and according to van de Ven (2004: 39 et seq., 112 et seq.), the beginnings of flood protection were coined by low group and grid (unlike today)¹². Until the first emergence of water boards during the 13th century (Lazaroms/Poos 2004), flood protection had been accomplished individually (low group) and followed the principle of trial and error. As time went on, coping technologies in the form of dikes, polders or flood gates became more and more intricate, complex, and expansive. The continuous individual measures resulted in problems of coordination, conflicting interests and negative externalities. In other words, the technology and its externalities became more and more connected (high group) and well-engineered (high grid).

At present it can only be speculated where the egalitarian, social-democratic bias of the Netherlands originates from which stands in contrast to the "Oriental Despotism" as described by Wittfogel. Was the inducement of participatory rights necessary for better acceptance and for decentral regulation and maintenance of the dikes themselves? Or was it due to the fact that the economic development of the Netherlands was based on strong movements of trader capitalism and therefore is the result of a balance between liberal and coordinated institutions?

After the flood of 1953 had cost 1853 casualties, The Netherlands pursued a strategy of “zero tolerance” with regard to potential floods – absolute control of nature (and strong belief in its practicability) was the declared goal. Dikes were reconstructed and strengthened and with it the famous “Delta Works” assumed their present shape. However, these efforts were accompanied by negative externalities, such as shrinking retention space and confined view from the houses behind the dikes. Despite these efforts (or because of the negative externalities), The Netherlands only narrowly escaped severe flooding during the 1990ies and it became apparent that absolute control of nature was not a feasible goal. In consequence, a new type of water management – “Room for the River” – was developed and put into practice. Large pieces of land are designated as retention polders and further on only used for grazing or cropping, but not for settlement. With regard to social relationships, the new situation can be described by increasing degrees of grid and group: national and transnational residents have to negotiate about new spaces for flood retention and individuals have to be resettled or even disappropriated (Roth/Winnubst 2009, Kropp 2002). With regard to the natural environment, the dimension of grid is more ambivalent - control over land is sacrificed for the sake of more control over water.

¹¹ According to van de Ven, the emergence of the water-boards can be described as a process of centralisation. The management of flood protection devices “(...) was transferred from the self-governing village communities to the regional water boards” (van de Ven 2004: 114) and thus lifted onto a higher administrative level resulting in higher grid.

¹² It has to be mentioned that van de Ven draws a rather sophisticated picture of water management between 800 and 1250 AD. Dependent on local particularities (e.g. communities of free or un-free peasants and respective forms of community organization like mutual agreement or coercion), the situation was characterized by varying combinations of grid and group.

In sum we can observe a good match of flood protection technologies and the social-democratic bias of the Netherlands and in contrast a mismatch for Louisiana, with the liberal bias there allowing only for regressive reactions, but not for reliable flood protection or systematically organised large scale rescue operations.

b) grid/group dimensions of wind turbines in Texas

In contrast to dikes, wind turbines represent an unconnected technology, at least in the Texan context. Against the background of the liberal bias, wind turbines are installed to tackle the (favourite) risks of rising energy prices, increasing dependency on foreign energy supplies and the fear of terrorist attacks (U.S. Department of Energy 2010).

In the past, wind turbines were an individual and unconnected technological device to settle and cultivate the new frontier. Due to the width of the land and because early settlers (mostly farmers) were allowed to possess as much land as they were able to individually cultivate, decentralized settlement structures (and energy supply) evolved. In consequence, it can be argued that decreasing returns on government action are an inevitable consequence. Although it cannot be denied that there was strong solidarity between neighboring farmers, the general situation was coined by low grid and group. Leaving their highly structured and institutionalized home countries behind (in oppressive feudalistic Europe), settlers were eager to avoid any form of institutionalization except strong property rights and individual liberty, which resulted in the current situation of high liberal grid.

In this context, the religious community of the Mormons presents an interesting exception. Whereas low grid and group farmers were not able to cultivate the arid fields in Utah and neighboring states, the Mormons managed to provide and maintain irrigation systems and to settle in these inhospitable areas. Here, it can be argued that the properties of the religious community are coined by high grid and high group which are crucial preconditions for collective action. Instead of individually trying to cultivate dry fields or to emigrate, the Mormon community was able to hark back on solidarity and conventions that enabled the successful and efficient cooperation and hence the provision of irrigation systems (cf. Wittfogel 1957: 36, Arrington/May 1975).

Today, and due to the fact that wind farms are coordinated via market mechanisms, they present a coping technology which is coined by high liberal grid as defined above (cf. RPS, Langniss/Wiser 2003, Wiser/Barbose 2008, Menz/Vachon 2006). With regard to the dimension of group, it can be argued that the erection of wind turbines and the sheer production of electricity take place in a rather unconnected way in Texas. According to their liberal bias, the exploitation of wind (instead of oil) is just another way of making money and of securing their liberal way of life. Texans claim that, even from an aesthetic point of view, wind parks even look better than drilling rigs and pumping stations (Krauss 2008, Galbraight 2009). It is the other way round in European states like Germany. In densely populated areas, erecting wind parks is a highly disputed project. Similarly to dikes, investors have to brace themselves for long negotiations between different stakeholders like environmentalists, residents and communities. In addition, strong European group regulations, i.e. admission procedures, present another stumbling block to effectively installing wind parks or even single

wind turbines and hence to the reduction of carbon dioxide.

