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Balancing multiple functional subsystems of society – a strategy for addressing the Sustainability Development Goals (SDG2030)
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The paper analyses the problems and deficiencies of good governance goals and other suggestions or prescriptions to follow the sustainable development goals (SDG2030) from 2015. This can be seen as a possible way to improve the performance and results of the public sector initiatives in dealing with the respective challenges. The natural environment will be taken as focal point for empirical examples. The structuring of the observations and conclusions is done by referring to the all-embracing system theory of Niklas Luhmann (1927-1998)[2].

In the first part of the paper a brief introduction into the "history" of dealing with sustainability issues (see the Club of Rome 1972) is given – combined with some recent examples of deficiencies concerning good governance and the pursuit of SDG: they are mainly selected from the German/European experiences. This way of approaching the topic – identifying deficiencies – is favoured in contrast to providing examples of "good practice". It allows an access to good governance topics via the scheme of "symptom-description vs. diagnosis vs. aetiology" – concerning many problems which are unexplained and good intentions which are unfulfilled.

In the second part of the paper this analysis will be continued by a description and valuation of "aetiology" - i.e. a theoretical foundation for the organization of observations - and possible "therapies". Four components of the theory of Luhmann are briefly described: a. modernization as the societal evolution towards a functional differentiated society, b. necessities and complications of balancing functional subsystems (as task of good governance) c. inclusion of the population into these subsystems, d. the special challenges of multi-level systems, which include supra-national units (like UN, EU).

In the third part of the paper some selected types of intersystem-relations are described – which should be seen as elements of "therapeutic strategies": a. autopoiesis and the lack of stopping rules, b. observation of system environments, irritation and resonance, c. structural coupling and capturing.
Some recent examples of the use of these strategies with regard to the relations between politics, economy and mass-media, climate change issues will be described (mainly from Germany/EU): the political system is put into the centre of analysis and multiple levels (from global to local) are included.

In the final part of the paper a summary with regard to good governance and SDG2030 will be formulated. What can be the overall contribution of the proposed format of analysis in order to follow the goals and cope with their challenges?

1. Introduction: The SDG2030 - well known problems but not sufficiently tackled

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[2] Three books are mainly used for the development of the arguments: Luhmann 1986; Luhmann 2017 and Grunow 2017. Some references will be made to a study (2009-2014) about adaptation to climate change in the RuhrDistrict (Germany): Grunow 2014.

It is easy to foresee that the sustainable development goals will be widely missed - as so many international development goals. This is not just the result of the recent backlash of international cooperation procedures (and their institutions). It is also a long prevailing lack of an effective implementation of international goals or agreements (if existing). In Germany there is a saying: paper is patient (Papier ist geduldig); similar important is the saying: if you don't know how to proceed, if you are stuck – establish a commission (wenn du nicht mehr weiter weißt, gründe einen Arbeitskreis)[3]. There are never-ending stories about such a situation not only on the UN-level but also in a country like Germany or in the European Union. In the debate about an "action-plan" for the next years of government (coalition of two parties) it was a kind of entertainment to show at which time (during the last 20 years) these topics have already been part of the government programs – often with the same words. When the German government recently decided to stop the mining and use of brown coal by 2038, many actors have complained that "such hurry is not necessary". Germany shall miss its goals concerning the reduction of CO2-emissions by 2020, but the debate about the *strategies of their reduction* (tax? fee? emission-entitlements?) is blocking a timely decision[4]. Even the widely endorsed action of school children under the heading "Friday for Future" has not made any difference – although it is their future, which is under debate ("on fire")[5]. The winners were the various news media – similar to the hype they have organized for Greta Thunberg (the 16 years old girl from Sweden).

There is a strange contrast between delaying actions in the environmental/climate issues, while complaining about slow progress in the digitalizing of the world. These days – in the context of many regional (and EU) elections – the political actors escape in a rather stupid debate about the deficiencies of capitalism. However, this might be seen as an indicator for even more deficiencies, if other issues of sustainability (from the long list of SDG2030) are discussed: aspects of a decent living (regarding, water, food, education, health provisions etc.), which might demand for various redistributive activities within and between countries world-wide. Even in Germany we have intensive debates about minimum wage and expected earnings (poverty) after retirement.

With reference to SDG2030 the recent observations can be generalized in the sense, that many of the problems/deficits and goals are well known and articulated since many years or even decades. Many of the highly visible documents were published by the Club of Rome (1972) and in its "revisiting" book from 2012 – in which the reasons for a very critical outlook for the 21th century are formulated[6]. Since many years there is a notice about the "earth overshoot day" (Welt-Erschöpfungstag): in 2018 it was the 1st of August. Every year it is earlier than the year before. Since many years there is a projection about the number of globes we would need, in order to cover the consumption on all continents. For a global consumption level like in Germany we would need three (or even more) globes. Again: it is becoming more and more over time. New research results are available about the forested space on the globe – in order to identify areas and

[3] It should be noted, however, that in the context of commission work data and options for actions are produced – and sometimes are made available to the general public.

[4] It is important to mention, that even the IMFC has emphasized the necessity of CO2 emission reduction.

[5] There was a noteworthy situation in Cattovice in 2018, when the implementation of the Paris agreement was discussed. A young woman insisted on getting access to a discussion group with the argument that she would have to suffer the consequences of climate change – and not the grey-haired participants at the conference table – which do not want to give up their comfort zones.

[6] Randers 2012; see also Hölz 2012

size of losses each year. New research gives an account of the interdependence between climate (change) and weather incidences and their impact.
All this has got attention, sometimes even protest, many declarations and lots of paperwork (even contracts or laws) – with little effect. To declare this as an "implementation gap" – caused by another level of governance - seems to be a too easy excuse. But it is often done: like in the Brexit campaign (against EU commission), but also in China between central and local level governance (administration). In Germany there is a continuous struggle about the question: which state level pays for which policy? And of course, there are always implementation gaps – but this often is the consequence of false resource allocation. Two other observations from Germany should be added: shortly after the prolonging of atomic energy provision has been decided on, a complete reversal has taken place: the "energy-turn" after the Fukushima incidence (2011). What does this tell us about political decisions and implementation effectiveness? Are disasters the solution? In a recent conference of the German section of IIAS (Leipzig, 2018) it became visible, that the production and enforcement of rules and regulations become ever more difficult (impossible) – especially with regard to natural conditions and technological innovation but also with regard to multi-level governance.

