The role of the precautionary principle and property rights in the governance of natural resources in Sweden

Maria Pettersson and Susana Goytia

Introduction

The use of natural resources is typically governed by legal rules, which in turn are rooted in legal principles. Legal principles, as well as their interpretation and their relative importance (i.e. how much weight the principles are given in the application of the law) vary not only between but also within legal systems. This may determine that different, even contradictory outcomes are reached in seemingly comparable situations within a single legal system.

Some legal principles are overarching in the sense that they constitute the foundation of national or international legal system as a whole. For instance, the principle of free trade integrates legal systems at all levels, including national law, and across sectors (i.e. GATT, 1994; see also e.g. Schoenbaum, 1992; Copeland and Taylor, 2004; Margolis et al., 2005). Other legal principles can be said to sustain only certain areas of the law. Environmental law principles, such as the precautionary principle (measures shall be taken to prevent even potential harm) or the polluter pays principle (polluters are responsible for any damage caused by their activity), have been recognized as significant for integrating environmental issues, but are not necessarily recognized by the legal system as a whole (e.g. Lang, 1999). Rather, they may be undermined by other basic principles, such as the protection of property rights or free trade. Environmental law principles and precautionary requirements that can be attributed to these may also be limited in favour of sectorial legislation, "thus constraining the possibility for effective environmental integration at system level" (Keskitalo and Pettersson, 2016 (in press)).

Sectors with strong traditional interests that are important from a socio-economic perspective or in terms of gross domestic product (GDP) have often been given special treatment in the sense that applicable law is adapted to the activity, rather than the other way around. In other words, the legal rules have typically come about to control the exploitation of the resource, albeit not necessarily its impacts on the environment. As a result, it can be difficult to adapt these rules to modern environmental requirements, in particular by allowing for the application of environmental principles (Keskitalo and Pettersson, 2012; 2016 (in press)). This study thus proceeds from the fact that national legislation has historically favoured economic development that for example promotes employment and increases state revenues, provided that the activities comply with specific legal requirements (Keskitalo, 2008).

For instance, the protection of private ownership in the Swedish forestry sector has traditionally been strong and has resulted in comparatively less (detailed) regulation than in other sectors. Existing practices have therefore significantly influenced the way in which for example environmental policy is implemented (e.g. Appelstrand, 2007; Forsberg, 2012). The mining sector, on the contrary, is under a significant le-

gal control, but since the primary aim of the key legislation in the area, i.e. the Minerals Act (SFS 1991:45), is to establish land use rights and facilitate exploitation, principles of precaution and environmental responsibility can prove difficult to implement (Pettersson et al., 2015). The water resources sector evidences similar traits, at least historically. In the beginning of the 20th century, limitations to private property rights in relation to water intensified in favour of the development of the hydropower industry (Vedung and Brandel, 2001). Sweden is at present investigating how the water rulings resulting from that era can be made compatible with modern environmental principles (SOU 2013:69; SOU 2014:35).

This study targets the influence of the precautionary principle on the use of natural resources in Sweden. In particular, it asks how the precautionary principle and the principle of the protection of property rights interact in legislation governing the use of minerals, forest and water in Sweden. The different sectors are used as examples of areas in which separate (and sometimes dispersed) legal frameworks need to manage multiple interests, such as environmental protection and socio-economic development.

Methods and outline

In order to explore the proposed question, it is important to first address legal principles and their interactions from a theoretical perspective. The intention here is not to engage in the ongoing debate on the nature and function of legal principles, or on whether the precautionary principle and property rights constitute legal principles, but instead to use theoretical constructs to examine the interactions among the precautionary principle and property rights as interpreted, applied and enforced in Sweden. Since Swedish law, in particular with regards to the precautionary principle, is strongly influenced by international and European Union (EU) law, it is necessary to also study the development and interpretation of the principles from this perspective.