Here, it is important to have in mind that the sheer technology – wind turbines – is unconnected. It only becomes connected because of positive or negative externalities that go hand in hand with the technology and federal subsidies. In liberal societal environments like in Texas, which have a strong reputation for not caring much about environmental niceties, negative externalities are more or less neglected. Who cares about a handful of birds, which may be chopped up by the rotors, or some disoriented whales? Taking positive externalities into account, the Texan example appears in a different light. Although Texas rejects any environmental political guidelines from Washington, and although environmental protection and mitigating climate change has never been a “first priority project” on their agenda, Texas is about to become one of the world leaders with regard to regenerative energies.

Summing up, it can be argued that the liberal bias selects and copes with risks that can be approached with unconnected coping technologies and via the market institutions whereas in the European context - less space and pro-coordination bias - the same technology meets with strong reservations.

5. Conclusion

What we have tried to sketch out here is an approach that builds a synthesis between the social constructivism of Cultural Theory and the technological functionalism of New Institutional Economics. The social constructivism of Cultural Theory claims that actors forge their institutions corresponding to their value and belief systems and conceive the stimuli and challenges from the social and natural environment and the reactions and coping strategies accordingly. Markets for example are built on liberal values and market actors conceive the world as a universe of disconnected chances and risks to win or lose money with their investments. Climate change is seen as nobody's guilt but rather as a turbulence in the environmental conditions of business. Coping means to write off some older investments and to swing to new waves and possibilities in the right moment¹³. Therefore an ideal type liberal would spit on the Kyoto and Copenhagen protocols and dismiss them as communist conspiracies of bureaucrats and intellectuals to enlarge their power and to strengthen their paranoid control regimes. For textbook liberals collective conceptions and reactions are conceivable only in one exemption: if property rights as the very precondition of markets are at stake - in this case nervous police and military reaction is the rule, as the "war on terror" has most recently shown.

Technological and ecological determinism of New Institutional Economics on the other hand contends that physical properties of technologies and their contexts necessitate specific institutional and organisational settings to work efficiently. Of course everybody may fence a dike around her own house and land, but obviously it is more efficient and brings increasing returns to scale if the dikes are built around a larger settlement. In consequence, the individuals in the settlement without individual dikes around their houses live more intimately together and need stronger social cohesion to uphold the common responsibility for the public

¹³ cf. http://en.wikipedia.org/wiki/T._Boone_Pickens

dike out there. Hence collectivist institutions have to be established and when the collective grows above a certain level hierarchies become necessary to contain opportunism and to uphold coordination. Based on collectivist traditions and institutions the conception and reaction to climate change typically differ from the liberal one: climate change is perceived as a result of human guilt and responsibility, with the consequence that redistribution and concerted prevention activities are envisioned.

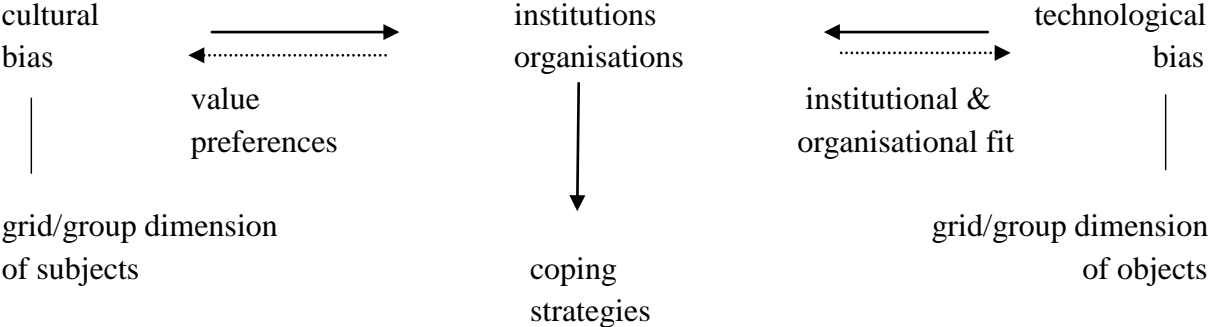


Figure 10

Up to this point we have an antithesis to cultural determinism and technological determinism standing in opposition. But what about the announced synthesis? To a certain extent geographical and environmental peculiarities may have been influential on the path selection during the foundation phases of the existing nation states and institutional settings. Yet, wars and class coalitions may have had a stronger impact (cf. Knöbl 1993). But that has long been over and since that phase, what we can observe, is rather strong path dependence and inertia in the institutional settings of nation states (Esping-Andersen 1991, Pierson 2004, Hall 2007). For established institutional settings and in the short run we would contend an institutional inertia over environmental and technological challenges: institutions first select and shape those risks which they are fit to cope with; secondly they select and shape the technological and organisational responses accordingly. This is even true of medium terms even if the above described risk conflicts may induce new regulations to be issued and new technologies to be developed. Only in the long run, external events such as economic crises may break the institutional inertia and with it the existing cultural bias, giving rise to more systemic adaptations. The Great Depression for example challenged the liberal bias of the United States, opening the way for the New Deal, i.e. a more coordinated and collectivist mode of institutional settings. In consequence of the economic crisis of the 1970ies the United States switched back to a neoliberal agenda (Fourcade-Gorinchas/Babb 2002). We have no such historical examples of environmental events up to now. But with stronger impacts on economic operations and everyday life, in the future major environmentally induced institutional adaptations - or the ruin of non-adaptive societies - are not unthinkable.

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