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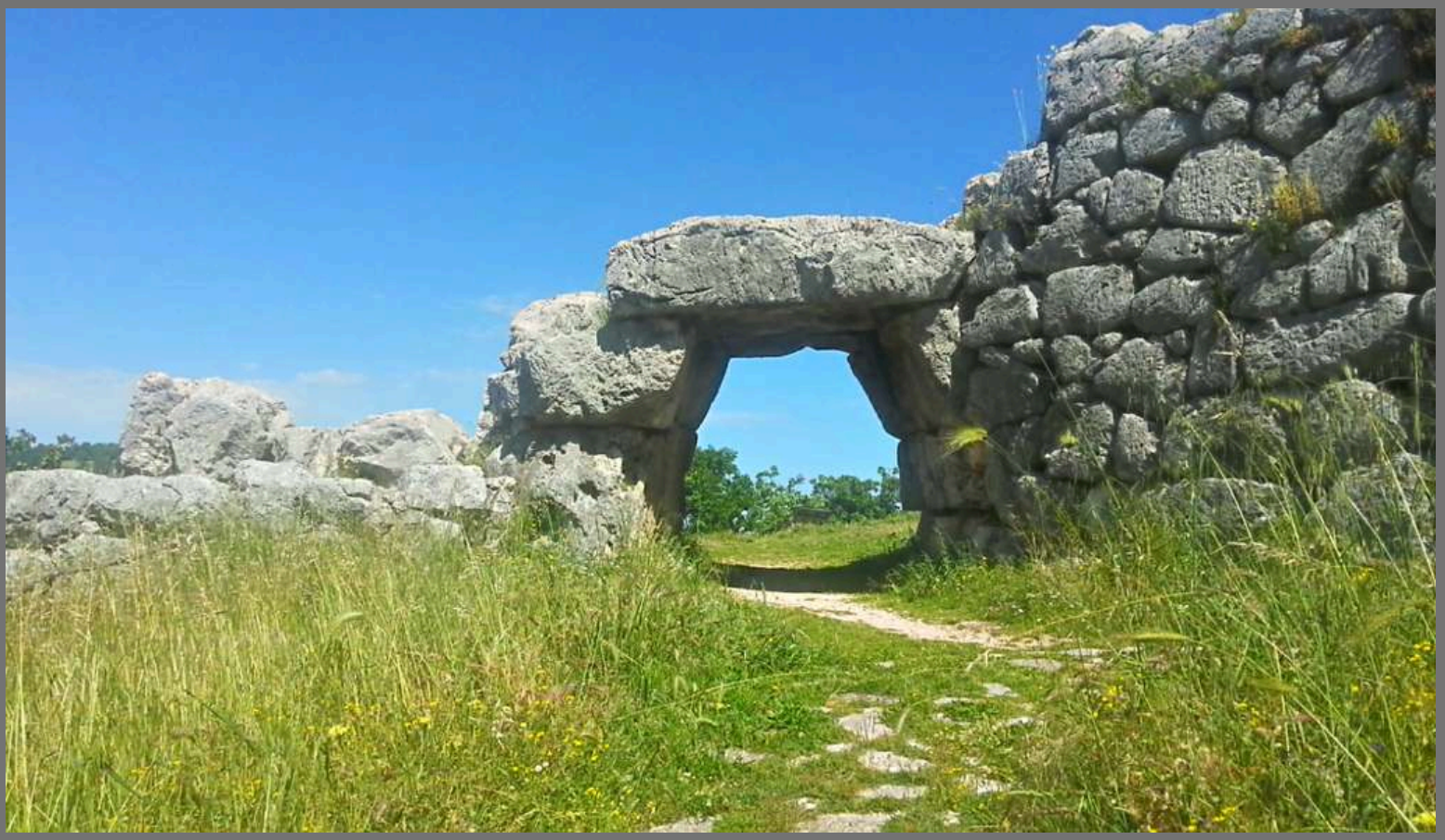

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THE TIME OF SUSTAINABILITY AND PRECAUTION IN CRIMINAL LAW

IL TEMPO DELLA SOSTENIBILITA' E DELLA PRECAUZIONE NEL DIRITTO PENALE

di Luca FRANZETTI

Abstract. This article examines the impact of the principles of sustainable development and precaution on criminal law, focusing on the transformation of its temporal dimension. Traditionally oriented ex post, criminal law is increasingly confronted with anticipatory logics: the precautionary principle lowers the threshold of intervention in the face of scientific uncertainty, while sustainable development extends responsibility toward future generations. This dual movement challenges fundamental principles such as legality, harmfulness, and culpability, risking a shift toward a form of risk-management criminal law. Through an analysis of international and European developments, as well as of criminal law theory, the paper highlights the limits of integrating these principles into criminal law, particularly in terms of defining legal goods and typifying offences. It concludes that precaution and sustainability should primarily guide administrative and civil regulation, preserving criminal law as an ultima ratio instrument.

