INTERNATIONAL ENVIRONMENTAL LAW IN THE ANTHROPOCENE: TOWARDS AN EARTH SYSTEM LAW FRAMEWORK

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ABSTRACT

"Man is both, creature and moulder of his environment", as proclaimed in the UN Stockholm conference of 1972, is in essence, the idea of the 'Anthropocene'. The term 'Anthropocene', as coined by atmospheric chemist Paul Crutzen and biologist Eugene Stromer, refers to an unprecedented ongoing geological event wherein humans, or homo sapiens are posited to be influential geological forces shaping the environment around them with their activities. Given such an impact, a gap is seen as the current environmental laws do not suffice for the regulation of the amount of ecological damage caused by humans to the environment, as evidenced by the destructive mass-scale industrialisation prevalent in mostly developing and developed countries. There are two main arguments made regarding the insufficiency in regulation and complicity in maintaining the Anthropocene respectively and the need for a more holistic framework to mitigate the detrimental impacts of human activities. Its principal limitations include fragmentation across multiple treaties and institutions, continued reliance on State consent and sovereignty, weak enforcement mechanisms, an anthropocentric orientation, and insufficient coordination between scientific knowledge and legal decision-making. Therefore, it is argued that the perspective through which the environment and its humans must be governed is through that of an Earth system perspective, a holistic understanding of the Earth as one single entwined socio-ecological system. The purpose of this paper is to examine the regulatory gaps and challenges posed by international environmental legislations and propose a framework of binding Earth system laws that would address the aforementioned lacunae and rise to meet the current challenges posed.

Keywords: Anthropocene, Earth System Laws, Environment Laws, New Paradigm.

Introduction.

The Planet Earth is more archaic than the conception of the term itself, and is more adequately measured not in the seconds of a clock or the ever-changing rays of the sun, but by the great geological changes that have taken place in it.

Humans have often taken an anthropocentric view of the Earth. Most of the advancements that have been made have been of a detrimental nature, especially with regards to the natural environment surrounding the same. Pollution of the air, of the water and of the land have taken place due to the emissions of many gases that are toxic and inconducive to fostering living and growth. The global climate has changed and has resulted in the ushering in of a new geological event known as the 'Anthropocene'. The term Anthropocene, is an ongoing geological event within the ongoing 'Holocene', wherein human activities act as geological forces shaping their environment with their various activities such as deforestation, industrialisation, etc. This means that the ramifications of human activities in one portion of the Earth may have far-reaching consequences that stretch beyond political boundaries[1]. The Anthropocene is said to signal a shift from the 'Holocene', a post-glacial geological epoch that started after the previous Ice Age and has been ongoing for around 11,700 years[2]. The International Union Of Geological Sciences, in 2024, recognised it as an 'invaluable descriptor of human impact on the earth system'[3].Serious discussions regarding this topic became quite prominent in the 19th century, when Italian geologist and priest, Antonio Stoppanio spoke about an 'anthropozoic era', wherein it was postulated new rising telluric force had the power of some of the greatest forces on Earth[4].

The Anthropocene is posited, by Paul Crutzen (based upon some famous priorly held academic postulates regarding an upcoming new era), to have started in the latter half of the 18th century, when analyses of air trapped in polar ice showed traces of concentration of methane and carbon dioxide. The invention of the steam engine by James Watt in 1784 seems to have been a major turning point in the ushering in of the Anthropocene, which is characterised by major greenhouse-gas emissions (a consequence of most human activities undertaken, especially the

[1]Jedediah Purdy, 'The Law in the Anthropocene Epoch' (2017) 106 Geo LJ 1.
[2] Noel Castree, 'Anthropocene and Planetary Boundaries' in D Richardson and others (eds), *The International Encyclopedia of Geography* (2017) 161.
AND Paul J Crutzen, 'Geology of Mankind' (2002) 415 Nature 23.
[3] https://stratigraphy.org/news/152
[4] Eugenio Luciano and Elena Zanoni, 'Antonio Stoppani's "Anthropozoic" in the Context of the Anthropocene' (2023) 56 BJHS 103.

