



Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha



The rule of law in governance of complex socio-ecological changes

Jonas Ebbesson^{a,b,*}

^aStockholm Resilience Centre, Stockholm University, S-106 91 Stockholm, Sweden

^bDepartment of Law, Stockholm University, S-106 91 Stockholm, Sweden

ARTICLE INFO

Article history:

Received 23 May 2009

Received in revised form 21 October 2009

Accepted 27 October 2009

Keywords:

Rule of law

Legal certainty

Environmental law

International law

State sovereignty

Resilience

Multilevel governance

Socio-ecological change

Environmental governance

Administrative decision-making

Environmental decision-making

ABSTRACT

This article discusses the impact of the rule of law on the resilience of societies for governing complex socio-ecological changes. It concludes that the notions of the rule of law and legal certainty have changed, and that they can be compatible with the use of framework laws of a rather open-textured character, provided certain legal safeguards, such as the right to a legal review, are at hand. While legal certainty is an important virtue of law, it does not as such necessarily prevent adequate flexibility in administrative decision-making concerning health, the environment or the use of natural resources. The article also considers to what extent certain established administrative means of control in the field of environment protection and the use of natural resources match the findings and proposals, e.g. on flexibility and adaptability, provided by resilience research. Finally the article discusses the impact of state sovereignty on governance of large-scale socio-ecological changes, with reach across state borders. It concludes that, despite some attempts of softening the impact of state borders in transboundary environmental decision-making and management, state sovereignty still hampers multilevel governance and management of resources in such contexts.

© 2009 Elsevier Ltd. All rights reserved.

1. New thoughts and new wisdom: new law?

New understandings of adverse environmental effects from human behaviour thoroughly challenged law and legal thinking in the 20th century. This is reflected in the development of environmental law as a specific field of law, in the adoption of specific environmental legislation in many countries and in the hundreds of international environmental treaties entered into only in the last half century. Yet, it is apparent that many of the legal regulations have failed to provide adequate protection for the environment and to create settings that promote sustainable utilisation of common-pool resources (Ostrom, 2005).

In this article I discuss, on a general level, some basic notions of law as well as some common legal approaches to controlling harmful activities and the use of natural resources in light of findings in research on the resilience of socio-ecological systems. This field of research focuses on the understanding of the dynamics of socio-ecological systems, and it highlights the non-linear dynamics, thresholds, uncertainties and surprises in these systems. Starting off

from studies in ecology, resilience research has increasingly come to focus on the interplay of social systems and ecological systems, in order to understand how social processes and institutions matter for the management of ecosystem services (Folke, 2006). One essential findings in resilience research is that, to sustain and absorb stress, external interference and complex changes, society should aim at strengthening the ability to deal with uncertainties and surprises, rather than attempting to control nature, maintain once and for all a given social or ecological situation, or counter any change (Walker and Salt, 2006; Folke, 2006).

The literature on resilience is not homogenous in its conclusions. Yet, the following factors and conditions have been identified in several empirical studies on resilience as particularly relevant for the ability to govern socio-ecological systems and common pool resources, and to cope with surprises and unpredicted and complex changes (Walker and Salt, 2006; Folke, 2003, 2006; Folke et al., 2002; Adger, 2000; Adger et al., 2005):

1. Flexibility in social systems and institutions to deal with changes.
2. Openness of institutions so as to provide for *broad participation*, not least in local decision-making and administration.
3. Effectiveness of *multilevel governance*.
4. Social structures that promote *learning and adaptability* without limiting the options for future development.

* Correspondence address: Department of Law, Stockholm University, S-106 91 Stockholm, Sweden. Tel.: +46 8162245; fax: +46 86124109.

E-mail address: jonas.ebbesson@juridicum.su.se.

Obviously, the listed “resilience factors” are set out in a highly abstract manner, and provide only limited detailed guidance on how to design social institutions. For instance, flexibility may refer to organisational matters, to decision-making procedures, and to the leeway bestowed on actors and institutions when deciding on the management of resources. Despite the vagueness of the given factors and conditions, as guidance for the governance of socio-ecological system, they are affected by the legal structure and context. Legal rules and institutions not only mark out rights, obligations and responsibilities, but also define what is permitted, who has the power to do what, and the consequences of different acts, omissions and situations. Legal institutions, property rights and regional divisions of jurisdictions and power affect the degree of flexibility and effectiveness of multilevel governance of common problems and resources. Moreover, in large-scale situations and transboundary contexts, legal structures are also crucial for determining who may make binding decisions on the content and application of general norms in different jurisdictions.

The listed factors trigger a number of questions on law and legal thinking. At the most abstract level, it should be asked whether the notions of “the rule of law” and legal certainty are at all compatible with the objective of promoting sustainable utilisation of natural resources and the ability to sustain and absorb disturbances and complex changes. Does legal certainty imply a too rigid approach to cope with uncertainties and complexities? Is it possible for legal norms and institutions to ensure predictability and legal certainty, while also warranting flexibility and adaptability? And how should legal principles, institutions and systems be designed to promote such utilisation and ability, taking into account the emphasis in resilience research on complexity and dynamics, non-linear effects and tipping-points in societies and ecosystems. How define individual responsibility when you cannot link the damage to a specific act or actor, when the risks and damage may be unpredictable, and the damage may result from multiple actors. How define acceptable emission levels or catches of, say, fish, or criteria for permitted activities, taking the unpredictability of ecosystems into account? And again, how promote effective management of resources, deal with common threats, make binding decisions and enforce possible sanctions in large scale and transboundary contexts?