Abstract. Il contributo analizza l'impatto dei principi di sviluppo sostenibile e di precauzione sul diritto penale, con particolare riferimento alla trasformazione della sua dimensione temporale. Tradizionalmente orientato ex post, il diritto penale si confronta sempre più con logiche anticipatorie: il principio di precauzione abbassa la soglia di intervento in presenza di incertezza scientifica, mentre lo sviluppo sostenibile estende la responsabilità verso le generazioni future. Questo duplice movimento mette in tensione i principi fondamentali di legalità, offensività e colpevolezza, rischiando di trasformare il diritto penale in uno strumento di gestione del rischio. Attraverso l'analisi delle fonti internazionali ed europee e della dottrina penalistica, il lavoro evidenzia i limiti dell'integrazione di tali principi nel diritto penale, soprattutto nella definizione del bene giuridico e nelle tecniche di incriminazione. Si conclude che precauzione e sostenibilità trovano una più adeguata collocazione negli strumenti amministrativi e civili, preservando il diritto penale quale extrema ratio.

Key words: criminal law; precautionary principle; sustainable development; future generations; risk society; prevention; legal good; environmental law.

Parole chiave: diritto penale; principio di precauzione; sviluppo sostenibile; generazioni future; società del rischio; prevenzione; bene giuridico; diritto ambientale

1. Introduction

Criminal law traditionally operates *ex post*, once harm has already occurred, thereby ensuring certainty and predictability of sanctions. The emergence of the precautionary principle—as developed at the European level—and of the principle of sustainable development—as incorporated into international treaties and the Italian Constitution—introduces, however, a temporal dimension that places the classical categories of criminal law under strain. The first principle urges an anticipation of the threshold of protection, justifying the criminalisation of risky conduct even in the absence of harm or danger to the protected legal interest, particularly under conditions of scientific uncertainty. The second expands the temporal horizon of responsibility, imposing long-term and intergenerational considerations.

A dual movement thus arises: a narrowing of the time of intervention (precaution) and an extension of the time of responsibility (sustainability). This transformation risks reshaping criminal law into an instrument of mere risk management, raising questions of compatibility with the principles of legality, harm, and culpability. The essay analyses these tensions and outlines a balanced model in which criminal law retains its function as *extrema ratio*, complemented by administrative and civil instruments better suited to managing the temporalities of uncertainty and sustainability.

2. The Progressive Emergence of the Principles of Sustainable Development and Precaution on the International Stage

It is now widely acknowledged that contemporary society has reached a point of no return. Humanity faces global emergencies that jeopardise its very survival. Climate change, armed conflicts, global warming, and economic and financial crises constitute well-known fault lines of modern "unsustainability", and their intersection with criminal law has been extensively examined by leading criminal law scholarship, particularly in connection with Ulrich Beck's theory of the "Risk Society".

In this historical–political context—rightly termed the "Anthropocene" by scholars[1]—the temporal dimension upon which political decisions (including those related to criminal law) operate shifts from the present to the *future*: "*what is relevant now is the future itself: only in the future will the imminent disaster become visible and palpable with distressing inevitability; if possible, it can be prevented or at least mitigated only now, and this future disaster should thus be anticipated in contemporary criminal law*"[2].

Stratenwerth's observation—clearly oriented toward an expansive, pervasive use of criminal law in defence of the future—nonetheless offers useful insights for reflecting on the temporal coordinates (and protection thresholds) within which criminal law reasoning now unfolds. The very dimension of futurity, embodied in the paradigm of "future generations" (*künftigen Generationen*), shapes and gives content to two principles that, with varying degrees of success, have entered the landscape of international and European law: the principle of sustainable development and the precautionary principle.

2.1. The Affirmation of the Principle of Sustainable Development

The concept of sustainability (and its corollary, "sustainable development") does not lend itself easily to a precise and unambiguous semantic definition. Precisely because of its vagueness, sustainability—elevated to emblem of contemporary (and future) society and to a cultural *topos*—risks generating significant methodological confusion, including within legal discourse[3].

In its earliest historical and normative manifestations, the principle of sustainability encompassed only an environmental dimension, referring to the capacity of specific ecosystems to withstand external pressures: the greater a system's stability vis-à-vis external disturbances, the greater its self-regulating capacity[4].

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[1] The term refers to the current geological epoch, in which the terrestrial environment—across its physical, chemical, and biological characteristics—is profoundly shaped, at both local and global scales, by the effects of human activity, with particular reference to the rising concentrations of CO_2 and CH_4 in the atmosphere. For this neologism, see CRUTZEN, *Benvenuti nell'Antropocene!*, Milano, 2005.

[2] STRATENWERTH, *Zukunftssicherung mit den Mitteln des Strafrechts?*, in *ZStW*, n. 105/1993, p. 680.

[3] On these aspects see, CACCIARI, *L'ideologia della sostenibilità*, in *comune-info.net*, 2017; RIST, *Lo sviluppo. Storia di una credenza occidentale*, Torino, 1997, p. 197, who interprets sustainable development as a "*capitalist mystification*"; ANTONIOLI, *Sostenibilità dello sviluppo e* governance *ambientale*, Torino, 2017, p. 91; PISANI TEDESCO, *Strumenti privatistici per la sostenibilità ambientale e sociale*, Torino, 2024, p. 9, who describes it as a "*challenging*" term; PONZANELLI, *Sostenibilità delle regole di responsabilità civile*, in *Contr. imp*., n. 3/2023, p. 716.

[4] GIOVANNINI, *L'utopia sostenibile*, Bari, 2018, pp. 4 (also related to the planet boundaries theory).

