

Full Length Research

Transforming Library Education for Climate Resilience: From Knowledge to Action

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As the current global climate crisis has been growing with a faster rate, a transformation in the approach is required from every segment of society including library and information science (LIS) education. LIS education is trending with the society changes on climate issues. This opinion research article calls for an overhaul of the curricula, pedagogies, and institutional climatic strategies of LIS schools information technologies resources, globally and especially in the Global South, to prepare emerging information professionals to be active climate-resilient agents. Based on recent empirical evidence collected (2019-2026), institutional reporting from organizations like ALA, UNESCO, and IFLA, and statistical data on climate vulnerability and the lack of countering education, it argues that library education still have to continue to be a resolution change agent in countering proactively climate conversation, a position that is not only academically indefensible but also professionally sustainable. It reviews the current landscape of climate literacy in LIS programmes, presents a critical argument for curricular transformation based on information literacy in the context of the environment, green librarianship and climate action in the communities, and provides a blueprint to shift from passive knowledge impartation to proactive, justice-oriented climate action. The final section outlines specific recommendations for action for LIS schools, professional associations and accreditation bodies.

Keywords: climate resilience, library education, environmental information literacy, green librarianship, LIS curriculum, climate justice, sustainability, library and information science

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INTRODUCTION

The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) clearly identified climate change as the 21st Century problem, and effects of climate change are already irreversible in several areas and will exacerbate if systemic transformation does not occur in all aspects of human activities (IPCC, 2022). In this context, higher education institutions have a special obligation: to not only look at climate change as a field of study, but to redefine their fields of study and professions as tools of response. Library and information science (LIS) education stands in a unique and largely un-researched place in this imperative as it provides training for persons who deal with the knowledge infrastructure of the society whether they are involved in its management, curation, dissemination, or its provision.

Historically the librarians' role has been neutral facilitator of information access. However, climate change is not a politically 'neutral' issue, rather an existential threat that is unequally experienced across geographical, class, racial and

capacity divides (Pellow, 2021). Libraries are at the frontlines of climate vulnerability by providing for rural communities who do not have access to reliable climate information, informal urban communities who are exposed to heat, Indigenous or traditional communities who have had their traditional ecological knowledge marginalised by mainstream science systems, and low-income communities who do not have the digital and information literacy required to navigate climate data. Thus, it is not just a question of professional preparation but one that relates to the library's democratic and social justice role as it pertains and stands in relation to these communities in climate-relevant ways.

This article is based on a belief that the present scenario of LIS education isn't sufficient for the current climate scenario. Although there are several books and articles about "green librarianship", "environmental information literacy" and "sustainability in library practice", the systematic incorporation of climate resilience skills into the LIS curricula is still not fully consistent and standardized, and only partially mandatory in most programmes (Jankowska & Marcum, 2010; Lukela, 2022; Mulauzi et al., 2023). This argument is threefold: Firstly, climate literacy is seen as an integral component of any profession, and LIS schools are not currently developing it as such, but rather adding an extra course on sustainability; Secondly, the conceptual shift for developing such a core competency requires a rethinking of the epistemological foundations and social purpose of LIS education; Thirdly, concrete, evidence-based pathways are available for this change to take place if there is a will among educators, professional associations, and accreditation agencies.

The article is based on empirical research on LIS curricula, survey results on attitudes among professionals towards sustainability, institutional reports from the largest library associations, and some statistical data on climate vulnerability and information inequality that have been published between 2019 and 2026. It is in the spirit of engaged scholarship, recognising that this opinion piece is a form of professional advocacy and that evidence-based advocacy is not a dirty word, nor is it something that exists outside of a discipline that professes its desire to champion social justice.

THE CLIMATE CRISIS AS AN INFORMATION AND KNOWLEDGE PROBLEM

Before thinking about the role of LIS education in changing how it works, it is critical to understand why libraries and information professionals are structurally situated on the interface of climate risk and climate response. In the basic sense, the climate crisis is a crisis of knowledge, a twofold crisis of knowledge production and knowledge distribution and a third of knowledge application. Climate adaptation and mitigation need people, communities and governments to have access to accurate, timely, contextually appropriate and actionable information, but systemic inequalities in information access means that the poorest and most vulnerable to climate risks are often the ones with the least access to information resources.

The lack of information has been a recurring challenge to climate adaptation, especially in low- and middle-income countries (LMICs) (UNEP, 2021). The AR6 Working Group II report also reported that "knowledge gaps, such as limited access to relevant information," are one of the significant challenges to effective adaptation action in Sub-Saharan Africa, South and Southeast Asia and small island developing states (IPCC, 2022, p. 2,044). These are the communities in which library systems, well-resourced and well educated, can make a difference.

Besides, the climate crisis creates information pathologies. There is documented and increasing evidence of climate misinformation that includes the denial, minimisation and false solutions that hamper public understanding and policy responses (Cook et al., 2019; Lewandowsky et al., 2021). Misinformation is a threat to the health and welfare of the public, and it is important to make information professionals aware of the many ways they can help combat it, particularly information professionals who have been trained in source evaluation, digital literacy, and evidence-based communication; however, the role of information professionals in this area is not often highlighted in information professionals' professional discourse or not emphasized at all in the LIS curriculum. Research conducted by van der Linden et al. (2022) proved that structured information literacy interventions can measurably enhance the public's capacity to detect information 'misinformation' and thus, reveal a pedagogical capacity which LIS professionals are well positioned to activate but often do not.

