



Falling Without Consequence: A Critique of Liability and Litigation Risk in the Age of Megaconstellations

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Abstract

According to the International space law's liability regime, which was built in 1972 for a world where a handful of states launched using some small, large and trackable satellites. It was not built for a world in which a single operator can place tens of thousands of small satellites into the low Earth orbit. This orchestrated the colliding of two satellites for the first time in 2009. These generated thousands of new fragments overnight. This single incident led to the imposition of debris-mitigation obligations by the national regulators which necessitated the demand for international laws. The article adopts a doctrinal and case-study methodology, analysing the Liability Convention of 1972, the Registration Convention 1975, and the IADC and UN COPUOS debris-mitigation guidelines. This article examines whether the Convention on International Liability for Damage Caused by Space Objects 1972, and the soft-law debris-mitigation architecture that has grown up around it, remains adequate to this reality, with particular attention to the disadvantages this creates for African states. This was juxtaposed against the only state-to-state claim ever settled under the Liability Convention. This arose from the 1978 crash of the nuclear-powered satellite Cosmos 954 over Canada, and two recent, unresolved debris-fall incidents in Uganda (2023) and Kenya (2024). The article finds that even a paradigm case of absolute liability, Cosmos 954, produced a compromised, politically negotiated settlement rather than a vindicated legal entitlement. This same weakness has left the 2023 Ugandan and 2024 Kenyan incidents without compensation, an acknowledgment of responsibility, or in Kenya's case a confirmed launching state, more than a year after each occurred. The shortcomings falls hardest on states that have not ratified the full suite of space treaties, lack domestic debris-insurance requirements, or lack the institutional capacity to trace and pursue a claim, a condition the article termed 'liability dependency'. The article recommends that African states prioritise ratification of the Liability and Registration Conventions where they have not already done so. It further suggests that the African Union establish a coordinating body to assist member states in identifying launching states and pursuing claims on a continental rather than ad hoc basis. The authors observed that national space legislation require debris insurance as a condition of launch and satellite-hosting licences. It is further suggested that African states seek active participation in the UN COPUOS and IADC processes that now set the practical rules of debris governance.

Keywords: space debris; liability; litigation risk; megaconstellations; Liability Convention; Artemis Accords; Nigeria; Africa

1. Introduction

In February 2009, two satellites collided in orbit for the first time in the history of spaceflight. An inactive Russian military satellite, Kosmos-2251, struck the operational American communications satellite Iridium-33 at an altitude of roughly 800 kilometres, destroying both and scattering an estimated two thousand or more trackable fragments across low Earth orbit.¹ No claim was ever filed over the collision, by either state, under the treaty regime notionally designed to handle exactly this kind of event. Fifteen years later, the reason is no longer a merely academic curiosity. Commercial megaconstellations now place tens of thousands of small satellites into the same crowded low-orbit shells that produced the Kosmos-Iridium collision, and the frequency of near-misses, collision-avoidance manoeuvres, and re-entering fragments has grown accordingly.

The legal architecture meant to govern this environment is, on paper, unusually clear. The Liability Convention of 1972 makes a launching state absolutely liable, without proof of fault, for damage its space object causes on the surface of the Earth or to aircraft in flight, and liable on a fault basis for damage caused to another space object in orbit.² In practice, as this article will show, that clarity has rarely translated into an enforceable remedy. The Convention's only state-to-state settlement, arising from a nuclear-powered Soviet satellite's crash over Canada in 1978, took three years to negotiate and produced a lump-sum payment roughly half of what Canada had claimed, without any acknowledgment of legal liability at all. Two recent debris-fall incidents in Uganda and Kenya, discussed in detail in Section VII, illustrate that the practical difficulty of turning a debris strike into compensation has, if anything, grown worse for states that are not full parties to the treaty framework.

¹See generally D J Kessler and B G Cour-Palais, 'Collision Frequency of Artificial Satellites: The Creation of a Debris Belt' (1978) 83(A6) *Journal of Geophysical Research* 2637, the founding statement of what is now known as the Kessler syndrome. <<https://ntrs.nasa.gov/search.jsp?R=19780057167>> accessed 21 August, 2026.