Only from the latter half of the twentieth century onwards did the concept of sustainability (and sustainable development) progressively expand and evolve into a multidimensional notion. This evolution diluted its original ecological emphasis while rendering it applicable—and meaningful—in contexts beyond strictly environmental concerns[5]. In this sense, the term, indeterminate and abstract, takes the form of a general clause, capable of adapting to changing social needs and ongoing scientific innovation; its cross-sectoral nature inherently fosters a plurality of meanings. This is the version of sustainability eventually endorsed by the United Nations in the context of the 2030 Agenda. A common thread emerging from international and EU sources is a conception of "responsibility" toward future generations: "*act in such a way that the consequences of your action are compatible with the continued existence of human life on Earth*"[6].

Sustainable development—an epiphenomenon of modern complexity—thus gives rise, within the legal sphere, to the category of future generations, accompanied by corresponding rights and expectations.

If, however, one seeks a more precise definition of "sustainable development", encompassing not only ecological/environmental but also social and economic dimensions, reference must be made to the Report of the World Commission on Environment and Development (the Brundtland Report). There, the principle is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs, grounded in the balance of three fundamental pillars: economic growth, social equity, and environmental protection—promoting responsible resource use and a reduced ecological footprint to safeguard future well-being[7].

In the 1990s, with the Rio de Janeiro Earth Summit (1992)—which also marked the first formal recognition of the precautionary principle—sustainability was articulated into a set of principles and action programmes (Agenda 21, the climate and biodiversity conventions). A holistic understanding of the paradigm emerged, linking environment, economy, and society. This vision was consolidated

[5] KUHLMAN, FARRINGTON, *What is Sustainability?*, in *Sustainability,* 2010, pp. 3436, who, however, warn that such an evolution of the concept of sustainability risks diminishing the importance of the environmental dimension.
[6] JONAS, *Il principio di responsabilità. Un'etica per la civiltà tecnologica*, Torino, 1990, p. 16. The imperative not to harm future generations shifts the discourse from being to ought, such that the core of the very idea of sustainability appears to lie in intergenerational solidarity (or equity).
[7] "*Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits – not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth*" (United Nations, Report of the World Commission on Environment and Development. Our Common Future, cit., § I.3.27).

through subsequent conferences and conventions, culminating in the Millennium Declaration (2000) and its Millennium Development Goals, which aimed to steer global development toward social as well as economic objectives. The definitive maturation of the concept occurred with the 2030 Agenda (2015), introducing the 17 Sustainable Development Goals (SDGs) and 169 operational targets. The Agenda establishes the indivisibility of the three dimensions—economic, social, and environmental—and assigns an active role not only to States but also to citizens and enterprises, calling for changes in consumption and production patterns. Sustainability thus becomes a transversal principle guiding all public policies[8].

On this basis, the European Union has played a leading role in receiving and operationalising the principle. Already in the Treaties of Maastricht and Amsterdam—as well as in the TFEU and the Charter of Fundamental Rights of the EU—sustainable development is recognised as a foundational objective of EU action, endowed with normative value and interpretive force. Originally linked to environmental protection, the principle is projected here into an integrated dimension capable of shaping the Union's economic and social policies.

At the implementation level, EU initiatives may be grouped into three macro-areas: (a) circular economy, aimed at reducing waste and resource inefficiency by promoting recycling, reuse, and product repairability; (b) corporate social responsibility (CSR), strengthened by the Directive on supply-chain due diligence, requiring monitoring of environmental and social impacts in production processes (CS3D); (c) sustainable communication, intended to ensure transparency and accuracy in environmental claims and to combat greenwashing.

All these measures converge in the broader framework of the European Green Deal, which represents the EU's strategic commitment to transforming its growth model into a fair and sustainable one – "*the defining task of our generation*"[9].

In conclusion, the principle of sustainable development has undergone progressive institutionalisation: from a scientific and political notion to a genuine legal principle capable of guiding global and European decision-making. Originally rooted in environmental protection, it has evolved into an integrated paradigm of social, economic, and ecological justice, grounded in

[8] PISANI TEDESCO, *Strumenti privatistici*, cit., p. 17; GIOVANNINI, *L'utopia sostenibile*, cit., p. 41; BUONFRATE, *Ambiente, economia, società,* governance*: l'epoca delle grandi trasformazioni*, in *Trattato breve di diritto dello sviluppo sostenibile* (a cura di BUONFRATE-URICCHIO), Milano, 2023, pp. 11.
[9] European Commission, Communication on the European Green Deal, 11 December 2019, COM (2019) 640 final, § 2.

responsibility toward future generations and in the need for structural change in production and consumption models.

2.2. The Affirmation of the Precautionary Principle

Similarly to the principle of sustainable development, the *Vorsorgeprinzip* has undergone a gradual emancipation from its purely ecological and environmental foundations, eventually acquiring the status of a guiding criterion for decision-making under conditions of scientific uncertainty. As anticipated, the principle was formally recognised at the international level in Principle 15 of the 1992 Rio Declaration, which states that: "*In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*".

