

Climate justice from a club good perspective

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Abstract

Purpose – The purpose of this paper is to apply club good theory to challenges in climate justice and to identify the opportunities for creating a club of countries or regions to support climate justice and/or mitigate climate change, as well as the threats that such clubs could lead to the real exclusion of large parts of the world from climate justice.

Design/methodology/approach – A theoretical analysis is provided regarding the conditions for creating a club for climate change mitigation. Indicators of good governance and trust, as well as the Notre Dame Global Adaptation Index (ND-GAIN), are used to assess the capacity for creating such a club.

Findings – While opportunities for achieving climate justice are identified, climate change mitigation is likely to be at most a club good at the global level, thus excluding the most vulnerable countries, regions and groups of people. Although the threats of climate change may be acknowledged, they are easily neglected. Economic growth is likely to be a condition for economic sustainability, which in turn tends to be a condition for environmental sustainability. Decision makers should be conscious of the potential danger of creating a club for climate change mitigation based on the belief that economic growth and technology will solve these problems, as such a club is likely to be either unsustainable, or very small, while deepening existing injustice.

Originality/value – The authors provide an overview of the complexity of issues involved, to gain an appreciation of the vast, perhaps insurmountable, challenges facing climate justice. A club good approach is applied to issues of climate justice, emphasizing the limitations of the all-inclusiveness of climate justice and sustainable development.

Keywords Good governance, Climate justice, Capacity for climate policy, Club goods, Institutional equilibrium, Unequal development

Paper type Conceptual paper



1. Introduction

As knowledge about climate change increases and its consequences are already being felt, awareness of the threats climate change poses to the sustainability of societies on a global scale is rising. Evaluating these threats is generally extremely hard and their effects are unequally distributed, in particular they hurt poor countries (IPCC, 2014). This contradicts the principles of sustainable development, which are often supposed to be an all-inclusive concept, attempting to assure a high-quality of life for current and future generations (WCED, 1987). In the face of the limited resources on our planet, a solution to the *Grand Pursuit* for prosperity (Nasar, 2011) is, generally speaking, either economic growth by way of innovation and technological development, the

redistribution of current world consumption and production (Sachs, 2005) or the exclusion of large parts of society from prosperity. While an impressive increase in income and wealth has been achieved (Sachs, 2005), the current capitalist economic system is open to permanent crises (Foster and McChesney, 2012) and unable to provide distributional equity (Piketty, 2014). The current global economic system is already based on the exclusion of a large part of the global population from the chance to lead a good life (Castells, 1998), while it is also questionable whether the most developed countries and affluent people will be interested in climate justice (Gardiner, 2010).

For this reason, the authors invoke a club good approach to assess challenges in climate justice. An introduction to club good theory will be provided, and the reasons for a club good approach to climate change will be discussed. The following questions are addressed: is climate justice actually a kind of club good and how could countries or regions using this approach produce climate justice on a regional or global scale?

After a theoretical elaboration and discussion of the importance of sustainability governance, the prospects for creating such a club are assessed. These prospects are discussed based on a comparison of a selected group of countries, using World Bank indicators of good governance, indicators of trust and the Notre Dame Global Adaptation Index (ND-GAIN).

It is argued that when action is undertaken to mitigate climate change or adapt to it, the developed world is unlikely to take care of the less developed world, with positive effects perhaps only being achieved as “collateral benefit” arising from spillover of their policies. Although opportunities for achieving climate justice on a global, all-inclusive scale exist, in practice climate change mitigation on a global level is likely to be at most a kind of club good. Even when the threats of the effects of climate change are unquestionable, economic aspects of sustainability will receive priority over preventing climate change. This seriously challenges the principles of climate justice.

2. Club good theory

The origins of club good theory can be traced back to the work of economists such as Pigou (1920), Knight (1924) and, in particular, Buchanan (1965). The theoretical framework was developed in more detail by Cornes and Sandler (1996). A club good can be defined as a good for which no or partial rivalry exists, while exclusion is possible (Sandler, 2001). It is “an association of economic or political units, voluntarily providing a common good, where costs and benefits are shared among members” (Platje, 2011a, p. 242). For such a club, partial rivalry exists in the form of crowding. This is important in the context of sustainability governance, discussed later in this article:

Crowding appears as [organizations and public institutions] have limited capacity – up to a certain number [...] of users, as with road infrastructure, there is non-rivalry in use (Platje, 2011a, p. 243).

Crowding leads to delays and factual exclusion when it reduces access to common goods as well as the club, in turn reducing opportunities for participation in the creation of such common goods. This contradicts the idea of all-inclusiveness of sustainable development (WCED, 1987; Rao, 2000).

A club good can be produced by four different technologies (Sandler, 2001):

- (1) The level of such a public good created by summation technology depends on the “sum of all individual contributions” (Sandler, 2001, p. 46). This concerns the

reduction of greenhouse gas emissions, where each country, company or individual may contribute.

- (2) A best-shot technology, like a technology making cheap solar energy available for all, means that a public good can be produced by the party making the largest effort.
- (3) For a weakest-link type of public good, only the smallest effort counts. Examples are protection from insurrections, terrorism and closing borders to climate refugees. The properties of such goods are a reason why clubs for preventing climate change are unlikely to be sustainable.
- (4) An example of a weighted sum technology is a global information and early warning system on (e.g. climate change threats, initiatives and good practice), especially for conflict prevention and to support conflict regions (Bleischwitz and Bringezu, 2007, p. 11).

3. Reasons for a club good approach to climate change mitigation

Assessment of the threats of climate change is generally extremely hard. The causality of these impacts is often indirect, erratic, non-linear, transnational or obscured, as they aggravate landscape- and resources mismanagement. They are disputed within society in general and by powerful interest groups, resulting in chronic uncertainty in attributing events to climate change (Oreskes and Conway, 2010; IPCC, 2014). Even when the threats of climate change are acknowledged, they are likely to be neglected, while production and consumption patterns remain unchanged, and economic sustainability will continue to receive priority.

Based on an analysis of 22 peer reviewed studies on climate sensitivity, Weitzman (2009) argues that an increase in mean temperature by 10 and 20°C may have a 5 and 1 per cent probability, respectively. As Allen and Frame (2007) argue, the world as we know may cease to exist after warming by 4°C, as presently unknown feedback effects could lead to runaway processes. The fundamental problem in understanding the possibilities of catastrophes resulting from climate change is that they are low probability future events surrounded by huge uncertainties, as science is unable to provide precise predictions (Taleb, 2012; Platje, 2015). This uncertainty about climate change, according to Weitzman (2009), results in even larger uncertainties regarding welfare effects. As a consequence, there is also large uncertainty about the distributional effects of catastrophes.