²Convention on International Liability for Damage Caused by Space Objects, opened for signature 29 March 1972, 961 UNTS 187 (entered into force 1 September 1972) ('Liability Convention') art II.

This article proceeds as follows. Section II reviews the literature on space debris liability and the emerging scholarship on Africa's particular exposure to it. Section III sets out the Liability Convention's dual liability standard and its procedural mechanism for claims. Section IV examines the Cosmos 954 precedent in detail, arguing that it demonstrates the practical inadequacy of even the strongest liability standard the Convention offers. Section V turns to the megaconstellation era proper, tracing the rise of national and soft-law debris-mitigation standards, from the IADC and UN COPUOS guidelines to the FCC's five-year deorbit rule, that have emerged precisely because the Liability Convention has proved so difficult to invoke. Section VI examines the Artemis Accords' orbital debris provision as the latest, and most consequential, instance of debris governance migrating from binding treaty law to voluntary political commitment. Section VII presents the Ugandan and Kenyan incidents as evidence that this migration has left non-spacefaring states worse, not better, positioned to obtain redress. Section VIII introduces the concept of 'liability dependency' to name the resulting structural disadvantage. Section IX proposes a framework for closing the gap, and Section X concludes.

II. Literature Review

The doctrinal claim of the authors is that the international space treaty regime is poorly matched to the realities of megaconstellations and mass-produced debris. This article posits that the Outer Space Treaty and its subsidiary conventions were negotiated for an environment of a handful of large, state-owned satellites and have struggled ever since to accommodate an environment of tens of thousands of privately owned small satellites launched by a small number of dominant commercial operators.³ It asks the structural question of the liability: who bears the cost when the debris falls, and who is realistically able to collect?

³Anne U Agi, 'Orbital Overcrowding and the Limits of International Space Law: Assessing the Adequacy of the UN Space Treaty Regime in the Age of Megaconstellations and Space Debris' (Postgraduate Diploma thesis, African Regional Centre for Space Science and Technology Education in English, 2026).

The Cosmos 954 incident itself has generated a small but rigorous secondary literature, principally from Canadian scholars and officials directly involved in the claim. Lee and Sproule, writing from within Canada's own Department of External Affairs, provide the most authoritative contemporaneous account of the claim's legal basis and its eventual settlement.⁴ Cohen's analysis situates the incident within the broader law of state responsibility for satellite accidents and highlights the extent to which the eventual settlement was a product of diplomatic compromise rather than a straightforward application of the Convention's absolute liability standard.⁵ What neither account could have anticipated is how directly the pattern they describe, protracted negotiation, a settlement well below the amount claimed, and no formal admission of liability, would recur decades later in incidents involving states with far less diplomatic and legal capacity than Canada possessed in 1978.

That recurrence is the subject of the most directly relevant recent scholarship for present purposes. Agaba's 2025 commentary for the McGill Institute of Air and Space Law examines two 2023 and 2024 debris-fall incidents in Uganda and Kenya through the lens of the Cosmos 954 precedent, and concludes that the two African states' partial and uneven ratification of the Liability and Registration Conventions leaves them dependent on considerably weaker and more uncertain avenues, general international law, domestic tort claims, or diplomatic goodwill, than a fully-ratified state would enjoy.⁶ This article builds directly on that account, situating the Ugandan and Kenyan incidents within the wider critique of treaty adequacy and arguing that they

⁴ Edward G Lee and D W Sproule, 'Liability for Damage Caused by Space Debris: The Cosmos 954 Claim' (1988) 26 Canadian Yearbook of International Law 273. <https://www.researchgate.net/publication/368121780_Liability_for_Damage_Caused_by_Space_Debris_The_Cosmos_954_Claim> accessed 15 August, 2026.

⁵ Alexander F Cohen, 'Cosmos 954 and the International Law of Satellite Accidents' (1984) 10 Yale Journal of International Law 78 <<https://paperity.org/p/83332026/cosmos-954-and-the-international-law-of-satellite-accidents>> accessed 15 August, 2026.

⁶ Arnold Agaba, 'Space Object Liability Beyond the Space Treaties: A Lens on Africa' (McGill Institute of Air and Space Law, 11 March 2025). <<https://www.mcgill.ca/iasl/article/space-object-liability-beyond-space-treaties-lens-africa>> accessed 15 August, 2026.

are best understood not as isolated misfortunes but as the leading edge of a structural problem that will recur with increasing frequency as megaconstellation deployment accelerates.