developed ones), such as those of carbon dioxide, methane, sulphur dioxide, etc[5]. The International Union of Geological Sciences, rejecting the proposal that the 'Anthropocene' should be classified as a chronostratigraphic unit, has instead classified the 'Anthropocene' as a geological event, one that can be used as a measure of the impact of human activities on the earth. Since the catastrophic World War II, the impact of human activities upon the environment has increased at an accelerated pace, almost doubling in its magnitude, leading to it being given the widely accepted term; the 'Great Acceleration' by scholars J. R. McNeill and Peter Engelke', in their book *The Great Acceleration: An Environmental History of the Anthropocene since 1945*[6]. This resulted in the acceleration of the rate of the power of human intervention on the planet. Additionally, it has resulted in humans and human activities having reached the point of having transformed into forces with the same magnitude as natural telluric forces and the capacity of poisoning and eventually obliterating the ecology as it exists.

The framework of the current environmental laws is insufficient to deal with the challenges of the Anthropocene, as well as conducive to the ever-increasing environmentally-averse activities, as it often prioritises State sovereignty over crimes to the biodiversity and ecology, especially when some of the more powerful States are at war with humans and the ecology alike. From the 1980s, academic discourse suggested a 'systems approach' to cope with the challenges posed by the same. The systems perspective involves the idea of an integrated paradigm with which to structure the relevant institutions on a global level by changing the current view of disjointed wilful units to one wherein all of these units are seen as multi-layered components of a single global socio-ecological system. In this kind of perspective, the current parties to global governance are not seen as separate entities prioritising their own interests, rather as interacting components collaborating and co-operating with a single aim, notwithstanding political relations and interests. This is known as the Earth System perspective[7].

In order to make sense of and help implement the new holistic manner of governance, the current legal system requires a change. Earth System law is an alternative framework for law,

[5] Noel Castree, *Ibid,* nt. 2.
[6] Environment & Society Portal, 'Interview with J.R. McNeill and Peter Engelke, Authors of The Great Acceleration',https://www.environmentandsociety.org/mml/interview-j-r-mcneill-and-peter-engelke-authors-great-acceleration-environmental-history, accessed 1 July 2026.
[7] Rakhyun E Kim and Louis J Kotzé, 'Reimagining International Environmental Law for the Anthropocene: An Earth System Law Perspective' (2022) 14 Earth System Governance 100153.
AND Louis J Kotzé and others, 'Earth system law: Exploring new frontiers in legal science' (2022) 11 Earth System Governance 100126.

to facilitate and give structure to the holistic new paradigm that is the Earth System perspective on Governance. It is thereby proposed as a replacement for the current framework of International Environmental Laws.

Review of Literature

Academic discourse on the Anthropocene agrees upon the fact that current international environmental law (IEL) is fundamentally ill-equipped to govern this new geological event. Stoppani's early "anthropozoic" postulations[8]and Crutzen's identification of human-driven telluric forces,[9] shows the disastrous impact humans have had on the environment.[10] The post-World War II, 'Great Acceleration', as posited by McNeill and Engelke[11] has hastened the early years of the Anthropocene, for which new laws are required.

Scholars such as Purdy[12], emphasize that existing IEL frameworks remain fragmented, state-centric, and anthropocentric, failing to address planetary boundaries holistically. Garmestani and Ors. further critique the untapped, capacity for resilience within traditional environmental legal structures, whereby a radical change in the framework of laws is required.[13] Authors like Kotzé and French argue that contemporary international initiatives, such as the Global Pact for the Environment, merely reiterate previously agreed upon Pacts and Protocols, rather than providing actual, enforceable laws for the protection of the environment.[14] To resolve this gap, Kim, Kotzé, and other distinguished scholars advocate for an 'Earth System Law' perspective[15] This emerging paradigm reconceptualizes humans as parts of a single, intertwined holistic Earth system, demanding binding planetary laws capable of overriding sovereign economic interests to prioritize ecological survival over mere human greed.