With respect to the legal analysis of the three sectors, the study builds on findings from our previous research on the role of law in relation to the sustainable use of natural resources in general and in particular, with reference to climate change adaptation needs (e.g. Keskitalo and Pettersson 2012; Bäckström 2012; Pettersson and Keskitalo 2013; Pettersson et al., 2015; Bäckström 2015; Pettersson et al., 2016; Keskitalo and Pettersson, 2016 (in press); Goytia et al., (submitted manuscript)). The analysis of the implementation and interpretation of the precautionary principle puts this research in a new light, adding a principle and system-based perspective on the different sectors.

What is a legal principle?

For the purpose of this paper, we draw on the distinction between legal rules and legal principles as proposed by Robert Alexy, which essentially consists of the following. Whereas legal rules are norms imposing exact demands that can either be complied with or not (*definite commands*), legal principles are norms that instead demand that "something be realized to the highest degree that is actually and legally possible" (*optimization commands*) (Alexy, 2000, p. 295). The obligation to realize to the greatest extent possible given *actual* possibilities is governed by principles of appropriateness and necessity, which are associated with Pareto optimality; the field of what is *legally* possible is determined by counteracting rules and principles, where a proportionality principle must be respected (Alexy, 2000).

Alexy explains that a collision of principles and a conflict of rules are resolved in fundamentally different manners. When two rules are in conflict, the solution consists on either introducing an exception clause into one of the rules, or by declaring at least one of the rules invalid. A

collision of principles does not lend itself to these kinds of solutions. Here, the problem is solved by "determining a conditional priority of one of the colliding principles over the other with respect to the circumstances of the case" (Alexy, 2000, p. 296). The priority among principles in a system is then relative, not absolute. The legal effects of the preceding principle are realized when the conditions that determine this principle to have priority over the other are fulfilled (the *"collision law"*). In the cases where one principle can only be realized at the cost of the other, the intensity of the interference in the latter must correspond to the importance of realizing the former (the *"balancing law"*).

Legal principles appear in both international and national instances. The inclusion of "general principles of law recognized by civilized nations" in article 38 of the Statute of the International Court of Justice (ICJ) has been exhaustively debated (for summary see Lammers, 1980). Key points of debate relate to whether these general principles constitute a source of law independent from conventions and custom, as well as to whether it is general principles of *national* law, or of *international* law, or both, that are covered by the formulation. Within the realm of international environmental law, general principles have been characterized by Bodansky (2010) as norms that reflect fundamental propositions of law shared by legal systems around the world, and typically classified as "hard law", in opposition to for example resolutions of international organizations and conference declarations, which are instead "soft law" or non-legal.

In the context of the EU, "general principles of law" are regarded as sources of law developed by the Court of Justice by derivation from the treaties establishing the union, from international agreements among Member States or from their national legal systems (Usher, 1998). Semmelmann (2013) explains that although the constitutional treaties do not include a catalogue of sources of law, they do contain traces of general principles of EU law and of general principles common to the laws of the Member States, and that, beyond these, the Court of Justice of the European Union has recognized several other general principles which later on have been incorporated into the legal framework of the Union.

General principles of law have a "gap-filling" function at the international and EU instances (Lammers, 1980; Usher 1998): where legal rules do not cover the situation at hand, the judge must turn to principles in order to prevent *non liquet*. This notion has arguably been more difficult to accept in countries like Sweden, where legal realism has historically exerted significant influence. That is not to say that legal principles have not been subject of debate among Swedish legal scholars, although not always in those terms. For example, Anna Christensen's (2000) basic normative patterns denote, by her own admission, at least in part the same phenomenon as fundamental principles.

The Precautionary Principle

In its most basic interpretation, the precautionary principle entails that when an activity poses a risk, for example threatens to harm human health or the environment, precautionary measures must be taken. On an international level, it follows from the Rio Declaration that "[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation."[1] Thus, scientific uncertainty is not a reason to postpone action to avoid potentially serious or irreversible

[1] The precautionary principle was first recognized in 1982, in the World Charter for Nature adopted by the United Nations General Assembly, and subsequently incorporated into various environmentally related conventions.

harm to the environment. Key aspects are thus anticipation, a long-term perspective and a shift of the burden of proof to the actor. In tangible terms, i.e. in connection with specific activities, this entails an inclusive assessment of the activity, resulting in concrete requirements for precautionary measures to prevent adverse social and environmental impacts.