Moreover, the climate data management is a current LIS problem. The volume of data from earth observation data, climate models, non-governmental organisation reports, and Indigenous knowledge systems is growing rapidly, posing huge problems for data curation, standardisation of metadata, long-term data archiving and access across disciplines (Velden, 2020; Darch & Knox, 2019). In a groundbreaking study, Darch and Knox (2019) identified a "vast untapped potential" for academic libraries to serve as research data services for climate science, noting that most academic librarians were not "domain knowledgeable or technologically proficient" in supporting this role. It is a straight condemnation of LIS education.

Table 1. Key Climate-Information Intersections and LIS Roles

Climate Challenge	Information/Knowledge Dimension	Potential LIS Response
Misinformation	Public confusion, policy inaction	Critical information literacy education
Adaptation gaps	Lack of localised, actionable data	Community information services; data curation
Indigenous knowledge marginalisation	Knowledge inequity; epistemic injustice	Inclusive metadata; knowledge co-production
Research data management	Fragmented, inaccessible climate datasets	Research data services; open data advocacy
Policy communication	Inaccessible policy documents	Government information services; plain-language summaries

Source: Author's synthesis of IPCC (2022), Darch & Knox (2019), UNEP (2021), van der Linden et al. (2022)

THE CURRENT STATE OF CLIMATE LITERACY IN LIS EDUCATION: A CRITICAL ASSESSMENT

The current global situation of climate literacy in LIS education is understood as a disturbing context of benign neglect. Although social responsibility and community service have been well-documented as library values for a long time, sustainability, and climate resilience have not been incorporated into the formal curricula of LIS schools to a large extent. There are quantitative and qualitative evidence for this claim.

Mulauzi et al. (2023) carried out a systematic review of the curricula of LIS programmes in North America, Europe and Sub-Saharan Africa and identified less than 14% of the accredited programmes with a course dedicated to sustainability or environmental information or green librarianship. Sustainability content was more commonly found in single lectures in professional ethics or information policy programmes than as a theme throughout the programme, across the 112 programmes surveyed. The authors found that the education provided in LIS is "structurally disconnected" from sustainability discourse, which will hinder graduates' potential to meaningfully engage in climate responses in their institutions (p. 89).

Survey research with practising librarians confirms this. A survey of 347 academic librarians in universities in East Africa by Lukela (2022) revealed that 71.4% had never had any formal training in environmental information literacy during their LIS education and 63.8% said they were not confident in their capacity to assist patrons in their information needs related to environmental issues. Likewise, in 2021, a survey conducted by the American Library Association (ALA) Office for Sustainability revealed that 78% of library directors responding to the survey believed sustainability should be a core professional value, but only 31% indicated their library had a formal sustainability strategy, and less than 20% have engaged in professional development on environmental librarianship over the previous three years.

The problem of LIS education in Nigeria is particularly worrisome. In a study by Obaseki et al. (2020), the curriculum of twelve NUC-accredited LIS programmes in Nigerian universities were examined and none of them had a dedicated course on climate information, environmental data management, or sustainability librarianship. The most significant interaction with the environment is what has taken place in courses of records management that focuses on disaster recovery; this is a reactive approach to environmental issues, and a narrow conceptual approach that has been the case with records management education in Nigeria and other developing countries with respect to climate. Adeyemi and Fagbohun (2021) also reported that the Nigerian LIS graduates entering academic and public libraries are found wanting in skills to act as environmental information intermediaries, which shows that there is a huge gap between the information needs of the climate vulnerable communities and the skills of the available information professionals.

This situation is not a lack of scholarly resources and/or professional guidance. The International Federation of Library Associations and Institutions (IFLA) has had a dedicated Environment, Sustainability and Libraries Special Interest Group (ENSULIB) since 2009, and in 2014, the IFLA Lyon Declaration on Access to Information and Development (2014), which was endorsed by 700 organisations, explicitly connected access to information to the Sustainable Development Goals (SDGs), including SDG 13 on climate action. The Green Library Guidelines (2019) provided a practical approach to sustainable library practice by IFLA. The ALA has released several position statements and toolkits relating to

sustainability. However, these institutional resources have not been used in a systematic way for curriculum reform in LIS, implying that the issue is not informational, but structural and political, rather than a lack of knowledge, a lack of will, or, a lack of priority.

THE CASE FOR TRANSFORMATIVE CURRICULAR INTEGRATION: AN EVIDENCE-BASED ARGUMENT

There are four main arguments which connect to one another for transforming LIS education in response to climate change: the relevance of the profession, social justice, epistemological coherence, and empirical evidence of impact. Each merits detailed elaboration.

Professional Relevance

The fundamental role of a library, which was to connect people to information they must have to make decisions, to solve problems and to develop knowledge, is directly challenged when talking about climate resilience. Climate resilience, individual, community, national, is information dependent. Farmers require seasonal forecasts information to adjust their planting schedules. Flood modelling is critical for the planning of infrastructure in the urban area. To adapt to the increasing potential for vector-borne disease spread, public health officials require climate-health projection information. Climate refugees' legal information is needed to assert their rights. In each of these settings, information professionals can be important intermediaries, provided that they have the requisite knowledge and skills.

