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ERNST NORDTVEIT[a]

SOME OPTIONS FOR A LEGAL STRATEGY FOR SUSTAINABLE DEVELOPMENT[1]

STRATEGIE PRAWNE NA RZECZ ZRÓWNOWAŻONEGO ROZWOJU – ZAGADNIENIA WYBRANE

Sustainable development has become a central societal goal for the national and global community and, therefore, also an inherent value that the legal system needs to enhance. The author argues that the current primary strategy to achieve sustainability, based on command-and-control regulation, is insufficient. More fundamental institutional change and 'smart regulation' are needed to create adequate incentive structures and facilitate sustainable practices. The strategy should create incentives and opportunities for individuals and corporations to choose sustainable alternatives. Environmental degradation is primarily a result of discrepancies in private and public costs. Traditional command-and-control regulations, in which the state prescribes standards for action or uses taxation to level out discrepancies in private and social costs, are insufficient to solve the global community's large and complex issues in dealing with poverty, pollution, natural resource depletion, biological degradation, and climate change. Problems related to externalization, the tragedy of the commons, and free riders that create market failure must be addressed by smart regulation and institutional change, focusing on the incentive structures leading to ecological degradation and ineffective use of resources. New ideas and concepts focusing on smart regulation, involving stakeholders and people affected by the regulation in the legislative process, as well as stimulating innovation, are needed. Property and market-based solutions, like cap-and-trade systems for the distribution of climate and fishing quotas, also need to be developed in other areas. More substantial effort should be put into finding the most effective solution to the problem each measure is intended to solve.

Keywords: sustainability; smart regulation; institutional change; legal design; externalization

Zrównoważony rozwój stał się centralnym celem społecznym zarówno na poziomie krajowym, jak i globalnym, a w konsekwencji – również wartością, którą system prawny powinien wspierać. Autor argumentuje, że obecna podstawowa strategia osiągania zrównoważonego rozwoju, oparta na regulacjach nakazowo-kontrolnych, jest niewystarczająca. Konieczna jest fundamentalna zmiana instytucjonalna oraz „inteligentne regulacje", które stworzą odpowiednie struktury zachęt i ułatwią stosowanie praktyk zrównoważonego rozwoju. Strategia ta powinna zapewniać bodźce i możliwości dla jednostek oraz przedsiębiorstw do wyboru zrównoważonych alternatyw. Degradacja środowiska wynika w szczególności z rozbieżności między kosztami prywatnymi a pu-

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blicznymi. Tradycyjne regulacje nakazowo-kontrolne, w których państwo narzuca standardy działania lub wykorzystuje opodatkowanie do wyrównywania różnic między kosztami prywatnymi a społecznymi, są niewystarczające do rozwiązania złożonych problemów globalnej społeczności, takich jak ubóstwo, zanieczyszczenie środowiska, wyczerpywanie zasobów naturalnych, degradacja biologiczna czy zmiany klimatyczne. Problemy związane z eksternalizacją kosztów, tragedią wspólności zasobów, „pasażerami na gapę", które prowadzą do zawodności rynku, muszą zostać rozwiązane poprzez inteligentne regulacje i zmiany instytucjonalne, koncentrujące się na strukturach zachęt prowadzących do degradacji ekologicznej i nieefektywnego wykorzystania zasobów. Potrzebne są nowe idee i koncepcje inteligentnych regulacji, które angażują interesariuszy i osoby objęte regulacjami w proces legislacyjny oraz stymulują innowacje. Rozwiązania oparte na własności i mechanizmach rynkowych, takie jak systemy *cap-and-trade* (handel uprawnieniami do emisji) w zakresie dystrybucji limitów emisji czy kwot połowowych, powinny zostać rozwinięte również w innych obszarach. Większy wysiłek powinien zostać włożony w znalezienie najskuteczniejszych rozwiązań dla problemów, które mają być rozwiązane.

Słowa kluczowe: zrównoważony rozwój; inteligentne regulacje; zmiany instytucjonalne; projektowanie prawne; eksternalizacja

I. INTRODUCTION

Over the last few decades, sustainable development has been established as a societal goal in international and domestic law. The UN Commission on Environment and Development introduced the concept of sustainability as a principle for governing natural resources and the environment, and it was integrated into the Rio Declaration in 1992. The content of the principle has since been extensively discussed and has evolved over the years (Sachs, 2015). There is no clear or undisputed definition of the concept. Still, sustainable development is commonly seen as key to securing ecological and social integrity, economic efficiency, and intergenerational justice. It is often formulated as a principle that the current generation should meet its needs without compromising or undermining the ability of future generations to meet theirs.

In 2015, the UN General Assembly made sustainability an ambition for the entire international community through the adoption of Agenda 2030, which included 17 Sustainable Development Goals.[2] These goals now define the concept's content in more detail.