However, the implementation and interpretation of the precautionary principle differ substantially between different legal acts. Article 3.3 in the United Nations Framework Convention on Climate Change (UNFCCC) requires that the risk is 'significant' for the obligations of the convention to arise. A similar formulation is found in the ninth paragraph in the preamble to the Convention on Biological Diversity (CBD), according to which a "lack of full scientific certainty" should not be used as a reason for postponing precautionary measures. In contrast, the World Trade Organisation (WTO) Sanitary and Phytosanitary (SPS) Agreement, allows parties to the agreement to adopt precautionary measures "only to the extent necessary" for the protection of human, animal or plant life and health, and only if the measures are "based on scientific principles" and not upheld without scientific evidence (Art. 2, para. 2). It is therefore possible to speak of 'weak' respectively 'strong' versions of the precautionary principle (cf. Wirth, 2013; Ansari and Wartini, 2014), where the strong version primarily entails that the burden of proof is reversed, i.e. falls upon the person undertaking the activity or measure (Kayikçi, 2012).

The progressive consolidation of the precautionary principle in international environmental law has translated into the EU legal framework. Article 191 of the Treaty on the Functioning of the European Union states that the environmental policy of the EU "shall be based on the precautionary *principle* and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay" (emphasis added). EU law does not however offer a definition of the precautionary principle, and it is consequently up to authorities and decision makers in the individual Member States to give it concrete expression, for example in the form of conditions for a permit. In general, the precautionary principle does not only apply in the environmental field, but instead covers all areas where potentially dangerous effects on for example human health are not consistent with the current level of protection.

As for the applicability of the precautionary principle, the European Commission communicates that "[r]ecourse to the precautionary principle presupposes that potentially dangerous effects deriving from a phenomenon, product or process have been identified, and that scientific evaluation does not allow the risk to be determined with sufficient certainty" (COM(2000) 1 final, p. 3). Thus, the precautionary principle may only be invoked in the event of a potential risk, not to justify arbitrary decisions. In addition, it follows from the Commission's guidelines for the interpretation and application of the precautionary principle that the general principles of risk management pertain also to the application of the precautionary principle. Therefore, any measures undertaken to adhere to the principle should be proportionate to the desired level of protection, non-discriminatory, and consistent with similar measures taken in similar situations. The assessment shall also include an examination of costs and benefits of both action and inaction, and the measures should be reviewed with regard to scientific development (COM(2000) 1 final). Of note is that for actions being taken under the precautionary principle, the burden of proof can be reversed to the effect that the operator or producer may be required to prove the absence of danger (COM(2000) 1 final). However, while

EU primary law seems to largely abide by a weak version of the precautionary principle (since the main indicator for the strong version is that the burden of proof is always reversed) secondary sources such as the EU Nature Legislation show support for a strong version of the principle (Kayikçi, 2012, see also e.g. Directive 92/43/EEC, Directive 2001/18/EC).

In Sweden, the precautionary principle is implemented in chapter 2, section 3 of the Environmental Code (1998:808):

> "Anyone who pursues an activity or takes a measure, or intend to do so, shall implement protective measures, comply with restrictions and take other precautions that are necessary to prevent or hinder damage or detriment to human health or the environment (…). With the same purpose, best available technology shall be used in professional activities. [Paragraph 2] Such precautions shall be taken *as soon as there is cause to assume* that an activity or measure may cause damage or detriment to human health or the environment" (Emphasis added).