This initial international formulation already contains the essential elements of the principle later codified in the 2001 Communication of the European Commission: (a) the threat of serious and irreversible damage (to environmental matrices); (b) a situation of scientific uncertainty regarding the aetiology of adverse phenomena; (c) the need for prevention—namely, to "act before it is too late". With the Commission's Communication, however, the principle is generalised and its scope broadened to all situations in which an objective, preliminary scientific evaluation indicates reasonable grounds for concern that potentially harmful effects on the environment or human health may be incompatible with the high level of protection chosen by the Community[10]. In essence, then, the *Vorsorgeprinzip* pertains to risk management in cases where scientific uncertainty precludes a complete assessment of that risk, and where decision-makers believe that the chosen level of environmental or health protection may be jeopardised[11].

Thus, while the precautionary principle originated as a regulatory tool in the environmental sector, it subsequently expanded and now applies—albeit with variations—to all areas that fall under the broad umbrella of "safety"[12].

[10] European Commission, Communication from the Commission on the precautionary principle, COM (2000) 1 final, § 3.
[11] *Ivi*, § 5.
[12] Thus, for example, the precautionary principle has also found application in the context of the fight against international terrorism. See, in this regard, SUNSTEIN, *Laws of Fear*, Cambridge, 2005.

Here too, however, a diachronic and multigenerational perspective emerges, closely connected to the philosophical matrix from which the principle derives: Hans Jonas's *Verantwortungsprinzip*. Jonas conceptualises a new form of "project responsibility" projected into the future, which differs from traditional understandings of responsibility in two essential respects: first, its collective dimension, in contrast to traditional individual responsibility; and second, its future-oriented temporal direction, in contrast to the retrospective orientation of conventional responsibility centred on sanction or reparation. In response to this collective responsibility, a new imperative arises: "*act now to prevent irreparable harm in the future*".

2.3. Summary

In sum, both the precautionary principle and the principle of sustainable development offer a compass for guiding present-day action through a preventive or prudential lens, in order to safeguard for future generations, the same opportunities available today.

The core of precaution lies in its prudential logic rather than in classical preventive logic, especially where no adequate nomological explanation exists regarding the aetiology of certain phenomena. Decisions taken in a context of scientific uncertainty necessarily entail an anticipation of the threshold of intervention—beyond the usual preventive logic that characterises criminal law, particularly in the form of endangerment offences (both concrete and abstract).

Sustainable development, by contrast, employs the perspective of future generations as a basis for extending responsibility – echoing Jonas – or, in the words of the *Bundesverfassungsgericht*, for mandating the protection of "future freedoms" (*intertemporale Freiheitssicherung*)[13]. These are freedoms that may be threatened directly by climate change and indirectly by governmental inaction. As that judgment states, it should not be permissible "*to consume a large share of the carbon budget while bearing only a relatively light burden, if doing so forces future generations to bear a far more radical burden and exposes their lives to a significantly greater loss of freedom*"[14]. Here, unlike the *Vorsorgeprinzip*, the issue is not one of "scientific darkness": the nomological explanation of events such as climate change is well-established. The challenge is not the determination—case by case—of prudential measures to contain risks inherent in specific substances or products. Rather, it concerns

[13] BVerfG, 24.03.2021 - 1 BvR 2656/18, 1 BvR 96/20, 1 BvR 78/20, 1 BvR 288/20, 1 BvR 96/20, 1 BvR 78/20 noted by RATH-BENNER, *Ein Grundrecht auf Generationengerechtigkeit*?, in *verfassungsblog.de*, 2021.
[14] *Ivi*, § 122.

a long-term orientation capable of steering modern policymaking toward more efficient and conscious choices vis-à-vis future generations and toward an awareness of the limits inherent in unlimited consumption.

3. The Time Variable in Criminal Prevention

3.1. The Variable in Classical Prevention (Crimes of event and Endangerment Offences)

When one relates the specific sphere of legislative criminalisation techniques to the temporal variable, it becomes evident that for several years the role of event-based criminal law has become recessive in comparison with prevention[15]. In the criminal law landscape, and in parallel with the sociological rise of the *Risikogesellschaft*, a growing need has emerged to prevent large-scale dangers and remote, megascopic harms that may affect individuals.

Classical criminal law (*Kernstrafrecht*), epitomised by the ideal type of the commission-based result offence, has long been in decline. With the rise of the welfare state[16] and the intensification of sources of danger for citizens within a highly globalised context, the need to guarantee—through criminal law—robust prevention has grown increasingly prominent, as a means to contain the pockets of social insecurity in which citizens live. It is particularly in the sphere of major risks tied to productive activities that one observes a proliferation of endangerment offences, especially those of an abstract nature. Product-related harm is subject to an inherent "crisis of uncontrollability" within classical criminal law, which proves incapable of addressing such a complex phenomenon, particularly at the causal level.