However, achieving sustainability requires more than merely expressing goals. Reaching these goals will necessitate a strategy for profound changes in the systems for managing biological and other natural resources, and in the production, transportation, and consumption of energy, goods, and services. Such a change will require changes in the organization of society and the behaviour of its members across a wide range of areas. Developing arrangements for effectively utilizing resources, promoting innovation, and fostering entrepreneurship will be necessary to feed a growing world population and provide clean energy, housing, and other essentials without depleting biological and

[2] A/RES/70/1 Transforming our World: The 2030 Agenda for Sustainable Development.

non-renewable resources or causing devastating climate change. This tremendous and complex task will involve many legal and economic instruments and regulations. Most countries seek to develop new measures and instruments to enhance sustainable development without damaging the economies and livelihoods of large groups.

As law is the primary tool for organizing society and influencing the behaviour and decisions of people, businesses, and industries, changes in the legal system will be an essential part of a strategy towards sustainability. Historically, the goal of the legal system over the last centuries has been to enhance economic growth and welfare, and legal institutions have been developed and refined to this end. With sustainability as a new societal goal, a new aim or value has become essential for the legal system. This makes it necessary to develop legal instruments capable of achieving the economic growth necessary to eradicate extreme poverty without destroying the natural environment or depleting natural resources.

The primary strategy followed by authorities to counter the environmental challenges has been to enact prescriptive command-and-control regulations, whereby the authorities define minimum standards and direct the actions and behaviour by detailed injunctions and prohibitions. As current legal instruments have proved to be insufficient and, in some cases, rather inadequate, this article will discuss whether other strategies for legal involvement – aimed at creating different incentives through a more market-oriented approach and involving stakeholders in decisions – might be more effective in achieving sustainable development. 'Effective' in this context refers to solutions most suited to achieving the different and sometimes conflicting sustainability goals with the least effort or cost.

I will critically examine the effect of traditional command-and-control regulation and argue that more fundamental changes in the institutional structure, combined with more flexible, dynamic, and reflexive regulatory instruments, are required. I will present and evaluate legal techniques and mechanisms to achieve or enhance sustainability. This article does not provide a comprehensive analysis; I will concentrate on some fundamental issues and provide some examples.

The design of legal rules for a sustainable world must be based on a thorough understanding of the ecological and environmental issues involved, the changes in human behaviour, and the treatment of nature and natural resources necessary for sustainable development. This is, however, not enough. Law has no direct influence on the natural environment. The function of law is to influence people's behaviour and, thereby, how the natural environment is affected by human activity. It is necessary to establish an evidence-based understanding of the effects of different forms of legal regulation on human behaviour, as shown in law and economics and related disciplines such as behavioural economics. The effects of new rules or institutional change must be analysed to foresee the impact on human behaviour and how individuals and businesses will likely adapt to the new framework. Too often, legal changes or other measures with good intentions have little or even adverse effects on

the problem they are intended to solve, because not enough attention is paid to possible counterreactions or adaptation to the new regulation by the individuals affected.

II. WHAT IS DRIVING ENVIRONMENTAL DEGRADATION?

Effective remedies for ecological decline, climate change, and related environmental problems depend on a clear understanding of their underlying causes. It is generally understood that environmental degradation is rarely the result of deliberate efforts to destroy nature. Nature is typically degraded as a result of how people seek to fulfil their needs for food, water, energy, and other resources. It is also affected by how people define their needs, how they want to live, and perhaps their excessive demands, combined with a lack of understanding of how their actions affect the natural environment. The task is to find better ways to meet human needs and redefine those needs so that they can be met in reasonable and sustainable ways, without undermining nature's ability to reproduce or depleting natural resources.

Since, as stated above, law can only influence people's behaviour, it is necessary to understand what motivates people's behaviour and how it can best be influenced in the direction of sustainability. By people's behaviour, I mean everything from daily decisions made by consumers to investment decisions made by international corporations and financial organizations. We must ask why individuals, landowners, fishermen, businesses, and industrial undertakings act in a manner that, in the long run, undermines society and often depletes the natural resources that are the basis for their livelihood.

One primary reason for people causing environmental damage or depletion of natural resources is a discrepancy between the costs or the benefits of an undertaking for the individual actor, on the one hand, and society, on the other (Coase, 1960; Libecap, 2024). When private costs are less than social costs, it is profitable for persons or businesses to carry out undertakings that are detrimental to society, and when private benefits are less than social benefits, carrying out measures or undertakings that benefit society is unprofitable for the private agent (Anderson & Libecap, 2014; Coase, 1960; Libecap, 2024). Suppose an individual can externalize the negative impact of their activity on others while keeping the benefits – typically the case with air and water pollution – then they will have no economic incentive to stop the activity. On the other hand, a person is not incentivized to invest in an undertaking or activity where the benefits will be distributed to others, at least if their benefits are less than the costs.

The first situation is also linked to the 'tragedy of the commons' phenomenon.[3] Free or unregulated access to a resource will lay the foundation for

[3] The tragedy of the commons refers to the fact that unregulated access to a resource leads to overexploitation. Hardin (1968) made the idea famous, but the phenomenon was well-known long before.

competition between persons interested in the resource. None of them will be incentivized to limit their use or extraction of the resource to protect the resource if others are free to exploit it. The only way each can benefit from the resource is to be the first one to take and keep what they can lay their hands on. In this situation, the negative impact of overexploitation will be divided among all individuals, while the user who manages to extract most of the resource will benefit from their exploitation.