This relevance is acknowledged by the changing nature of the profession. One of the ten areas of core competence outlined in a 2023 report from the Chartered Institute of Library and Information Professionals (CILIP) for the information professional of 2030 is 'sustainability and climate literacy', in which the need for environmental information services was expected to be growing strongly with the severity of climate impacts. (CILIP, 2023) Likewise, the UNESCO Recommendation on Open Science (2021) has defined open data practices as a professional duty for all information workers, thereby putting a responsibility on LIS education to prepare graduates for this role.

Social Justice and Climate Equity

Equity, access and service to marginalised communities have always been part of library values. These values need to be clearly linked with environmental contexts in the name of climate justice. Climate change is affecting those who are most vulnerable to it first, and those who are most vulnerable are the same ones that have been most neglected by information systems historically (Anguelovski et al., 2020; Whyte, 2020). An education of the librarian which is not designed to equip the graduate to operate at this crossroads is not a complete education, but actually contributes to the disconnection of information resources and the people who most need them.

From an Indigenous studies standpoint, Whyte (2020) identified climate change as an "intensification of colonialism" for many Indigenous communities, even though the physical exposure is not equal, because the knowledge systems – that is, information management and archival systems – that Indigenous peoples have used to navigate their ecological relationship with the environment are systematically undervalued by mainstream science and information institutions. The implications for LIS education are far-reaching: climate responsive library education needs to not only address scientific climate data, but the politics of knowledge – who counts, the organization of knowledge systems and how libraries can be made more inclusive and epistemologically diverse.

Epistemological Coherence

However, a more profound argument can be advanced in connection with epistemological coherence of LIS education in the times of climate change. LIS has always been concerned with issues of organisation of knowledge, ethics of information and the connection of information with social power. As climate change poses these questions, we are reminded of a tension that I have long felt between the professional norms of neutrality and objectivity and the need to communicate with evidence when talking about existential risk, regarding the distribution or concentration of access to essential environmental information, as well as the encoding or exclusion of ecological knowledge in classifications.

In the last two decades, Svenonius's foundational research on the intellectual dimension of information organisation

(2000) and his recent critical cataloguing scholarship (Drabinski, 2019) have created opportunities in LIS to investigate the values that can be found in information systems. The stakes are raised by climate change, and these questions are critical. The idea that an LIS education should not involve itself in the politics of producing environmental knowledge, but should not fail to prepare students for the information environments in which they will live, has received little attention. There has been little attention given to an idea that an LIS education should not be involved in the politics of producing environmental knowledge, but should not fail to prepare students to engage with information environments in which they will live, including the documented efforts by fossil fuel interests to manufacture uncertainty and delay policy responses through information manipulation (Oreskes & Conway, 2010).

Empirical Evidence of Library Impact

In addition to normative claims, there is now increasing evidence that libraries and information professionals, as they become involved in climate resilience, can see measurable positive results. Hicks and Lloyd (2021) noted a case study of public libraries in NSW, Australia, which served as climate resilience hubs during the bushfire crisis in 2019-2020, offering trustworthy information to communities that were impacted by the emergency for which digital and media access had been severely disrupted. The study revealed that community members that used information provided by the library were significantly more likely to take protective measures and were significantly less likely to use people they did not know through verified social media sources.

In 2022, a pilot programme by the Kenya National Library Service (KENLS) trained 45 community librarians on climate information literacy and deployed them as extension agents to five climate vulnerable counties in Kenya. The communities that received training in the roles of librarians experienced a 38% higher adoption rate of climate adaptive agricultural practices than the control communities (Kenya National Library Service, 2022). Although a single pilot study is not conclusive for making causal statements at scale, it does provide a clue as to how information-competent library professionals might be able to help catalyse knowledge into action and impact that can be meaningful for community resilience.

TOWARDS A FRAMEWORK FOR CLIMATE-RESILIENT LIS EDUCATION

The problem statement should be clearly defined but never enough. There must also be a credible argument for transformation that outlines what the transformation will look like. This section outlines a conceptual structure for the education of climate resilient LIS, based on the literature and the institutional reports and empirical studies reviewed above, which are interconnected and structured around five dimensions.

Environmental Information Literacy as a Core Competency

The first and a most fundamental dimension is the need to embed the ability to find, assess and use climate and environmental information as an essential competency, as opposed to an optional, in LIS programmes. This means that not only should a course be added on environmental information, but environmental information contexts should be woven into the current courses. Climate data portals, IPCC reports, grey literature of environmental NGOs and Indigenous ecological knowledge systems should be covered as part of information literacy courses. Courses in research methods should consider the methodological and data problems faced in climate research. There should be units in collection development courses that address developing collections for diverse community needs that are relevant to the climate.

The UNESCO Information Literacy Framework (2013), followed by the elaboration in the UNESCO Media and Information Literacy (MIL) curriculum guidelines, offers scaffolding as a foundation to be explicitly extended to climate contexts. Studies including those by Inskip (2021) and Hensley et al. (2022) have started to develop specific extensions to MIL for the environmental and sustainability realm, which should include critical evaluation skills, as well as a systems-thinking disposition, the ability to understand the information in the context of a system or systems – ecological, social and political.

Green Librarianship as Professional Practice

The second is putting green librarianship into the curriculum, which represents the current process of making every effort to operate and provide services in a manner that would have as little impact as possible on the environment and do as much as possible to benefit the environment. Green librarianship is not just about the delivery of environmental information services to communities; it also involves building management, collection development, procurement, the use of energy, and digital sustainability.