To respond to this drive for risk containment, abstract endangerment offences have appeared, especially in German doctrinal discourse, as the most suitable solution: "*as long as endangerment offences are lacking in this area, courts are almost forced—where certain conduct appears worthy of punishment, or where spectacular mass damages prompt demands for criminal sanctions—to base convictions on crimes of event, even if upon closer inspection their requirements are not met or are*

[15] On the relationship between classical criminal law and modern criminal law, the literature is virtually boundleff. It suffices to refer to the clear and systematic analysis offered in PALIERO, *L'autunno del patriarca. Rinnovamento o trasmutazione del diritto penale dei codici?*, in *Riv. it. dir. proc. pen*., n. 4/1994, pp. 1220.
[16] On the role of the Social State as a driver of criminal-law interventionism, see TIEDEMANN, *Tatbestandsfunktionen im Nebenstrafrecht: Untersuchungen Zu Einem Rechtsstaatlichen Tatbestandsbegriff. Entwickelt Am Problem des Wirtschaftsstrafrechts*, Heidelberg, 1969, p. 106. In Italy, remain fundamental Paliero's work Minima non curat praetor. *Ipertrofia del diritto penale decriminalizzazione dei reati bagatellari*, Padova, 1985 (especially Cap. I).

at least highly doubtful"[17]. Abstract endangerment offences are said to succeed where *Erfolgsdelikte* and *Konkrete Gefährdungsdelikte* fail, as they do not require judicial determination of causation and, crucially, do not require the occurrence of harm[18].

With abstract endangerment offences, however, one remains within the realm of prevention. These offences are based on an (absolute) presumption of danger constructed by the legislature, which presumes—pursuant to the criterion of *id quod plerumque accidit*—that certain conduct is dangerous for the protected legal interest. Yet the legislative presumption must comply with the principle of reasonableness: while the presumption functions as a probative shortcut compared to concrete endangerment offences, it must nevertheless withstand empirical scrutiny[19]. In situations where the dangerousness of a given behaviour can neither be confirmed nor excluded—such as in cases of "scientific darkness" related to product liability—a presumption is illegitimate precisely because of the absence of knowledge.

And it is precisely this scenario of scientific darkness and lack of knowledge—where it is unknown whether a substance is harmful to health—that constitutes the natural domain of application of the precautionary principle, which operates as a prudential, policy-driven response to scientific uncertainty.

Protection afforded by endangerment offences—and thus by criminal law of prevention in a broad sense—stops at a different, more proximate temporal threshold. As keen scholarship has noted,

[17] In these terms EICHINGER, *Die strafrechtliche Produkthaftung im deutschen im Vergleich zum anglo-amerikanischen Recht*, Frankfurt am Main, 1997, p. 349.

[18] EICHINGER, *Die strafrechtliche Produkthaftung*, cit., pp. 351 ff.; KÜHNE, *Strafrechtliche Produkthaftung in Deutschland*, in *NJW*, 1997, p. 1954; HILGENDORF, *Strafrechtliche Produzentenhaftung*, in *SRA*, n. 78/1993, pp. 169; KAUFMANN, *Tatbestandsmäßigkeit und Verursachung im Contergan-Verfahren: Folgerungen für das geltende Recht und für die Gesetzgebung*, in *JZ*, n. 18/1971, p. 571; KUHLEN, *Strafrechtliche Produkthaftung*, in *Handbuch Wirtschaftsstrafrecht* (eds. ACHENBACH-RANSIEK-RÖNNAU), 6. Auflage, Heidelberg, 2024, r.n. pp. 55 ff.; SCHÜNEMANN, *Unternehmenskriminalität und Strafrecht*, Köln, 1979, pp. 207; FREUND-ROSTALSKI, *Wesentliche Inhalte und Ergebnisse der Tagung „Strafrechtliche Verantwortlichkeit für Produktgefahren" (18.–20. Juli 2013, Marburg*), in *Strafrechtliche Verantwortlichkeit für Produktgefahren. Internationales Symposium vom 18.–20. Juli 2013 an der Philipps-Universität Marburg mit Beiträgen aus China, Deutschland, Japan, Spanien, Taiwan und der Türkei,* (eds. FREUND-ROSTALSKI), Frankfurt am Main, 2015, pp. 19.

[19] On the need for support from a scientific corpus that does not convey complete obscurity but at least a partial possibility of danger (the so-called "real danger" to the protected legal interest), see. PIERGALLINI, *Danno da prodotto e responsabilità penale*, Milano, 2004, p. 508; STELLA, *Giustizia e modernità*, Milano, 2003, pp. 524 ss.; D'ALESSANDRO, *Pericolo astratto e limiti-soglia*, Milano, 2012, pp. 152-216 (who, together with Stella, speaks of "real danger"); DONINI, *Il volto attuale dell'illecito penale*, Milano, 2004, 102 ss.; MANES, *Il principio di offensività nel diritto penale*, Torino, 2005, pp. 287 ss.; PULITANÒ, *Giudizi di fatto nel controllo di costituzionalità di norme penali*, in *Riv. it. dir. proc. pen*., n. 3/2008, p. 1010. The Constitutional Court likewise warns the legislature against grounding abstract-danger offences on an insufficient scientific basis, requiring instead knowledge capable of revealing some degree of insight into the dangerousness (or lack thereof) of certain conducts (see, for example, Constitutional Court, 11 July 1991, no. 333).

"*criminal norms sometimes refer to a danger that has already arisen, fixed in time; sometimes to situations of danger that continue over time, or to dangers of future harm within a more or less extended timeframe*". In short, endangerment offences operate within a relatively limited temporal interval—certainly differentiated but nonetheless bounded[20]. The criminal law of prevention, as traditionally conceived, is rooted in an ethics of proximity. As Sgubbi observes "*criminal responsibility and duties toward others are grounded in the ideal social contract among autonomous, free, and equal agents; they are also grounded in social contact, but always on the assumption of spatio-temporal contiguity. The past or the future cannot constitute sources of obligation*"[21].