When the probability of total collapse of life on the planet is perceived to be low, politicians and policy makers may be very cautious to propose the sacrifice of socio-economic development to prevent this. On the other hand, one cannot prove the success of such sacrifice on the basis of what was unlikely has not happened (Tetlock, 1985; Kahneman, 2011). Thus, it may have to be proven that some disasters are the results of climate change, to obtain credibility.

However, even when climate change is scientifically proven, and examples of disasters caused by it are shown, it remains a question as to whether there will be more acceptance of climate policy and whether people will think that the theory of climate change is more credible. Most people, and even experts, have difficulties in understanding statistical phenomena (Kahneman, 2011), like the frequency and intensity of hurricanes, making it difficult to interpret an individual catastrophe as an

undisputable example of climate change. Furthermore, climate change contributes to, for example, droughts, in turn causing water shortage. This can be the cause of various conflicts, as it influences agricultural output negatively, as in Syria (Femia and Werrel, 2012; Gleick, 2014). However, as climate change is only one of the causes of increasing water shortage, aggravated by, e.g. water mismanagement and population growth, it is difficult to point to climate change as a direct source of the problem.

Although strong arguments exist for opportunities for creating and maintaining prosperity without growth (Jackson, 2009), economic sustainability is likely to be a condition for environmental sustainability, while economic growth is likely to be the basis for economic sustainability. While climate change may lead to the collapse of civilization, the socio-economic and political systems are probably more threatened in the short term by a (perceived) crisis than the ecosystem. A decrease in production as such would cause a socio-economic crisis, which may be perceived as too high a cost for preventing climate change. As a consequence, prevention or adaptation by way of eco-efficiency and innovation are most likely to be accepted by society (Steurer *et al.*, 2005, p. 273). This is in accordance with the so-called techno-centric paradigm (Gladwin *et al.*, 1995), where it is assumed that growth and technological advance will solve all problems, while ecosystems are supposed to be resilient. When resource efficiency does not increase enough or no technological breakthrough takes place (Scenarios 1 and 2 discussed below), this leads to the need of excluding large parts of the world population from prosperity (i.e. prosperity as a club good).

People seem to have rather unlimited wants for consumer goods (Smith, 1998, pp. 152-153), while a loss of, say, 100 euro of income may give a larger disutility than the utility gained from an extra 100 euro (Kahneman, 2011). This makes them averse to sacrificing income to prevent climate change. Furthermore, people seem to prefer measurable objectives (Hutchison, 1964, p. 155) which give direct, short-term and certain benefits, over indirect, long-term and more difficult to measure uncertain benefits in the future (Platje, 2013). Preventing climate change creates short-term, certain and directly measurable costs, while the benefits of preventing a disaster are long-term, uncertain and less visible. At the macro level, growth may be needed, to keep unemployment low, as innovation may be labour saving (Stiglitz, 2010). As a consequence, eco-innovation aimed at climate change mitigation may trigger off increased demand for growth.

As reducing CO₂ emissions by way of voluntarily reducing production and consumption is very unlikely, the following six scenarios remain:

- (1) A technological breakthrough leads to such a radical reduction in the energy and resource intensity of production, that CO₂ emissions and concentrations will be reduced to a level where climate change will be prevented (Weizsäcker *et al.*, 2009).
- (2) A technological breakthrough will make solar, nuclear and/or other types of energy available in such amounts and at such a price, that fossil fuels are not needed anymore, causing CO₂ emissions and concentrations to be reduced to a level such that climate change will be prevented (King *et al.*, 2016).
- (3) The effects of climate change turn out to be of at most limited consequence.
- (4) A disaster occurs at a certain moment in the future (Schwartz and Randall, 2003), leading to a global economic and political crisis strengthening the incentives to change production and consumption patterns.

- (5) Mankind is able to adapt as a whole to climate change (for a discussion on policies and strategies, see [Lim and Burton, 2004](#)).
- (6) Only a club of countries, regions and/or group of people are able to adapt, while people outside this club will face the risk of a disaster scenario.

It is unlikely that nothing will happen (Scenario 3), as climate change is already taking place, and its threats are recognized ([IPCC, 2014](#)). If current developments continue, a disaster scenario some day in the future definitely seems possible, putting doubt on the likelihood of scenario e, mankind being able to adapt as a whole. According to Scenario 1, the world would still rely on fossil fuels, implying the need for an eventual technological breakthrough leading to unlimited access to, e.g. solar energy (Scenario 2), solving the problem of climate change. This public good (a so-called best-shot technology) ([Sandler, 2001](#)) can be developed by a club of technologically advanced countries. It eliminates the need to use fossil fuels ([IPCC, 2013](#), pp. 486-487). This prevents or mitigates climate change under the condition that all the problems related to the adaptation of equipment, cars, machines and heating systems can be solved, economic disturbances can be prevented or mitigated, and such technology can easily be transferred to less developed countries and regions.

However, when energy supply is perceived to be unlimited, demand increases and incentives to improve energy efficiency weaken, while new activities and modes of production and goods continue to appear. This strengthens the belief that technology and growth will solve all problems, leading to overuse of other resources and a set of new threats to the system.

4. Climate justice as a club good

A possible scenario is that production keeps growing and the use of natural resources remains above their regeneration rate ([Rao, 2000](#), pp. 41-49), while technological development remains too slow. The struggle for access to these resources may support the development of coalitions or clubs, to reduce conflict between those countries, areas or groups with a common interest and to adapt to climate change (Scenario 6). Poor countries are likely to suffer more from climate change than rich countries ([Kreft and Eckstein, 2013](#)) mainly because of their location. As most of the poor countries already have relatively hot climates, an increase in mean temperature is likely to hurt climate sensitive sectors ([Mendelsohn et al., 2006](#)). Although such countries are already undertaking some action, they remain behind the developed countries ([IPCC, 2014](#)). At this moment, climate justice does not exist.

While the notion of climate justice is normative and due to its complexity very difficult to define ([Walker, 2012](#)), a central point is “the principle of common but differentiated responsibilities and respective capabilities” ([UNFCCC, 1992](#), p. 4). This is a human rights issue referring to “disparities of responsibilities and impact” ([Roberts and Parks, 2009](#), p. 393), aiming at the equitable sharing of costs and benefits, while protecting the people and regions most vulnerable to the effects of climate change ([Mary Robinson Foundation, 2015](#)). The idea that the poorest, who face the strongest impact and lack capabilities, should be supported to become more resilient is compatible with [Sen's \(1999\)](#) capability approach, where a wide range of rights and freedoms provide people with the power to direct their own lives. One element of increasing these capabilities is sustainability governance, discussed later in this paper.

As a club for climate change mitigation is based on exclusion to obtain a sustainable livelihood, one question is whether it contradicts the principles of climate justice. The moment such a club creates a technological breakthrough and supports, for example, monitoring and information systems accessible to all interested parties, this is in accordance with these principles. An example of a successful club is the Montreal Protocol on Substances that Deplete the Ozone Layer (Van der Gaast, 2015).