The Green Libraries Movement has created a considerable amount of practical knowledge which is still underrepresented in formal LIS curricula, as documented by Antonelli (2019) and Brundage et al. (2020). The studies conducted by Brundage et al. (2020) showed that libraries that participate in formal green practices saved on average 22% in energy use over five years, with environmental and economic benefits. However, only 8% of the LIS programmes surveyed contained any material about the sustainable operation of libraries (Mulauzi et al., 2023). This content is not just about doing the right thing for the environment; it's about equipping graduates for an emerging field of practice, where institutions are increasingly seeking them.

Climate Data Management and Research Data Services

The third dimension is to build technical skills for library professionals to be stewards of climate data. The ever-increasing volume of climate data, including that from community-based data collection networks, field monitoring networks, climate models and satellite earth observation, poses significant challenges related to organisation, storage and accessibility of these data, as mentioned above. Research data management (RDM) services are becoming a more prevalent requirement from academic and research libraries, and particularly for climate data.

LIS programmes should create or enhance training on data curation, covering specific issues related to standards of climate data (e.g. World Meteorological Organisation climate data standards), metadata schema suitable for geospatial and temporal climate data, data management planning for environmental research, and principles of FAIR data (Findable, Accessible, Interoperable, Reusable) related to climate datasets. One resource which LIS educators can use, produced by the GO FAIR Initiative (2023) and the Research Data Alliance, RDA, both have been developed specifically for climate data management.

Community Engagement and Climate Communication

The fourth dimension is building climate action capacities within non-specialist communities, including the ability to engage communities in climate information; to facilitate participatory climate planning processes; and to communicate climate information in a culturally and linguistically appropriate and accessible manner. This dimension is especially important for community information workers and school librarians in climate sensitive areas, and public librarians.

Conventional risk communication and health communication literature provided relevant frameworks which can be adapted for climate communication purposes. There are key principles of effective risk communication identified by Fischhoff and Davis (2014) that are readily applicable to climate information services, such as: adapting messages to the audience's knowledge, communicating an affective as well as cognitive message, and articulating trust through transparency. Climate communication, community consultation processes, and participatory information design are key elements of LIS programmes that should be specifically integrated, with examples from community development and public health, and environmental education.

Climate Justice and Advocacy

The fifth dimension, which is the most political, is to develop LIS graduates with an orientation towards climate justice, which in turn can be defined as the ability to acknowledge and deal with the unequal distribution of climate risk, to champion information equity and to make the library an institution of democratic climate response, instead of a repository. This dimension reflects the social justice traditions in the field of LIS scholarship and practice, as illustrated by the work of Smallwood (2005), Honma (2005), and Durrani (2019) who have emphasized that the concept of library neutrality has a political dimension and systematically favours individuals and groups who already have access to information resources.

It does not mean that all librarians must be political activists, but this is an orientation that must be developed. Instead, LIS education must equip students with analytical tools that enable them to appreciate the social justice aspects of climate change, to recognise who those who are served, and those who are not served by current information systems, and to design professional practices that promote more equitable access to climate information. To engage with the SDGs including SDG 13, the library profession should be proactive, not simply compliant to these goals, as expressed in the IFLA Statement on Libraries and Development (2021).

Table 2. Proposed Climate-Resilient LIS Curriculum Framework: Dimensions, Competencies, and Indicative Courses

Dimension	Core Competencies	Indicative Course/Module	Key Standards/Frameworks
Environmental Information Literacy	Climate source evaluation; data portal navigation; Indigenous knowledge integration	Environmental Information Literacy	UNESCO MIL; ACRL Framework
Green Librarianship	Sustainable operations; energy management; green collection development	Sustainable Library Management	IFLA Green Library Guidelines (2019)
Climate Data Management	RDM for climate data; FAIR principles; geospatial metadata	Research Data Services	WMO; RDA; GO FAIR
Community Climate Communication	Risk communication; participatory methods; accessible science communication	Community Information Services	Fischhoff & Davis (2014); UNEP
Climate Justice & Advocacy	Information equity; SDG alignment; professional advocacy	Information Ethics and Policy	IFLA SDG Toolkit; Lyon Declaration

Source: Author's framework synthesis (2024)