When answering these questions it should be recalled that, whereas resilience research essentially focuses on the system level, the legal analysis should consider law at the system level as well as at the level of the individual, in terms of legal rights, duties, privileges, power and responsibilities. Moreover, contrary to the socio-ecological systems, the legal system is essentially a system of ideas, although it is closely linked to social institutions and social actions.

The impact of law on socio-ecological resilience not only pertain to institutions and norms concerning the protection of the environment in a narrow sense, but also to the regulation of, e.g. social security and unemployment, education, property rights, corporate structures and international relations. Moreover, the resilience of societies is likely to be affected by the degree of social trust, experience, distributive justice, and the legitimacy of rules and institutions – all matters with a bearing on law. Despite these integrative elements implied by the notion of resilience, I will limit myself to discussing how the notion of rule of law fits with resilience thinking at a more abstract level, to mapping out and analysing some legal means for administrative control of harmful activities and the use of natural resources, and to considering the impact of state sovereignty on governance of large-scale changes. The attempt is thus to place the legal considerations tentatively in the context of the findings on the governance of socio-ecological systems in resilience research, but not to analyse in depth the

adequacy of each and every legal concept or legal approach to controlling or managing natural resources.

2. The rule of law: legal certainty vs. flexibility

Prima facie, dealing with complex and unexpected changes and ensuring flexibility does not seem to square well with the notion of the rule of law and the inflexibility implied by requirements of legal certainty. If drastic changes take place as a result of, say, climate change or loss of biodiversity, effective leadership appears crucial to mitigate such effects as well as to adapt to new circumstances. At a smaller scale, when decision are made on permits and concessions for polluting activities or the extraction of natural resources, it seems appropriate to entrust the decision-making body with discretion to decide on the means necessary to prevent harm on human health and the environment. Why, then, pose legal constraints on governments, the public administration and civil society in these cases when choosing means and procedures for dealing with crises, adverse surprises and changed circumstances?

The notion of the rule of law implies constraints on the power of government (Raz, 1977; Dworkin, 1986) and is conventionally understood as ensuring legal certainty and predictability, so as to make it possible for members of the public to know and predict what is permitted, ordered and prohibited. To simplify, sanctions and restrictions should not be imposed on members of the public without due political procedures and publicity to reveal what is permitted and what is not. In constitutional terms, the rule of law means that the governing power is also subject to law, i.e. to legal constraints, requirements and sanctions. Ideally, one may argue, legal certainty is one important factor of many to provide for trust in government and also for the possibility for individuals to plan their lives without unexpected interference from public authorities or other members of the public.

Yet, government through the rule of law says very little, if anything, about the content of the law (Raz, 1977); whether it promotes or blocks sustainable utilisation of resources, whether it is discriminatory, or whether it provides adequate flexibility and participatory structures for decision-making or limits the means for effective management of common-pool resources.

Despite the general acclaim for legal certainty and predictability, the popular view of law exaggerates the static and fixed nature of law. First, there is always room for interpretations, although within more or less fixed limits, when statutes or precedents are considered. The scope of discretion depends on what has been referred to as the “open texture” of the standards of behaviour. Second, to identify what the law *is* requires more than interpreting a statute or precedence only. It involves considering several arguments – whether found in statutes, preparatory works, established legal principles, guidelines, international agreements, court cases, or literature – and weighing them against each other in support of or against a particular interpretation. The material relevant for legal reasoning is often of a broader scope in environmental law than in private or criminal law. Third, and most importantly, it is impossible to predict in advance all the aspects to take into account in the application of law. Thus, it is not even desirable – indeed it would be vain – to consistently claim “certain rules”, e.g. by means of detailed provisions.

To be sure, in some situations other values and ethical concerns override the value of legal certainty, since legal certainty may simply amount to maintaining unfair, discriminatory or obsolete laws. In such cases the arguments in favour of deviating from previous precedence are thus stronger than those of insisting on predictability (Raz, 1977; Dworkin, 1986; Peczenik, 1995), for instance when predictability would imply racist decisions. This, again, reveals the immanent tension in adjudication between the

principle of legal certainty and the claim to a legitimate application of law, so as to render a correct or right decision (Habermas, 1996, p. 197). The compromise between the desire for legal certainty and the need to leave open for later settlement by an informed, official choice is always present in the application of law (Hart, 1994).

Ambiguities, lacunae and inconsistencies, and even outdated rules, are well known features of law; and it is for the judge to aim at the equilibrium where the stability, possibly provided by legislation or previous case law, is balanced against the need for flexibility in the application of rules and principles (Peczenik, 1995, p. 44). While reaching such an equilibrium is essential in all systems under the rule of law, the means and legal reasoning for doing so may differ from one jurisdiction to the other, depending, e.g. on how the role of the court is perceived. For instance, if comparing countries of “common law” system and “civil law” systems, rule-fixation is possibly stronger in countries adhering to the “civil law” tradition, where codifications and the use of statutes, rather than judge made law, have traditionally had a greater impact. In certain legal systems the court may also be expected to more actively create or develop the law than in other systems. A good example of this is the European Union, where the European Court of Justice has had to resolve numerous cases and disputes dealing with issues that had not been regulated in the basic treaties creating the EU, nor in European legislation. Nevertheless, in cases where a court changes its direction compared to previous rulings, makes an expansive interpretation of a statute or even sets aside a piece of legislation, this normally requires justifications in the reasoning just because it challenges the notion of predictability.

While the rule of law and legal certainty remain widely acclaimed notions of public, democratic governance, it has also been questioned whether they really remain essential elements in the government of welfare states and security states. A sociological (functionalist) understanding of law during different epochs of government – the ideal-typical liberal state, welfare state and security state – would underscore the increasing complexity of governmental tasks; as moving from preserving social order (liberal, constitutional state), via the distribution of social compensation (welfare state) to the management of collective risks (security state). Thus the different forms of government have been tailored to cope with different epochal themes and goals: legal certainty, social welfare and risk prevention (Habermas, 1996).