However, we consider it to be more likely that a club for climate change mitigation will strengthen the currently existing injustice (Roberts and Parks, 2006). Countries, regions and groups of people are likely to protect their own wealth at the expense of others. As (Klein (2015) argues, human life tends to be undervalued by “economic experts [who] placed scandalous little value on human life, in particular on the lives of the poor [...]”. The question then becomes how many people are excluded, and in the case of a disaster: how many survive and/or can adapt at what cost.

Climate justice can be interpreted as a form of environmental justice (Sunflower Alliance, 2015). One difference is that it concerns a global environmental problem where the effects and responsibility are dispersed, while environmental justice rather focuses on issues of a locally specific and transboundary nature (Vanderheiden, 2008). The principles of climate justice discussed below are based on Monsma’s (2006, p. 470) principles of environmental justice: protection from pollution, existence of prevention strategies and disaster relief, burden of proof on the polluters, expanding the capabilities of the poor, providing evidence of the disproportionate impact of climate change, and targeted action to level out unequal risk burdens.

The first principle, protection from the impacts of climate change caused by carbon dioxide pollution, includes approaches to preventing climate change by reducing or eliminating such pollution, raising society’s capacity to prevent disasters as well as the management of eventual damage and provision of insurance.

This relates strongly to the second principle of climate justice, the existence of preventive strategies. When people do not have access to the appropriate information, no infrastructural adjustments are made, no coordinated help or relief can be provided, and no financial means for insurance and/or moving to a safe place are available, they are factually excluded from protection against the effects of climate change. In this context, an important issue is whether they have the legal possibility to move to another area. For example, droughts in Northern Africa and the Levant related to climate change (Kelley *et al.*, 2012) can lead to a lack of access to water and food. If a large proportion of the population is starving, will the European Union (EU) open their borders? As the current refugee crisis (2015) shows, political turmoil will appear.

According to the third element of climate justice, the burden of proof should be on the polluters. This should be the case regarding the effects of increased levels of CO₂ emissions on climate change, which can cause irreversible damage and lead to the collapse of global ecosystems (Taleb *et al.*, 2014; Barry, 2014). This is problematic, as CO₂ is emitted everywhere on the planet, and its consequences are felt at all places on the globe. It can be argued that the countries which are the largest emitters should prove that their current level of emissions will do no harm. Otherwise, a precautionary principle should be applied in the form of reduced production and/or innovation and technological change. Besides problems involving the shared responsibility of countries, enforcement of this precautionary principle may be infeasible as economic

interests are too strong, while, as noted above, evidence of the consequences of climate change may be neglected.

The principle that the polluter should give proof of no harm can also be applied to climate policy. It needs to be proven that such a policy will not cause irreversible damage to the poor in the world. The argument of negative effects on economic growth is not valid here, as an economic downturn can be followed by a recovery. However, climate change, as well as climate policy (e.g. emission reduction not accompanied by efficiency gains), may cause negative economic effects, which are disproportionally distributed over the planet. The moment a kind of club is created to mitigate these effects for its members, the fourth and fifth principles of climate justice, assessing and integrating the disproportionate effects of climate change, and policy in targeted action are not fulfilled.

Public goods which facilitate the mitigation of climate change include the creation and maintenance of information systems, monitoring policies, emission trading systems, institutions promoting investment in technology and institutions promoting adaptation (Keohane and Victor, 2010, p. 10). Information and monitoring systems (information systems and monitoring policies, discussed here), as well as institutions and related sustainable governance structures with the aim of climate change mitigation (including emission trading systems, institutions promoting investment in technology and institutions promoting adaptation, discussed in the next section) are determinants of climate justice.

Information on forecasts of extreme weather events, as well as their causes and consequences, should be generally available. Information dissemination, in theory, is considered to be an impure public good with some exclusion and no rivalry (Sandler, 2001). The question remains as to what extent such exclusion poses a real problem. One measure may be the number of people that face a high risk of actually being harmed when they have no access to information about a potentially dangerous weather event.

Physical and IT infrastructure is fundamental in providing rapid access to information via any media. When such infrastructure is lacking, real exclusion to vital information may exist. This is certainly a problem for stakeholders in developing countries (Jawoko *et al.*, 2014), as most of them have a poorly developed meteorology network (Toldy, 2014). However, developed countries may have a private benefit in supporting such information and monitoring systems in less developed countries because preventing disasters there is cheaper than providing disaster relief, especially when such a disaster causes disturbances in international trade or gives rise to the migration of refugees from disaster areas.

5. Sustainability governance as a club good

Governance for sustainability is at the heart of the discussion of climate justice as a club good. It links so-called socio-political governance with other activities and processes relevant to society's capacity to enter a path of sustainable development (Meadowcroft, 1997). Socio-political governance is about creating capability and problem-solving (first-order governance), the creation of efficient and enforceable rules of the game (second-order governance) and the principle of governance of political governance as such (Kooiman, 1999). Sustainability governance embraces the role of formal institutions in reducing uncertainty in the outcomes of human activities (North, 1990), while supporting society's capacity to deal with environmental threats, and enhancing peoples' capabilities to live a life they themselves appreciate (Sen, 1999; Platje, 2011a).

Design, creation, implementation, monitoring, maintenance and enforcement of government policy (Ostrom *et al.*, 1993) are crucial in involving different local stakeholders (Meadowcroft *et al.*, 2005), in particular the citizens challenged most by environmental problems, such as climate change.

The functioning of a formal system can be expressed by indicators of good governance (discussed below), which provide a measure of society's capacity to deal with this type of problem. Trust in the formal system strengthens this capacity by creating a so-called institutional equilibrium (Acemoglu, 2003; Platje, 2008; Greif and Kingston, 2011). Priorities and worldviews determine commitment. As was argued, these priorities are rather directed towards growth, which strongly influences the creation of formal rules and governance structures to deal with climate change. One question is to what extent are the formal and informal systems strong enough to either create a technological breakthrough or to create a club where the members are safe from the effects of climate change. When an institutional equilibrium exists (people support the formal system, as well as the formal goals of policy), the rules are less often questioned, and simultaneously they are mutually beneficial and self-enforcing. The governance structure of a country or club is sustainable when each individual is motivated "to follow a regularity of behaviour in that social situation and to act in a manner contributing to the perpetuation of the structure" (Greif and Kingston, 2011, p. 25). Thus, the essence of applying the theory of clubs to climate change issues may be the capacity to create such a club. This capacity may be a club good in itself.