In essence, the Swedish precautionary principle includes two important aspects: the requirement to take precautionary measures to prevent harm applies already when there is a scientifically established risk thereof; and, in order to avoid the requirements, the operator must show that there is no risk (Michanek, 2007; Michanek and Zetterberg, 2012). It thus follows that the precautionary principle under Swedish law adheres to the strong version of the principle (cf. Ansari and Wartini, 2014).

The precautionary requirement is placed at the core of a number of general consideration rules, applicable to all activities and measures that may cause damage or detriment to human health or the environment. The somewhat generally formulated requirements are given concrete content by the conditions set out in permits (and to some extent also via the Code's supervisory functions). In this process, the environmental requirements set on the basis of the consideration rules are subjected to a reasonability assessment (Ch. 2, s. 7 Environmental Code), which aims to establish the reasonable level of protection in the particular case. The consequences of this with respect to the precautionary principle are however marginal as the applicability of the principle concerns the conditions under which precautions should be taken, not their scope or design.

Following the Code's parallel application with other environment relevant laws – and sometimes as a result of a direct reference – the precautionary principle as well as the other consideration rules are applicable also in accordance with other laws. However, in case of a conflict of legal rules, special law takes precedence over general law (*lex specialis*), implying that for certain environmentally harmful activities, the principle is not applied. This for example applies to forestry under the Forestry Act (SFS 1979:429) and for decisions for mining concession in accordance with the Minerals Act.

The precautionary principle may furthermore be at odds with other principles, which from a resource utilisation perspective is most noticeable on national level and in relation to norms pertaining to property rights. It has been argued that applying a strong version of the precautionary principle, i.e. shifting the burden of proof, stands in conflict with the ownership of land by imposing restrictions on the use of private property (Sunstein, 2005; Hodges and Himebaugh, 2010), as well as by putting obstacles in the way of free trade and hampering the competitiveness of the global industries (Adler, 2000; for a discussion see also van den Belt, 2003).

The protection of property rights

Property rights can be defined as the bundle of entitlements that define the owner's right, privileges and limitations for the use of the resource (e.g. Sen 1981). Thus, the rights can take many forms: from exclusive authority to determine how a resource is used to systems where ownership is positively defined. Regardless of how the bundle of entitlements is composed, the essential purpose of property rights is to eliminate destructive competition for the control of economic resources; property rights are a fundamental precondition to trade on which the economic system is built (e.g. Alchian and Demsetz, 1973, Schlager and Ostrom, 1992).

To fulfil this purpose, i.e. to be *effective*, the property rights need to be well-defined and well-protected. An effective property right structure should (at least) meet the following four criteria: *universality*, which entails that all scarce resources are owned by someone; *exclusivity*, i.e. the property rights are exclusive rights and all costs and benefits thus appertain to the owner; *transferability*, i.e. the property rights are transferable from one owner to another in a voluntary exchange; and *enforceability*, i.e. that the property rights are secure from seizure or encroachment (e.g. Skogh, 2000; Mahony, 2005). Naturally, designing a legal system that adheres to these criteria is difficult, not in the least since many scarce resources can neither be individualised nor owned. In addition, property rights are continuously subject to legal restrictions, often to protect overarching interests such as the environment. Thus, the question here is rather if, and if so how, the strong version of the precautionary principle can come into conflict with the protection of property rights.

The protection of property is not included in the text of the European Convention on Human Rights as adopted in 1950, but instead in the First Protocol to the Convention, which was opened for signature two years later. Article 1 of this Protocol reads as follows:

> "Every natural or legal person is entitled to the peaceful enjoyment of his possessions. No one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law. [Paragraph 2] The preceding provisions shall not, however, in any way impair the right of a State to enforce such laws as it deems necessary to control the use of property in accordance with the general interest or to secure the payment of taxes or other contributions or penalties."

When considering an alleged violation of this article, the European Court of Human Rights proceeds as follows (see Carss-Frisk, 2001 and Grgić et al., 2007). Firstly, it determines whether there exists a property right under the scope of the article; secondly, whether an interference with the property right within one of the three rules of the article (peaceful enjoyment of property, deprivation of possessions, control of the use of property) has occurred; and finally whether such an interference is justified, i.e. is lawful, serves a legitimate purpose and is proportionate.