Remaining at this abstract level, a historical survey would show that the development of the welfare state – with its demand upon the government to intervene with a view to solving societal problems related to health, safety, labour relations and environmental degradation – also entailed changes in the structure and functions of law to more interventionist legislation. Generally speaking, rather than following a formal, conditional structure, legislation acquired a more “open-textured” character, either by defining general principles to be applied or by setting goals to be achieved by public institutions. Thereby, this type of legislation provides for varying degrees of discretion – and thus some flexibility – to public decision-making institutions (Ebbesson, 1997), which is relevant also for the ability to cope with changes.

However, this kind of legislative structure does not imply that the rule of law or legal certainty become irrelevant or obsolete elements of public government. Nor does it rule out that legal certainty of some form can be compatible with or even supportive to sustainable management of resources and the ability to cope with complex changes. Jürgen Habermas criticises, and I agree, the view that only the liberal state can solve the problem of legal certainty by means of the legal medium, whereas the welfare state and the security state would rely on other means of control. He argues that new risks to legal certainty do not pose new problems

but at most exacerbate the old ones, posed by the diminishing binding power of regulatory law. Rather, possible tendencies to diminish constitutional principles reveal not so much that these principles “place aporetic demands on an increasingly complex governmental activity, as that such principles are *insufficiently institutionalized*” (Habermas, 1996, p. 436). This, I submit, is precisely the kind of challenge we face in promoting resilient social structures.

When regulating issues related to social welfare, security and collective risks, such as climate change, hazardous chemicals and water supply, law not only defines rights and duties, but also obtains an instrumental character with regard to the given objectives. Thereby, the division between public and private interest often becomes blurred or overlapped. Just for the reason of flexibility and broad applicability, so as to cover a large number of activities and installations, environmental laws are often drafted in an “open-textured” manner, while conferring on different public authorities (e.g. permit authorities and supervisory authorities) and courts the power to apply the given principles and consider the relevant objectives in the decision-making. Despite the discretion given to the authorities, they are nevertheless expected to remain within the limits of discretion – within the framework set by general laws (Raz, 1977) – and to apply the principles in a consistent way; and thus to hammer out a normative pattern that may provide for some legal certainty. In that sense, law also retains a right-based element, and it would be for the courts to ensure that.

An indication that the rule of law and legal certainty still matter for the legitimacy of decision-making is found in the increasing concern for “access to justice” in environmental matters, i.e. a right for members of the public to a review procedure in order to challenge decisions, acts and omissions by public authorities as well as by private subjects. Drawing on established notions of human rights law, in particular the right to a fair trial, this “proceduralist” approach to environmental law is part of a scheme for public participation in decision-making, which has been developed also in international law. Today, more than 40 states and the European Community are parties to the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention),¹ which sets minimum standards on the right to access to review procedures (Ebbesson, 1997). While there is no corresponding regime for other regions of the World, the subject matter is part of the legal discourse also elsewhere. One of the rationales for granting members of the public a right to challenge administrative decisions, acts and omissions in courts or court-like bodies (fair, independent and impartial), is to keep the public administration within legal bounds, while acknowledging the need for openness and flexibility in environmental decision-making. Thereby, the rule of law and legal certainty can be ensured, although differently than under the ideal-typical liberal state.

As I describe below, the decision-making procedures may contribute to some flexibility and the screening of alternative options when deciding on harmful activities. Despite the desire for flexibility in social contexts and decision-making, however, some forms of flexibility are clearly unsuitable. For instance, we do not want administrative authorities to ignore rules aiming at protecting human health, nor do we appreciate corruption in the name of flexibility. Thus some constraints are necessary for effective decision-making and for trust in the government, and they promote rather than block resilience of socio-ecological systems and the ability to prevent and adapt to adverse changes.

Increased confidence in public participation in decision-making as well as broadening access to judicial remedies reflect an expansive notion of democracy, which diverges from the standard

¹ 38 *International Legal Materials* (1999), p. 515.

liberal approach; and it provides for a “reflexive modernization”, as Ulrich Beck puts it, that is apt to environmental decision-making and risk considerations. Such reflexive institutions square well with the findings in resilience research, about the need to foster learning and adaptability. When administrative decision-making procedures become sites for public participation and engagement, where hazardous projects could be examined in public and the environmental impact could be assessed, courts also provide arenas for invoking legal principles and rights relating to health and the environment, since:

“[e]ven courts become omnipresent monitoring agencies of political decisions; paradoxically, this occurs in exactly the degree to which, on the one hand, the judges exercise their ‘judicial independence’ even against the grain of politics, and on the other, citizens transform themselves from the loyal addressees of political decrees into political participants and attempt to sue for their rights in court *against* the state, if need be” (Beck, 1992, p. 194).

While the procedures for environmental decision-making may provide for openness as well as some degree of flexibility, that does not mean that these procedures suffice to cope with complexities and unexpected changes. To do so requires more, and, as I argue below, critical for such capacities are the procedural design as well as the normative principles on which the decisions are to be based. On the other hand, there is no indication either, that legal certainty as such hampers sustainable management. The rule of law can be said to be essentially a negative virtue, in the sense that it may minimise the danger of arbitrary power (Raz, 1977). Legal certainty can provide trust in government and opportunities for citizens and corporations to plan their activities, and to prepare for changes. Yet, as indicated, conformity with the rule of law does not in itself imply adequate laws, nor does it necessarily facilitate the realisation of various purposes of the law. Even so, while the principle of legal certainty may be poorly institutionalised, legal uncertainty, as such, does not provide a better ground for sustainable governance; rather the contrary.