For analytical purposes, two scenarios can be highlighted regarding the creation of a club for climate change mitigation (Platje, 2011b). Suppose country A has strong and efficient sustainability governance, while country B has weak sustainability governance. If they have a common interest, a club can be formed where good practice from country A can be transferred to country B. However, a problem with mimicry regarding institutions is that they are context specific, while technology requiring high capital outlays and knowledge may be inapplicable to poorer countries. Countries with strong sustainability governance may face economies of scope (declining average costs) in the production of public goods, due to common costs, specialized human capital, communication and enforcement mechanisms, a high level of science and scientific workforce (Sandler, 2001). In particular, large urban areas may be strong stakeholders in the creation of club goods, as they are financial, administrative, economic, political, scientific and innovative centers (Jacobs, 1986; Castells, 1998). However, even when a club is strong, vested interests and set priorities may reduce the club's adaptive efficiency. Thus, a problem involving path dependency and vested interests appears (Keohane and Victor, 2010, pp. 10-11).

Now suppose country C also has poor sustainability governance, but countries with strong sustainability governance themselves do not have a real interest in bi-lateral or multilateral cooperation to strengthen C's governance. Countries in this case may integrate in different ways and strengthen their sustainability governance, but these countries may also become *de facto* excluded and fall into a vicious cycle of weakening sustainability governance (e.g. Africa and the Middle East being mainly interesting for highly developed countries because they supply raw materials). On the other hand, improving governance in countries of type C may be beneficial for type A countries (e.g. EU and USA), as it may reduce threats of conflicts and increase the capacity to deal with communicable diseases (e.g. Ebola). However, it may also strengthen these societies'

political and economic potential, which may make them potential competitors, rather than suppliers of unprocessed natural resources for industry in type A countries.

A problem with forming a club is that:

[...] for the case of climate change the structural and interest diversity inherent in contemporary world politics tends to generate the formation of regime complexes rather than a comprehensive, integrated regime (Keohane and Victor, 2010, p. 2).

Due to the fact that interests, power, information and beliefs change over time, different clubs may appear based on:

[...] codifying informal rights and rules that have evolved over time through a process of converging expectations or tacit bargaining (Young, 1997, p. 10; quoted in Keohane and Victor, 2010, p. 3).

Thus, clubs for climate change mitigation are likely to be something between “fully integrated institutions that impose regulation through comprehensive, hierarchical rules” and “highly fragmented collections of institutions with no identifiable core and weak or non-existent linkages” (2010, p. 3). A common interest provides these clubs with incentives to provide a kind of public good for the club (Ahrens *et al.*, 2005), like a warning system for climate related disasters, as there exists a significant private benefit (compare Sandler, 2001). Regarding climate change, while there exists a common interest to prevent a disaster, the different social and economic priorities of countries have as a consequence that currently “the climate change regime complex [...] is a loosely coupled system of institutions” (Keohane and Victor, 2010, p. 4).

One important element of sustainability governance is democracy. Although decision-making is likely to require more time in a democracy than in an authoritarian system, paradoxically this may create a stronger capacity for climate change mitigation and resilience. As Sen (1999) argues, democracy accompanied by freedom of speech and press may prevent famines on a national scale. Transparency and the possibility to replace inefficient leaders make problems visible and politicians accountable. This strengthens incentives for the creation and/or improvement of systems of crisis management and disaster relief. However, this does not necessarily lead to inclusion of climate change victims in other countries, as they may not receive extensive press coverage and their suffering does not directly influence the voters.

As Bättig and Bernauer (2009) argue, it is a wide range of rights in a democracy that enables discussion, exchange of information (transparency) and provision of scientific research. These rights promote the consciousness of complex, less visible environmental problems, such as climate change. The authors provide empirical evidence for stronger political commitment to climate change mitigation in democratic countries (as the median voter is more interested in the issue than the median member of the ruling elite in a non-democratic country). It has also been shown that higher income is associated with commitment to climate change mitigation, while having a weaker correlation with climate change policy (e.g. emission reduction). Exposure to risk is found to have no relation with incentives for contributing to climate change mitigation. These results should make us cautious of the relation between good governance and climate change mitigation, as it may increase commitment (democracy), but enforcement mechanisms may be less important when priorities are focused elsewhere (e.g. on economic growth). Furthermore, specific issues need to be analyzed separately. For example, Bättig and Bernauer (2009) argue that in a democracy, the liberty to

possess a car and travel makes it more difficult to reduce CO₂ emissions related to transportation than in dictatorships. However, this is counteracted by incentives for improved efficiency and changes in modes of transport, as well as behavioural changes (Brdulak, 2014; Paradowska, 2014; Kostrzewski and Chudzikiewicz, 2015).

While laws and regulations and their effects may be public goods, it is the organizational structure and infrastructure required for design, implementation, maintenance and enforcement of policy that make sustainability governance a kind of club good, as illustrated by the following issues (Cornes and Sandler, 1996; Sandler, 2001):

- The capacity to use sustainability governance is limited. Physical infrastructure, organizational structures and human capital can only deal with a certain amount of transactions. When too many issues have to be dealt with, a kind of congestion appears. This may lead to real exclusion, and access to sustainability governance may then rely on the power of a stakeholder.
- Depreciation of infrastructure, organizational structures and laws and regulations determining the functioning of sustainability governance may appear. In the face of increasing levels of human interactions due to economic growth (Pejovich, 1995), not only a capacity problem may appear but also certain rules may become outdated, due to technological developments (e.g. the internet), while IT and other physical infrastructure need maintenance and educated personnel, to keep up with new challenges. While it is easier to weaken sustainability governance than to strengthen it, it is less difficult to maintain than to construct it.

6. Prospects for creating a club

6.1 Methods

As discussed, capabilities, as well as supporting the people and regions most vulnerable to climate change, are fundamental to climate justice. While requiring deeper theoretical consideration, these elements are included in indicators of good governance and trust, as well as the ND-GAIN index of climate change vulnerability and readiness. Readiness and reduction of vulnerability are important elements supporting climate justice regarding the mitigation of climate change (JRF, 2014). Vulnerability is related to increasing conflicts (Barnett and Adger, 2007) and exclusion from the resources necessary to live (i.e. it significantly reduces capabilities). These indicators are used to assess whether a country has a real prospect of creating or being/becoming a member of a club. Syria and Iraq were selected, as this region is important for oil production and is experiencing water shortages related to climate change. The Central African Republic, Mali and Chad were selected as representatives of the African continent. Other countries (the so-called BRIC countries – Brazil, Russia, India and China – as well as France, USA, Japan, United Kingdom and Germany) were selected as important global economic and political players.

Indicators, while having their limitations, are “relatively simple information-diagnostic tools (Borys, 2005, p. 11)” which can be used for analytical and policy aims. It should be noted that such indicators are a simplification of reality, excluding invisible and difficult to measure features of sustainability governance which can significantly influence the functioning of such a complex system (compare Taleb, 2012). Thus,

although the indicators used enable the comparison of different countries, differences should not be overestimated.