Statement of Problem

Human activities such as deforestation, pollution etc., are largely detrimental to the natural

[8] Eugenio Luciano and Elena Zanoni, 'Antonio Stoppani's "Anthropozoic" in the Context of the Anthropocene' (2023) 56 BJHS 103.
[9] Paul J Crutzen, 'Geology of Mankind' (2002) 415 Nature 23.
[10] Noel Castree*, supra*, nt. 2
[11] *Supra, nt. 5.*
[12] Jedediah Purdy, 'The Law in the Anthropocene Epoch' (2017) 106 Geo LJ 1.
[13] Ahjond Garmestani and others, 'Untapped Capacity for Resilience in Environmental Law' (2019) 116 PNAS 19899.
[14] Louis J Kotzé and Duncan French, 'A Critique Of The Global Pact For The Environment: A Stillborn Initiative Or The Foundation For Lex Anthropocenae?' (2018) 18 Intl Envtl Agreements 811.
[15] Rakhyun E Kim and Louis J Kotzé, *supra*, nt. 6

environment they live in. Since the period of the 'Great Acceleration' as brought about by World War II, the detrimental effect of human activities has resulted in a great harm to the environment. The current framework of the International Environmental Law is both complicit to and insufficient in dealing with the environmental challenges posed by the Anthropocene. An alternative framework for such laws arising from a perspective of an integrated Earth system is proposed.

Current Challenges of The Framework of The International Environment Law.

In the current world situation, more than three-quarters of the ice-free land surface area of the earth is made up of anthropogenic biomes, or places wherein humans have altered the ecosystem through agriculture, urbanization, industrialisation, etc.[16] The humans have, in true anthropo-centric form, built ecologically threatening "developing" civilisations, which have reduced the once ecologically rich and biodiverse environment to a mere fraction of its pre-human self. In the year 2009, a group of 28 renowned scientists of the Stockholm Resilience Centre proposed a framework of nine planetary boundaries to identify the biophysical limits, adherence to which would ensure that the Earth continued to be a hospitable planet conducive to the survival of living beings. From 2023 onwards, regular assessments began and the Planetary Health Check Report of 2025 revealed that seven of these nine boundaries had been transgressed, most of which had reached the high-risk zones in terms of magnitude of damage caused[17].

A monumentally large gap can be observed between the end as envisioned by the International Environmental Lawmakers and the current state of the environment as seen above. The current Global Pact for The Environment as proposed by the United Nations is heavily criticised for its lackadaisical approach towards ensuring any kind of real enforceability and for simply regurgitating previously established laws. It's refusal to discuss the sectorisation of the current International Environment Law, and to provide apropos substantive and procedural aspects to the given pact has further solidified this author's view of it as merely a set of guidelines and not having fulfilled its very object of its being a globally binding legal treaty of environmental rights and enforceable duties. The anthropocentric view taken by the Pact does establish, in a sense, a refusal, still, of viewing humans as part of the environment, and instead, as a moulder

[16] Rakhyun E Kim and Louis J Kotzé, *supra*, nt. 6
[17] Planetary Health Check, 'Reports' https://www.planetaryhealthcheck.org/#reports-section accessed 7 July 2026.

of it for their own needs[18].

There are some issues in the current International Environment Law. They are:

1. **Regulatory Gaps**: There is no single environmental government at the global level. The United Nations Environment Assembly is the closest to a single government for global environmental law, but its legitimacy is derived from the States recognised, thereby, leading to fragmented sources of authority, whose sovereign interests often are in conflict with their political, social and economic interests. This leads to a reduction in the power of the IEL in regulating environment destroying human behaviour[19].

2. **State- Centrism**: The current IEL, despite being of an internationally binding nature, is quite state-centric. This is because, it derives its legitimacy from the States and needs State apparatuses to simply exist. As per the 21st Principle of the Stockholm Declaration of 1972, States have the *"sovereign right to exploit their resources pursuant to their own environment policies*"[20] , which gives the States the power to use their resources as they see fit. Ostensibly, this seems to be a provision that respects the sovereignty of the States, but it is fallacious by way of existence, as this gives way for States to further their own economic interests at the cost of the exploitation of their natural resources. Thereby, the IEL is a series of political, economic and environmental interests and the best compromise to be found among them. The lack of enforceability and political will is quite evident given the neoliberal pro-corporate growth stance taken by most of the States in the world today. A main reason for this is that industrialised countries are some of the main players in the global economy in the present day. One of the best examples of that would be the fact that the top three carbon-dioxide emitting countries, i.e., USA, India and China respectively (which when combined are responsible for over 50% of the world's carbon emissions)[21], are seen to be among the top ten economies of the world[22]. A framework of laws meant to be protecting the environment, therefore, brings about the lowest denomination of ecological protection, while catering instead,