3. Resilience in decision-making?

3.1. Design and scope of institutions

Although the rule of law does not preclude flexibility or adaptability in decision-making, the challenge remains of finding appropriate relations between legal certainty and flexibility, in order to cope with changes and complexities. The tension between, on the one side, stable and predictable laws and, on the other side, flexibility and adaptability not only matters for formalised, administrative decision-making, but also for the opportunities of civil society to engage in the management of common resources and to establish other social institutions and networks to that end. In this respect, the legal structure may be more or less enabling and more or less “trust-providing”. For example, depending on the legal design, property rights and administrative divisions of power may have blocking as well as promoting effects for resource management and for the creation of informal institutions, trust funds and other arrangements to that end.

It is hardly possible to generalise on which legal factors work in a particular direction in all cases or on how to design legal institutions in order to promote sustainable utilisation of resources. There simply is no once-and-for-all or one-fits-all solution, nor are there any “sure-fire” methods or normative

solutions, whether they include formal rules or informal social norms, for sustainable utilisation of common-pool resources. For numerous situations, administrative institutions and centralised rule-making may not even be the best means for effectively managing common-pool resources and complex changes (Ostrom, 2005). In such cases, cooperative arrangements with persons and organisations engaged in the resource could be more apt to cope with risks, uncertainties, surprises, changes and complexities than, say, formalised permit systems or supervisory authorities. Still, the design and scope of administrative institutions and decision-making in environmental contexts matter for the utilisation of resources, not only in and for itself, but also for the opportunities of establishing alternative forms of management *outside* the administration; i.e. the administrative institutions may be more or less supportive and facilitative for such forms of management.

In administrative fora, the degree of flexibility and the ability to adapt to and cope with complex changes depend on both *procedural law*, i.e. on the rules governing the form and procedure of decision-making, and the *substantive law*, by which is meant the rules and principles denoting what is prescribed, permitted or banned or the aspects to be taken into account when making decisions. Indeed, procedure and substance are closely intertwined in the determination whether or under which conditions a certain activity, installation or plan is lawful.

In Sections 3.2 and 3.3 I will analyse some procedures, instruments and concepts commonly used in environmental law in light of the four “resilience factors” listed in Section 1. While the measures are essentially developed and established in national laws, I also refer to some examples where they have been prescribed in European Community law and international law in order to reveal the wide acknowledgement of these approaches. As further discussed in Section 4, international law and, for most part, European Community law must be implemented by national means, compatible with, respectively, the international and European norms.

The examples will reveal how legal procedures, instruments and concepts for administrative control of harmful activities and for the protection of health and the environment are not adequately designed to cope with new circumstances in ways that succeed in promoting socio-ecological resilience. A closer assessment of the resilient capacity of different approaches to manage natural resources must be based on case analyses, where the particularities of the society, e.g. in terms of legal structures and economic and ecological situation, are also considered. Nevertheless, already the mapping out at the abstract level will reveal the need for reviewing and adapting existing means of control so as to ensure a higher degree of resilience.

3.2. Flexible and adaptive decision-making procedures?

The laws relating to administrative procedures matter for the flexibility, openness and transparency, and adaptability of such decision-making. It does so by defining, e.g. the scope of persons allowed to participate and the possibility of having administrative decisions appealed and reviewed in light of new circumstances. It also matters for the requirements of prior assessment and follow-up monitoring of the possible effects of activities, plans and programmes, and for the need to consider alternative options.

Permit requirements and procedures are common means for controlling activities and installations that may affect health and the environment. Permit procedures, in which it is decided whether and under which conditions an activity should be permitted or a concession should be granted, can be more or less integrative and more or less flexible. The tendency has been to

make such procedures increasingly integrative, so as to consider a broad scope of effects, risks and concerns in one process, rather than in several parallel processes.² Thus a more comprehensive assessment can be made. An important factor for the flexibility and adaptability provided by permit procedures, and for the ability to cope with changes and new circumstances within the framework of such procedures, are the grounds on which the permit, once granted, can be challenged, reviewed and even withdrawn. Such review procedures are critical, for instance, when it is realised that the adverse effects from the activity were far worse than expected, when the ecosystem has declined or is at risk of declining significantly, and when better technology has been or could be developed. In this respect, the legal implications of a permit or concession matter from a resilience and flexibility point of view, since it is more difficult to adapt and cope with changes if permits, once granted, can hardly be reviewed or revoked at all than if such opportunities exist, albeit regulated. One way of providing some legal certainty for the operator is to set out either in the statutes on which the permit is based or in the permit itself under which conditions it may be reviewed or withdrawn. In order to facilitate the considerations of new circumstances, the permit could – indeed should – also be granted for a limited time only.

Another critical factor for the capacity to deal with new circumstances and changes is the scope of issues – effects, alternatives, costs, risks and uncertainties – that are taken into account in decision-making processes related to health, the environment and natural resources. To what extent can anyone else than the applicant, whether supervisory authorities, private persons or NGOs, invoke factors to be considered? Is it mandatory to consider the specific activity in a larger context in order to ensure a better picture of the combined harmful and long-term effects of different activities, projects and installations?