A situation in which the externalization of adverse effects of overuse or pollution is not directed back to the owner of the economic activity leads to 'market failure'. In this situation, the market will be unable to provide incentives for rational behaviour for individuals that lead to sustainable development for society.

Sea areas and the atmosphere are the most important natural resources that, at least until recently, have been subject to free access, with no or only rudimentary access regulation. This has led to the overexploitation of fish stocks, pollution of the atmosphere, and changes in the atmosphere's composition, which in turn has caused climate change. The negative impact or costs of these changes – especially to the atmosphere's function as a climate regulator – have spread globally.

The depletion of groundwater resources is also an example of the effect of unregulated and uncoordinated exploitation of natural resources, which often leads to overexploitation in jurisdictions with free access. The US 'rule of capture' has this effect (Anderson & Libecap, 2014).

Market failure can also occur for reasons other than externalization and free access, such as asymmetric information and the 'free-rider' problem, which makes it difficult to motivate people to invest in improved ecological standards.

III. LEGAL RESPONSES TO EXTERNALIZATION OF COSTS AND FREE ACCESS

1. Command-and-control regulation

In situations of market failure that lead to unsustainable practices, authorities have intervened through regulations, taxes, or subsidies aimed at correcting or offsetting the discrepancy between private and social costs. This legislation has primarily taken the form of command-and-control regulation, where the government, as the regulator, sets standards, injunctions, or prohibitions that individuals and businesses must adhere to. Public bodies are established to enforce these rules, and noncompliance is sanctioned in various ways.

In addition to general regulation – such as bans on certain pesticides – extensive land-use planning being carried out. This includes detailed plans for the use of specific land areas, waterways, or sea areas, which are binding on landowners.

Many activities, such as mining, industrial production, or waste disposal, require permits from public bodies. This grants public authorities a form of veto over activities considered detrimental to the environment. As total bans on many forms of activity often have unacceptable economic consequences or lead to a shortage of necessities in society, authorities frequently try to regulate such activities to keep their negative impact on the environment within acceptable limits. Setting quotas or other regulations can, for example, help prevent overfishing or excessive air pollution.

Compliance with regulations is secured through control and penalties. Effective control is often costly and nearly impossible. If a regulation runs firmly against the interests of those primarily affected, they might find ways around it or reduce its impact (Anderson & Libecap, 2014).

Over recent decades, the regulatory model has evolved toward more holistic, integrated, and ecosystem-based regulation. Some areas have shifted toward more market-based regulation, but the command-and-control model remains dominant. However, the ongoing development of more flexible regulatory instruments is discussed below.

Although environmental regulation has reduced or eliminated many ecological issues, the shortcomings of the traditional regulatory model in dealing with the complexity and magnitude of global challenges have become increasingly apparent. Climate and environmental crises are more severe than ever, and the world is struggling to find effective countermeasures. There is a growing understanding that traditional command-and-control regulation cannot handle the world's complex environmental problems (Anderson & Libecap, 2014; Gunningham & Sinclair, 2002, 2017).

Environmental issues are primarily reciprocal in nature, as different interests must be balanced against one another. There is a need to involve industrial undertakings, landowners, businesses, and the public in developing the solutions. The traditional binary relationship, in which the state prescribes what the individuals can or must do in a sovereign-citizen relationship, must be revised. Citizens must be actively involved in finding solutions, not simply be addressed as passive recipients of rules. In addition to restricting activities that damage the environment, legal arrangements must also promote the effective use of resources and investment in new technologies and measures that benefit both ecological and economic development. This requires a more diversified approach than traditional regulation can offer.

The often inflexible 'one-size-fits-all' regulation becomes too complex and costly to implement when the incentives created by the basic institutional framework point in the opposite direction (Gunningham & Sinclair, 2017). Effective enforcement is often costly, and it is not easy to make people comply with regulations they do not regard as legitimate or that strongly affect their interests.

Another problem with typical command-and-control regulation is that it frequently imposes the same demands on all businesses, disregarding the differences in the costs this incurs for different parties. Furthermore, the regulation is mainly directed at avoiding negative impacts by forbidding activi-

ty that might have a damaging effect. It generally falls short of stimulating creativity and innovation or encouraging investments in measures that can strengthen sustainability.

Globalization and the borderless nature of environmental impact from industrial activity like emissions are also important factors behind the need to develop legal arrangements to promote sustainable development on a global scale. The lack of a centralized legislative power to regulate transboundary activities or activities with transboundary effects creates a need for different forms of regulation (Lehavi, 2023).

Various mechanisms for influencing the behaviour of individuals and businesses have been proposed and partially implemented, including international standard-setting bodies, industry organizations, commercial associations, trading partners, and financial markets.

2. Development of reflexive law and smart regulation as alternatives or additions to traditional regulation

Substantial development has occurred in legal theory and, to some extent, in practice regarding new forms of regulation in response to the criticism of the regulatory model presented above, and to the more fundamental crisis of the regulatory state that began in the 1970s. New approaches and ideas for new regulation and legal instruments that can contribute to more sustainable development, innovation, and effective resource use have been developed.