What does this tell us about the outlook into the future and the chances of SDG2030 based reforms?

Described in very simple terms (i.e. with the model of medical treatment) it can be said, that

- we have lots of documented *symptoms* concerning the lack of sustainability (including the losses of various kinds)
- we have lots of *diagnoses* about causes and effects – even if many are debated
- we have many suggestions, sometimes even small-scale practical examples, for problem solving and improvements (*therapy*)

but we are not able to implement effective changes on a large scale in a national and even less so in an international scope (as often necessary).

The conclusion from these observations should be that we have to look for a sound explanation (*aetiology*) of the *continuous failures* concerning the establishment of a sustainable development. In other words: what kind of obstacles do we have to attack and to overcome? To continue with the reference to the model of medical treatment: one of the typical deficiencies of the aetiology (theory) is the focus on only one or too few factors with regard to the health condition (illness symptoms). *In the context of sustainability a complex-macro-theoretical framework is needed – to avoid an appeasement with small scale discussions*[7]. This should not imply an exclusion of concepts which focus on micro or meso-processes; but they are to be checked with regard to their possible contribution to the explaining capacity of the overall aetiology. To mention one example: with regard to policy making and implementation the "multiple-stream analysis" (Kingdon and others [8]) could be included. It looks at three streams (problems, policies, politics) and emphasizes the role of "windows of opportunity", in which these streams fit together[9].

[7] An example: when the „Green Party" in Germany suggested to introduce one vegetarian meal per week in canteens of some business organizations, they were accused to introduce an "eco-dictatorship" by many media and on Facebook.

[8] Kingdon (1984)

[9] It can be applied on the "energy-turn" in Germany.

When looking for a theoretical basis which might allow for an aggregation of many macro-components and various perspectives of observation – as defined by the SDG2030, the system theory of Niklas Luhmann (1927-1998) is a good choice.
It offers the necessary analytical complexity[10] to deal with the sustainability (resilience) issues – including the macro-level (society) of analysis. In contrast to similar approaches – like Beckert (2016)[11] – the analysis of communications about the "Society of the Future" refers to the broad set of societal subsystems and their interdependencies. This is to be seen as the result of the long-term evolution of large societies and an indicator of modernity/capability of modern states. Sustainability means in this context, that one of the mega-challenges for today and even more for the future will be *the balancing of these various functional subsystems of society* (with their different functions and codes of communication). This can also be formulated in negative terms: it is a strategy to avoid the "capturing" of one subsystem by another. When the political-administrative system (PAS) is taken as the main focus for such a "capturing", "failed states", "dictatorship", "civil war", and "religious suppression" etc. can be some of the extreme (negative) consequences of imbalance. However, these observations refer to countries which had already developed "some kind" of a functional differentiated society. There are other cases, in which such an evolutionary development has not yet taken place on a large scale[12]. It has to be noted, that some of the negative/disastrous consequences of this lack of functional differentiation in populous countries can be compensated by international exchange. Typical examples are some Middle East countries with oil-resources: it is not by chance that they are characterized by the word "resource malediction": they lack the incentive toward functional differentiation, because they can buy everything everywhere in the world.

Many examples of the recent developments also draw the attention towards a further element of the functional differentiation of societies: the necessary multiple inclusion of the population into these subsystems: into the political, judiciary, educational, economic, religious, medical, media system (and others). Thereby, also a link between the levels of observation is possible: from individual to societal.
It is quite evident, that a *scientific approach* toward these issues is easier, if the *self-description of a society* and its subdivision somehow corresponds with the basic categories used. For the German case, the Basic Law ("Grundgesetz") fulfils such a demand[13], because the legalistic German system can be seen as a fairly good representation of the basic architectures of society – notwithstanding many deviations and missing segments.

2. Theoretical background for the analysis of sustainability issues

System theory has many origins, sources and versions. They cannot be described here. The following discussion concentrates on the "functional-structural"[14] and "autopoietic" version of this theory as it was developed by Niklas Luhmann. His theory has a universal perspective which covers almost all segments of society. It focuses its observations on (social) communication.

[10] This characteristic has also its disadvantages: the complexity of the theory – which cannot be described in this presentation in all its details.
[11] His analysis of the risks of future developments is concentrated on the economic system (Capitalism).
[12] See f.e. the analysis of Lei (2018) with reference to China.
[13] However, this topic will not be taken up explicitly in this paper.
[14] Putting functions first has the advantage that the structures (organizations, institutions) are seen as varying in temporal and regional terms.

Systems are areas of dense communication which are empirically separated from their environment(s). The necessity to generate systems of communication is seen in the ever growing complexity and contingency of the modern world(-society). The function of system-building is the reduction of complexity and the coping with the unforeseeable: this ability can be described as a very basic and profound mode of resilience and sustainability. It becomes ever more important in a growing and ever more interrelated (connected), globalized world.
In the process of societal evolution different types of functional subsystems emerged, which are essential for the development and survival of all growing societies. They have organized their communication in different ways. This does not mean, that traditional modes of differentiation (territorial, hierarchical, centre vs. periphery) are not existing any more. They can remain as additions or might be "reinvented" for establishing a dictatorship, a kingdom or a cult. It is the advantage of this theory that it opens the view to different types of systems, their various functions and their multiple forms of functioning. One type of variation relates to the scope of communication systems: the simple social system = communication on the basis of personal presence; organizational social systems = systems which are specialized on decisions and which coordinate their communication basically by membership roles; societal subsystems = systems which fulfil specialized functions for society and use specific media and codes for each subsystem. The system of *world* society includes all communicators which can be reached by any communication.
The "autopoietic" character of the social systems strengthens the transparency of communication processes, because they can only do what they can do. They are closed in terms of internal operations (communication). At the same time the systems are open for "irritations" from the environment; sometimes they are even structurally coupled with aspects of their environment. Systems can observe the environment and its reactions to their operations. Nevertheless, the reactions to the observations are rebound to the system-specific internal communication. All subsystems exist/survive because their specific operations contribute to the functioning of society - when dealing with complexity and the dynamics of globalization. The problem of this differentiation is evident: *there is no centre of society (like a king), from which commands or coordination is expected and accepted*. Every subsystem represents society – but only in a specific way. The specifics are defined by function, media of communication and code. In this theoretical context – f.e.(!) - the PAS and the economy are different subsystems with different functions, media and codes; the economy: function = supply of society with privately produced, purchased and used goods and services; medium = money; code = payment - no payment. The PAS: function = setting of priorities for collective values/goals and the preparation and/or enforcing of binding decisions; medium= power and law; code =power (political majority) no power (political opposition); legal - illegal action. In similar formats the subsystems of education, public media, science, religion, law, health, family, civil society, …. are being defined. It should be noted, that the substructures (organizations, simple social systems) can vary between subsystems and different societies. They are analysed as "functional equivalents": f.e. different administrative architectures (more or less centralized or rather federal); f.e. different models of universities…However, they have to fulfil the same function by using the same code of communication. With other words: it is not essential to put a sign "hospital" on the building, if the only focus is making money – by keeping persons as long as possible hospitalized. It is the same functional subsystem as the pub which keeps guests drinking all night: they are part of the economic system (if the flow of money is guaranteed).
Subsystems are representing society – but only in their specific scope, based on media and code. And therefore – more or less – they depend on each other. This is the reason why they observe, irritate or even influence other subsystems. To avoid a complete separation of the subsystems or a