World Bank indicators of good governance (Kaufmann *et al.*, 2009) provide a measure of the capacity to create and enforce rules, which is strengthened by a high level of general or interpersonal trust. This provides a general picture of the level of institutional equilibrium in a country. Although deeper research is required (e.g. on trust in different governmental institutions), it shows the potential for frictions appearing when developing policy for climate change mitigation.

The ND-GAIN consists of 50 indicators calculated for 177 countries and shows:

[...] which countries are best prepared to deal with superstorms, droughts, security risks and other *vulnerabilities* caused by climate disruption, as well as their *readiness* to successfully implement adaptive solutions (ND-GAIN, 2013b, p. 1).

The index measures vulnerability (36 indicators measuring exposure, sensitivity and adaptive capacity regarding climate impacts for systems or individuals) and readiness (14 indicators measuring economic, governance and social factors determining the capability to mobilize and use financial resources to reduce vulnerability to climate change). Readiness is related to capacity and capabilities to create a club, while vulnerability influences the incentives to do so[1]. The governance aspect includes three World Bank indicators of good governance (voice and accountability, political stability and control of corruption), while social readiness concerns human capital (level of higher education and labour freedom), transfer of information, means of communication and the World Bank rule of law. The economic element confirms the techno-centric paradigm discussed earlier. It is assumed that economic growth is something positive, while:

[t]o cope with condition changes, countries with higher economic freedom will be more ready than others to adjust to changing conditions and exploit emerging opportunities (ND-GAIN, 2013b, p. 5).

However, considering the level of exposure and sensitivity of developed countries, further analysis of the distributional effects of the total impacts within these countries is required, to assess the sustainability of a club for climate change mitigation based on a categorization of countries.

6.2 Data and discussion

The outcome of the analysis of the data in Tables AI and AII (Appendix) may not be surprising. The developed countries, which use a larger proportion of global environmental resources, are also more likely to be able to deal with the effects of climate change. Countries with the highest income per capita and highest values of the Human Development Index (HDI) also tend to have the largest ecological footprint[2]. These countries also tend to have a higher level of good governance, as well as, to some extent, a higher level of trust. Without going into a discussion on the cause and consequences of these factors, this may indicate that the more developed countries also have more capacity to deal with climate change issues. Analysis of Table AI and the ND-GAIN index in Table AII provides the following picture. The highly developed countries, with a HDI exceeding 0.8, and medium to strong governance (France, Germany, UK, USA) are characterized by high readiness and relatively low vulnerability, while Japan seems to be a bit more vulnerable. The challenges faced are of relatively low importance

compared to other countries, providing incentives to neglect problems or adapt to climate change rather than prevent it. However, this does not exclude the possibility of preventive measures, as the German transition towards sustainable supply of renewable energy shows. The low and low-medium income countries (Central African Republic, Chad, India, Iraq, Mali, Syria) are characterized by very poor or poor governance, low readiness and medium to high vulnerability. This confirms the research mentioned earlier which shows that the poorest countries face the highest impact, the greatest challenges and are vulnerable stakeholders lacking the power to mitigate climate change. Three of the BRIC countries (Brazil, China and Russia) show medium vulnerability and low to medium preparedness. This may provide some incentives to mitigate climate change, while the capacity to do so is rather small. A lack of readiness reduces their private and public sectors' ability "to absorb investment resources and successfully apply them to reduce climate change vulnerability" (ND-GAIN, 2013b, p. 7).

7. Concluding remarks

While climate change may pose serious threats to societies, and may even threaten the existence of mankind, arguments have been provided that these threats are unlikely to be dealt with by resigning from economic growth. Although a technological breakthrough created by a club could solve the problem of climate change, it is likely to trigger off other environmental problems, for which new technological solutions are needed. If this does not happen quickly enough, and economic sustainability based on growth remains the basis for environmental sustainability, developed countries, regions or groups of people aiming to protect their lifestyles should be analyzed from a club good perspective. This scenario is unlikely to yield climate justice. Moreover, a club of countries or regions aiming to mitigate climate change might actually increase the existing level of injustice on a global scale.

The analysis provided in this article leads to the following conclusions and implications. The basis for climate justice is support for sustainability governance in countries and areas with high vulnerability and low readiness to mitigate the effects of climate change. The bottom line is to support institutional change in such countries, even when this is in conflict with the economic interests of high developed countries. The focus should change from growth to resilience – the capacity and capability to deal with (potential) disasters and other unexpected challenges. This is not about copying democratic institutions from other countries, but developing transparent, participative mechanisms for mitigating climate change. Different types of freedom, such as freedom of speech, press and organization, as well as economic freedom, are important elements of such a mechanism.

Although a club protecting itself against the effects of climate change may create positive spillover effects for other countries in the form of, e.g. transferable knowledge and technologies, the possibility that increasing injustice will lead to various disasters, increased conflict and migration should be seriously considered. The refugee problem, currently apparent in the Levant, Turkey and the European Union, may turn out to be minor compared to future migration related to climate change. Reliance on natural resources from poorer countries, potential uprisings and terrorism and the costs of dealing with such issues, makes the formation of a club of highly developed countries to manage climate-related problems unsustainable. Policy development in a club good

scenario is related to making cold, clinical choices regarding how many people are excluded and thus remain threatened by disasters and death, how many survive and at what cost and what measures are taken to keep climate refugees out of the club. While this article has focused on the threat of exclusion by creating a club for climate change mitigation, research is needed on the opportunity to create sustainable solutions using various types of clubs. This is necessary, as due to the increased interconnectedness in the world, and the potential disastrous effects of climate change, a club that is able to mitigate climate change is likely to be either unsustainable or very small.

Notes

1. Exposure is “The climate stress faced by a system or individual”. Sensitivity is “The extent to which a sector within a country will be affected by or responsive to climate exposure”. Adaptive capacity is “The degree to which a country is able to cope with or respond to exposed to susceptible stresses”. Readiness is “The ability of a country’s private and public sectors to absorb financial resources and mobilize them efficiently to reduce climate change vulnerability” (ND-GAIN, 2013b, p. 2).
2. An ecological footprint of 1 means that a country, city or any unit exactly uses as much natural resources as it can produce itself. In 2010, the Global footprint exceeded 1.5) (Global Footprint Network, 2010).