Obviously, the input of knowledge and science in the decision-making matters for the ability to foresee and adapt to changed circumstances as well as for the learning of operators, authorities and members of the public engaged in the process. A common means in environmental decision-making to improve the knowledge base is to supplement the permit requirements with *environmental impact assessments*. Such assessments may not only add useful knowledge in the decision-making procedure, but also reveal and expand the scope of relevant concerns, identify lack of knowledge and information, and force the operator to reflect on the undertakings. Yet, the degree to which this is achieved differs considerably depending on the structure and implementation of such assessments – and of course on the degree to which the information provided is really taken into account by the deciding entity. Today, numerous national laws require environmental impact assessments for specific projects and activities as well as for plans, programs and policies (“strategic environmental assessments”), and it is also part of European Community law and international law.³ Both forms of assessments are to be carried out *before* the permit is given or the plan is adopted, and they should involve procedures for public participation. Although environmental impact assessments should aim at identifying likely effects beforehand and thus to avoid or control the effects, they may also

improve the ability to reveal complexities and adapt to changes. Such assessments can also be combined with continuous requirements on post-monitoring, in order to identify changed circumstances or other critical factors as soon as possible. In practice, however, unless the procedure is transparent and members of the public are given a true opportunity to voice their concerns at an *early stage* in the decision-making process, there is a constant risk that assessment procedures become mere *pro forma*, with little real bearing on the decision-making.

Permit systems as well as impact assessments are used also for other activities than polluting industries, for instance, when allocating quotas or caps for the exploitation of natural resources (fish, game, forests and minerals). The degree to which these systems promote resilience and the ability to cope with changes (such as significant reductions in fish stock) is affected by the quality of the assessment, but also by the possibility to have the given permits, quotas and concessions reviewed and withdrawn.

In addition to permit procedures and environmental impact assessments, the mandate and competence of authorities in charge of supervision – their means of enforcing environmental laws, but also their duty to serve, guide and assist operators – will affect the capacity to withstand and even avoid socio-ecological changes. But the dynamics of the administrative control system also depends on the possibility of other actors – private persons, civil society organisations and corporate entities – to trigger administrative or judicial procedures concerning harmful operations, and to engage themselves in the management of natural resources. In the administrative and judicial procedures concerning hazardous activities, the ability to cope with ecological changes and react to new circumstances is affected by the kind of remedies available for supervisory authorities and members of the public in different judicial or administrative procedures. In particular, the possibility to request injunctive relief, also on an interim basis, is important to prevent harmful ecological effects and quickly adapt to changed circumstances.

3.3. Flexible rules and principles?

The degree of flexibility and the scope of discretion bestowed on administrative agencies, public authorities and courts also depend on the substantive rules and principles to be considered when deciding on activities with an impact on health or natural resources or on the means for managing a common pool resource. It is on the basis of these rules and principles that the competent authority decides on, for instance, the operation of harmful industries, technical requirements for cars, the use of hazardous chemicals, the protection of nature, and the management of wastes. The legal requirements are defined with varying degrees of detail, depending, e.g. on the activity to be controlled and the legislative tradition of the country in question. Although detailed rules and technical standards are sometimes set out in legislation, a more common approach in the field of health and the environment is to legislate by means of general principles and framework laws, where the substantive requirements and standards are set out by more open-textured rules, principles and goal-oriented norms. In these cases the legal framework will have to be supplemented either by governmental regulations or conditions set by permit authorities or supervisory authorities, case by case, on the basis of the framework laws. Other material, although not legally binding in itself, may also be relevant.

Ruling by principles imply stating a certain normative direction and indicating different possible factors that may be taken into account and weighed against another, without the aspiration of exactly denoting or determining the outcome of the decision-making. Ruling by objectives or goal-oriented norms means that the objective is defined, but it is left over to the competent

² One such example is the European Community Directive 2008/1/EC Concerning Integrated Pollution Prevention and Control, 2008 OJ L24, p. 8, which obliges the EU member states to establish integrated permit procedures for certain installations and activities.

³ See European Community Directive 85/377/EEC on the assessment of the Effects of certain Public and Private Projects on the Environment, [1985] OJ L175, p. 40; European Community Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment, [2001] OJ L197, p. 30; UNECE Convention on Environmental Impact Assessment in a Transboundary Context, Espoo, 1991; and UNECE Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, Kiev, 2003.

authority to decide on the means. In reality, much decision-making in environmental law involves both detailed rules and general principles as well as the consideration of environmental and health objectives.

Concepts such as *Best Available Technology* (BAT) have been predominant in numerous countries, as a means to define the performance standards for industries and other activities with an environmental impact. BAT-like concepts reveal the notion of “Modernity” and the idea of economic optimisation in environmental law, by setting the standard of technical performance at the best available technology that is economically feasible. Hence, the presumption is that the activity or project is to be permitted provided the technical standard is met without really challenging the economy of the project or the operator. BAT-like concepts are indeed flexible in the sense that the requirements on the operator change with improvements in the technical developments. Yet, by only focusing on the technology used in the installation, rather than its effects on health, the environment and natural resources, this approach fails to consider the impact of ecological changes on the responsibility of the operator of the activity. Therefore, in order to promote the ability to deal with new circumstances, performance standards of this kind must be supplemented or combined with normative frameworks that take due account of the impact of the activity on health, the environment and long-term utilisation of natural resources.

The notion of *optimisation*, with a rather short-term basis for economic calculations, is reflected also in other regulatory techniques to control polluting or otherwise harmful activities, and in regulations of resources exploitation. An apparent example is the regulation and control of fishery, where total allowable catches (TAC) have been based on optimal yield rather than long-term management, with devastating effects on some marine ecosystems (Walker and Salt, 2006).

Some legal concepts and elements of legal frameworks do consider the totality of adverse effects on the environment from diverse pollution sources, and may thus supplement performance standards that apply to each operator. One such example are *environmental quality standards* for air and water, which have been used, e.g. in the federal environmental laws of the USA and in European Community law. Defining in legal terms permissible qualities or concentrations of substances for air and water may appear ideal because this approach “starts off from the environment”. Yet, the effectiveness and relevance of such norms for preventing undesirable effects depend on several legal, social and ecological factors. This is even more so when the standards are set at the US federal or European Community level, while the implementation takes place at the level of a member state of the federation or the community.