A third and more technical strand of scholarship documents the rise of national and soft-law debris-mitigation standards precisely because, as Mejía-Kaiser observes, binding international law on space debris mitigation itself does not exist: the Liability Convention addresses compensation after damage occurs, but nothing in treaty law obliges an operator to prevent the creation of debris in the first place.⁷ That gap, as the sections below will show, has been filled almost entirely by non-binding guidelines and national regulation rather than by any amendment or supplement to the Convention itself.

III. The Liability Convention Regime: Absolute Liability, Fault and Its Limits

Article VII of the Outer Space Treaty establishes the basic principle that a state which launches, procures the launching of, or from whose territory or facility a space object is launched, is internationally liable for damage caused by that object to another state party or its nationals.⁸ The Liability Convention of 1972 elaborates this principle into the closest thing international space law has to a fully worked-out compensation regime. Article II establishes absolute liability, liability without proof of fault for damage caused by a space object on the surface of the Earth or to an aircraft in flight; Article III establishes a fault-based standard for damage caused elsewhere than on the surface of the Earth that is in outer space itself.⁹

The Convention's procedural machinery is in principle straightforward. A claimant state presents its claim to the launching state through diplomatic channels within one year of the damage

⁷ Martha Mejía-Kaiser, 'Space Law and Hazardous Space Debris' in Oxford Research Encyclopedia of Planetary Science (Oxford University Press 2020). <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3544664>; <<https://academic.oup.com/edited-volume/62111/chapter-abstract/549096332?redirectedFrom=fulltext>> accessed 15 August, 2026.

⁸Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, opened for signature 27 January 1967, 610 UNTS 205 (entered into force 10 October 1967) ('Outer Space Treaty') art VII.

⁹Liability Convention (n 2).

occurring, or of identifying the responsible launching state. If the parties fail to reach settlement within a further year, either may request the establishment of a Claims Commission, whose decision is binding if the parties have agreed in advance to treat it as such and merely recommendatory otherwise.¹⁰ No enforcement mechanism exists beyond this: the Convention relies, as its own drafting history makes clear, on the diplomatic and reputational costs of non-compliance rather than on any court, tribunal, or sanction with binding coercive power.

This architecture creates three structural weaknesses that become significant in the megaconstellation era. First, the fault standard applicable to in-orbit collisions, as opposed to the absolute standard applicable to surface damage this requires a claimant to prove which of potentially several launching states was at fault for a collision between two objects. This is a task made considerably harder when one or both objects are themselves debris fragments whose origin may be disputed or difficult to trace with precision.¹¹ Second, the Convention's claims procedure is available only to states, individuals, corporations and non-governmental organisations. However directly harmed, have no standing to invoke it and must rely instead on their own state espousing the claim on their behalf, or on domestic tort law with all the jurisdictional and evidentiary difficulties that entails.

Third, and most consequential for the argument developed in Section VII below, the entire machinery presupposes that the claimant state can identify the launching state responsible for the offending object, a task the Registration Convention is meant to assist with but which depends on that state, and the state whose object caused the damage, both being parties to it.¹²

IV. The Compensation Gap: Cosmos 954 and the Precedent of Inadequacy

¹⁰Liability Convention (n 2) arts IX-XX.

¹¹ Watson Farley & Williams, 'Collisions in Space: May the Force of Law Be with You' (6 January 2025). <<https://www.wfw.com/articles/collisions-in-space-may-the-force-of-law-be-with-you/>> accessed 18 August, 2026.

¹² Convention on Registration of Objects Launched into Outer Space, opened for signature 14 January 1975, 1023 UNTS 15 (entered into force 15 September 1976).