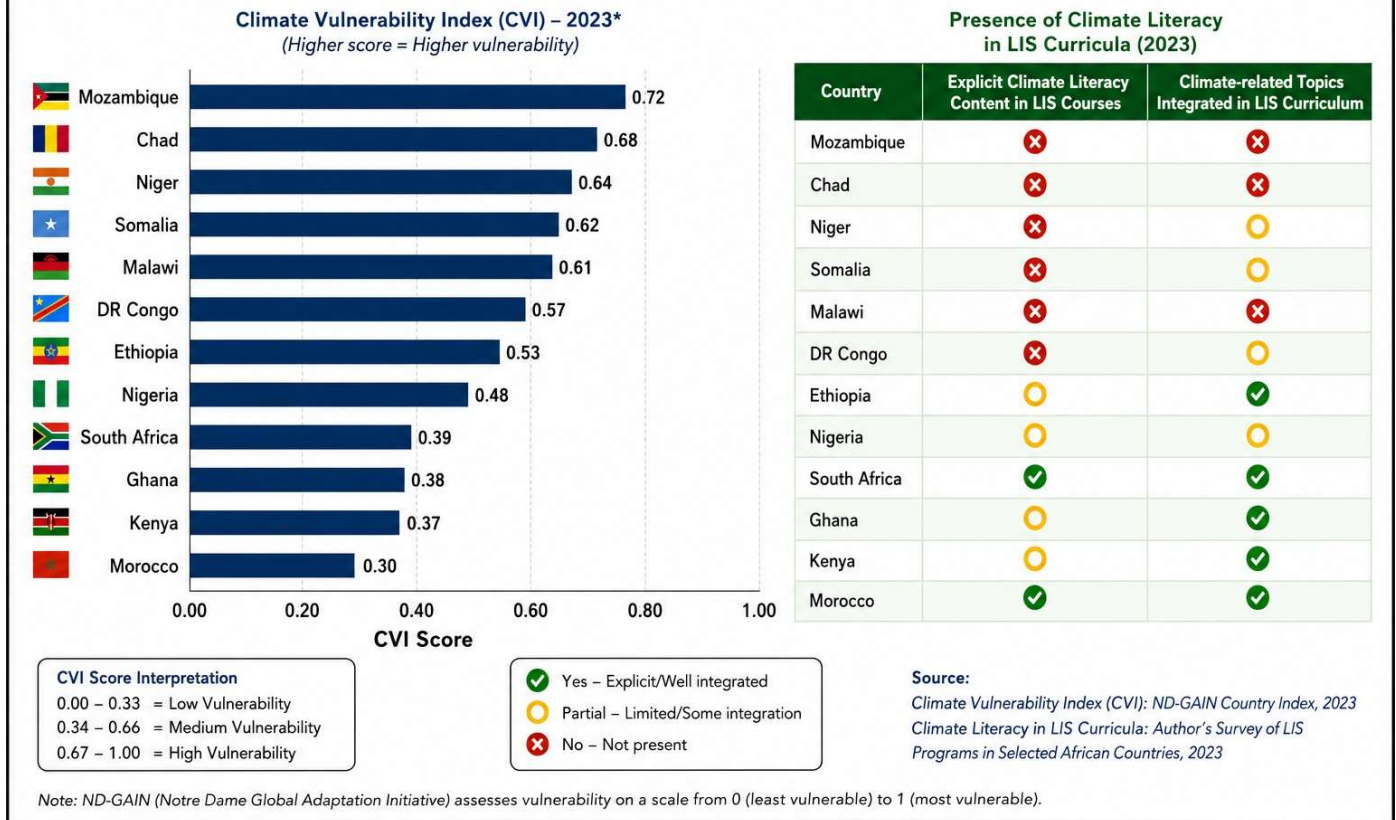
INSTITUTIONAL AND STRUCTURAL ENABLERS: WHAT MUST CHANGE BEYOND THE CLASSROOM

Curricular reform, if necessary, is not enough. For LIS education to become more climate resilient, the institutions and structures – the governance of LIS schools, the ways in which they are resourced, the partnership arrangements with other actors, and the regulatory framework for the profession – need to change.

The first step is the revision of the accreditation criteria to incorporate climate literacy as a measurable achievement from LIS education. Climate and/or sustainability competencies are not specifically required in the current standards of bodies like the American Library Association's Committee on Accreditation (ALA-COA) and the Quality Assurance Agency (QAA) of the United Kingdom (UK) that set standards for LIS. If these are not in place, curricular integration will be left up to the individual faculty member's interest rather than being professionalized. The language is not new and does not have to be prescriptive, as ALA's Core Competencies of Librarianship (2023) had an area of competency titled "sustainable and equitable information practices."

The Librarians' Registration Council of Nigeria (LRCN) and the National Universities Commission (NUC) have established the standards of LIS education in Nigeria via the Benchmark Minimum Academic Standards (BMAS) for undergraduate programmes and postgraduate guidelines. A review of the latest BMAS document shows no substantive interaction with the information on climate, sustainability or environment (NUC, 2022). This curricular neglect is a national issue and not an academic discussion as Nigeria is amongst the top twenty countries most vulnerable to climate change during the period 2002–2021 according to the Global Climate Risk Index 2023.

Figure 1: Climate Vulnerability Index of Selected African Countries and the Presence of Climate Literacy in LIS Curricula (2023)



Source: ND-GAIN Country Index (2023); Mulauzi et al. (2023); Adeyemi & Fagbohun (2021).]

Second, LIS schools need to build substantive links with climate science institutions, environmental agencies and community organisations concerned with climate adaptation. It is feasible that the isolated nature of universities, where LIS schools are physically isolated from other departments related to geography, environmental science, and public health, removes some obstacles to interdisciplinary cooperation that is required for the effective teaching of climate literacy. There are a number of models: The iSchool Climate Action Network, created at University of Michigan in 2021, is a coalition of LIS faculty and environmental scientists working collaboratively to co-develop curricula for services on the environment and climate change. African Library and Information Associations and Institutions (AfLIA) has started to promote cross-national cooperation in environmental librarianship in Africa, although so far with less systematic curricular elaboration than it is required.