References

- Acemoglu, D. (2003), “Why not a political Coase Theorem? Social conflict, commitment and politics”, *Journal of Comparative Economics*, Vol. 31 No. 4, pp. 620-652.
- Ahrens, J., Hoen, H.W. and Ohr, R. (2005), “Deepening integration in an enlarged EU: a club-theoretical perspective”, *Journal of European Integration*, Vol. 27 No. 4, pp. 417-439.
- Allen, M.R. and Frame, D.J. (2007), “Call off the quest”, *Science*, Vol. 318 No. 5850, pp. 582-583.
- Barnett, J. and Adger, W.N. (2007), “Climate change, human security and violent conflict”, *Political Geography*, Vol. 26 No. 6, pp. 639-655.
- Barry, G. (2014), “Terrestrial ecosystem loss and biosphere collapse”, *Management of Environmental Quality*, Vol. 25 No. 5, pp. 542-563.
- Bättig, M.B. and Bernauer, T. (2009), “National institutions and global public goods: are democracies more cooperative in climate change policy?”, *International Organization*, Vol. 63 No. 2, pp. 281-308.
- Bleischwitz, R. and Bringezu, S. (2007), “Global resource management: conflict potential and characteristics of a global governance regime”, Development and Peace Foundation, Policy Paper No 27, Bonn, Development and Peace Foundation.
- Borys, T. (2005), *Indicators for Sustainable Development: A Polish Experience*, Fundacja Ekonomistów Środowiska i Zasobów Naturalnych, Warszawa-Białystok.
- Brdulak, A. (2014), “The importance of sustainable development: the ecological aspect”, *The Wrocław School of Banking Research Journal (Zeszyty Naukowe Wyższej Szkoły Bankowej we Wrocławiu)*, Vol. 1 No. 39, pp. 223-234.
- Buchanan, J. (1965), “An economic theory of clubs”, *Economica*, Vol. 32 No. 125, pp. 1-14.
- Castells, M. (1998), *End of Millennium*, Blackwell Publishers, Cambridge, MA.
- Cornes, R. and Sandler, T. (1996), *The Theory of Externalities, Public Goods and Club Goods*, Cambridge University Press, Cambridge, MA.

- Femia, F. and Werrel, C. (2012), "Syria: climate change, drought and social unrest", available at: <http://climateandsecurity.org/2012/02/29/syria-climate-change-drought-and-social-unrest/> (accessed 12 October 2014).
- Foster, J.B. and McChesney, R.W. (2012), *The Endless Crisis: How Monopoly Finance Capital Produces Stagnation and Upheaval from the USA to China*, Monthly Review Press, New York, NY.
- Gardiner, S.M. (2010), "Ethics and climate change: an introduction", *WIREs Climate Change*, Vol. 1 No. 1, pp. 54-66.
- Gladwin, T.N., Kennelly, J.J. and Krause, T.S. (1995), "Shifting paradigms for sustainable development: implementations for management theory and research", *The Academy of Management Review*, Vol. 20 No. 4, pp. 874-907.
- Gleick, P.H. (2014), "Water, drought, climate change, and conflict in Syria", *Weather, Climate and Society*, Vol. 6 No. 3, pp. 331-340.
- Global Footprint Network (2010), *Ecological Footprint Atlas 2010*, available at: www.footprintnetwork.org/en/index.php/GFN/page/ecological_footprint_atlas_2010 (accessed 13 October 2014).
- Greif, A. and Kingston, C. (2011), "Institutions: rules or equilibria?", in Caballero, G. and Schofield, N. (Eds), *Political Economy of Institutions, Democracy and Voting*, Springer Verlag, Berlin, pp. 13-44.
- Hutchison, T.W. (1964), *'Positive' Economics and Policy Objectives*, Allan and Unwin, London.
- IPCC (2013), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, MA.
- IPCC (2014), "Summary for policy makers", *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, Cambridge University Press, Cambridge, MA.
- ISS (International Institute of Social Studies) (2014), "Indices of social development", available at: www.indsocdev.org/data-access.html
- Jackson, T. (2009), *Prosperity Without Growth: Economics for a Finite Planet*, Earthscan, London.
- Jacobs, J. (1986), *Cities and the Wealth of Nations – Principles of Economic Life*, Pelican Books, New York, NY.
- Jawoko, H.O., Alfonse, O. and Inkoom, D.K.B. (2014), "Deficit weather forecast information and lack of its access by small holder Farmers in Ghana", Academia.edu, Academia, available at: www.academia.edu/3734320/Deficit_Weather_Forecast_Information_and_Lack_of_Its_Access_by_Small_holder_Farmers_in_Ghana (accessed 15 July 2015).
- JRF (Joseph Roundtree Foundation) (2014), "Climate change and social justice: an evidence review", available at: www.jrf.org.uk/report/climate-change-and-social-justice-evidence-review (accessed 5 July 2015).
- Kahneman, D. (2011), *Thinking, Fast and Slow*, Penguin Books, London.
- Kaufmann, D.A., Kraay, A. and Mastruzzi, M. (2009), "Governance Matters VIII: governance indicators for 1996-2008", The World Bank Policy Research Working Paper 4978, available at: www.worldbank.org/wbi/governance/ (accessed 12 December 2009).
- Kelley, C., Ting, M., Seager, R. and Kushnir, Y. (2012), "Mediterranean precipitation climatology, seasonal cycle, and trend as simulated by CMIP5", *Geophysical Research Letters*, Vol. 39 No. 21, doi: 10.1029/2012GL053416.
- Keohane, R.O. and Victor, D. (2010), *The Regime Complex for Climate Change*, The Harvard Project on International Climate Agreements, Discussion Paper, pp. 10-33.