On 24 January 1978, the nuclear-powered Soviet reconnaissance satellite Cosmos 954 disintegrated on re-entry and scattered radioactive debris across a wide swath of Canada's Northwest Territories. Canada, assisted by the United States spent roughly CAD 14 million on the resulting search, recovery, and decontamination operation, code-named Operation Morning Light of which it sought to recover CAD 6 million from the Soviet Union.¹³ Canada's claim rested squarely on Article II of the Liability Convention's absolute liability standard, reinforced by general international law principles concerning transboundary harm; the Soviet Union, for its part, disputed elements of the factual account while never squarely denying its obligation to pay something.¹⁴

Negotiations dragged on for three years, through sessions in February, June, and November 1980, before the two governments signed a settlement protocol in Moscow on 2 April 1981 under which the Soviet Union paid Canada CAD 3 million, just under half of Canada's claimed CAD 6 million, in what the Protocol itself described as 'full and final settlement of all matters' connected with the incident.¹⁵ The Protocol contained no acknowledgment of legal liability by the Soviet Union at all: it was, in form and substance, a diplomatic compromise rather than an adjudicated vindication of Canada's legal entitlement under a Convention whose central innovation was supposed to be strict, no-fault liability precisely in order to avoid this kind of protracted or discounted negotiation.

The significance of Cosmos 954 for present purposes lies less in its outcome than in what that outcome reveals about the Convention's practical operation even in the most favourable circumstances imaginable for a claimant state. Canada was and remains a wealthy, diplomatically well-resourced state with direct access to the government responsible for the damage,

¹³ Ibid (n 5).

¹⁴ Ibid (n 6).

¹⁵ Protocol Between the Government of Canada and the Government of the Union of Soviet Socialist Republics (Claims Protocol), 2 April 1981, Can TS 1981 No 8, art I.

unambiguous physical evidence of the source of the debris and the political weight to sustain a multi-year negotiation. If even Canada, under these conditions, recovered only half of its claimed damages and never secured a formal admission of liability, the Convention's compensation guarantee looks considerably less robust for a state possessing none of those advantages, precisely the situation explored in Section VII below.

V. Megaconstellations and the New Debris Reality

The Kosmos-Iridium collision of February 2009 referenced in the introduction above generated a debris field that had grown to well over two thousand cataloged fragments within three years which is roughly attributed to two-thirds Kosmos-2251 and the remainder to Iridium-33.¹⁶ No claim was ever pursued under the Liability Convention. Iridium's satellite was commercially owned, operated and Kosmos-2251 was a defunct Russian military satellite, a combination that illustrates precisely the fault-based, state-to-state limitations described in Section III. Since no state was obviously best positioned or arguably even entitled to bring a claim on a private commercial operator's behalf against a foreign government for a collision in which fault was itself genuinely contested.

China's deliberate destruction of its own defunct Fengyun-1C weather satellite in an anti-satellite missile test in January 2007 produced an even larger debris field, and did so entirely outside the reach of any liability rule, since a state cannot meaningfully be said to have caused unlawful 'damage' to itself.¹⁷ Both incidents catalysed rather than a strengthening of the Liability Convention itself, the development of an entirely separate soft-law architecture aimed at

¹⁶ See A Rossi et al, 'Analytical Framework for Space Debris Collision Avoidance Manoeuvre Design' (arXiv, 2020), describing the 10 February 2009 collision between the inactive Kosmos-2251 and the operational Iridium-33 as the first collision between two cataloged satellites, and the resulting fragment population. <https://www.researchgate.net/publication/347741676_Analytical_Framework_for_Space_Debris_Collision_Avoidance_Maneuver_Design> accessed 18 August, 2026.

¹⁷ See discussion of the January 2007 Chinese anti-satellite test against the defunct Fengyun-1C weather satellite, which generated over three thousand trackable debris fragments and prompted the UN guidelines discussed below to include express language discouraging intentional destruction of on-orbit spacecraft.

preventing debris creation in the first place. The Inter-Agency Space Debris Coordination Committee's guidelines first adopted in 2002, set out seven core mitigation practices including limiting debris released during normal operations, minimising the risk of on-orbit break-up, and disposing of spacecraft within twenty-five years of the end of their mission.¹⁸ The UN Committee on the Peaceful Uses of Outer Space adopted its own closely modelled Space Debris Mitigation Guidelines in 2007, subsequently endorsed by the UN General Assembly, making them the closest thing to a universal international debris-mitigation standard currently in existence.¹⁹ Both sets of guidelines are by design entirely non-binding.