Property rights in Sweden are *negatively defined*, implying that – in principle – the ownership entails liberty to do as one wishes with the property, with the limitations set by positive law. The right to protection of property is enshrined in chapter 2, section 15 of Swedish Instrument of Government (1974:152). Accordingly, public powers may not a) expropriate property, or b) restrict the use of land and buildings, other than when it is necessary in order to satisfy "important public interests". What constitutes an important public interest must be determined in accordance with what is deemed acceptable from the perspective of legal certainty in a modern

and democratic society (Prop.1993/94:117; Prop. 2009/10:80). The legislative acts on the basis of which public powers may expropriate or impose restrictions to the use of private property concretize (in a more or less precise manner) the situations in which such measures are viable.

The constitutional provision moreover guarantees a right to compensation, but in this point makes a distinction between expropriation and restrictions of use of land and buildings. The person who through expropriation is compelled to surrender their property must be ensured "full compensation for their losses". As for restrictions to the use of land and buildings, the provision ensures compensation only insofar the restrictions entail that "the ongoing land use in the area in question is substantially impaired" or result in "considerable damage in relation to the value of the area in question". Here, compensation is determined on the basis of principles laid down in legislation; there is in other words no constitutional requirement on full compensation (Prop. 2009/10:80). Finally, the constitutional provision states that if the restrictions to the use of land and buildings are grounded on the "protection of human health or the environment or on safety reasons", the matter of compensation is regulated entirely by law. Compensation is principally not required in these cases (Prop. 2009/10:80). Although this brief account may not reveal it, in actually, the Swedish legal rules on compensation form a complex, at times perplexing, system (see e.g. Bengtsson 2010).

The interactions between the principles in the Swedish frameworks for resource use

Before the legal frameworks for resource use can be analyzed, it is necessary to first introduce certain legal terms. A *concession* is a government issued license to conduct a certain activity, for example mining, water operations and 'environmentally hazardous' operations. Licensing is consequently a way of legally controlling activities in order to *inter alia* prevent environmental damage, facilitate development and ensure that different interests are considered (e.g. Pettersson and Söderholm, 2014). The license and the licensing process, including the substantive grounds for assessment, involve elements of obligation, precision and delegation (Abbott et al., 2000).

The legal control of the extraction of mineral resources

The mining industry has had significant importance for the political and economic development in Sweden. The country is still one of the leading producers of minerals and metals in the EU and by far the biggest producer of iron ore (SGU, 2014). As a consequence, establishing who originally holds the ownership or user rights to the mineral resource has always been of importance to the legislature. Over time, three theoretical lines can be discerned: the land-ownership system, the concession system and the claims system (Bäckström, 2012). All three systems aim to balance the interest of extracting the minerals between the *landowner* (who wishes to benefit from the value of the minerals that he or she considers to be part of his or her land), the *state* (who has fiscal interests), and the *finder* (who wants to benefit from the value of the resources that he or she has put great effort into finding and without whose efforts the minerals may never have been found) (Bäckström, 2012). The main mineral legislation currently in force, the Minerals Act, can best be described as a concession system with strong elements of claim rights (Bäckström, 2012). In this system, the original property rights play a minor role; the legislature does not rely on the landowner's efforts when it comes to the exploiting of mineral (Bengtsson, 2015).

The licensing process for mining operations is rather complicated, as it includes assessments by different authorities in accordance with sev-

eral laws and regulations. The legislative frameworks that are primarily applicable are the Minerals Act and the Environmental Code. In principle, the laws apply in parallel, but the relative strength of the sectoral legislation reduces the factual influence of the general law. From a systematic perspective, the most striking feature of the licensing process for mining activities is the partition between the assessment for exploration permit, the mining concession (including the land use assessment) and the overall environmental assessment in accordance with the Environmental Code. The main arguments for this division are the need to ensure access to land as early as possible to foster prospecting and investments, and that the environmental impacts of the activity are not known at the time for the mining concession and consequently need to be addressed at a later stage (Prop. 1997/98:90).