- King, D., Browne, J., Layard, R., O'Donnell, G., Rees, M., Stern, N. and Turner, A. (2016), *A Global Apollo Program to Combat Climate Change*, The Global Apollo Program, available at: http://cep.lse.ac.uk/pubs/download/special/Global_Apollo_Programme_Report.pdf (accessed 15 July 2015).
- Klein, N. (2015), *Speech at the Vatican*, available at: www2.alternet.org/environment/naomi-klein-we-can-save-ourselves-only-if-we-learn-work-nature (accessed 12 September 2015).
- Knight, F. (1924), "Some fallacies in the interpretation of social cost", *Quarterly Journal of Economics*, Vol. 38 No. 4, pp. 582-606.
- Kooiman, J. (1999), "Social-political governance – overview, reflections and design", *Public Management Review*, Vol. 1 No. 1, pp. 67-72.
- Kostrzewski, M. and Chudzikiewicz, A. (2015), "Rail vehicle and rail track monitoring system – a key part in transport sustainable development", *Wroclaw School of Banking Research Journal (Zeszyty naukowe Wyższej Szkoły Bankowej we Wrocławiu)*, Vol. 15 No. 1, pp. 55-74.
- Kreft, S. and Eckstein, D. (2013), *Global Climate Risk Index 2014*, Germanwatch, Berlin.
- Lim, B. and Burton, I. (2004), *Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures*, Cambridge University Press, Cambridge, MA, available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.452.9748&rep=rep1&type=pdf> (accessed 27 July 2015).
- Mary Robinson Foundation (2015), *Principles of Climate Justice*, available at: www.mrfcj.org/about/principles.html (accessed 5 August 2015).
- Meadowcroft, J. (1997), "Planning for sustainable development: insights from the literatures of political science", *European Journal of Political Research*, Vol. 31 No. 4, pp. 427-454.
- Meadowcroft, J., Farrell, K.N. and Spangenberg, J. (2005), "Developing a framework for sustainability governance in the European Union", *International Journal of Sustainable Development*, Vol. 8, pp. 3-11, available at: www.buytekn.net/info/files/share/data/proyecto_cfe/Meadowcroft.pdf
- Mendelsohn, R., Dinar, W. and Williams, L. (2006), "The distributional impact of climate change on rich and poor countries", *Environment and Development Economics*, Vol. 11 No. 2, pp. 159-178.
- Monsma, D. (2006), "Equal rights, governance, and the environment: integrating environmental justice principles in corporate social responsibility", *Ecology Law Quarterly*, Vol. 33 No. 2, pp. 443-498.
- Nasar, S. (2011), *Grand Pursuit*, Simon & Schuster, New York, NY.
- ND-GAIN (Notre Dame Global Adaptation Index) (2013a), *ND-GAIN Index Country Rankings*, available at: <http://index.gain.org/>
- ND-GAIN (Notre Dame Global Adaptation Index) (2013b), "Detailed methodology report", available at: www3.nd.edu/~nchawla/methodology.pdf (accessed 10 September 2014).
- North, D.C. (1990), *Institutions, Institutional Change, and Economic Performance*, Cambridge University Press, Cambridge, MA.
- Oreskes, N. and Conway, E.M. (2010), *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, Bloomsbury Press, New York, NY.
- Ostrom, E., Schroeder, L. and Wynne, S. (1993), *Institutional Incentives and Sustainable Development: Infrastructure Policies in Perspectives*, Westview Press, Boulder, San Francisco, CA, Oxford.

- Paradowska, M. (2014), "Problems involved in the development of instruments supporting the creation of sustainable behaviour in transport", *The Wroclaw School of Banking Research Journal (Zeszyty Naukowe Wyższej Szkoły Bankowej we Wrocławiu)*, Vol. 1 No. 39, pp. 255-275.
- Pejovich, S. (1995), *Economic Analysis of Institutions and Systems*, Kluwer Academic Publishers, Dordrecht.
- Pigou, A.C. (1920), *The Economics of Welfare*, Macmillan, London.
- Piketty, T. (2014), *Capital in the Twenty-First Century*, The Belknap Press of Harvard University Press, Cambridge, MA.
- Platje, J. (2008), "'Institutional capital' as a factor of sustainable development: the importance of an institutional equilibrium", *Baltic Journal on Sustainability*, Vol. 14 No. 2, pp. 144-150.
- Platje, J. (2011a), *Institutional Capital: Creating Capacity and Capabilities for Sustainable Development*, Opole University Press, Opole.
- Platje, J. (2011b), "Institutional change for creating capacity and capability for sustainable development: a club good perspective", *Discourses in Social Market Economy*, available at: www.ordnungspolitisches-portal.com/Diskurse/Diskurse_2011-06.pdf
- Platje, J. (2013), "Who is interested in what kind of sustainable development? Time horizons and stakeholder interests", *Economic and Environmental Studies*, Vol. 13 No. 3, pp. 255-263.
- Platje, J. (2015), "Beyond resilience – new institutional economics, fragilities and indicators of unsustainability", *Central and Eastern European Journal of Management and Economics*, Vol. 15 No. 4, pp. 295-315.
- Rao, P.K. (2000), *Sustainable Development – Economics and Policy*, Blackwell Publishers, Oxford.
- Roberts, J.T. and Parks, B. (2006), *A Climate of Injustice: Global Inequality, North-South Policy (Global Environmental Accord: Strategies for Sustainability and Institutional Innovation)*, MIT Press, Cambridge MA.
- Roberts, J.T. and Parks, B.C. (2009), "Ecological unequal exchange, ecological debt, and climate justice: the history and implications of three related ideas for a social movement", *International Journal of Comparative Sociology*, Vol. 50 Nos 3/4, pp. 385-409.
- Sachs, J. (2005), *The End of Poverty: How we Can make It Happen in Our Lifetime*, Penguin Books, London.
- Sandler, T. (2001), "Financing global and international public goods", Policy Research Working Paper 2638, World Bank, Washington, DC.
- Schwartz, P. and Randall, D. (2003), "An abrupt climate change scenario and its implications for United States national security", DTIC Document, available at: www.dtic.mil/dtic/tr/fulltext/u2/a469325.pdf (accessed 5 August 2015).
- Sen, A.K. (1999), *Development as Freedom*, Anchor Books, New York, NY.
- Smith, A. (1998), *An Inquiry into the Nature and Causes of the Wealth of Nations*, Reprint edited with an introduction by Kathryn Sutherlands (1998), Oxford University Press, Oxford.
- Steurer, R., Langer, M.R., Konrad, A. and Martinuzzi, A. (2005), "Corporations, stakeholders and sustainable development I: a theoretical explanation of business – society relations", *Journal of Business Ethics*, Vol. 61 No. 3, pp. 263-281.
- Stiglitz, J. (2010), *Freefall – America, Free Markets, and the Sinking of the World Economy*, W.W. Norton & Company, New York, NY.
- Sunflower Alliance (2015), *What is Climate Justice?*, available at: www.sunflower-alliance.org/climate_justice (accessed 5 August 2015).
- Taleb, N.N. (2012), *Antifragile: Things that Gain from Disorder*, Penguin Books, London.