Quality standards for air and water are only relevant if there are means available for ensuring compliance. One such means is the adoption of implementation plans for areas where the standards have not been met. When designing these plans, the competent authorities have considerable discretion in choosing the means. This normative approach may indeed be supportive to decision-making when coping with complex changes and may also promote learning and, possibly, the adaptability among those concerned. Yet, to be effective such norms should entail legal consequences and possible sanctions or restrictions once the standards are exceeded. Moreover, in order to be adaptive, such norms must be continuously reviewed. A legal framework with far-reaching ambitions in this respect is the European Community Water Framework Directive of 2000,⁴ which starts off from environmental objectives, to be achieved by environmental quality objectives,

river basin management plans and procedures for continuous monitoring in the EU member states. The Directive establishes an ambitious and quite complex legal structure for water management, that is adaptive to changed circumstances, but to function effectively the environmental quality standards will have to be matched by adequate social institutions and entail restrictions for the actors contributing to the adverse effects on the water quality. It is still too early on to conclude whether the Water Framework Directive will achieve that.

Environmental quality standards are attractive from a legal point of view because they are relatively precise and reduce the risk that environmental interests are set aside. Moreover, the legal criteria for what is permissible start off from the loads in the recipient, although not really from the ecological effects. Yet, without adequate institutions and continuous reviews, they may be too static and fail to strengthen the capacity of a society to adapt to new circumstances. Likewise, legal protection of nature through *zoning instruments*, such as nature reserves that prohibits certain activities within well-defined areas, may be attractive because they are relatively precise and limit the risk of having the environmental interests set aside within the given area. Yet, for some species and environments, zoning and the designation of protected nature reserves are less adequate means to promote sustainable management and resilient structures than, say, the development of general legal principles – or extra-legal institutions (such as Forest Stewardship Council, FSC) – to promote sustainable forestry in *all* areas (Ebbesson, 2003).

Regardless of the legal approach chosen – whether starting off from the technical performance or the effects on health and the environment – effective management of socio-ecological systems include adequate policies for the consideration of risks and uncertainties. Relevant from a resilience perspective is how new insights and indications of adverse effects should be considered in decision-making. What should be the legal effects of *risk* indications and of uncertainty with respect to complex cause-effect relationships? At what stage should such risks and uncertainties entail legal effects, so as to prevent certain conduct or to impose certain preventive measures? As an approach to considering risks and uncertainties, the *precautionary principle* has been recognised as a legal principle in numerous countries as well as in European Community law and international law. The principle is not construed identically in all jurisdictions. Yet, it is generally understood as implying an obligation to take precautionary measures with regard to activities and substances already when there are indications of risks for harm, and not only when there is complete evidence (if there ever was) about a cause-effect relation. Despite the wide acceptance, the legal implications of the principle in coping with ecological changes and promoting resilience depend *inter alia*, on how risks are balanced against the costs for taking preventive measures, on who has the burden to prove that there is or is not a risk in the first place, and on the institutions in place to control the implementation (Sadeleer, 2007).

A different rationale in the control of polluting activities from the mentioned administrative institutions is found in market-based instruments, such environmental taxes and *emission trading* in green house gases. In trading schemes, the incentive to cut down emissions is economic rather than legal, and the effectiveness from an environmental point of view depends on whether the economic incitements are strong enough to promote reductions of emissions. The extent to which trading systems promote resilience and the capacity to cope with ecological changes is a different matter. Emission trading allows considerable flexibility for each actor involved in deciding if and how to cut down emissions. Yet, the ability to adapt cap-and-trade schemes to new circumstances will depend on, *inter alia*, how the total cap of emission is calculated in

⁴ Directive 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy, [2000] OJ L327, p. 1.

light of new science and on how quickly and effectively the total cap of emissions can be reduced – adapted – in pace with new learning.

4. Scales: the impact of state borders and sovereignty

The legal approaches surveyed above, on the control of harmful activities and the use of natural resources, were developed essentially to cope with domestic environmental and health concerns. However, these measures and approaches are also relied upon in transboundary and international contexts, although combined with, e.g. procedures for notification, consultation and cooperation with other states. They are also part of environmental legislation in the EU. To be sure, if the means described appeared insufficient for dealing with changes and new circumstances in domestic contexts, governance in transboundary contexts and large-scale cases concerning health and the environment is even more complex and more likely to fail. Even so, today few issues related to health, the environment and the use of natural resources remain fully within national borders. Climate change, ozone layer depletion, marine pollution and over-fishing at the high sea are obvious examples of issues beyond the nation-state, but also the management of fresh water resources and air quality, the protection of endangered species, the control of chemical products and the preservation of fragile nature consistently expand across state borders.

While the geographical scope – the “scale” (Walker and Salt, 2006) – of the environmental or health issue at stake matters for the prospect of effective management and control, state borders and state sovereignty add to the picture. International law affects states in two respects with regard to transboundary effects on health, the environment and natural resources.

First, international law imposes the duty on states to maintain control over activities within their respective jurisdiction, so as to limit transboundary harmful effects (Handl, 2007). Although it is well settled in international law that states must not permit activities within their jurisdiction or control that cause significant harm outside the territory of that state, the adequacy of the principle for ruling harmful activities differs from one context to the other. In certain situations, where it is relatively easy to trace the harm to a particular activity or installation, this principle of international law can effectively rule and entail legal responsibility for the state of the activity, and possibly prevent further harm. In other situations, however, polluting substances from one state may not in themselves cause significant harm, but may do so in combination with similar emissions from other states. In numerous cases, such as the depletion of the stratospheric ozone layer and climate change, it is therefore almost impossible to trace a particular harm to the conduct of or in a particular state. To be relevant, in these situations, the legal approach to controlling harmful activities must take another form, and the responsibility of states must be defined in other ways. This is the case also with regard to the protection of ecosystems. While international law imposes duties on states to protect ecosystems, there is no clear legal status of ecosystems under international law. Instead, management of transboundary ecosystem remains subject to state sovereignty, and to the extent measures are agreed upon internationally it is for each state to implement them within its territory (Tarlock, 2007).