complete takeover by other subsystems – which most often will destroy their specific contribution to the survival and development of society – a kind of resonance and balance between them is necessary. This might not be visible with regard to small-scale tasks and practices, but it is essential for following/fulfilling programs like the SDG2030.

Before looking at mechanisms of inter-system-resonance two additional elements of the overall scenario have to be added. So far the systems under observation have been *social systems based on communication*, which needs a message, a way of transmission and a reception/understanding. The completion of such a process needs a "shared set of meaning". The basic achievement is the reduction of world complexity. Without such an achievement the world would end in chaos.[15] However, social systems have also to refer to two types of non-social environments: nature (ecology) and human beings (physical and mental disposition). If humans are not to be completely eliminated and nature is not completely destroyed social systems have to develop resonance towards these "external" systems. But this is far from self-evident – even for human beings who can participate in social communication/systems: this is not only a question of war but also of misuse in the economic and many other systems – altogether ignorance against basic human rights[16].
However, as the world society observes ever more scared, the problems of resonance are even more pressing with regard to nature. One of the reasons is quite clear: nature (flora, fauna, climate etc.) cannot participate in the social communication: people have to assume this role – like the pupils in Germany do it every Friday ("- for future"). Although there might be lots of controversial debates, many lobbyists and "merchants of doubt"[17]: the impact of the two external systems have more relevance (and often more effects) with regard to various subsystems of society: they cannot be easily ignored – as long as the world society is not accepting the entire substitution of humans by robots and/or the destruction of the globe. "Laws of nature" are not in the same way debatable as minimum wages for taxi-drivers (Uber?).
To use a category of resonance – which will be explained in the following section – it can be said that "double coding" is necessary: Any communication and decision prevailing in a specific medium and code of a functional subsystem has to observe and show resonance to the "human condition" and to the architectures and logics of natural environment. Although this might be unexpected – especially in contrast to the speed of global commerce – the demand for resonance with regard to these two "natural" environments include ever more often also time-calculations. Since many decades *sciences* have already contributed to this perception of time limits of specific developments – i.e. the wastage and damage of natural resources, the human footprint. Much more often scientific contributions have addressed the "conditio humana" (life spans, phases of psychic and physical developments) - because they are included in the communication processes. This fact has lead system theory to consider the *inclusion* of the population into the societal subsystems as an essential element: it is a possible way to ease/realize the above mentioned

[15] Some features of it can be already observed in the new net of digitalized media: nobody is able to receive and decode the masses of data, which "arrive" on the smart-phones: it is mainly data overload and not communication. How difficult it is to organize communication can be seen in any talk show – if the moderator is not able to stop the participants talking all at the same time. With reference to individuals the new development can be described as "loss of civilized behaviour" (in German language: "Rüpel-Republik"). This can be observed not only in the pattern of hate speech and shit storms in the media but also in the form of physical attacks on staff members of police and rescue organizations. However, there are also situations with long tradition: it is well known that administrative inspectors of food producing companies never execute their job without one or two colleagues.
[16] The Catholic Church can be chosen as a recent example.
[17] Including President Trump – when he said, that climate change is a nightmare, invented by the Chinese government.

double coding. People could and would include their natural features and capacities into the communication and – eventually - also their experiences/knowledge from other subsystems, in which they are also included. "The population" (civil society) therefore can be an important source for necessary observations and resonance (or even balancing) between subsystems (with their specific code). Nowadays this can be better observed if the opposite is case. Many explanations related to all variations of populism are dealing with the "exclusion" of parts of the population: from education, economy, health, science…- even politics. A quite different example is the mass-media system – which seems to be almost captured by civil society (based on Facebook, Youtube…). However, this might lead to the danger of disruption of this functional subsystem altogether. Open remains the question: who will finally "capture" the media system: The political system with Trump, Xi Jinping, Erdogan ….. and all kinds of fake news or news-suppression; the economic system – dominated by the "masters of the universe" (Silicon Valley), the security system (observation by police; secret service)….?

It is not the aim of the paper to compare the all/various functional subsystems (and their codes) with regard to their performance, the scope of inclusion of the population, their capacity for resonance (even balancing initiatives), their tendency to capture other subsystems or being captured etc. For the size and purpose of this paper it must be sufficient to characterize the selection of the fields of communication for further observations – guided by system theory. The political (incl. administrative) system is a good choice, because it has a high (formal) level of inclusion of people – at least in democratic systems. This implies a good position with regard to resonance towards other subsystems. Remarkable is also the large number of observer-positions held by the political system with reference to other subsystems (and their codes), which allows for some forms of "balancing". This reference is enlarged by the choice of issues/"demands" of the (external) natural environment: all subsystems are obliged to observe and react to conditions and developments of this natural environment[18]. But what kind of performance (actions and effects) can we observe in this field? Is there any kind of mutual resonance leading to a kind of harmonized reaction to ecological hazards?
Is the rather pessimistic perspective in the first part of the paper confirmed when looking at more details – which again will be taken mainly from Germany, which is not said to be a "back-bencher" in these fields of public policy? What kind of suggestions can be derived from the observations and the explanations put forward?