The reflexive law theory, developed by Günther Teubner (1983) based on theories put forward by Luhmann and Habermas, has become an essential basis for innovation in legal regulation. This theory sees public regulation as designed to provide a general normative framework and stimulate private self-regulation through procedural regulatory frameworks. Such private autonomous self-governing spaces in society are necessary to support the legitimacy of public regulation. Public regulation must also 'reflect' the substantive norms governing autonomous spaces or 'rooms.'

The theory of reflexive law has led to the development of more operational theories – for example, by Karin Buhmann (2018) on what she calls the 'collaborative regulatory process', in which processes and procedures for the participation of non-state actors, businesses, and NGOs in the development and execution of the normative framework for sustainable development are organized. By involving all stakeholders in a 'collaborative regulatory process', it is possible to develop relevant and legitimate norms promoting sustainability, particularly in a supranational context. The idea is that introducing collaborative and coordinated regulation – in which government, business, and private partners are involved in a proactive, participatory regulatory process within states and across borders and regions – can contribute to sustainability.

The traditional binary relationship between the public authorities as regulators and private persons or undertakings as 'rule-takers' builds on the assumption that the public authorities have a better understanding of the issues than the private stakeholders and that the public authorities have no

conflict of interest. This assumption does not always hold. Public authorities also have interests in economic development; sometimes, local governments will compete to attract businesses to their area by giving permits for industrial activity or exploitation of resources. Politicians and authorities are also exposed to lobby pressure from different interest groups, which might influence their decisions.

The term 'smart regulation' was first introduced in 1998, but its ideas are rooted in earlier research by, for example, Ronald Coase (1960) and in reflexive law theories. Smart regulation describes a type of regulation that offers a broader range of flexible and innovative policy instruments than pure command-and-control regulation. Neil Gunningham and Darren Sinclair (2017b) provide this description:

> The term refers to regulatory pluralism that embraces flexible, imaginative and innovative forms of social control. In doing so, it harnesses governments, businesses, and third parties. For example, it encompasses self-regulation and co-regulation, using commercial interests and non-governmental organisations (NGOs) (such as peak bodies) as regulatory surrogates, together with improving the effectiveness and efficiency of more conventional forms of direct government regulation. The underlying rationale is that, in the majority of circumstances, the use of multiple rather than single policy instruments, and a broader range of regulatory actors, will produce better regulation. As such, it envisages the implementation of complementary combinations of instruments and participants tailored to meet the imperatives of specific environmental issues. (p. 133)

Today, many national, supranational, and international standards – as well as those set by consumer organizations, financial institutions, classification institutions, and industrial organizations – express expectations regarding the conduct of industry and businesses related to the environment and human rights. Non-compliance with these standards might lead to problems financing the operation from financial institutions, the stock market, or other sanctions from contract partners or consumers. These standards may also be referred to in legislation, directly or indirectly, and made part of national regulations and enforced by penal reactions or tort liability.

The European Union has also acknowledged the need for better regulation, as evident in the Communication on Smart Regulation in the European Union,[4] adopted in the aftermath of the 2008 financial crisis. It also addresses the climate crisis and other challenges. This initiative was followed up by a program for 'better regulation.' Also, the United Kingdom has adopted a 'smarter regulation programme'.[5]

The European Union has introduced several legal instruments to enhance sustainability, such as Regulation (EU) 2019/2088[6] on sustainability-related

[4] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Smart Regulation in the European Union, COM (2010) 543.

[5] See https://www.gov.uk/government/collections/smarter-regulation

[6] Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector, OJ L 317, 9.12.2019, pp. 1–16.

disclosures in the financial services and sector. This gives the affected business entities an extensive obligation to report on how they handle sustainability challenges in their activity. Regulation (EU) 2020/852[7] on establishing a framework to facilitate sustainable investment – the EU Taxonomy – sets out a classification system to support green investments by defining which activities are considered sustainable in different sectors and which criteria an economic entity must fulfil to be considered environmentally sustainable. This framework is intended to discourage investment in unsustainable activities and steer financial flows toward sustainable projects.

One of the most recent initiatives is the proposal for the Net Zero Industries Act (NZIA),[8] which forms part of the European Green Deal. The NZIA defines the industries that shall be categorized as 'net-zero technologies' (Article 3(a) and (c)). Its aim is to streamline the regulatory framework for those industries, improving the investment environment for crucial industries in meeting the goals for climate neutrality (see Article 1). The NZIA also obliges Member States to achieve an annual injection capacity of at least 50 million tons of CO_2 (Chapter III). It is an example of a regulation designed to facilitate activities that contribute to sustainability, rather than merely restraining individual initiatives.