[18] Louis J. Kotze and Duncan French, *supra*, nt.13
And International Environment Forum, 'Node 913' https://iefworld.org/node/913 accessed 12 July 2026.
[19] Louis J. Kotze and Duncan French, *supra*, nt.13
[20] U.N. Conference on the Human Environment, Stockholm 1972, UNITED NATIONS, https://www.un.org/en/conferences/environment/stockholm1972 (last visited July 10, 2026).
[21] Selectra, 'Most Polluting Countries' https://climate.selectra.com/en/carbon-footprint/most-polluting-countries accessed 13 July 2026.
[22] World Bank Data Catalog, 'GDP Ranking', https://datacatalog.worldbank.org/search/dataset/0038130/gdp-ranking accessed 5 July 2026.

to the economic and political interests of the individual States instead, thereby being complicit in the maintaining of the Anthropocene.

3. **Anthropocentrism**: The current framework and structures of the IEL, is aimed at promoting human interest, given the centrality of humans in human consciousness. Instead of accommodating both human and non-human interests ecologically, the complicity of the IEL in allowing pursuance of technologies such as solar geoengineering, further proves the intent of humans to master their environment, bending it to human interest. The currently followed definition of environmental crimes is as followed by the Rome Statute, 2002, wherein the damage to the natural environment due to an intentional act of war is only considered as a war crime when it's long-term and severe damage would outweigh any advantages gained by the military. A separate definition of ecocide as given in draft form, alludes to a 'wanton and reckless act' which would be in excess to the social and economic benefit received (to humans).[23] Thereby, while the object of the IEL ought to be of maintaining the environment, in having an anthropocentric approach, it is complicit in prioritising one species with the capacity to destroy the environment for its own sense of development. The current IEL, is therefore, complicit in maintaining the current human behaviour in the Anthropocene.

4. **Basis Of Holocene**: The Current International Environment Laws are based upon the preceding geological events of the 'Holocene'. The current IEL is not yet sufficient to rise to the challenges raised by the Anthropocene. The Anthropocene, is by nature, unstable and in a state of disharmony, as compared to the harmonious and stable Holocene. Law, as a sociological, or in this case, a socio-ecological institution, must transform itself to stay relevant and address the issues that are too great in magnitude to be left unaddressed. For example, the current IEL does not deal properly enough with the depleting resources such as fossil fuels, as that was not an issue during the Holocene, when resources were quite replete for the population and its needs[24]. Thereby, the languidly generic toothless statues, treaties, pacts, etc. to protect the environment are based upon a geological epoch wherein saving the environment from human activities

[23] Rome Statute of the International Criminal Court (adopted 17 July 1998, entered into force 1 July 2002) 2187 UNTS 3.
[24] Rakhyun E Kim and Louis J Kotzé, *supra*, nt. 6 AND Ahjond Garmestani and others, *supra,* nt. 12.

was not of paramount importance.

5. **Fragmented Environmental Scope**: The scope of the current framework of environmental laws is restricted to geographic localizations mostly. There are Multilateral Environmental Agreements for almost every issue, which is considered separately and usually not in the backdrop of the larger environmental concerns. This reductionist scope also means that there is no integrated or unified goal, which is integral to the ecological processes. [25].

6. **Lack of Enforceability**: One of the issues with the current framework of the International Environment Law is that most of the substantive norms contained in it are not enough to limit human behaviour in any impactful way to reserve the integrity of the planet. An example of this would be the non-adherence to the Paris Agreement, wherein the States of the world are not at the requisite stages of temperature control they need to be in. The USA-Iran-Israel conflict caused a great deal of damage to the environment, with cities like Tehran even facing 'toxic rain', and serious threats to the Marine biodiversity of the Persian and Oman Gulfs[26], and the most the United Nations Environment Programme could do was call for immediate cessation of hostilities, without any real means to prevent further damage to the natural environment[27].

Earth System Law

The current framework of International Environment Law has embedded within it, an anthropocentric view of the ecology as a tool to determine the human end, rather than one of humans co-existing with the other non-human species on the planet. So far, the evolution of environmental law has revolved around the idea of humans being at the centre of the human consciousness and perception of the planet.