Before these questions are taken up, some additional elements of resonance analysis should be briefly described. The term "resonance" is used in many social settings – especially with regard to persons and their environment (see Rosa 2016). In the following it is used as an "umbrella term" for interdependencies between functional subsystems (or within subsystems)[19]. The social systems under observation are closed (on the basis of the modes of communication) but also open with regard to observation of other systems. Therefore, the interdependencies can be described with different focus points and with varying intensity - for example! -:
* *Observation of other systems*: scope and intensity.
As all systems are depending (somehow) on (many/all) others, observation is an almost universal feature; however, the scope and frequency might be very different – between overload and

[18] If the list of SDG2030 would be checked in detail not too many goals could be expected to possess these context conditions.
[19] Within each functional subsystem many social systems can be differentiated and observed. Lanfer (2016) describes "resonance-differentiation" as a mode of innovation within functional subsystems.

ignorance; - between permanent and sporadic observation. In many systems special "watch-units" have been installed.

* *Irritation of the systems as a result of observations*:

Irritation can be an internal effect of observations – it might change the internal operations on a regular ("retention") or sporadic/situational base; it might even function as a kind of stop-rule – f.e. when observing the legal system[20]. The scope of irritation is influenced by the scope of observation. The intensity of the effects depends on the ability of the systems to adopt new elements into their (specific) communication processes.

* *Double coding and structural coupling*:

There are fields of communication which are closely coupled: like public administration and law or education and politics. The processes within one system are depending on external conditions (other systems) – without being substituted by these environments. The most important example is the "conditio humana" as a precondition of communication ("interpenetration") and their co-evolution – as long as robots have not taken over.

* *System capture (destruction)*: Although such a situation seems to be unlikely in a society in which each subsystem depends on the fulfilment of other functions by other systems, it still happens (like in Turkey today – of even in EU-countries like Poland or Hungary[21]). This can be the beginning of the destruction of a functional differentiated society: chaos (failed states) or back to old models (like authoritarian models, dictatorship) – can be observed more often then expected and desired.

The overall development (evolution) of modern societies (with its population growth) stimulates the increasing complexity of the social world and its processes of differentiation – not only between but also within functional subsystems. As human beings are necessary elements of this development, their inclusion into the systems plays a crucial role. This also holds true for the "management" of the various interdependencies which were listed above. There are many instruments which try to strengthen the individual abilities on behalf of the reductions (not identical with elimination!) of complexity: communicating in various functional systems; meetings between "representatives" of various systems, task/job rotation, mediation and coordination techniques; work and travel, voluntary social year, adult education ….These are all attempts to reduce or compensate extreme specialization and narrow-mindedness. All of this can contribute to the complicated task of "balancing" societal system without a centre with universal steering competence/power[22].

As will be demonstrated more detailed in the following part, any attempt to balance the subsystems is facilitated – if not only made possible – by a boundary of a societal (national) system. It helps to decide about the systems which should be observed and possibly reacted to (in internal communication). If the boundary is the world society with global governance and globalized economy etc. the balancing task is almost impossible[23]. Therefore, the typical mode of

[20] The difficulties to establish and enforce stop-rules are well known as a kind of escalating process – whereby new rules are the consequences of strategic ignorance of previous ones (f.e. corruption, tax-evasion, crime…) and at the same time the new rules are blamed as an excessive bureaucratization.

[21] These examples can also be seen as a warning about the consequences: loss of societal capacities.

[22] The development of China under the rule of the CCP should be observed closely as an adverse case – where ever more terms are forbidden in public communication.

[23] Just three examples: if the economic system is observing the education subsystem (for staff recruitment) it might have to observe the respective system in many countries. The same challenge can be seen, if the companies are controlled by "their" administration with regard to human rights applied by their sub-sub-sub-sub-contractor anywhere in the world economy. Another type of challenge is the "alignment" of international cooperation on behalf of developmental politics and projects.

global governance is a kind of piecemeal strategy: small elements (rights, duties, prohibitions..) are selected for "irritation": but even if there are some of these elements defined – it is all but sure that they are also observed, accepted or implemented (elements of system internal communications)[24]. The problems can probably best be illustrated with examples from the EU – in which somehow a transnational level of balance is attempted.
And: this is not just the "Brexit" case – with the phrase "I want my country back".

3. Observation, irritation, balancing? Environmental protection in the multi level context

The previous analysis (aetiology) has indicated the important role of functional differentiation for the development of a capable modern society. But this has also shown demanding prerequisites with regard to the balancing of the interdependence of the subsystems– often with the broad inclusion of the population. Coming back to the SDG2030 – and excluding other societal conditions (like dictatorship, fallen states, chaos etc.) - it could be shown, that all goals with regard to nature (environment) are extremely demanding, because all subsystems are affected. The balance has to take place on various levels of world society – which enlarges the general handicap: nature does not communicate. This handicap is reduced because natural science can communicate in a less "constructive modus" – also on an international level (see ICCP). This does not mean, that this communication is always observed by other subsystems and that "doubt merchants" are not prevailing. To achieve a balanced reaction to the natural system is one of the most convincing examples of what was called a "highly unlikely" reaction/solution to the complexity of modern world society[25] by Niklas Luhmann.
Counter-narratives are often based on economic interests. The following examples focus the interdependence of the subsystems economy, politics/administration and civil society. All levels of world society are included.

3.1 Global level

The following selection of the SDG2030 describes the necessary resonance with regard to the natural system. Goal 12 is especially concerned with the "irritation" of the economic system. The context is – primarily - each society (national level):

Goal 12. Ensure sustainable consumption and production patterns
12.1 Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.
12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.
12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

[24] Child labour is forbidden in Germany – but how about German companies in African countries? Who can and will "irritate" the business organizations?
[25] In his book about ecological communication (from 1986) he had shown, that this problem was solved – during many centuries – by resonance with regard to the religious system: the protection of nature as a divine demand.

12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.
12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.
12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.
12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.
12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.
12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities.