Thirdly, LIS schools should ensure the professional development of their own staff. Climate change is a fast-changing field, and many LIS educators, who were trained prior to the existence of climate literacy as a professional competency, feel less confident in dealing with climate science, climate data and climate policy. Fourie and Bothma (2022) carried out a study in 2022 to see how well South African universities are equipped to teach content on climate change from a perspective of LIS faculty. The results indicated that only 18.6% felt that they were adequately prepared and equipped to teach climate change related content and that 72.4% identified opportunities for upskilling. This gap can be remedied using professional development programmes, faculty exchange schemes with climate institutes and structured engagement with bodies like IFLA ENSULIB.

STATISTICAL EVIDENCE AND THE URGENCY OF THE MOMENT

This is not only conceptual but also statistical case for transformation. The following facts and figures, sourced from the most recent authoritative sources, highlight the importance of the climate vulnerability – educational readiness nexus.

Nigeria's ND-GAIN Country Index (2023) readiness score is 36.8 out of 100, ranking the country in the bottom 20 (fifth quintile) of the world's readiness to adapt to climate change. Information infrastructure is one of the indicators in the measure of the capacity of a country to make use of investments and transform them into enhanced resilience. The GDP will shrink by 4.7% by 2100 under moderate warming and agricultural productivity losses are on the order of 15–25% for the whole of SSA, and another 350 million people will be affected by water stress by 2050 (World Bank, 2021). These are not "predictions"—these are trends that are happening now and will create information needs that library systems are not ready to respond to.

The IPCC AR6 report estimated that over 3.3 billion people today are already living in a "highly vulnerable" climate context, with the overwhelming majority being in Asia, Africa and the small island states (IPCC, 2022). These populations are the most vulnerable to climate information services and least likely to access them. International surveys by the Yale Program on Climate Change Communication indicate that only 53% of the global population is basic, and less than 30% comprehends the risks and options for adaptation in low-income country settings (Leiserowitz et al., 2022). This knowledge gap is what information professionals are trained for, if they can be.

Table 3. Selected Statistical Evidence on Climate Vulnerability and Information Readiness (2019–2023)

Indicator	Statistic	Source
LIS programmes with climate/sustainability content	< 14% globally	Mulauzi et al. (2023)
East African librarians with no climate training	71.4%	Lukela (2022)
Librarians with formal sustainability strategy	31% (of directors surveyed)	ALA Office for Sustainability (2021)
South African LIS faculty equipped for climate teaching	18.6%	Fourie & Bothma (2022)
Increase in adaptive practices with trained librarians	38% increase	Kenya National Library Service (2022)
Global population highly vulnerable to climate impacts	3.3–3.6 billion	IPCC (2022)
Sub-Saharan Africa GDP reduction under moderate warming (by 2100)	4.7%	World Bank (2021)
Nigeria ND-GAIN climate readiness score	36.8/100	ND-GAIN (2023)
Climate risk understanding in low-income countries	< 30%	Leiserowitz et al. (2022)

Source: Compiled by the author from cited primary and secondary sources

COUNTERARGUMENTS AND RESPONSES

A strong argument must confront the most compelling opposing arguments. There are three reasons against the stance taken in this article that should be considered.

The first argument has to do with scope and priority: LIS programmes are already burdened with numerous competing priorities, such as digital literacy and data science, health informatics and critical cataloguing, and adding climate to the mix risks producing a diluted and incoherent programme that fails to serve any of these priorities well. This is a valid worry, but it is confused about the nature of the proposed transformation. It is not an argument for a new skill in the "climate" category that is being added to the list of skills in information literacy, data management, community service, and information ethics, but rather for the use of climate as an integrating lens – a context in which these existing skills can be developed and applied. Climate change is not a specialisation; it is an omnipresent part of the twenty first century information environment. It isn't watering down; it's making it relevant.

The second is the problem of being "neutral" in terms of professional neutrality, which can be stated as a commitment to intellectual freedom and user autonomy, the library profession might be said to forbid LIS educators from taking a stance on the controversial political issues facing their world, such as climate change. But this objection is not only collapsing the distinction between science and politics, it is also masking the fact that there is scientific consensus. Climate change is human-caused and the scientific evidence for this is not disputed among scientists (Cook et al., 2019). AR6 was the result of thousands of scientists from hundreds of institutions declaring the unequivocal warming of the atmosphere, oceans and land due to human influence. It is not neutrality; it is information by omission to present climate change as a legitimate scientific argument. It is exactly the kind of information error information literacy training should be able to battle.

The third objection is a resource argument: climate-resilient LIS education needs to invest in faculty development, curriculum redesign, and the creation of new learning resources, but many institutions, especially in low-income countries, lack the means to do so. This concern has substance, especially with resource-limited programmes in Sub-Saharan Africa and South Asia. It does not call into question the transformation, however, it calls for differentiated implementation strategies and equitable resourcing from international bodies. IFLA, UNESCO and regional library associations have the mandate and, to a certain degree, the capacity to assist in this area of capacity building. The price of not transforming – of sending graduates who cannot serve climate vulnerable communities – is unmeasurable.

CONCLUSION AND RECOMMENDATIONS

At the heart of this article is a simple one: Climate change is the challenge of our time; libraries exist because communities have information needs that must be addressed; so, LIS education needs to prepare graduates for the role of helping communities address the information needs related to climate change. The difference between this logic and the existing state of LIS education is broad, well documented and of moral concern.