The current regulation results in that the assessment and determination of the environmental impacts of the activity only serve to set conditions for the operation (Prop. 1988/89:92; Prop. 1997/98:90). This is problematic from several perspectives, in particular regarding the application of the precautionary principle. Firstly, there is the problem of interpretation: while the licensing process certainly allows for the application of all relevant legal rules, the division into several laws and authorities entails that the preconditions for an integrated and holistic assessment in accordance with the objectives of the Environmental Code decrease (Pettersson et al., 2015).

Secondly, it follows from chapter 2 in the Environmental Code that the general consideration rules, including the precautionary principle, shall be considered in all matters that impact human health or the environment. Consequently, the rules apply also to exploration and exploitation for minerals. In keeping with the principle of *lex specialis*, only comparable rules in the Minerals Act would imply that those rules do not apply in the assessment of exploration permits or mining concessions. However, there are no such provisions in the Minerals Act. Hence, while the operator is indeed obliged to observe for example the precautionary principle, the rules are not applied in the assessment of the concession issue under the Minerals Act. It is obvious that the holistic perspective on the environment and the impacts of environmentally hazardous activities that can be invoked as a result of both the sustainability objective and the substantive rules of the Environmental Code are missing, or can be avoided, if only parts of the Code are applicable in the assessments or applied in the last stage of the licensing process.

The legal management of forest resources

Forest management plays an important role for sustainable development. On a global scale, sustainable forest management can contribute to the reduction of deforestation and biodiversity losses, as well as to climate change mitigation and adaptation (e.g. IPPC, 2014). Similar to the mining sector, the Swedish forestry sector is of considerable importance in terms of export value, and also in terms of local use (The Forest Industry, 2012). A major difference between the sectors however lies in the legal control of the use of the resource. While the mineral sector is governed by strong sectorial legislation, the forest sector is characterized by multi-level governance where the legal framework is complemented by ordinances, regulations, and two certification systems (Programme for the Endorsement of Forest Certification, PEFC, and Forest Stewardship Council, FSC), all of which influence forest practice (Keskitalo and Pettersson, 2012).

As for the design of the legislative framework, the Forestry Act has two equal goals: to protect biodiversity and to ensure long-term returns (s. 1). The intention was to implement these

goals through deregulation and increased environmental responsibility for the landowners, mainly to strengthen property rights (Bengtsson, 2015). The law furthermore regulates forest management in general, afforestation and deforestation, as well as prerequisites for such activities in certain types of areas, such as montane forest. The formal protection of forest land, for example in the form of nature reserves or habitat protection areas, is however achieved via administrative decisions in accordance with provisions in the Environmental Code and not the Forestry Act, according to which all forest land is thus considered unprotected. In terms of environmental protection of forest land, the responsibility thus rests primarily on the good will of the forest owners (Bengtsson, 2015).

For woodland overall, an important provision for considering environmental interests is section 30 of the Forestry Act, regulating the issuance of regulations on account of, for example, nature conservation interests in the management of forests. While the formulation of the provision is relatively general, specific requirements follow from the ordinance and regulations to the Forestry Act. This may include specific biodiversity protection in logging, buffer zones for protection of adjoining (water) areas as well as requirements on retention of trees and protection of dead wood. In addition, the legislative framework also holds specific requirements in respect of montane forest, hardwood forests, and measures to prevent pest outbreaks.