Goal 13 has its focus on climate change and for this the demand for resonance is enlarged in terms of scope and levels (world society):

Goal 13. Take urgent action to combat climate change and its impacts*
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
13.2 Integrate climate change measures into national policies, strategies and planning.
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.
13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

The background paradox of the long list of necessary actions concerns the existing/possible "predictions" of some (climate) developments on one side and the continuous inability to solve the conflicts over priorities, distributive justice, responsibilities etc. on the other side. A special topic is related to the question, how different parts of the world are affected by climate change, whether the polluters are also the most affected – and – finally - whether we all are somehow sitting in the same/one boat (earth). This latter question draws the attention to the possibility of a small group of

very rich people[26], to organize their survival individually – f.e. by buying a shelter in one of the US missile-silos or an "island" in the orbit, as the movie "Elysium" describes.
The (possible) solutions for those conflicts are also prevailing topics for traditional theoretical discourse: on the level of decision making processes the discourse concentrates on the "common pool" resources and the "tragedy (i.e. overuse) of the commons". In the context of rational choice models the Nash-Equilibrium is seen as the expected outcome: opportunistic short term benefits are dominating the choices. The key problem of these models is the *normative* turn: the "prognosis" is turned into an advice. From this point of view the only alternative is seen in a hegemonic (despotic) power structure. Elinor Ostrom argues against these propositions. She claims that there are *various modes* of rational behaviour. To improve cooperative behaviour she proposes four mechanisms: direct (inter-personal) communication; sanctions against opportunistic behaviour; establishing a learning background for cooperative behaviour (starting in schools); good examples of altruistic decisions – to strengthen cooperative principles (Ostrom/Walker 2003, 19pp).
The observations based on system theory have the advantage to specify the diverse logics of the "addressed" functional subsystems and their autopoietic communication. Against the background of the replicated diagnosis - complex and contingent resonance and balancing problems - the "typical" practical advices appear highly simplified. This is even true for all suggestions concerning global communication: Although people meet in the international G20 conference they cannot be sure to communicate with actors of political systems (with a respective function and communication code)[27].

3.2 National/European level

Looking at developments (communications) on the national level (Germany), we can refer to a somehow complete functional differentiated system, but it is not balanced with regard to the natural system environment. Partially this is co-influenced by the European Union and its role in environmental policy making. The main reason, however, is the dominance of the economic subsystem. During the last years the scandal about automobile-emissions is the most prominent example. Here, the German national government has always tried to prevent any stricter (European) level of emission control. Whereas some of the large companies have paid lots of money in the US to consumers and to the state, the German government has even hidden an expertise which has shown acceptable ways to improve the emission reduction of many cars. One of the first statements of the new government (2017) was to announce that the (in Paris) proclaimed target of CO2 emission reduction (by 2020) will not be achieved. The coming elections for the EU parliament (2019) have stimulated a new debate about the establishment of a CO2 tax (or any equivalence). The debate/conflict about the *alternative strategies* has "saved" the actors from taking decisions. The car industry is one area in which the political system is not only structurally coupled with, but almost captured by industry[28]. One typical mechanism is the fast and easy rotation of politicians to positions in the economic system.
However, there are other areas in which resonance (with regard to human and natural environment) is missing. A new business-related example is the purchase of the Monsanto-company by the Bayer-holding (chemistry for the agri-business). One politics-related example is the decision, to take the prohibition of open air cigarette advertising from the "to do list" of the government. Germany is the only country which does not follow the respective European initiative.

[26] 47 of them hold as much capital as the rest of the world.
[27] It could be an oligarch, a business-boss, a religious leader, a general, a dictator of any kind….
[28] Nota bene: the government holds 20% of the Volkswagen-shares.

Transparency is one of the key aspects to make the (im)balance of functional subsystems visible. Although there is a respective court decision, the German parliament is not willing to list the lobbyist in Berlin (probably 4 or 5 times the number of parliamentarians). The same holds true for the question, which donations are given to the political parties or individual members of them (problem of corruption). Watch-organizations as part of civil society have only seldom any effect (f.e. on corruption): communications are fast and easily replaced by new communications. This is a typical rather new problem of resonance management: the speed of data transmissions in the new media – which do not allow for (time-demanding) communication.

In this context the inclusion of the population – here especially as consumers in the economic system – plays an ambivalent role. Although data are available and presented, resonance to ecological consequences and risks of mass consumption is often missing. This might even be an occasion, in which the following phrases will be cited: "We do not allow our living standard to be questioned"; or: "Why are we going to drive the same cars in the next 200 years? Because we want it"; - and the like: no end of the dominant sale of SUVs to be expected; new records in 2019. To pick up some further examples – again from Germany: 1. companies are successfully opposing sustainability standards in public procurement procedures; 2. each person has used 71 plastic bags in 2017 (average in the EU: 178) – with some reductions lately: although the negative effects on the environment are well known; 3. the scandal about manipulated emission rates in cars (VW etc.) has revealed, that public (control) authorities have known at least some of the facts since a long time – and did not intervene; 4. There are many new applications of German airports to extend their territory and number of flight slots; 5. Every day 78 ha of land are being sealed in Germany; 6. There was an "outcry" in the public when the Green Party suggested the introduction of *one* veggie day each week in public canteens ("eco-dictatorship"); 7. Young people active in the "Friday for future" initiative are criticized: "leave the problems to be tackled by experts" 8. Ever earlier children are "trained" as mega-consumers by electronic media advertisement[29]……..

3.3 German initiatives (regional level)

Various rates of emission – especially from cars – are much higher in some of the larger German cities than allowed by WHO and European standards. These cities somehow are forced to keep some types of cars from entering specific (central) city areas. On the other hand there are increasing numbers of severe weather related damages (from storm, rain, hail etc.). Insurance companies offer detailed information about this development. All this puts the nature/climate issues ever more often on the regional/local level of a society. This includes an important role of the citizens (civil society) and the addition and extension of *adaptation* issues in contrast to "traditional" protection issues (mitigation). This shift indicates that many of the goals of environmental policies have not been effective and sustainable. Again, the topic for the more abstract discussion remains the question of the balancing between functional systems. One of the indicators is the allocation of this task in the architecture of public tasks (ministries, offices etc.): in Germany there is always a debate, whether the energy policy should be part of the ministry (offices) of environmental protection. Another indicator is the fact, that – in spite of many attempts – it was not possible to build up a law-book for EP ("Umweltgesetzbuch") to summarize multiple areas of resonance - although there are lots of regulations in use in Germany: 82 laws/165 decrees.