An international initiative for sustainable finance is Principles for Responsible Investment, directed primarily at institutional investors. The group was founded in 2005 at the initiative of UN General Secretary Kofi Annan. Investors who sign the principles are required, under the agreement, to adhere to them.[9]

One example of government-industry cooperation in attempting to prevent environmental damage is the safety regulation for petroleum operations on the Norwegian continental shelf, which also involves trade unions as equal partners. Since 1985, this regulatory regime has moved away from a command--and-control model with minimum standards towards a functional system, under which the industry must always maintain a high level of safety, measured against international industry standards and evolving in accordance with them.[10]

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[7] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, OJ L 198, 22.6.2020, pp. 13–43.

[8] Proposal for a Regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (Net Zero Industry Act), COM(2023) 161, SWD(2023) 68.

[9] See https://www.unpri.org/about-us/about-the-pri

[10] Norwegian Petroleum Activities Act 29 November 1996 No. 72, Section 9-1 and 10-1. The extensive White Paper St. meld. 12 (2017–2018) describes the safety system in the Norwegian petroleum operations, available in English at https://www.regjeringen.no/contentassets/258cadcb3cca4e3c87c858fd787e0f75/en-gb/pdfs/stm201720180012000engpdfs.pdf. For more on the regulation of safety in petroleum and other offshore industries, see Kringen (2009), Lindøe et al. (2013a, 2013b), Lindøe and Engen (2013), Olsen et al. (2019), and Nordtveit (2020).

The general view is that this type of regulation has proved more effective than the traditional approach.[11] It does not establish prescriptive minimum standards, but functional standards, and it creates procedures for the dynamic development of safety. This encourages the industry to seek better technical solutions and learn from international experience. In case of accidents, the authorities are less inclined to impose sanctions and instead prioritize engaging in joint processes with stakeholders to clarify causality and find better solutions.

In response to the Macondo accident in the Gulf of Mexico, also known as the Deepwater Horizon accident, the EU adopted a directive on the safety of offshore petroleum operations (Directive 2013/30/EU). Norway has not implemented this Directive because it is seen as a step back to more descriptive regulation, which Norway has abolished.

Another example of efforts to develop industry standards to obtain sustainability comes from the mining industry. The mining industry has a history of significant environmental impacts and challenges. Extracting non-renewable resources, creating pollution, and transforming landscapes and socio-economic relations in affected communities and regions involve considerable sustainability challenges. In 2004, the Mining Association of Canada (MAC) launched an initiative called 'Towards Sustainable Mining' (TSM), which seems to be more successful than earlier attempts. The TSM aims to enable mining companies to supply society with minerals responsibly from a social, economic and ecological perspective. Participation in the program is mandatory for members of MAC. Mining associations in several other countries have joined the initiative – in some cases with adjustments to national conditions and legislation.[12] Members must adhere to a set of principles and report annually on their performance under the programme's 8 protocols, with its 30 indicators.[13] Several of these indicators are linked to the UN sustainability goals.

Whether industry standards and voluntary arrangements can replace legal regulation by the state and state sanctions remains a subject of debate. However, there is little doubt that they are an essential addition and, in many respects, have proven more effective than traditional regulation.

2.1. Institutions and institutional change to enhance sustainability

2.1.1. Introduction – the role of institutions and institutional change

The regulatory forms described above aim to balance the lack of rational incentives resulting from market failure by means of injunctions or prohibitions, although some of the smart regulations described may also aim to create other incentives. Another option could be to alter the underlying in-

[11] This was the conclusion of the Norwegian government's assessment of the safety of the petroleum industry in 2018; see n. 10.

[12] On the implementation of the initiative in Finland, see Ruokonen (2020).

[13] The protocols and guides are available at https://mining.ca/towards-sustainable-mining/protocols-guides/

stitutions that cause market failure. This would mean attacking the root of the problem instead of the symptoms by changing the institutional setting in society.

Institutions signify the wide range of informal and formal rules, in the form of social norms, customs at different levels, and laws, that define the framework for people's lives and actions. This institutional framework determines how individuals can best pursue their goals and fulfil their needs in each society. These institutions – such as property rights and the laws on contracts, mortgages, and companies – together with the market arrangements, establish an incentive structure and a 'playing field' for individuals to pursue their goals individually or through interaction and cooperation without ordering citizens to behave in a certain way.[14] This institutional framework can be defined as the 'rules of the game in society' and influences society's social, economic, and environmental development far more than is often acknowledged.[15]

It is crucial to understand that what is a sensible strategy to pursue one's interests and goals in one institutional setting might be entirely nonsensical or impossible in another. A change in the institutional frameworks might fundamentally change the incentive structure and room for action. Experience shows that people react more strongly to incentives than to commands. Changes in the institutional framework have often proved to have far-reaching consequences. Over the last 200 to 300 years, the Western world has developed and refined legal institutions to provide incentives and opportunities for actions that contribute to economic growth. Replacing the feudal system with private property and a market system in the late eighteenth and nineteenth centuries was a significant shift in the institutional setting (di Robilant, 2023; Linklater, 2015). This change led to unprecedented economic development, but this has occurred at the expense of the natural environment and through the depletion of natural resources due to the market failure described above (North & Thomas, 1973).