3.2. The Variable of the Precautionary Principle in Criminal Law

The precautionary principle has found multiple avenues through which to penetrate the criminal law system. Fundamentally, it impacts two areas most significantly: on one hand, typification, which entails examining how the *Vorsorgeprinzip* influences legislative choices to define "prudential" criminal offenses; and on the other hand, the field of precautionary rules, i.e., negligence informed by prudential assessments.

Following the approach adopted in this work, the starting point is the typification techniques of offenses that incorporate the principle under discussion. The precautionary principle, by influencing the identification of risk management measures concerning legally protected interests relevant to criminal law (the environment, human health, etc.), is considered at the legislative level to implement forms of anticipatory criminal protection.

However, it is important to distinguish between abstract danger (the traditional lower-bound formula in classical prevention) and offenses centered on the precautionary principle. This distinction stems from the very nature of the principle and the necessary requirement of reasonableness that must always underlie any presumption of danger. Indeed, if the only offensive projection within an offense derives from precaution, there is no minimum level of harmfulness required by criminal offenses under the guarantee-based principles governing the field[22]. The pathways through which

[20] PULITANÒ, *Diritto penale*, Torino, 2021, pp. 177 and the reflections applied to sustainability in RUGA RIVA, *L'ambiente in Costituzione. Cambia qualcosa per il penalista?*, in *sistemapenale.it,* 2023.
[21] SGUBBI, *Il diritto penale totale*, Bologna, 2019, pp. 33. On the ethics of proximity and its philosophical foundation, see JONAS, *Il principio di responsabilità*, cit., *passim*.
[22] In the literature, see PERINI, *Il reato di pericolo: la fattispecie oggettiva*, in *Il sistema penale* (a cura di PALIERO), Torino, 2024, p. 238. On the distinction between abstract danger and offenses based on the precautionary principle, see also the two monographs by Stella and D'Alessandro cited above.

presumptions of danger and the precautionary principle operate are different: the latter functions in situations of recognized scientific uncertainty, as it presupposes, on one hand, the identification of potentially negative effects deriving from a phenomenon, product, or process (i.e., from a conduct) and, on the other hand, a scientific evaluation of the risk which, due to insufficient, inconclusive, or imprecise data, does not allow for the risk in question to be determined with sufficient certainty. Consequently, a criminal norm prohibiting or mandating conduct on the basis of the precautionary principle would rest on the premise that such conduct might not trigger any actual offensive projection against the protected interest. Such an offense would consciously include within the ambit of criminal liability conduct whose harmfulness is uncertain, rather than established.

Thus, whereas preventive logic aims at eliminating or reducing known risks, whose effects are therefore predictable and preventable, precautionary logic seeks to address unknown risks, which, according to current scientific knowledge, cannot be reasonably excluded. Within offenses shaped by precaution, there remains a noticeable lowering of the criminal protection threshold, well beyond the limits of actual danger, clearly undermining the principles of harmfulness and materiality that must, in any case, inform criminal prevention strategies.

3.3. The Variable of Sustainability in Criminal Law

Analysing the role of the principle of sustainable development in establishing new criminal offenses requires contextualizing the topic within the transformed constitutional landscape, where the principle has recently been explicitly enshrined.

With the 2022 constitutional reform, the protection of the environment, biodiversity, and ecosystems, including in the interest of future generations, was expressly incorporated into the Constitution (Art. 9 Const.)[23].

This progressive affirmation of the sustainability component has inevitably led criminal law scholars to consider its potential applications within their field. Sustainable development involves interests not of a current cohort of citizens, but of an undefined set of future individuals. Translating this programmatic line into a legally protected good represents an intriguing challenge for the criminal

[23] PORENA, *"Anche nell'interesse delle generazioni future". Il problema dei rapporti intergenerazionali all'indomani della revisione dell'art. 9 della Costituzione*, in *federalismi.it*, 2022, pp. 125 ss.

law scholar of tomorrow, but especially for the criminal law scholar of today[24]. Referring to potential future interests, and to a concept—sustainable development—that is inherently somewhat vague, risks a return to strictly anthropocentric views, from which environmental goods are attempting to emancipate themselves[25]. Such uncertainty regarding definitional boundaries should, at first glance, discourage any attempt to classify or delimit a potential legal object characterized by sustainability.

The most immediate consequence of this temporal disjunction between present and future interests is primarily felt in criminal law protection techniques. Indeed, it has been noted that the need to relate criminal prevention of harmful events also to future generations could considerably extend the temporal horizon for risk assessment in danger offenses, incorporating factors that are not hermeneutically clear and potentially aligning with issues raised by the precautionary principle[26].

However, constitutional recognition of future generations does not automatically imply the configuration of sustainability as a legally protected good[27]. Not all constitutional values, even fundamental ones, require criminal protection: the Constitution expresses a dynamic balance between heterogeneous principles, to be weighed case by case. Constitutional recognition alone does not establish an obligation to criminalize "unsustainable" conduct.