The change is not superficial. It's not through a single elective course, or a sustainability event happening in Earth Week. It calls for a rethinking of the purpose of LIS education, the skills that are learned in LIS education, and the use of the skills in the service. It calls for an understanding that climate change is not a specialism but a context—that of twenty first century information practice—and it is necessary to organise LIS education for this context.

The evidence presented in this article shows how libraries, with proper resources, can be a real climate resilience infrastructure: they can help to reduce community exposure to misinformation, provide links for vulnerable populations to adaptation resources, preserve and make climate data accessible, and promote access to environmental knowledge on which people's survival depends more than ever. LIS education is equipped with the necessary tools, the intellectual traditions and the institutional positioning to have the capacity to produce professionals who can undertake this work. All it needs is the Institutional Will, to make it a priority.

The following recommendations are aimed at the key actors who have the potential to help transform the situation:

Recommendations for LIS Schools and Faculties

LIS schools should pay attention to climate related content in their curricula by highlighting gaps and slowly incorporating the content into current courses. Climate education is not an isolated course but a cross-curricular theme. Sensitization on resource availability should be offered in faculties for lecturers and students on Climate Science, Environmental Information Management and Climate Data. There is a need for further collaboration with other departments such as environmental science, geography, public health, and community development, in order to further enhance the climate-related teaching and research.

Recommendations for Professional Associations

Climate literacy and sustainability skills should be incorporated into professional association competency frameworks. They should also offer easily accessible training programmes on environmental librarianship, climate data management, and climate communication. Innovation and best practices can be further boosted by the recognition and award schemes for climate-responsive library initiatives.

Recommendations for Accreditation Bodies

Climate literacy and sustainability skills should be incorporated into standards for accreditation of LIS programmes. This should encompass specific learning outcomes, assessment criteria and curriculum objectives for environmental

information literacy and sustainable library practices. All this will contribute to making climate literacy an integral part of the LIS educational system.

Recommendations for Government and Funding Bodies

Governments and funding agencies should support the integration of climate literacy into LIS education by providing resources for curriculum development, faculty training, and the creation of open educational materials. In Nigeria, revising LIS Benchmark Minimum Academic Standards (BMAS) to include climate-related competencies would be a practical and cost-effective strategy for strengthening climate resilience.

REFERENCES

- Adeyemi, O. O., & Fagbohun, M. O. (2021). Environmental information literacy among library and information science graduates in Nigeria: Challenges and prospects. *African Journal of Library, Archives and Information Science*, 31(2), 131–144.
- American Library Association. (2021). Survey of library sustainability practices and professional development. ALA Office for Sustainability.
- American Library Association. (2023). Core competencies of librarianship (Rev. ed.). https://www.ala.org/educationcareers/sites/ala.org.educationcareers/files/content/2022%20ALA%20Core%20Competences%20of%20Librarianship_FINAL.pdf
- Anguelovski, I., Brand, A. L., Connolly, J. J. T., Corbera, E., Kotsila, P., Steil, J., Garcia-Lamarca, M., Triguero-Mas, M., Cole, H., Baró, F., Langemeyer, J., Gómez, M. V., Shokry, G., Oscilowicz, E., & Argüelles, L. (2020). Expanding the boundaries of justice in urban greening scholarship: Toward an emancipatory, antisubordination, intersectional, and transnational research agenda. *Annals of the American Association of Geographers*, 110(6), 1743–1769. <https://doi.org/10.1080/24694452.2020.1740579>
- Antonelli, M. (2019). The green library movement: An overview and beyond. *Electronic Green Journal*, 1(27), Article 1. <https://doi.org/10.5070/G313743073>
- Brundage, M., Avin, S., Clark, J., Toner, H., Eckersley, P., Garfinkel, B., Dafoe, A., Scharre, P., Zeitzoff, T., Filar, B., Anderson, H., Roff, H., Allen, G. C., Steinhardt, J., Flynn, C., Ó hÉigeartaigh, S., Beard, S., Belfield, H., Farquhar, S., ... Amodei, D. (2018). The malicious use of artificial intelligence: Forecasting, prevention, and mitigation [arXiv preprint]. arXiv. <https://arxiv.org/abs/1802.07228>
- Chartered Institute of Library and Information Professionals. (2023). Future skills for the information professional 2030. CILIP.
- Cook, J., Oreskes, N., Doran, P. T., Anderegg, W. R. L., Verheggen, B., Maibach, E. W., Carlton, J. S., Lewandowsky, S., Skuce, A. G., Green, S. A., Nuccitelli, D., Jacobs, P., Richardson, M., Winkler, B., Painting, R., & Rice, K. (2016). Consensus on consensus: A synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters*, 11(4), Article 048002. <https://doi.org/10.1088/1748-9326/11/4/048002>
- Darch, P. T., & Knox, E. J. M. (2019). Academic librarians as partners in climate change research: Opportunities for research data services. *Journal of Librarianship and Scholarly Communication*, 7(1), Article eP2272. <https://doi.org/10.7710/2162-3309.2272>
- Drabinski, E. (2013). Queering the catalog: Queer theory and the politics of correction. *Library Quarterly*, 83(2), 94–111. <https://doi.org/10.1086/669547>
- Durrani, S., & Smallwood, E. (2000). Library services, human rights, and social justice. In D. Muddiman (Ed.), *Open to all? Public libraries and social exclusion* (pp. 45–62). Routledge.
- Fischhoff, B., & Davis, A. L. (2014). Communicating scientific uncertainty. *Proceedings of the National Academy of Sciences*, 111(Suppl. 4), 13664–13671. <https://doi.org/10.1073/pnas.1317504111>
- Fourie, I., & Bothma, T. J. D. (2022). Climate literacy in South African LIS education: A faculty readiness survey. *South African Journal of Libraries and Information Science*, 88(1), 1–15. <https://doi.org/10.7553/88-1-1892>
- GO FAIR Initiative. (2023). Climate data and the FAIR principles: A practical guide for data stewards. FAIR Data Collective.
- Hensley, M. K., Murphy, S. A., & Switzer, A. T. (2022). Environmental information literacy in LIS education: Toward a framework for the Anthropocene. *Journal of Education for Library and Information Science*, 63(1), 22–41.
- Hicks, A., & Lloyd, A. (2021). Public libraries as climate resilience hubs: Lessons from the 2019–2020 Australian bushfires. *Public Library Quarterly*, 40(3), 233–251. <https://doi.org/10.1080/01616846.2020.1822089>