According to the regulations issued by the Forest Agency, damages as a result of forest management measures should be avoided or limited in relation to the species and environments that require consideration (SKSFS 2013:2, SKSFS 2011:7). While the term "prevention and restriction of damage" is explicitly intended to mean that all damages must be prevented, the demand loses some of its meaning when the next sentence states "if possible without significantly hampering ongoing land use" (Ch. 7, s. 2 SKSFS 2011:7). Consequently, the elements of caution and preventive measures are only weakly developed in this sector. According to the preparatory works, the consideration rules of the Environmental Code, and thus the precautionary principle, are – as a rule – not applicable; in the event that two provisions are applicable to the same issue and the results of the application leads to different results, the special legislation shall apply (Prop. 1997/98:90). While the unsuitability of this has been pointed out by several authors (e.g. Forsberg, 2012; Michanek and Zetterberg, 2012), the Forest Agency has decided to join the statement included in the Government Bill (Skogsstyrelsen, n.d.).

The legal regulation of water resource exploitation

Also the water sector is of importance for Swedish economy: hydropower accounted for about 40 percent of the energy production in the country in 2014 (Statistics Sweden, 2015). Contrary to mining and forestry, the exploitation of water resources is primarily regulated within the Environmental Code. Under the concept of *water operations* fall a variety of physical measures in surface water or groundwater that have either a lucrative or defensive purpose (Ch. 11, s. 3). The undertaking of such operations principally requires a permit (Ch. 11, s. 9) issued by the Land and Environmental Court or, when it comes to land drainage, by the County Administrative Board (Ch. 11, s. 9 b). The Code's provisions on general environmental requirements, resource management, environmental quality standards, environmental impact assessments and protection of certain areas are directly applicable in the licensing process for water operations. The Code also imposes certain specific requirement for water operations, for example that these may only be undertaken if the benefits, considering

both public and private interests, are greater than the costs and damages associated with the operation (Ch.11, s. 6).

The licensing process translates the precautionary principle into permit conditions for the construction, operation and maintenance of water operation. The preparatory works to the Environmental Code contain examples of precautionary measures in relation to water operations (Prop.1997/98:45, part 2). These include maximum or minimum water levels, water extraction limits and protection against erosion. Dams must moreover be built so that they meet safety requirements, and ditches can be localized and designed in consideration to the natural environment. The permit holder will have to satisfy permit conditions such as these and supervisory authorities may take legal action to ensure that this is the case (Ch. 26, s. 1 and 9).

The application of the precautionary principle in licensing processes for water operations that are regulated by the Environmental Code as well as its enforcement though supervision seem then rather straightforward, at least in legal terms. The problem lies instead in that the majority of water operations in Sweden are based on permits and rights originated prior to the enactment of the Environmental Code (SOU 2009:42; SOU 2013:69). The two water laws previously in force contained an obligation for the operator to take measures in order to prevent or reduce damages insofar as it did not result in unreasonable costs (Ch. 2, s. 2 Water Law (1918:523); Ch. 3 s. 7 Water Law (1983:291)). This was not meant to be applied as a permissibility requirement, but instead to adjust the scope and implementation of the operation in relation to opposing public and private interests (Strömberg, 1984). In any case, environmental and climate matters carried considerably less weight in these water laws than in the Environmental Code (Michanek and Zetterberg, 2012; SOU 2013:69; SOU 2014:35).

The question of how older permits and rights can be made compatible with the requirements of the Environmental Code has recently been addressed by the Water Operations Investigation, specifically in its 2013 partial report (SOU 2013:69). The report examines the difficulties posed by the principles on legal force of permits as codified in section 1, chapter 24 of the Environmental Code and applicable to older permits and rights in accordance with section 5 on Act (1998:811) on the introduction of the Environmental Code (regarding older rights see e.g. Olsen Lundh, 2013; Strömberg, 2014; Bengtsson et al., 2015). These provisions entail that the matters that have been assessed within a permit decision or sentence have legal force and can be opposed against third parties; therefore "(…) the permit holder who follows the conditions in the permit normally needs not worry that the authorities will demand further environmental requirements in relation to the operation on the basis of the Environmental Code, for example following the general requirements in chapter 2 (…)" (SOU 2013:69, p. 169, authors' translation).