[29] About 200 billion US$ are "invested" every year worldwide into advertisement.

These and similar developments have fuelled *regional* strategies. In the following an example will be described: The development of an "Umweltschutz-Plan" (environment protection plan) – designed as a multi-level *participatory approach* towards the implementation of an "Umwelt-schutz-Gesetz" (Environmental Protection law) in North Rhine Westfalia, Germany (2013).

§3 Klimaschutzgesetz
defines the goals of climate protection ("Klimaschutz-Ziele")
(1) Emission reduction (base 1990) by 25% (2020); by 80% (2050).
(2) Measures/action: protection of resources; energy saving; priority of renewable energy; energy efficiency
(3) Limitation of negative effects of climate change by sectional/regional adaptation

§ 6 of the law defines the development of a climate protection plan:
* The state government develops under a comprehensive participation of societal stakeholders and communal associations the climate protection plan, which will be finally decided upon by the NRW parliament.
* First version of the plan 2013; revision every five years.
* Goals: reduction of emission rates; renewable energy gets priority (energy turn); energy efficiency; defining the possible contributions of all societal sectors; including measures of adaptation; regulating financial issues with regard to this policy, etc.
The process of preparation takes place in two phases:
* Autumn 2012: start of concept development by 400 experts: six working groups (sector-specific); 4 workshops (issue-specific); Proposition of strategies and measures/action
* NRW Climate Congress Dec. 2013: Results of concept phase were presented to the public; the role of NRW in the national and international climate politics was discussed
* Diffusion, differentiation and networking Dec.2013 – March 2014 (online interviews; small scale congresses and workshops)

Explanation of the graphic:[30]

[30] *Concept development (expert meeting/workshop);Mitigation: Energy Transformation; Industry/business; Construction/buildings; Traffic; Agriculture, Forestry, soil; Private households; Adaptation: Information, Education;*

The 6 working groups have developed 258 propositions – the largest number in the building-/construction segment. *About half of the propositions are qualified as controversial*. In an open participatory process all kinds of actors could write their comments to these propositions or add some further elements.
Many organizations endorsed the request for participation - as the example of the *Essener Klima-Agentur* has shown:
Klimaschutzplan mitgestalten ("please engage in the development of the climate protection plan")
"Climate protection is one of our central issues for the future".
"The Online-questionnaire can be used until February 21st. 2014 at www.klimaschutz.nrw.de".

The participation was very intensive; however, the stakeholders of different economic/business branches were dominating. The list of activities/measures to be taken: 154 concerning mitigation; 66 concerning adaptation. Quite a few propositions have been omitted, because "it would not be possible to implement them" (?). On Dec.17th 2015 the plan was accepted by the Landtag (NRW parliament); a review and adjustment is planned for every five years. As the list of goals already indicates, the catalogue of future action is a long remuneration of compromises between economic interests and climate hazards. No radical shift of production or consumption is to be expected. Whether the only "red border line" – the warming up by 2 degree Celsius or less and its locally defined preconditions – can be realized, remains an open question. The "success-story" of the state government contains mainly a list of activities – including many groups/organizations of civil society - and only little effects regarding the level of CO2 emissions.
In the context of these and various other participatory debates and suggestions, a growing emphasis on *adaption* to climate change can be observed in many similar initiatives. It leaves the question open, whether this means a retreat from the expectation of a successful climate protection strategy.
In 2008 the German government has formulated the "Deutsche Anpassungsstrategie an den Klimawandel" (DAS: German Adaptation strategy to climate change). Parallel initiatives have been taken by the EU-Commission: Whitebook 2007; Greenbook 2009. It is the concept for dealing which future contingencies (resilience), following a lack of mitigation impact.
Because of the little progress in all of these issues – and almost no effect on CO2 and other emissions, in 2019 the first German cities declared a status of "Klimanotstand" (state of emergency with regard to climate issues): all energy and mobility related policies are set under the restriction of ecology/sustainability. This can be seen as an example of controlled "double coding".

3.4 Local level

rural districts; industry/ craft; 4. dwelling areas; Differentiation/Networking for general public: Online interviews; local administration congress: local business congress; citizen round table; Suggestions; Plan formulated by government; Plan decided upon by parliament

As many policies concerning sustainability are developed on the European level, the possibilities and difficulties of local implementation have to be considered: many of the effects of policies are not systematically controlled.

In an empirical study (Grunow 2002) EP administrators of 87 cities (N=98) were asked to describe the most pressing (local) implementation problems –concerning European rules and regulations; the most often mentioned problems were:

- Unclear delineation of responsibilities 19%
- complicated, contradicting implementation rules/too much paperwork 18%
- laws are ambivalent in goal definition etc. 10%
- conflicting traditions of rule of law in Europe ("misfit" for Germany[31]) 10%
- lack of resources (staff) for implementation tasks 6%
- ….
- High expenses for coordination tasks 3%
- Lack of acceptance by politics and population 3%
- The implementation problems which were specified by the local experts differ with the various public policies: Flora Fauna Habitat FFH (46 %); UVP (38%); waste water (35%); garbage (30%), emissions (22%).

This again is a good example not only for the problems of resonance to natural environment but also for additional complications caused by the multilevel interdependence: the functional subsystems are often manifold in the EU member countries. This can be tested especially on the local level of politics and public administration. The lack of intersystem-resonance on higher levels is witnessed especially in the implantation phase of public policies.

Some evidence with regard to the scope of resonance (observation, irritation, structural coupling) has been collected from empirical research in the city administration of Duisburg: expert interviews in 35 administrative units[32] have been focused on the following topics:

- Relevance of EP issues
- Special tasks in the EP field
- General network partners
- Special EP network partners
- Outlook on climate change and EP in the city

Results: Relevance of EP-issues in various offices (policy fields) and their inclusion in (number of) EP-networks

[31] This is a well known problem of multilevel arrangement: especially the bottom-up communication – to share implementation procedures and problems - is often not sufficient.

[32] (Grunow 2014) A first result was the first contact on behalf of an interview-appointment: first reaction: "you should ask/contact the office for environment protection – I am not responsible/competent".