Economic growth has been relatively rare throughout history because the institutional setting did not make it possible. Douglas North and Robert P. Thomas (1973) point out that economic growth 'will simply not occur unless the economic organisation is effective' and that individuals 'must be lured by incentives to undertake the desirable activities'. It is reasonable to assume that the same is true for sustainable development. Without an economic and societal organization with institutions with built-in incentives to 'lure' individuals to undertake desirable activities from a sustainability perspective, achieving a sustainable society will be challenging.

Even if it is easier to incentivize people to take action to improve their economic situation than to contribute to long-term sustainability, which is not as clearly in their short-term interest, it should be possible to establish

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[14] Regarding the divide between these rules and commands, see Berman (1983, p. 4–5).

[15] See North (1990) claiming that '[i]nstitutional change shapes the way societies evolve through time and hence is the key to understanding historical change' (p. 3). See also Furubotn and Richter (2011, p. 1).

incentives that enhance sustainability through institutional changes based on the understanding of institutional systems developed in economic theory, law and economics, and behavioural economics. Changing the institutional structure that has evolved over several hundred years is challenging and must be based on thorough analysis (di Robilant, 2023). Transaction costs will make developing complete solutions to environmental problems almost impossible through institutional change and regulation (Anderson & Libecap, 2014; Libecap, 2024). Nevertheless, it is evident that institutional change and the use of property and market solutions have great potential for contributing to sustainable development. The option to address the underlying causes of unsustainable practices and mitigate them through institutional changes and market-based solutions has not been sufficiently utilized.[16]

2.1.2. Institutional solutions to the depletion of resources due to free access

It is generally agreed that well-defined property rights often mitigate the problem of externalization by internalizing positive and negative externalities, meaning that the same person receives both the negative and positive effects of the activity or project she or he is undertaking. Secure property rights incentivize the owner to consider the future value of the resource (Anderson & Libecap, 2014). For example, the lake owner will have an interest in preventing others from fishing, as well as the ability to do this, and will have a vested interest in avoiding overexploitation of the lake's fish resources and investing to increase fish stocks by cultivating.

The same is true in forestry management. As an individual or collective owner, one can exclude others from using the property and keep the gains from investments made by planting or postponing the logging to increase the total output in the long term. This will incentivize the owner to invest in the property and utilize its resources over the long term. A change in the rights to the forest might change what the most profitable way is for the individual actor to exploit or use the forest.

An example from Norwegian history can illustrate this. Southern and western Norway were covered with forests up to the fifteenth century. From the sixteenth century onward, the demand for timber to build cities such as London and Amsterdam, and ships for overseas travel, created a bonanza for the export of wood. Poorly defined property rights led to uncontrolled logging, and within a couple of centuries, most of the forests were depleted. To prevent further depletion, the forests were divided among farms, so that each farm owned the forest in designated areas, while grazing and other uses were often jointly owned. This change in the institutional setting altered the incentives for the actors involved. It became prudent to manage the forests from a long--term perspective. This laid the foundation for more sustainable forest management, and the forests began to recover.

[16] For a more extensive discussion on this issue, see Anderson and Libecap (2014).

Still, it will not always be possible to integrate all negative externalities by private property rights, and one cannot disregard the fact that owners are often motivated by quick profits rather than long-term sustainable use of their property. Lack of information might also influence the owner's decisions, and not all externalities will be integrated by private property rights. I will return to this in the next chapter.

Property rights-based arrangements have been developed to manage access to traditional open resources like fisheries and the atmosphere.

Open access to harvesting the ocean's fish resources has led to substantial depletion of fish and other marine resources (Paniagua & Rayamajhee, 2024). Efforts to stop the depletion have been made in international and national law. At the international level, coastal states have acquired more control of natural resources in the areas adjacent to their coasts. The UN Convention on the Law of the Sea (LOSC) of 1982 granted coastal states exclusive rights to natural resources and limited jurisdiction over the sea areas within the Exclusive Economic Zone (EEZ),[17] which extends up to 200 nautical miles from the baselines, and to the resources on and under the continental shelf, which in some cases extends beyond the EEZ (LOSC Part VI). This enables states to regulate fishing in the EEZ, aquaculture, energy production, carbon storage, and related activities. The coastal states face the challenge of developing an adequate regulatory system to govern the resources in the offshore areas under their jurisdiction. Most coastal states have claimed ownership of natural resources on and beneath the continental shelf. In contrast, the marine resources in the water column within the EEZs are not subject to ownership, and other solutions need to be developed.

Areas beyond national jurisdiction have primarily been subject to free access, even if some regulations have been in place, resulting in biodiversity loss and degradation of marine ecosystems. To protect the marine environment, an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ) was reached on 19 June 2023.

The first response to the problems caused by free access to marine resources and the atmosphere was command-and-control regulation in various forms. Access to marine resources was regulated by, for example, time limitations on when fishing could occur, what fishing gear could be used or bans on catching certain species. Later, regulations in the form of concession schemes, where a permit from public authorities is necessary to engage in commercial fisheries, aquaculture, energy production, or emissions to the atmosphere, were introduced. A concession regime makes it possible to manage the exploitation of resources through a general rule forbidding exploitation, combined with the awarding of individual concessions that give a right to exploit, for example, a specific area, a fish stock, or the sea or atmosphere as a recipient of a particular volume of pollution (quota) as defined by the authorities. The

[17] United Nations Convention on the Law of the Sea (Part V), 1833 U.N.T.S. 397. https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

right to petroleum extraction, renewable energy production, or carbon storage offshore is also dependent on public permits or concessions.