While the intent was to mitigate the damage caused to the ecological environment by humans, an underlying connotation was that saving the ecology and environment would need to be

[25] Rakhyun E Kim and Louis J Kotzé, *supra*, nt. 6

[26] ORF Middle East, 'The US-Israel-Iran Conflict: Energy, Climate, Food, Water Impacts' https://orfme.org/expert-speak/the-us-israel-iran-conflict-energy-climate-food-water-impacts/ accessed 10 July 2026.

[27] United Nations Environment Programme, 'UNEP Statement on the Environmental Damage Arising from the Conflict in the Middle East' https://www.unep.org/news-and-stories/statements/unep-statement-environmental-damage-arising-conflict-middle-east accessed 10 July 2026.

prioritised for the sake of future and currently existing humans who would live on this very planet, and not for the well-being of the other non-human species.

Recognising this vital issue, the need for a new framework of laws has been proposed by many scholars such as 'Kortze'. This is a new framework which calls for an approach wherein the Earth and all of its inhabitants are seen as parts of a living integrated system, rather than a loose collection of humans and the Other species. It is known as the Earth system framework, which aims to shift the focus away from the narrowly defined, nation oriented, fragmented, linear perspective and instead recognise the multi-layered, non-linear actors, irrespective of nations and other territorial divisions made on the basis of an abstracted notion of power prevalent only in the minds of humans[28].

This new need for a different perspective has been seen to gain importance. In 2014, the United Nations General Assembly adopted a resolution titled 'Harmony With Nature', wherein the concept of an integrated system was discussed. However, this was rather generic and did not elaborate much upon any particular structure, rather a need for integration, co-operation, broader measures, etc. It highlighted the importance of a better, more interconnected form of knowledge and the need for the same. The same was reflected in the 2030 Agenda For Sustainable Development, wherein the Goal for Prosperity is as stated; "*We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature*".[29]

Despite this recent awareness, the United Nations, and the IEL framework lacks the mandate to implement the same, given that this is in no way binding, and thereby, like most of the pacts, treaties, protocols, declarations, etc. that comprise the IEL, cannot limit damaging human behaviour.

A framework of Earth system laws or planetary laws is required. This kind of framework requires radical change in the current IEL and overall global governance.The below features must be a part of this new framework:

1. **Supranational Governance**: As seen above, one of the main problems with the current

[28] Rakhyun E Kim and Louis J Kotzé, *supra*, nt. 6
[29] UNGA Res 68/216 (11 February 2014) UN Doc A/RES/68/216, And UNGA Res 70/1 'Transforming our world: the 2030 Agenda for Sustainable Development' (21 October 2015) UN Doc A/RES/70/1.

IEL is its State – Centrism. The current State-Centric nature of the IEL means that it is dependent upon the States for its enforceability, thereby having an impact greatly diminished by the economic and political interests of the same.

Earth System Council: It is therefore proposed that a supranational governing body, an Earth System Council, be established by the partial ceding of the sovereignty of each Member State with respect to decisions regarding environmental sources and human activities that pose threats to the same. This arrangement would be in the form of a kind of social contract, as posited by thinkers such as John Locke, but in the sphere of managing the natural resources and human activities impacting the environment. This kind of arrangement would ensure an enforcement of the laws.

Earth Environmental Legislature And Adjudication: It is proposed that this supranational government consist of an Earth Environmental Legislature (to make further environmental legislations) consisting of one representative from each State party to this body, along with experts from various environment -related fields. Transparency in the law-making process, equitable representation and participation requirements, would help an Earth Environmental Judiciary (to interpret those legislations), comprised of one imminent judge from each Member-State And an Earth Environmental Executive (to ensure the functioning of the other two structures as well as the enforcement of the Laws) comprising of one representative from each Member-State . In this Earth System Environment Governmental set-up, it is proposed that the legislations be of a binding nature to all those ratifying them. Additionally, all of the candidates must be approved by a separate Board For Earth Environmental Governance.

So as to ensure fairness, equity and impartiality, the Chief Justice of this Earth Environmental Judiciary would hold that post on a fixed tenure, of for example two years. The Members of the Legislature, would also be re-elected by the Board at a fixed tenure, as would the Executive.

In order to prevent centralisation of power, the Legislature and the Judiciary would have checks on each other's power. Political relations would also not impact the functioning of this organisation.