It is therefore necessary to ask not only who is protected but also, crucially, in what and within what limits they are protected[28]. The definition of a legal good requires, at the very least, the identification—albeit imprecise—of the subjects entitled to it. Derek Parfit's theory of the "non-identity" of future generations is decisive here[29], demonstrating the impossibility of knowing the preferences and values of individuals who do not yet exist. This results in the indeterminacy and instability of future rights and interests. If the identity of future subjects depends on current decisions, the very value of rights could change prospectively, giving more or less weight to certain principles relative to others. "*Not knowing the identity of individuals who will form future generations, we*

[24] ROXIN-GRECO, *Strafrecht. Allgemeiner Teil, Band 1: Grundlagen. Der Aufbau der Verbrechenslehre*, München, 2020, pp. 59 e 64, but above all ROXIN, *Was darf der Staat unter Strafe stellen? Zur legitimation von Strafdrohungen*, in *Studi in onore di Giorgio Marinucci* (a cura di DOLCINI-PALIERO), ed. I, Milano, 2006, p. 736.
[25] For a critical perspective see RESCIGNO, *Quale riforma per l'articolo 9*, in *federalismi.it*, 2021.
[26] As revealed by RUGA RIVA, *L'ambiente in Costituzione*, cit.
[27] Building on the reflections of FIANDACA, *Sul bene giuridico. Un consuntivo critico*, Torino, 2014, pp. 53.
[28] PORENA, *"Anche nell'interesse delle generazioni future". Il problema dei rapporti intergenerazionali all'indomani della revisione dell'art. 9 della Costituzione*, in *federalismi.it*, 2022, p. 14.
[29] According to this framework, each of our existence and, consequently, our identity is inseparably the result of choices made by our predecessors (consider, for instance, birth), so that making different choices would result in the birth of an individual with a different identity or, indeed, could even prevent their birth altogether (PARFIT, *Reasons and Persons*, Oxford, 1987, pp. 351).

consequently do not know what their preferences will be. More precisely, we do not know which goods future generations will value, thereby generating rights or interests"[30].

Even if supra-individual goods and diffuse interests exist, projecting them onto future generations presents a radical issue: it concerns an uncertain, perhaps even non-existent, collective[31]. Including future interests within the notion of a legal good risks conflating the objectivity of the norm with legislative intent, undermining the critical function of the legal good concept[32]. The result would be the "institutionalization" of the good, i.e., its artificial creation via legislation rather than its empirical pre-existence[33].

Sustainability, therefore, does not appear capable of legitimizing a new legal good, but it can retain significance as a programmatic and teleological principle, guiding legislative choices[34]. It aggregates diverse interests (economic, social, environmental) to be balanced and projected toward the future, yet without stable or univocal determination.

In summary, the transgenerational constraint inherent in sustainable development lacks precise empirical-conceptual referents. According to the adopted definition, it can only be conceived as a complex aggregate of different interests and values (economic, social, environmental), which cannot always be considered equally recessive or preponderant. Moreover, these values must always be

[30] PORENA, *"Anche nell'interesse delle generazioni future"*, cit., p. 15. Feinberg also identifies in this determinacy the real problem of the rights of future generations - FEINBERG, *The Rights of Animals and Unborn Generations*, in *Philosophy & Environmental Crisis* (ed. BLACKSTONE), Athens, 1974, p. 65 - similarly adopting the paradox of potentiality.

[31] SIRACUSA, *Gli ecoreati al banco di prova dei nuovi art. 9 e 41 della Costituzione*, in *Riv. trim. dir. pen. eco*., n. 1-2/2024, 163.

[32] DONINI, *Il principio di offensività. Dalla penalistica italiana ai programmi europei*, in *Dir. pen. cont.-Riv. trim*., n. 4/2013, p. 9. The same author had already noted elsewhere (*Teoria del reato*, Padova, 1996, p. 145, note 71): "*It is the 'litmus test' of the liberal or critical conception of the legal good: if a (legitimate) good is 'found' everywhere as the 'object' of protection of a positive norm, the conception is no longer critical, but methodological (the good tends to coincide with the* ratio legis)".

[33] See the observations of CONTIERI, *Dialettica del bene giuridico. Per il recupero di una prospettiva costituzionalmente orientata*, Pisa, 2019, pp. 131-133. On the necessary requirement of the preexistence of the legal good as a criterion for fulfilling a genuinely critical and guarantee-based function, see, in the literature, for all, MANTOVANI, *Diritto penale. Parte generale*, Padova, 2015, p. 197.

[34] Explicitly, BATTISTONI, *La tutela penale delle generazioni future alla prova della teoria del bene giuridico*, cit., p. 76 assigns to future generations only the role of serving as an inspiring *ratio* for the creation of new offenses, without granting them the status of a legal good (although, in the following pages, he seems to show some openness toward the concretization of such a good). Substantially equivalent are the conclusions in German doctrine ROXIN-GRECO, *Strafrecht. Allgemeiner Teil, Band 1*, cit., p. 64, r.n. 59a, who see in the formulation of future-oriented behavioral norms *"the idea (communitarian or anti-liberal) that historically consolidated traditions and ways of life no longer need to justify themselves before individual freedom"*. Conversely, according to NEUMANN-SALIGER, *Vorbemerkungen zu § 1*, in *Strafgesetzbuch* (eds. KINDHÄUSER-NEUMANN-PAEFFGEN-SALIGER), 6. Auflage, München, 2023, r.n. 119e there are no intrinsic reasons precluding the recognition of interests for future individuals: this is not prevented by the indeterminacy of their identity, although the same authors add that a personalistic theory of the legal good seems to hinder the recognition of protection for tomorrow's victims.

projected toward the future in terms of protective expectations. Even if transgenerational interest represents a synthetic concept, it does not resolve the issue of its prospective relevance: conceptually, one must first project supra-individual goods (health, life, personal safety) and, second, spread the temporal significance of these goods from present to future individuals[35].