Second, international law affects the institutions and management of common pool resources in situations of ecological change and new circumstances, by providing the legal basis for state sovereignty. Among the different implications of state sovereignty, the almost exclusive jurisdiction and control of each state over activities within its territorial limits is essential for the prospect of coping with ecological changes and new

circumstances. This, in turn, means that when actions are taken to solve a common problem or manage a common pool resource, each state will have to take the measures needed within its territory or for its citizens, while transboundary management and decision-making essentially amount to coordination of different national efforts.

Somewhat ideally, one may argue that in the 20th century, the structure of international law changed in many respects from essentially a system of international co-existence to a system of international cooperation as the need for international institutions increased (Friedmann, 1964). Today, hundreds of intergovernmental institutions exist with the task of dealing with different transboundary or international issues, including health, the environment, natural resources and emergency situations. Many of these institutions, particularly within the UN system, pertain to almost all states, whereas other institutions operate on a regional or even bilateral basis. In addition to these intergovernmental organisations, numerous multilateral environmental agreements provide for autonomous institutional arrangements to manage specific common environmental problems or common pool resources (Churchill and Ulfstein, 2000). It is not possible to generalise on the effectiveness or the degree of success for the different organisations and arrangements, but, as far as implementation is concerned, it remains essentially for each state party to do it within its territory.

Put simply, state sovereignty implies that a state can decide not to be part of a particular international agreement or cooperative arrangement to solve transboundary problems of health and the environment. While such consent adds to the legitimacy of international law and politics, this requirement also creates hurdles for the development of adequate forms of management. Moreover, the division of territories, jurisdictions and powers into states and separate legal systems, as such, does not square well with the coupled human-environmental interactions that in most cases fully disregard state borders. The routine of centralising interstate cooperation means that all activities and communication must pass through the central governments rather than being entrusted to the regional or local units concerned, in the respective state. Such centralisation complicates for multilevel governance in transboundary contexts as it restricts cooperation across state borders between municipalities, and also limits the opportunities for members of the public to participate in decision-making and the management of a common resource on the other side of the state border.

In some regions and some regimes, some innovations of international law have developed so as to make it possible for members of the public to participate in management schemes and decision-making across borders. One such approach is to allow members of the public, including civil society organisations, to participate in decision-making on the basis of *non-discrimination*, i.e. they are granted the same rights to be part of the decision-making procedure as members of the public in state where the decision is to be made. Thus far, such opportunities have been set out in some regional environmental agreements, most of which in Europe. However, the International Law Commission, the UN body entrusted under the UN Charter with the mandate to progressively develop and codify international law, has actively promoted the principle of non-discrimination in transboundary environmental decision-making (International Law Commission, 2001). State borders could thus be transcended by members of the public requesting information, participating in decision-making and accessing the judiciary across state borders – and not only transcended via the offices of central governments. Yet, in practice, such transboundary participation in environmental decision-making remains quite unusual. As far as transboundary administrative cooperation below the level of governments is concerned,

there are rather few such arrangements, and this remains an underdeveloped area in international law and relations in light of current challenges to health and the environment.

The EU is a unique case of transboundary law, institutions and cooperation, also in the field of health and the environment. By its quasi-federal structure, the EU has managed to go beyond the stiff distinction between international and national law that prevails in most intergovernmental cooperation. Through indeed formalised procedures, the EU member states and the European Parliament have adopted a large volume of legislation in the field of health and the environment. This legislation is mostly in the form of *directives*, to be implemented by the member states within each jurisdiction, by means of national legislation and other relevant measures.⁵ While this legislation shall essentially be applied by all member states regardless of transboundary effects, there are also provisions in several directives that oblige the member states to coordinate their work across state borders, e.g. with regard to international rivers.⁶ Moreover, the EU member states must provide for participation of members of the public on the other side of the border in decision-making for projects, installations, plans and programmes where transboundary harm may occur.⁷

Essential for the level of governance of environmental and health matters in the EU is the *principle of subsidiarity*, according to which common measures and legislation should be taken only if and insofar as the objectives of an action cannot be sufficiently achieved by the member states, e.g. by reasons of scale.⁸ While the EU appears as a bureaucratic and stiff organisation in different respects, rather than as a flexible social institution, it nevertheless provides a relatively advanced form of transboundary cooperation for managing common resources compared to most international organisations.

In transboundary contexts, the legal system not only affects the flexibility of cooperation in the field of public law and among administrations at different levels, or the possibilities for members of the public to act across state borders. The legal structure also complicates the control of transnational corporations. While corporations and markets transcend state borders, the legal structures still make it difficult to hold transnational corporations responsible across state borders. In part, this explains why non-legal means of control, such as corporate codes of conduct, have had a larger impact on the behaviour of transnational corporations than international regulations through international agreements (Ebbesson, 2006). The shortcomings of international law to promote more effective control of transnational corporations presumably complicates also the management of certain common pool resources and the adaptability to new ecological challenges.