High relevance	Some relevance	Little relevance
Env.Prot (8)	city development (5)	education (2)
Health (5)	infrastructure (0)	city archive (0)
Consumer (10)	regional developm. (1)	culture affairs (0)
Veterinary (5)	city research (4)	youth (0)
Fire brigade (0)	social/housing (8)	communication (0)
Regulatory author.(6)	city marketing (0)	*finance(0)*
Real estate management (4)		a*ccounting (0)*
Water management (17)		
Construction (4)		
City planning (5)		
Strategic city development (11)		
Sports (0)		

The results show an extensive observation of the natural environment (issues) but a very heterogeneous degree of inclusion in communication networks. In addition: most often these networks are established on the basis of "single issues/cases/problems/catastrophes"; they often lack the background structures for continuous observation and communication[33].

3.5 Individuals (population, citizens)

In the context of the studies cited above, representative population surveys (2010, 2012, 2013) (Grunow 2014) have been included. In addition to surveys from public institutions (ministry of environmental protection etc.) our studies have focused on the *adaptation* to climate change. The results can illustrate a few implications of these issues for the perception of the citizens (from this region: the Ruhr District/North Rhine-Westphalia).

In the context of the interviews we could observe ambivalences with regard to the actors involved or concerned. Although there is a high level of awareness related to climate change issues: there is some interest in further talk but only little willingness for private action ("Ecological Behaviour"): *completely agree* concerning switching off the light (if not needed) almost 70%; concerning the use of public transport instead of own car about 30%; concerning acceptance of higher prices for renewable energy about 20%; concerning the changing of living place for ecological reasons less than 10%.

In detail: EP: Role/Perception of the German population

- The priority of EP-problems is varying, but not generally very high in the German public. If questions in surveys are formulated in an open format the EP-issues are usually named by 5% (+/-) of the population as a most important political problem. On the other side we have quite stable answers (2/3 to ¾ of the population) concerning the fear of unemployment of lack of security.
- Two thirds of the population shares the opinion, that the German government should take a leading role in EP-policies and they see Germany already advanced on this path.
- Two thirds of the population support further EP-actions only if their quality of life is not affected negatively.

[33] See also similar observation in a study on social policies in Hesse/Germany. The respected research was done from 2000 to 2008 (Grunow et.al. 2008/2011)

- Only 8 % are members of EP-organizations. It seems that political support is very high only if others (like industrial plants) are affected.
- Judgment of the population about the possibility of problem solution by PAS: about 60% of the population in Germany see little or no chance; a third of them is awaiting "some chances" for problem solution; only 5% are sure about it.

The results from the survey in the Ruhr-District can illustrate some implications of these issues for the perception of the citizens.

- about 80% of the citizens think that climate change and its implications are important public issues;
- almost 50% agree that they are already affected by climate change implications (storm, heavy rain, flooding, heat);
- the respondents use various media for information; more than 80% are following the discussions in the mass media; even more are discussing the issues in the context of peers/ family;
- many citizens (40%) feel uninformed – especially with regard to strategies of adaptation (to climate change) and about the implications and side-effects of the strategies;
- more information is demanded especially from mass-media, NGO (environment) and public administration (all about 80%);
- only 15% see local politics and administration making a "good job" on behalf of environmental protection; 60% see local politics too little engaged in adaptation initiatives (concerning climate change);
- more than ¾ of the respondents agree with the following statement: whether some progress is made in the context of environmental issues depends on the initiative and pressure of the citizens;
- between 30 and 50% of the respondents are willing to engage in various forms of public participation (with regard to environmental projects/programs)

Table 1: Citizen Participation

Table 2: Ecological Behaviour

These research results deliver some insight into the consequences of insufficient inclusion of the citizens into functional subsystems: rather little resonance to the various dependencies between social subsystems and the natural environment system. It also emphasizes the importance of a complex theoretical approach to understand the prerequisites for effective sustainable development on all levels of world society.

4. Concluding remarks: SDG2030, good governance and functional differentiated societies

The examples which were chosen from recent German developments and failures have provided evidence of the special situation of the external (natural) systems: the demand for high levels of resonance in all functional subsystems (and their codes) – often in a multi-level context. Initiatives towards an all-inclusive balancing are often (and well-founded) expected from the political/administrative and from the civil society: in many highly developed and democratic countries the level of inclusion of the population is very high. It is highly affected by

environmental developments (air, water, food; flora, fauna; climate, weather…). In these countries (societal systems) – an eco-dictatorship is quite unlikely (although sometimes evoked). Against this background it is justified to ask, how environmental SDG2030 can be addressed and balanced by the political/administrative system. One of the often given answers is the referral to the principles of "good governance"

- Respect for the rule of law;
- openness, transparency and accountability to democratic institutions;
- fairness and equity in dealings with citizens, including mechanisms for consultation and participation;
- efficient, effective services;
- clear, transparent and applicable laws and regulations;
- consistency and coherence in policy formation;
- and high standards of ethical behaviour. (Homepage of OECD)

Although these goals are not as old as the propositions of the Club of Rome, they also lack convincing effects on a large scale.

"John Gerring spelled out eight "criteria of conceptual goodness" that provide a useful framework. Four of these criteria are especially relevant here:

- First, "good governance" lacks parsimony. Unlike good concepts, good governance has endless definitions, and we always need the details of each to understand if we are talking about the same thing.
- Second, "good governance" lacks differentiation. Well-governed countries often sound a lot like functioning liberal democracies, for instance, and it is not clear how they differ.
- Third, "good governance" lacks coherence. Its many possible characteristics — from respect for human rights to efficient banking regulations — do not clearly belong together.
- Fourth, and most important, "good governance" lacks theoretical utility. It confuses, rather than aids, in the formulation of theory and the related project of hypothesis testing, not least because the concept is so fluid that analysts can easily define it in the way that best fits their data. " (http://www.stor.org/pss/3235246)

From the perspective of system theory, they main deficiencies should be described as the omission of the modes of intersystem-resonance and attempts to balancing the intersystem penetration:

- How is the observation of the natural environment organized in various subsystems? (problem: lack of resonance – because the natural system does not communicate)
- How is the observation between subsystems and their mutual irritation taking place? (problem: too much resonance – because of the "overload" with incomprehensible varieties of observation)
- Is there a mechanism of establishing stop rules ("red lines") for the internal communication (practices) within subsystems (retention, sunset-clause, impact assessment…)?
- Are modes of double coding (structural coupling) available – without the danger of capture or system destruction? How about the resonance between political subsystem and civil society: a basis for inclusion and balancing irritations?