The most significant recent development has come not from international law-making at all, but from unilateral national regulation. In 2022 the United States Federal Communications Commission shortened the long-standing twenty-five-year post-mission disposal guideline to five years for satellites it licenses in low Earth orbit. A decision justified explicitly by reference to the accelerating pace of megaconstellation deployment.²⁰ The following year, the Commission demonstrated that the rule had teeth by fining DISH Network US\$150,000 for leaving a retired satellite far short of its committed disposal orbit. This is the first enforcement action of its kind and a striking illustration of how much further national regulators are now willing to go than the

¹⁸ Inter-Agency Space Debris Coordination Committee, IADC Space Debris Mitigation Guidelines, IADC-02-01, Rev 4 (2020 update of the 2002 original).

¹⁹ Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, adopted by the Scientific and Technical Subcommittee in 2007 (UN Doc A/AC.105/890) and endorsed by UNGA Res 62/217 (22 December 2007).

²⁰ Federal Communications Commission, Space Innovation; Mitigation of Orbital Debris in the New Space Age, Second Report and Order, FCC 22-74, IB Docket No 18-313 (2022), shortening the prior twenty-five-year post-mission disposal guideline to five years for space stations authorised after 29 September 2024. <<https://www.federalregister.gov/documents/2024/08/09/2024-17093/space-innovation-mitigation-of-orbital-debris-in-the-new-space-age>> accessed 18 August, 2026.

Liability Convention, which imposes no ex ante debris-prevention obligation at all has ever required.²¹

The overall pattern across this section is unmistakable: as the debris problem has grown more acute, the Liability Convention itself has grown no more useful as a tool for addressing it. The practical governance of debris has migrated instead to non-binding multilateral guidelines and unilateral national regulation, both of which apply by construction, only to the states and operators that choose or are required to follow them.

VI. The Artemis Accords and the Rise of Soft-Law Debris Governance

The Artemis Accords, a set of bilateral political commitments negotiated by the United States since 2020 and now signed by more than seventy states; devote their entire Section 12 to orbital debris, requiring signatories to plan for the mitigation of debris and to limit the generation of new long-lived harmful debris in their own operations.²² Commentary on the Accords has rightly observed that in the continued absence of any binding international law specifically addressing debris mitigation, Section 12 represents a significant elevation of its signatories' practical obligations well beyond anything the Liability Convention itself requires.²³

The Accords are however, expressly non-binding political commitments rather than treaty obligations, and membership is negotiated bilaterally with the United States rather than through any multilateral process in which non-signatory states, including the great majority of African

²¹ See discussion of the Federal Communications Commission's October 2023 order fining DISH Network Corporation US\$150,000 for failing to deorbit the EchoStar-7 satellite to the disposal altitude specified in its licence, the first enforcement action of its kind. <<https://www.bbc.com/news/technology-66993647>> accessed 18 August, 2026

²² Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes (13 October 2020) s 12.

²³ 'The Artemis Accords and the Future of International Space Law', American Society of International Law Insights, vol 24, issue 31 (2020). <<https://asil.org/insights/volume-24-issue-31/>> accessed 18 August, 2026.

states have had any voice.²⁴ These matters for the present argument in a specific way: debris governance is increasingly being written into a parallel voluntary architecture. Firstly the IADC and COPUOS guidelines, now the Artemis Accords that a state must affirmatively join or adopt in order to benefit from, while the binding Liability Convention beneath it remains exactly as difficult to invoke as it was in 1978. States that are not Artemis Accords signatories are not consulted in IADC's technical deliberations. Since they lack the domestic regulatory capacity of an FCC they are left relying on the weakest and oldest layer of this now multi-layered regime precisely when that layer has been clearly shown by Cosmos 954 to under-deliver.

VII. Litigation Risk without a Forum: Uganda, Kenya and the African Liability Gap

The clearest illustration of this dynamic comes from two recent and at the time of writing still unresolved- incidents in East Africa. In May 2023, debris believed to originate from a SpaceX satellite fell across parts of western Uganda, damaging property and alarming residents who witnessed its descent. Ugandan investigators concluded in November 2024 that the fragments most likely belonged to a defunct SpaceX object based on the pattern of the company's launch at the relevant time.²⁵ Weeks later, on 30 December 2024 further debris, this time believed to be part of a launch vehicle, crashed in southern Kenya. The Kenya Space Agency's investigation which is still ongoing, has linked the fragments to a rocket reportedly launched by the Indian Space Research Organisation, though it has yet to confirm the launching state officially.