Finally, like the precautionary principle, sustainability and criminal law operate on irreconcilable temporal scales: the former is transgenerational and prospective, the latter immediate and proximate. Attempting to criminalize conduct for future interests generates a regressive paradox: every present-day criminal protection would be soon surpassed by claims to defend subsequent generations, leading to an infinite pursuit that undermines the practical function of criminal law.

Further supporting the impossibility of defining sustainability as a legal good is the difficulty in identifying suitable models for typifying criminal offenses: "When the concept of a legal good is no longer helpful, what should guide the construction of criminal protection aimed at the future?"[36].

Neither damage offenses nor concrete danger offenses suffice: the former lack a tangible object of harm, while the latter would introduce a random variable (future generations' interests) into the risk assessment framework, whose components are inseparably linked. Similarly, the abstract danger paradigm cannot adequately support the creation of sustainability-related offenses, as a presumption of risk affecting future generations may fail the reasonableness test required for such offenses.

4. Conclusions

From the foregoing, it appears difficult to grant criminal law recognition to either the precautionary principle or the principle of sustainable development. Both principles involve a temporal variable oriented toward the future. Precaution, driven by the need to prevent future and uncertain risks, due to the absence of a normative corpus, lowers the criminal protection threshold well beyond the limits of abstract danger, failing to respect the principles of reasonableness and harmfulness that must inform criminalization techniques.

As for sustainable development, many have suggested its aggregation as a new legal good, detached from its environmental matrix. Yet it remains difficult to hypothesize such a legal good,

[35] SIRACUSA, *Gli ecoreati al banco di prova dei nuovi art. 9 e 41 della Costituzione*, cit., p. 164-165. Once again, the principles of specificity and definiteness suffer, since within this dual, temporally extended abstraction it is not possible to identify precise contours for the legal good.
[36] STRATENWERTH, *Zukunftssicherung mit den Mitteln des Strafrechts?*, cit., pp. 683.

given the problematic identification of future generations' interests within criminal law typologies. In this regard, both damage and danger offenses prove inapplicable.

Therefore, the role of these principles seems to lie in shaping present-day decisions to ensure, as far as possible, the same possibilities available today (and even more in the past). The most appropriate operational context appears to be administrative and civil measures, aimed at managing the "future" variable in today's decisions, thereby honouring the *extrema ratio* principle underpinning criminal law. It seems unproductive to expend the precautionary principle in criminal law to crystallize offenses that are, in effect, "abstractly impossible"[37]; likewise, it does not appear feasible to grant sustainability the status of a legal good.

All of this holds true as long as one seeks to preserve the idea of a liberal criminal law based on specific guarantees and constraints. Otherwise, one would need to abandon these constraints and embark on an entirely new and uncharted path[38], fully aware—paraphrasing Giacosa's comedy—that "*he who leaves the old road for the new knows what he leaves behind, but not what he will find*".

[37] This is the incisive observation of CASTRONUOVO, *Principio di precauzione e diritto penale*, cit., p. 72 who further notes that such criminalizations appear to represent a "criminal law of the future," with at best doubtful applicability and inconsistent effectiveneff.

[38] The reference is, in particular, to the path marked by the abandonment of certain principles and guarantees of criminal law, foremost among them the legal good. On this topic, see, in German doctrine, ROXIN-GRECO, *Strafrecht. Allgemeiner Teil, Band 1*, cit., 63 ff., r.n. 57 ff. who, to be fair, do not reject the notion of the legal good but consider it necessary to extend it to future generations in order to ensure proper protection of the interests at stake, although, in practice, the discussion on how to concretely implement this remains entirely open. More pointedly, on the impossibility of abdicating criminal law in favor of pure self-regulation mechanisms to preserve the conditions of existence for future generations, see, ROXIN, *Conclusioni*, in *Critica e giustificazione del diritto penale nel cambio di secolo. L'analisi critica della scuola di Francoforte. Atti del Convegno Toledo, 13-15 aprile 2000,* (a cura di STORTONI-FOFFANI), Milano, 2004, p. 462. In disregard of the personalistic conception of the legal good, anchored in empirical reality, which would thus have encouraged the depletion of future generations' resources due to the senseless hedonism of a pseudo-industrially manufactured individualism (conduct that would instead fall within the ancestral concept of crime), see SCHÜNEMANN, *Kritische Anmerkungen zur geistigen Situation der deutschen Strafrechtswissenschaft*, cit., p. 207 (to which responds critically PRITTWITZ, *Società del rischio e diritto penale*, in *Critica e giustificazione del diritto penale nel cambio di secolo,* cit., p. 388 stating *"[…] on this point Schünemann provides no argumentative contribution. Those addressing this position with the pathos employed by Schünemann must not only theoretically justify abandoning a liberal state conception, but also explain politically how the potential abuse inherent in every version of the motto 'you are nothing, your people are everything' can be avoided")*".