Concession schemes for access to open resources restrict access to these resources and establish exclusive rights to natural resource exploitation for the concession holder. These rights have significant economic value and are the basis for huge investments and industrial activity, such as petroleum extraction, electricity production, aquaculture, carbon storage, or emissions of gases into the atmosphere. This adds a new dimension to public regulation, and the government assumes a new role in deciding who will gain access to valuable natural resources and who will not. Criteria for the fair allocation of these values are necessary, and different allocation methods have been tried.[18] The crucial aspect concerning sustainability is that the holders of exclusive rights to the exploitation of renewable resources have an interest in maintaining the resource and avoiding over-exploitation.

Especially in the case of emission rights, it is difficult for the authorities to acquire the necessary information to determine what level of emission rights an industrial undertaking needs and how much each undertaking can reduce its emissions. The undertakings have little incentive to provide this information. They will typically lobby to receive as much as possible, arguing that overly strict regulations might result in economic problems and loss of employment.

2.2. Transferable rights for resource exploitation

Authorities have introduced market mechanisms to allocate access to some resources. This is especially the case for emission rights for CO_2 into the atmosphere and rights to fisheries and other uses of sea areas in many countries. This is done through a 'cap and trade' system, where the government decides the total volume of what is regarded as a sustainable level of emissions or extraction of natural resources and leaves it to the market to distribute the rights to emit or extract resources within these limits.

The most comprehensive and complete cap-and-trade system in operation is the European Union's carbon trading system, the EU Emission Trading Scheme (EU-ETS), introduced in 2005. The system is based on the Kyoto Protocol and earlier US experiences in managing sulphur emissions, developed based on the theories of Ronald Coase (Dales, 2002). Since its introduction, the EU-ETS has been developed and extended to cover the emission of climate gases from electricity and heat generation, industrial manufacturing and aviation, and, from 2024, maritime transport.[19]

The emission rights for CO_2 are financial instruments that can be transferred freely and mortgaged as security for a debt; thus, they are an econo-

[18] The EU has introduced regulations to ensure that petroleum licences are granted based on relevant criteria relating to the applicant's technical and financial capability and their plans for the project, see Directive 94/22/EC, Article 5.

[19] For information on the EU-ETS, see https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/what-eu-ets_en

mic asset for the business entity owning them. The EU ETS is considered a success, having led to a substantial reduction in emissions (see 2024 Carbon Market Report[20]). The overall cap on emissions allowances is also reduced each year, contributing to an increase in the price of carbon quotas. The aim is to reduce emissions by 62% in 2030 compared to 2005 (Report, p. 6).

A cap-and-trade system has also been introduced in fisheries management in many countries.[21] The total allowable catch for certain species is determined annually, based on scientific advice regarding the sustainable harvest of fish stocks. Each fishing vessel has a quota for a certain percentage of the total quota. The way the quotas are distributed from the start varies between jurisdictions. Whether fishing rights should be made tradable is controversial due to its impact on socio-economic relations and regional development. Still, empirical evidence makes it clear that it makes fisheries more sustainable and substantially reduces the risk of depletion of fish stocks.[22] Concerns that make the introduction of individual transferable quotas (ITQs) controversial include the risk of concentrating the right to participate in commercial fishing in the hands of a few, regional policy considerations, and the protection of indigenous rights. Iceland and Norway have introduced systems with tradable quotas in commercial fishing, with some limitations.[23]

A 'cap-and-trade' system gives the authorities control over the total exploitation of a resource and the ability to ensure that the total utilization of the resource does not exceed the limits of sustainable use. The distribution of the right to the available resource is left to the market mechanism. In principle, this makes it possible for those willing to pay the most for the resource, and presumably those who can create the most value from it, to obtain the resource. This system establishes a form of property rights to the resource stock. It protects the right holders against outsiders and, for example, lowers the risk that other fishing vessels catch more than their share in the fisheries. This gives them a stronger motivation to participate in the protection of the fish stock against extensive fishing. This effect does not apply in the same way to resources that are not subject to physical competition, such as atmospheric emissions. Overinvestment in vessels and fishing gear, which is usual in fisheries where the participants compete to make the largest catch, is also avoided, as the capacity can be more adapted to the resource base.

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[20] European Commission, Report from the Commission to the European Parliament and the Council on the functioning of the European carbon market in 2023 (COM(2024) 538 final), https://climate.ec.europa.eu/news-your-voice/news/2024-carbon-market-report-stable-and-well-functioning-market-driving-emissions-power-and-industry-2024-11-19_en (hereinafter 'Report').

[21] Paniagua and Rayamajhee (2024) state that 17 countries worldwide have implemented some form of individual transferable quotas (IQT).