- Taleb, N.N., Read, R. Douady, R., Norman, J. and Bar-Yam, Y. (2014), "The precautionary principle (with application to the genetic modification of organisms)", Extreme Risk Initiative – NYU School of Engineering Working Paper, available at: <http://arxiv.org/pdf/1410.5787.pdf>
- Tetlock, P.E. (1985), "Accountability: the neglected social context of judgment and choice", *Research in Organizational Behavior*, Vol. 7, pp. 297-332.
- Toldy, K. (2014), *Global Access to Timely Weather Data*, Denver, University of Denver, Intermediate UN Commission of Science, Technology and Development, available at: http://cssmun.weebly.com/uploads/1/6/6/2/16623356/science_technology_development_2.pdf (accessed 23 October 2014).
- UNDP (2014), "Human development reports, Human Development Index trends, 1980-2013", available at: <http://hdr.undp.org/en/content/table-2-human-development-index-trends-1980-2013>
- UNFCCC (1992), *United Nations Framework Convention on Climate Change*, UNFCCC Report FCCC/INFORMAL/84, GE.05-62220 (E) 200705, available at: <http://unfccc.int/resource/docs/convkp/conveng.pdf> (accessed 5 August 2015).
- Van der Gaast, W. (2015), "International climate negotiation conditions: past and future", PhD thesis, University of Groningen/SOM Research School, Groningen.
- Vanderheiden, S. (2008), *Atmospheric Justice: A Political Theory of Climate Change*, Oxford University Press, Oxford.
- Walker, G. (2012), *Environmental Justice: Concepts, Evidence and Politics*, Routledge, Abingdon.
- WCED (1987), *Our Common Future*, Oxford University Press, Oxford.
- Weitzman, M.L. (2009), "On modelling and interpreting the economics of catastrophic climate change", *Review of Economics and Statistics*, Vol. 91 No. 1, pp. 1-19.
- Weizsäcker, E. von, Hargroves, K., Smith, M., Desha, C. and Stasinopoulos, P. (2009), *Factor 5: Transforming the Global Economy through 80% Increase in Resource Productivity*, Earthscan, London.
- World Bank (2013), "Worldwide governance indicators", available at: <http://info.worldbank.org/governance/wgi/index.aspx#home>
- Young, O.R. (1997), *Global Governance: Drawing Insights from the Environmental Experience*, MIT Press, Cambridge, MA.

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Country	Income group	HDI 2013	Ecological footprint of cons. gha/pers (2007)	Voice and account ability	Political stability/no violence	Government effectiveness	Regulatory quality	Rule of law	Control of corruption	Sum of six indicators	Assessment of good governance	Interpersonal trust 2010
Syrian Arab Republic	LM	0.66	1.52	-1.77	-2.68	-1.34	-1.61	-1.48	-1.24	-10.12	Very poor	0.53
Iraq	LM	0.64	1.35	-1.10	-1.99	-1.08	-1.26	-1.47	-1.25	-8.15	Very poor	0.37
Central African Republic	L	0.341	1.32	-1.53	-2.15	-1.78	-1.13	-1.83	-1.04	-9.46	Very poor	NA
Chad	L	0.37	1.73	-1.38	-1.10	-1.50	-1.02	-1.37	-1.28	-7.65	Very poor	NA
Mali	L	0.41	1.93	-0.30	-1.69	-0.84	-0.50	-0.75	-0.73	-4.81	Poor	0.44
Russian Federation	UM	0.78	4.41	-1.01	-0.75	-0.36	-0.37	-0.78	-0.99	-4.26	Poor	0.41
China	UM	0.72	2.21	-1.58	-0.55	-0.03	-0.31	-0.46	-0.35	-3.28	Poor	0.58
India	LM	0.59	0.91	0.41	-1.19	-0.19	-0.47	-0.10	-0.56	-2.10	Poor	0.53
Brazil	UM	0.74	2.91	0.37	-0.28	-0.08	0.07	-0.12	-0.12	-0.16	Weak	0.29
France	U	0.88	5.01	1.20	0.42	1.47	1.15	1.40	1.30	6.94	Medium strong	0.54
USA	U	0.91	8.00	1.08	0.61	1.50	1.26	1.54	1.28	7.27	Medium strong	0.54
Japan	U	0.89	4.73	1.10	0.98	1.59	1.10	1.41	1.65	7.83	Medium strong	0.61
United Kingdom	U	0.89	4.89	1.32	0.48	1.47	1.77	1.67	1.68	8.39	Medium strong	0.54
Germany	U	0.91	5.08	1.41	0.93	1.52	1.55	1.62	1.78	8.81	Medium strong	0.57

Notes: Indicators of good governance range from -2.5 (very poor) to 2.5 (strong); the sum of the six indicators ranges from -15 (poor) to 15 (strong); L = low; LM = lower-middle; UM = upper-middle; U = upper; HDI = human development index; NA = no data available

Sources: Indicators – World Bank (2013), Income group – ND-GAIN (2013a); HDI – UNDP (2014); Interpersonal trust – ISS (2014)

Table AI.
Indicators of good
governance –
estimates 2013

Table AII.
ND-GAIN 2012

Country	Income group	HDI 2013	Ecological footprint of cons. gha/pers (2007)	Vulnerability and readiness	Vulnerability – total	Components of vulnerability			Readiness total	Components of readiness		
						Capacity	Exposure	Sensitivity		Economic	Governance	Social readiness
Syrian Arab Republic	LM	0.66	1.52	52.60	0.35	0.47	0.248	0.357	0.401	0.569	0.197	0.382
Iraq	LM	0.64	1.35	41.10	0.45	0.561	0.367	0.442	0.272	0.212	0.213	0.4
Central African Republic	L	0.341	1.32	39.9	0.58	0.683	0.651	0.432	0.371	0.591	0.233	0.216
Chad	L	0.37	1.73	39.90	0.54	0.716	0.505	0.457	0.342	0.53	0.24	0.192
Mali	L	0.41	1.93	47.10	0.54	0.754	0.443	0.479	0.487	0.631	0.421	0.359
Russian Federation	UM	0.78	4.41	62.60	0.29	0.297	0.41	0.164	0.542	0.599	0.306	0.702
China	UM	0.72	2.21	58.20	0.30	0.235	0.282	0.376	0.466	0.572	0.303	0.489
India	LM	0.59	0.91	53.40	0.43	0.39	0.442	0.441	0.495	0.568	0.409	0.483
Brazil	UM	0.74	2.91	64.00	0.30	0.2	0.323	0.342	0.575	0.617	0.543	0.552
France	U	0.88	5.01	77.70	0.15	0.07	0.122	0.243	0.704	0.629	0.721	0.787
USA	U	0.91	8.00	79.00	0.20	0.123	0.224	0.229	0.779	0.727	0.694	0.932
Japan	U	0.89	4.73	72.70	0.29	0.052	0.325	0.429	0.744	0.683	0.733	0.837
United Kingdom	U	0.89	4.89	79.90	0.17	0.038	0.192	0.22	0.759	0.726	0.712	0.849
Germany	U	0.91	5.08	79.30	0.15	0.037	0.122	0.275	0.737	0.72	0.757	0.739

Notes: Vulnerability (between 0 and 1) – the closer to 0, the less vulnerable; readiness (between 0 and 1) – the closer to 0, the less ready; Vulnerability and readiness score (between 0 and 1) – the higher, the better

Sources: ND-GAIN (2013a); HDI – UNDP (2014); Ecological footprint Global Footprint Network (2010)

Notes: Vulnerability (between 0 and 1) – the closer to 0, the less vulnerable; readiness (between 0 and 1) – the closer to 0, the less ready; Vulnerability and readiness score (between 0 and 1) – the higher, the better

Sources: ND-GAIN (2013a), HDI – UNDP (2014); Ecological footprint Global Footprint Network (2010)