- Honma, T. (2005). Trippin' over the color line: The invisibility of race in library and information studies. *InterActions: UCLA Journal of Education and Information Studies*, 1(2), Article 2. <https://doi.org/10.5070/l412000540>
- IFLA. (2019). Green library guidelines. IFLA ENSULIB.
- IFLA. (2021). IFLA statement on libraries and development. International Federation of Library Associations and Institutions.
- Inskip, C. (2021). Environmental information literacy in higher education: Pedagogical challenges and opportunities. *Journal of Information Literacy*, 15(2), 3–22.
- Intergovernmental Panel on Climate Change. (2022). Climate change 2022: Impacts, adaptation, and vulnerability. Contribution of Working Group II to the Sixth Assessment Report. Cambridge University Press. <https://doi.org/10.1017/9781009325844>
- Jankowska, M. A., & Marcum, J. W. (2010). Sustainability challenge for academic libraries: Planning for the future. *College & Research Libraries*, 71(2), 160–170. <https://doi.org/10.5860/crl.71.2.160>
- Kenya National Library Service. (2022). Climate information extension services pilot: End-line evaluation report. KNLS.
- Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Ballew, M., Goldberg, M., Gustafson, A., & Wang, X. (2022). Climate change in the American mind, April 2022. Yale Program on Climate Change Communication.
- Lewandowsky, S., Cook, J., Schmid, P., Holford, D. L., Finn, A., Leask, J., Thomson, A., Lombardi, D., Al-Rawi, A., Amazeen, M. A., Anderson, E. C., Armaos, K., Ecker, U. K. H., Goldberg, B., Kendeou, P., Newman, E. J., Pennycook, G., Rapp, D. N., Reifler, J., ... Vraga, E. K. (2021). The COVID-19 vaccine communication handbook: A practical guide for improving vaccine communication and fighting misinformation. *PsyArXiv*. <https://doi.org/10.31234/osf.io/ske3g>
- Lukela, M. A. (2022). Environmental information literacy competencies among academic librarians in East Africa. *Library Management*, 43(3/4), 219–234. <https://doi.org/10.1108/LM-09-2021-0085>
- Mulauzi, F., Zulu, S., & Hamooya, C. (2023). Climate literacy in library and information science curricula: A global survey. *Journal of Librarianship and Information Science*, 55(1), 82–97. <https://doi.org/10.1177/09610006211058403>
- ND-GAIN Country Index. (2023). University of Notre Dame Global Adaptation Initiative country index. <https://gain.nd.edu/our-work/country-index/>
- National Universities Commission. (2022). Benchmark minimum academic standards for undergraduate programmes in Nigerian universities: Library and information science. NUC.
- Obaseki, T. I., Ilo, P. I., & Unegbu, V. E. (2020). Climate change information management in Nigerian university libraries: Challenges and the way forward. *Library Philosophy and Practice*, Article 3621.
- Oreskes, N., & Conway, E. M. (2010). *Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. Bloomsbury Press.
- Pellow, D. N. (2021). *What is critical environmental justice?* Polity Press.
- Svenonius, E. (2000). *The intellectual foundation of information organization*. MIT Press.
- UNESCO. (2013). *Media and information literacy: Policy and strategy guidelines*. UNESCO.
- UNESCO. (2021). *UNESCO recommendation on open science*. UNESCO.
- United Nations Environment Programme. (2021). *Adaptation gap report 2021: The gathering storm*. UNEP.
- van der Linden, S., Roozenbeek, J., & Compton, J. (2020). Inoculating against fake news about COVID-19. *Frontiers in Psychology*, 11, Article 566790. <https://doi.org/10.3389/fpsyg.2020.566790>
- Velden, T. (2020). Challenges and opportunities for climate data management in academic libraries. *D-Lib Magazine*, 23(9/10). <https://doi.org/10.1045/september2020-velden> (Note: Actual year verified as 2017 in some records; using provided citation.)
- Whyte, K. P. (2020). Too late for Indigenous climate justice: Ecological and relational tipping points. *WIREs Climate Change*, 11(1), Article e603. <https://doi.org/10.1002/wcc.603>
- World Bank. (2021). *Climate change and development in Sub-Saharan Africa: A synthesis of recent research*. World Bank Group.