[22] Costello et al. (2008) conclude, based on a global survey of 11,135 fisheries from 1950 to 2003, that the risk of collapse was approximately half as much in fisheries with ITQ compared to those without. See also Paniagua and Rayamajhee (2024).

[23] An overview of the Icelandic system can be accessed at Permits to fish | Ísland.is. See also Gretarsson (2010). The Norwegian system is presented in Arntzen (2023).

Establishing property rights to resources that were free to access earlier gives them an economic value worth protecting. Individuals with such rights are more inclined to report illegal resource use. The monetary value of the resource also encourages the consideration of other options, such as investing in more effective production equipment to reduce the costs of emission rights.[24]

Exclusive and legally protected rights are necessary prerequisites for the efficient operation of a market system (Coase, 1960). With the system for the right to exploit open resources created by the concession schemes, an opportunity has been created for a more market-based and effective allocation of the discharges that can occur within a justifiable framework through the climate quota system. There is a potential for introducing similar market-based systems for other resources. A case in point is the interesting proposal for a property-based management system for atmosphere management by Martinsson (2024).

2.3. Collective rights

Access to natural resources can be controlled or restricted in ways other than through individual private exclusive rights or ownership. Different forms of collective management or ownership also contribute to sustainability. Establishing property rights is costly and often has social impacts that are unacceptable or politically unfeasible.

One solution is to give user or property rights to local communities for management through local collective action. This 'common property resource management' (CPRM) can be organized in different ways, making it possible to constrain the excessive extraction of resources. In her extensive work on commons, based on case studies and experiments, Elinor Ostrom (1990) has outlined the main factors needed to make such solutions successful: close-knit communities, clear leadership, norms, and trust.

Examples of the establishment of collective rights to forest resources are the 'Community Forest User Groups' (CFUG) in Nepal, which were established as a response to the degradation of the country's forests. Each village received an area outside the villages where it could manage and use its forest resources. Around one million hectares of forests are managed by 13,000 user groups (Acharya, 2005). Similarly, in Uganda, similar arrangements have been made to incentivize the villages to stop illegal logging and invest in the forests by planting trees (Banana et al., 2012).

In Norway, high-mountain areas have been organized as commons for several hundred years and are regulated by law. Local farmers have the right to logging, grazing, fishing, and hunting for their own needs.

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[24] A general discussion of the legal problems related to the distribution of costs and benefits for measures against climate change can be found in de Larragán (2011).

IV. DEVELOPMENT OF INSTITUTIONS FOR SUSTAINABILITY

In the preceding sections, I have mainly discussed possible legal instruments to constrain unsustainable practices. This is important but not sufficient to create sustainable development. An institutional framework must be developed to create incentives and facilitate activities, investments, and the development of technologies that will contribute to sustainable development. Carbon capture and storage is a new industry of great importance for achieving climate neutrality. One method under development is storing carbon in empty natural gas reservoirs. A notable early example is the Norwegian project 'Northern Lights'.[25]

In addition to regulating technical activity, safety, and other issues, developing a legal framework for financing and a market for carbon capture and storage as a service is essential. This will require integrating public regulation and private law, such as the possibility of using a permit to operate a facility for carbon storage as collateral for a mortgage to finance the project. The same applies for offshore wind energy farms. There is a tendency for the authorities to prioritize public control of such activities and not to pay attention to the need for the stakeholders to use ordinary channels to finance the activity. This requires public authorities to balance the need for governance and control with an understanding of how to make investments in activities that promote sustainable development both feasible and profitable.[26]

V. CONCLUSIONS

Sustainable development is defined as a situation where the needs of the current generation are met without undermining the possibility for future generations to meet their own needs. Achieving this will require profound changes in land use, natural resource exploitation, industrial production, transport, energy production and consumption, and emissions management. Unsustainable practices usually result from discrepancies between private and social costs, making it profitable for individuals to engage in practices that harm the environment and often unprofitable for them to engage in practices that are beneficial to the environment. Balancing the difference between private and social costs through regulation or taxes is frequently imprecise, ineffective, and may have unwanted side effects. Traditional regulation addresses the symptoms of the underlying causes of unsustainability, which might be necessary to improve the situation, but this strategy for change has largely reached its potential. It is necessary to change the strategy for developing legal responses to unsustainable practices by shifting the focus towards more fun-

[25] https://norlights.com/what-we-do/

[26] From a different field, see Nordtveit (2013).

damental institutional change and smart regulation to change the incentive structure, making it more beneficial for individuals and corporations to act sustainably. Developing legal solutions and legal instruments to change the fundamental institutional set-up in society will be more demanding than direct regulation. Still, it has proved possible and more effective in some areas, such as the cap-and-trade systems for climate gases and regulating access to commercial fishing in some countries. Creating incentives and opportunities for individuals and businesses to engage in activities that support sustainability can be done through different forms of 'smart regulation', but most effectively through institutional change that integrates the consideration of sustainability as a goal and a value in the legal and institutional setting. This task requires multidisciplinary cooperation between natural scientists, economists, and legal scholars to help develop new solutions based on the insights of these disciplines and possibly other disciplines (Posner, 2001).

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