5. Lessons learned – in both directions?

Analysing legal structures, concepts and institutions differs from analysing social and ecological facts. We cannot deduce factual situations from a legal framework; whether we consider how institutions work or how ecological systems respond. Normative texts and structures cannot be taken as a pretext that the practice and human conduct “is” as it “ought to be”. Still, legal

⁵ Consolidated version of the Treaty Establishing the European Community Article 249, [2002] OJ C325, p. 33.

⁶ Directive 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy, [2000] OJ L327, p. 1, Arts 3, 13 and 14.

⁷ Directive 85/337/EEC on the Assessment of the Effects of Certain Public and Private Projects on the Environment, [1985] OJ L175, p. 40, Art 7; Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment, [2001] OJ L197, p. 30, Art 7; Directive 2008/1/EC Concerning Integrated Pollution Prevention and Control, [2008] OJ L24, p. 8.

⁸ Consolidated version of the Treaty Establishing the European Community Article 5, [2002] OJ C325, p. 33.

structures and concepts significantly affect the work of institutions in practice, also with respect to managing common resources. The legal structures, together with various social, economic and other facts, matter for the ability to manage common pool resources and to prevent adverse changes of socio-ecological systems. They also matter for the ability to adapt to such changes when they occur.

The first part of this article focused the rule of law and legal certainty, and showed that there is no support for the view that these notions, as such, necessarily hamper any ambition to create resilient structures and institutions. Rather, the extent to which law affects such ambitions depends on the content of the rules and the institutions set up. It was also shown that many established legal approaches to controlling harmful activities and managing common resources are not adequately designed to cope with new circumstances in ways that succeed in promoting socio-ecological resilience; they appear too static, and in great need of improvement. Finally, some general legal structures and existing legal concepts, for instance state sovereignty, counter the establishment of adequate institutions to cope with common pool resources.

While resilience research can further stimulate legal scholarship and research so as to help changing legal thinking and legal institutions in order better to cope with complexities and common risk, this is not a one-way street. Further research on law and resilience should consider different forms of liability in light of resilience, and link the systemic approach to concerns at the level of members of the public. Resilience research would benefit from deeper understanding of the functions, structures and complexity of law. Once the legal means of control are analysed, it becomes apparent, for instance, that “flexibility” and “openness” can refer to completely different features in administrative decision-making. Understandings of law may thus help making the repetitive references to flexible social institutions in resilience literature more nuanced. Finally, studies of multilevel governance can also be advanced by insights in legal structures and concepts. This cross-fertilisation suggests further research on the rule of law and the role of law when governing complex socio-ecological changes.

References

- Adger, W.N., 2000. Social and ecological resilience: are they related. *Progress in Human Geography* 24, 347–3644.
- Adger, W.N., et al., 2005. Social-ecological resilience to coastal disasters. *Science* 309, 1036–1039.
- Beck, U., 1992. *Risk Society: Towards a New Modernity*. Sage Publications, London/Thousand Oaks/New Delhi.
- Churchill, R., Ulfstein, G., 2000. Autonomous institutional arrangements in multi-lateral environmental agreements: a little noticed phenomenon in international law. *American Journal of International Law* 94, 623–660.
- Dworkin, R., 1986. *Law's Empire*. Harvard University Press, Cambridge, MA.
- Ebbesson, J., 1997. The notion of public participation in international environmental law. *Yearbook of International Environmental Law* 8, 51–97.
- Ebbesson, J., 2003. *Lex Permis Apivorus: an experiment of environmental methodology*. *Journal of Environmental Law* 15, 153–174.
- Ebbesson, J., 2006. Transboundary corporate responsibility in environmental matters: fragments and foundations for a future framework. In: Winter, G. (Ed.), *Multilevel Governance of Global Environmental Change: Perspectives from Science, Sociology and the Law*. Cambridge University Press, Cambridge, pp. 200–224.
- Folke, C., 2003. Freshwater for resilience: a shift in thinking. *Philosophical Transactions of the Royal Society London B* 2027–2036.
- Folke, C., 2006. Resilience: the emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16, 253–267.
- Folke, C., et al., 2002. Resilience and sustainable development: building adaptive capacity in a world of transformations. *Ambio* 31, 437–440.
- Friedmann, W., 1964. *The Changing Structures of International Law*. Stevens & Sons, London.
- Habermas, J., 1996. *Between Facts and Norms: Contributions to a Theory of Law and Democracy*. MIT Press, Cambridge, MA.
- Handl, G., 2007. Transboundary impacts. In: Bodansky, D., Brunnée, J., Hey, E. (Eds.), *The Oxford Handbook of International Environmental Law*. Oxford University Press, Oxford, pp. 531–549.
- Hart, H.L.A., 1994. *The Concept of Law*, 2nd ed. Oxford University Press, Oxford.

- International Law Commission, 2001. International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law (Prevention of Transboundary Harm from Hazardous Activities). Report on the Work of Its Fifty-Third Session, UN Doc.A/56/10/suppl.10, pp. 366–436.
- Ostrom, E., 2005. *Understanding Institutional Diversity*. Princeton University Press, Princeton/Oxford.
- Peczenik, A., 1995. *Vad är rätt? Om demokrati, rättssäkerhet, etik och juridisk argumentation*. Norstedts Juridik, Stockholm.
- Raz, J., 1977. The rule of law and its virtue. *The Law Quarterly Review* 93, 195–211.
- Sadeleer, N. (Ed.), 2007. *Implementing the Precautionary Principle: Approaches from the Nordic Countries, EU and USA*. Earthscan, London.
- Tarlock, D., 2007. Ecosystems. In: Bodansky, D., Brunnée, J., Hey, E. (Eds.), *The Oxford Handbook of International Environmental Law*. Oxford University Press, Oxford, pp. 574–596.
- Walker, B., Salt, D., 2006. *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*. Island Press, Washington/Covelo/London.