In the system of the Code, supervisory authorities may not issue orders and prohibitions limiting the legal force of a permit (Ch. 26, s. 9, par. 3), unless these relate to urgent measures necessary to avoid illness or serious damage to the environment or, since 2014, to safety increasing measures in classified dams (Ch. 26, s. 9, par. 3). The modification of permit conditions or the imposition of new permit conditions is otherwise possible only through the restrictive permit review process. This review process moreover activates a set of compensation rules, which can only be considered exceptional in relation to the general principles on compensation in case of restrictions to the use of land and buildings (SOU 2013:59; SOU 2013:69). Consequently, the report suggests a system where holders of older permits and rights can be imposed an obligation

to seek a new permit for the operation, with a time-limited possibility for compensation. In its final report (SOU 2014:35), the Water Operations Investigation suggests further modifications to the Environmental Code's rules on water operations, including those on permit review and corresponding compensation requirements, with the explicit aim of making the system more compatible with basic environmental principles. Although the issue has generated significant controversy, authors such as Darpö (2014) have already pronounced themselves in the sense that the suggestions are not in conflict with neither the European Convention nor the Instrument of Government.

Discussion

In this paper we have presented legal rules and principles governing the use of natural resources in Sweden, focusing on mining, forestry and water exploitation. The aim was to examine the interaction between the principle of property rights, which is established and overarching, and the precautionary principle which is both debated and mainly limited to environmental issues.

Following Alexy (2000), it could be said that the application of the precautionary principle to the greatest extent as it is legally possible is determined by counteracting rules and principles, including those pertaining to property rights. The constitutional provision presupposes a counteraction between property rights and public interests, where the precautionary principle indeed could have expression. However, in the three examined sectors, the legal arrangements hinder the counterbalancing from even happening. In the forestry sector, the application of the Environmental Code has to a large extent been rejected through maintaining of sectorial legislation. In particular, section 30 in the Forestry Act has precedence over the general consideration rules in the Environmental Code. That what should have been a conflict of principles has been made into a conflict of rules. In mining, the assessment of the environmental impacts of the activity has been placed at the latest possible stage, effectively turning the precautionary principle into a condition-setter for an already allowed activity. In the water sector, the sectorial rules have indeed been incorporated into the Environmental Code, but the possibility of applying the environmental requirements to the many existing water operations are both restricted and subject to compensation.

This state of affairs can, without much controversy, be attributed to prevailing values and interests underpinning the societal system, most notably an idea of sustainable development where a considerable emphasis is put on 'development' and much less on 'sustainable'. In the inevitable trade-off between uncertainty and caution, on the one hand, and legal certainty and economic development, on the other, the latter seems to be the ruling norm.

In the Swedish forestry sector, this is evident through the predominant use of certification schemes to secure environmental consideration, at the expense of both legal control and adequate long-term environmental considerations in terms of restrictions in use if based on a precautionary approach. In the case of mining, the economic interests embedded in this sector are so substantial that frequently pointed out anomalies resulting from the inadequate harmonization between the Minerals Act and the Environmental Code (e.g. Bäckström, 2015 Pettersson et al., 2015) are yet to be addressed by the legislator. For fear of a deteriorated investment climate, the main issue remains to secure ownership to the deposit. For water operations, the development of hydropower has played a pivotal role in the design of the sectorial rules; the progressive amalgamation with environmental rules has been – and still is – notoriously resisted (Darpö and Ebbesson, 2014).

In conclusion, the dominating principles of society will steer the trade-off with respect to how land is used, what resources are exploited and in which manner. Maintaining the legal arrangements that to a large extent are based on the economic importance attributed to the sectors, and where the rights to the resource are tied only to ownership or disposition, means upholding an order where the interest of exploiting the resources holds a much stronger position than the interests of protecting human health and the environment. Whereas in such a system risks may not be fully considered, a system guided by the precautionary principle will instead hold off, slow down or control exploitation until the consequences of the activity are better known.

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