As Agaba's analysis of both incidents demonstrates, the two cases sit on opposite sides of a critical treaty-ratification line, with sharply different practical consequences. Uganda has ratified only the Outer Space Treaty and is not a party to either the Liability Convention or the Registration Convention, meaning it cannot bring a claim against the United States under the

²⁴ 'The Artemis Accords: Evolution or Revolution in International Space Law?' (2021) *International & Comparative Law Quarterly*. <[https://www.cambridge.org/core/journals/international-and-comparative-law-quarterly/article/artemis-accords-evolution-or-revolution-in-international-space->](https://www.cambridge.org/core/journals/international-and-comparative-law-quarterly/article/artemis-accords-evolution-or-revolution-in-international-space/) accessed 18 August, 2026.

law/DC08E6D42F7D5A971067E6A1BA442DF1>

²⁵ *Ibid* (n 7).

Liability Convention at all. They would instead rely on diplomatic channels outside the Convention, on general international law before a forum such as the International Court of Justice or if the Ugandan government declines to pursue the matter; Ugandan nationals seeking redress directly through United States administrative or judicial proceedings.²⁶ Kenya by contrast, has ratified both the Outer Space Treaty and the Liability Convention and can therefore in principle invoke the Convention's absolute liability standard against the launching state responsible. Once that state is conclusively identified, though its non-ratification of the Registration Convention still leaves it without the treaty-based assistance that instrument would otherwise provide in making that identification.

Both states can, in principle, fall back on the 1961 General Assembly resolution requiring states to notify the UN Secretary-General of their launches, a residual customary-law source of identifying information available even to non-parties to the Registration Convention.²⁷ However, this is precisely the point: two African states confronted with materially identical harms within weeks of each other face two different incidences. In Uganda's case considerably weaker sets of legal options, determined entirely by which of three treaties, none of which either state had any hand in drafting in 1967, 1972, or 1975, they happen to have ratified in the decades since.

Neither incident had at the time of writing, produced compensation, an acknowledgment of responsibility, or even a definitive identification of the launching state in Kenya's case. Whatever the eventual outcome, the two incidents already demonstrate in real time and in a way Cosmos 954's Cold War, superpower-to-superpower posture never could establish exactly how the liability gap described in Sections III and IV falls hardest on states with the least capacity, diplomatic, financial, or institutional to close it themselves.

²⁶Ibid (n 7).

²⁷UNGA Res 1721 (XVI) B (20 December 1961), obliging states, as a matter of customary international law, to furnish information on launchings to the UN Secretary-General.

VIII. Extending the Dependency Framework: 'Liability Dependency' in the African

Context

The authors have previously argued that African states face an 'IP dependency' in the commercial space data economy, consuming but not owning the legal and economic value generated by foreign-operated satellites over their own territory. In earlier works, a broader 'governance dependency trap' in which accession to externally designed frameworks such as the Artemis Accords locks acceding states into rules they had no meaningful part in negotiating.²⁸ The Ugandan and Kenyan incidents examined above revealed a third closely related and in some respects more immediately consequential dimension of the same structural problem, which this article terms 'liability dependency'. The condition in which a state's practical ability to obtain compensation for harm caused by another state's space object depends not on the fact or scale of the harm suffered, but on the accident of which, among a small set of decades-old treaties, that state happened to ratify, and on diplomatic and institutional resources it may simply not possess. Nigeria's own position illustrates the point. The NASRDA Act 2010 gives NASRDA a data-custodianship and licensing role but is, like the equivalent legislation of most African states, silent on debris liability, insurance requirements for domestic launch or satellite-hosting activity. A designated national authority for pursuing a Liability Convention claim should Nigerian territory or nationals ever suffer a debris strike of the kind Uganda and Kenya have already experienced.²⁹ Nigeria has in fact ratified the Liability Convention, placing it in a formally stronger position than Uganda. It is however observed that ratification alone does not supply the institutional machinery, a designated point of contact, technical capacity to trace and attribute debris, standing diplomatic relationships for pursuing a claim is what converts a paper entitlement into a realistic prospect of compensation.