2. **A Formal Source of Law**: The current IEL is scattered and sectorized across multiple MEAs, Pacts, etc. In order to have an effective machinery with which to govern the human behaviour with regards to the environment, there must be a consolidated and codified formal source of International Environmental Law; a '*grundnorm*' from which retrospective and prospective legislations, pacts, treaties, etc., gain their validity. This 'grundnorm' must also be held supreme, subordinate to no other entity, especially political. This '*grundnorm*' must have been enacted by the Earth Environmental Legislature and must be codified and amendable, to stay relevant to the changing times. A heightened source of enforceability is made possible by this consolidation, as a formal authoritative source provides the stability required to sustain such a system.

3. **Stringent Enforceability**: One thing missing from the current framework of the IEL, is the enforceability of the Pacts, Protocols, MEAs, etc. Thereby, the new supranational government would ensure that the legislations are followed and adhered to by the ratifying States, by a variety of measures. This could include transparent reporting the way of sanctions. However, these sanctions must be designed in a way so as to ensure that the economic condition of an already under-developed country does not worsen.

   An incentive that could be given to the countries for the ratification of the new laws could be that the first loans taken from the World Bank would be repayable at a lower rate of interest, along with a longer time period than what is currently given.

4. **Holistic perspective**: As given above, one of the reasons for the IEL in being complicit to the Anthropocene is its anthropocentric view. The new Earth System Law as proposed, will contain the spirit of and be worded in accordance with the new integrated paradigm, wherein humans will only be seen as part of the components of this planet, while maintaining a duty of care towards other species that make up the natural environment.

   An example of this would be the recognition and transformation of the term 'ecocide', to not mean environmental crimes relatively '*ultra-vires'* to the human benefits brought about by the incriminating act, but the absolute meaning of ecological crime against the environment notwithstanding the human benefits conferred by the act.

5. **Change In The Markers Of Development Of The World Bank**: Industrialisation is

both, a marker for measuring development and one of the main causes of the gradual obliteration of the environment. While it would perhaps be more prudent to remove it entirely from the same, it would not be feasible. Therefore, it is proposed that new markers such as a cap on the level of pollution caused, a minimum amount of biodiversity to be maintained, are all included as markers to measure development by the World Bank[30].

This would then incentivise countries to ratify the proposed Earth System Law and the supranational environmental government.

6. **Funding**: To ensure fairness and impartiality in the making and enforcement of these laws by the supranational government, countries are not permitted to arbitrarily fund the same, but to adhere to a cap amount which cannot be transgressed, leading to bias in policy-making.

Conclusion

As seen above, the current framework of the International Environment Law(s) is quite insufficient in its power to deal with the new challenges that arise with the Anthropocene, a global epoch wherein human activities act as geophysical forces in the moulding of the environment. The anthropocentric nature, practical unenforceability, State-centrism, of the current IEL has rendered it not only severely lacking and therefore not fulfilling of its very purpose, it has also, by its very nature, been complicit in maintaining the level of environmentally detrimental human activity in the Anthropocene.

Therefore, a new paradigm of law, termed the Earth System Law (or planetary law) is proposed, so as to deal with the transforming, unstable, global epoch and its consequent challenges. This proposed framework of International Environment Laws, originating from a holistic perspective, will not stand on yet another anthropocentric notion, but rather recognise humans as merely components of the natural environment that transcends political boundaries and extends across the whole planet Earth. It will recognise the duty of care owed by the humans to their natural environment and ensure regulation of human activities detrimental to the ecology of the planet, while also being cognizant of the multi-level interaction between various

[30] World Bank Data, 'World Development Indicators',https://databank.worldbank.org/source/world-development-indicators accessed 5 July 2026.

actors in this integrated system.

Due to the currently scant provisions of IEL, radical changes will be required to implement the Earth System Law. Some of those would be, to increase the enforceability of its laws, to establish a supranational governance for the requisite governing of the member States in the environmental sphere, a formal, codified source of law for the force of environmental law and changes in the current markers for development as given by the World Bank so as to mitigate some industrial activity. This would bring about limits on human behaviour and ensure a sustainable planet for all species residing in Earth, currently and in the future.

The advent of the Anthropocene requires transformation, and therefore, so does law.

Law, a sociological institution, must be reshaped through a new paradigm and be made more sensitively responsive to the challenges that come with such an Earth system governance

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