- Is there any resonance (observations/irritations, double coding) possible between comparable subsystems on different levels – if some elements/breakpoints should be included in all these systems: f.e. international law and standards (what is the appropriate language?). How about the specification of "functional equivalents" with regard to the respective subsystems?

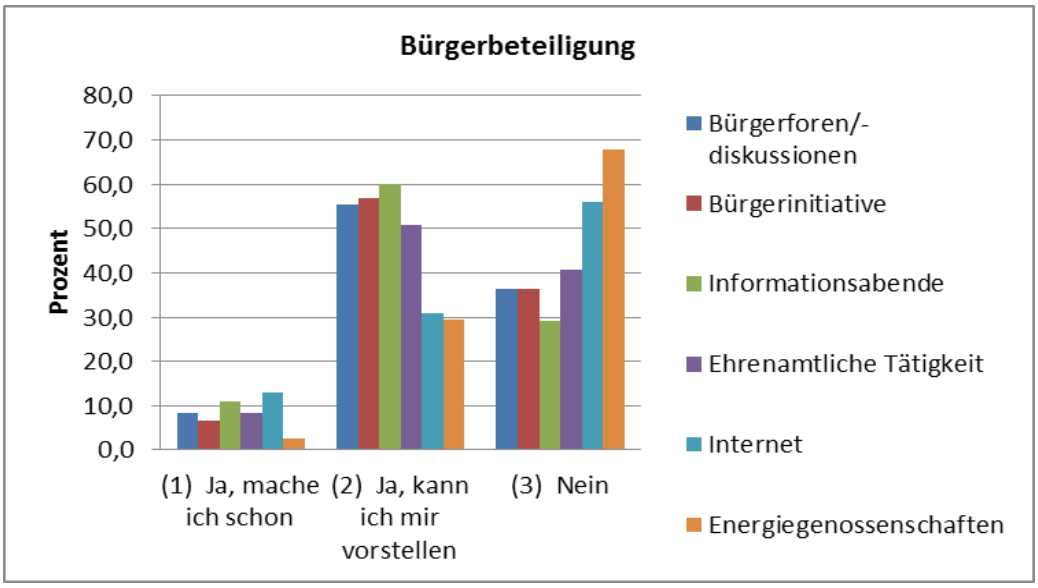
In the report of the UN – Committee of Experts on Public Administration (April 2018, Summary) suggestions with regard to the SDG2030 have been formulated:

"The Committee stressed that the indivisibility and the urgency of the Goals made policy and institutional coherence a priority. It suggested three pathways to improve coherence. First, institutional and policy coherence should be promoted together and should be context-sensitive and inclusive. Second, the promotion of coherence requires structural attention and coordination and a broad range of tools and might need specific work programmes or reforms. Third, there is scope for a global peer-to-peer learning mechanism to support the necessary change of structures, processes, skills and mindsets and to promote mutual learning, networking and knowledge exchange by all relevant stakeholders. In addition, national public administration schools and other training institutions should integrate the promotion of coherence for the Goals in their curricula."

This list is addressing some of the problems on the way towards the target achievement. But it is too sketchy: the lack of a theoretical basis is striking. With other words: "context-sensitive", "inclusive", "coordination", "learning", "networking" are relevant markers – but without theoretical coherence. This is the reason why so many of them are well-established but only little effective.
The paper has tried to argue about the causes: the balancing of functional (social) subsystems of societies which communicate in completely different formats (medium, codes, goals, programs) with regard to the natural (not communicating) environment needs a comprehensive theoretical basis (world society) for the observation ("symptoms"), interpretation ("diagnosis"), explanation ("aetiology") and goal attainment ("therapy") – concerning the SDG2030.

Table 1: Citizen Participation

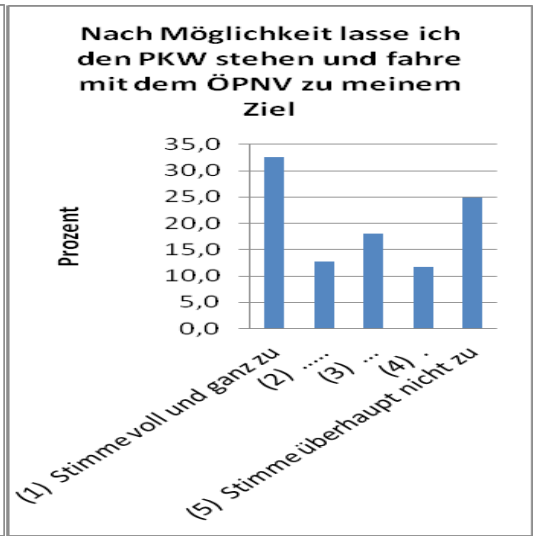
Discussions; Initiatives; Information-meetings; voluntary activities; Internet; energy cooperative: (1) I do already; (2) I might do it; (3) no interest



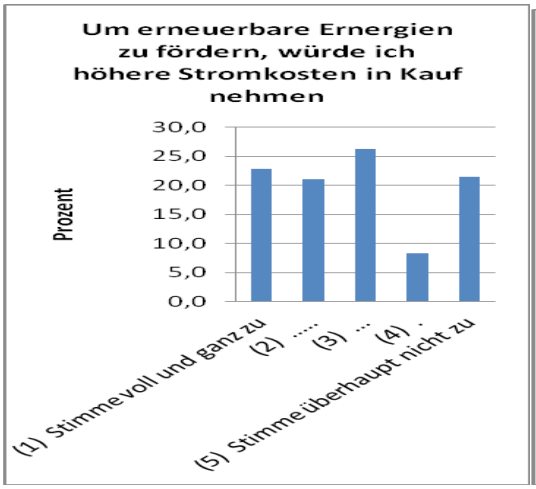
<u>Table 2: Ecological Behaviour</u>: (1) completely agree…….(5) completely disagree

Switch of the light in the room

public transport instead of private car



Accept high energy prices to foster renewable energy



Change living place for ecological reasons

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[34] The list of references does not only include the cited literature but also additional sources as bases for the analysis.

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