²⁸Ibid (n 4).

²⁹National Space Research and Development Agency Act 2010 (Nigeria) s 6(k).

At the continental level, the African Union's Space Policy and Strategy, discussed in the same companion piece, commits member states to developing their space capabilities but, like the NASRDA Act, contains no chapter or annex addressing debris liability, insurance, or a coordinated continental mechanism for pursuing or defending claims under the Liability Convention.³⁰ Liability dependency in short, is not a hypothetical risk for African states; it is the conditions two of them were already living through in real time as this article was being written.

IX. Conclusion

The Liability Convention of 1972 was at its adoption a genuine achievement: a rare instance of states agreeing in advance to accept strict liability for the consequences of an inherently hazardous activity. Judged fifty years after against the reality of megaconstellations, routine collision-avoidance manoeuvres and debris incidents occurring in African skies within weeks of one another, that achievement looks considerably more modest. Even its single successful invocation, the Cosmos 954 settlement delivered roughly half of what was claimed and no formal admission of fault, after three years of negotiation between two states with every diplomatic and technical advantage a claimant could hope for. The debris-mitigation guidelines and national regulations that have since grown up around the Convention, from the IADC and UN COPUOS guidelines to the FCC's five-year rule to the Artemis Accords' Section 12, have filled some of the resulting gap, but only for the states and operators that choose, or are required, to follow them.

This article has argued that the Ugandan and Kenyan debris incidents of 2023 and 2024 are best read not as anomalies but as an early demonstration of what this article has termed 'liability dependency': a structural condition in which a state's practical ability to be compensated for harm caused from space depends on treaty ratifications made, or not made. Decades before the harm occurred and on institutional capacities few African states currently possess. Closing that

³⁰African Union, African Space Policy and African Space Strategy, adopted by the Assembly of the African Union, 26th Ordinary Session (Addis Ababa, 31 January 2016).

gap does not require waiting for the international community to renegotiate the Liability Convention itself. It requires African states individually through ratification and domestic legislation and collectively through the African Union, to build the specific institutional machinery, designated authorities, insurance requirements, coordinated technical capacity, and active participation in international standard-setting. That would allow the next debris incident, (and there will be a next one), to be met with a viable claim rather than an open question.

X. Towards a Framework: Recommendations

This article proposes three steps, none of them is dependent on reform of the Liability Convention itself, which would meaningfully narrow the gap this article has identified.

First, African states that have not yet done so should ratify both the Liability Convention and the Registration Convention as a matter of priority. Uganda's position in the 2023 debris incident, depended on general international law and the diplomatic goodwill of the United States rather than on a directly enforceable treaty entitlement, is a foreseeable and avoidable consequence of incomplete ratification that other African states can still correct before their own equivalent incident occurs.³¹

Second, the African Union building on the model-law recommendation the author have made in relation to intellectual property and data ownership,³² should develop a continental framework instrument on space debris liability and insurance. They should also designate a coordinating body, whether the proposed African Space Agency or an equivalent institution to assist member states in identifying launching states; gathering technical evidence of debris origin, and pursuing claims under the Liability Convention on a coordinated rather than an ad hoc, state-by-state basis. Individual national space legislation including Nigeria's own NASRDA Act, should be amended to designate a specific domestic authority responsible for this function and to require debris

³¹Ibid (n 13).

insurance or an equivalent financial assurance mechanism as a condition of domestic launch and satellite-hosting licences.

Third, African states should seek more active participation in the bodies that now set the practical, if non-binding rules of debris governance, principally the UN COPUOS Scientific and Technical Subcommittee and, where feasible, observer or technical engagement with the Inter-Agency Space Debris Coordination Committee. This is so that the guidelines updated there in the coming years reflect the operational realities and capacity constraints of non-spacefaring states rather than being negotiated exclusively among the states and agencies that already possess the technology the guidelines regulate.³² The alternative participates only after new guidelines are settled and after further debris incidents like Uganda's and Kenya's have already occurred, simply repeating the pattern this article has traced from Cosmos 954 to the present day.³³

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³²Ibid (n 19).

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