

The Role of Digital Literacy in Mitigating Information Poverty for Improving SDGs Achievements: a Literature Review Study

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ABSTRACT

The achievement of the 2030 Sustainable Development Goals (SDGs) is a transformative global agenda demanding multi-stakeholder collaboration; however, this effort is hindered by the phenomenon of information poverty as a structural manifestation of the digital divide. The primary purpose of this research is to analyze the specific role of digital literacy as a key mediating factor in mitigating information poverty to optimize SDG achievement. The research method employed is a qualitative literature review. Data analysis was conducted using content coding techniques to synthesize findings from 23 final scientific articles, strictly selected from academic databases between 2021 and 2026. The results of the synthesis indicate that the role of digital literacy is hierarchical across three main levels: (1) functional digital literacy, which transforms Information and Communication Technology (ICT) limitations into productive economic opportunities (SDG 1 & 8); (2) critical digital literacy as a defense mechanism that overcomes information poverty by building a "cognitive shield" to protect vulnerable groups from data exploitation, disinformation, and cyber threats that can obstruct access to vital information (SDG 16) ; and (3) institutional digital literacy, which strengthens educational systems and public service accountability (SDG 4, 10, & 17). The main conclusion of this study asserts that digital literacy is not merely a technical skill, but an essential strategic competence for converting digital access into inclusive, secure, and equitable sustainable development impacts.

Keywords: Digital Literacy; Information Poverty; SDGs

1. INTRODUCTION

The achievement of the Sustainable Development Goals (SDGs) 2030 is a transformative global agenda that requires collaboration from multiple parties to realize a more just, prosperous, and sustainable future (Kamil et al., 2024). The pillars of the SDGs, ranging from poverty alleviation (SDG 1), quality education (SDG 4), to partnerships for achieving the goals (SDG 17), heavily rely on the availability and utilization of adequate information (Ramadani, 2024). In the era of digital disruption, digital

transformation has become a key catalyst for development, offering significant opportunities to drive sustainable and inclusive economic growth (Hoz et al., 2024; Patra et al., 2025). In this context, digital literacy is defined as the fundamental ability to use Technology, Information, and Communication (TIC) to access, manage, integrate, and utilize information critically and ethically (Kamil et al., 2024). Digital literacy has become a prerequisite for full participation in leveraging development opportunities (Mujtahid, Berlian, Vebrianto, Thahir, & Irawan, 2021).

However, the rapid development of technology is not always accompanied by equitable access and skills, which ironically creates a serious challenge in the form of information poverty (James, 2021), a condition where individuals or communities are hindered by limited access, skills, and resources to obtain and utilize vital information needed to improve quality of life and strategic decision-making. This condition of information poverty, exacerbated by the digital divide (Akpan, Offodile, & Akpanobong, 2024), directly hinders the progress toward achieving various SDG targets.

Several previous literature studies have identified the essential role of digital literacy in the context of sustainable development. In general, digital literacy is recognized as an empowerment tool that supports inclusion, poverty alleviation, and human development in developing regions (Shafira, 2024). Its role encompasses several sectors, such as improving access to quality educational resources (SDG 4) for elementary school students (Devi et al., 2024), strengthening financial inclusion and sustainable economic growth (Patra et al., 2025), and supporting collaborative efforts to achieve goals thru partnerships (SDG 17) (Ramadani, 2024). Additionally, the literature review also underscores the urgency of digital transformation at the community/village level as an effort to support sustainable development (Mayyora, Brawijaya, et al., 2025). Along with the emerging challenges, from digital threats that can hinder the role of information institutions such as libraries in advancing the SDGs (Oyedokun, 2024). However, the dominant focus of research tends to center on the direct relationship between digital literacy and the SDGs or on the dimension of access to digital technology (digital divide), resulting in a gap in deeper analysis.

Theoretically, the relationship between the three main concepts in this article is very fundamental. Digital literacy is viewed not just as technical skills (ICT skills), but as a multidimensional construct that includes access, skills to understand and evaluate information. And the strategic ability to utilize it (Kamil et al., 2024). This concept is related to information poverty, which in social-information theory, is a condition that is much more complex than just the digital divide (the gap in infrastructure access) (Akpan, Offodile, & Akpanobong, 2024). Information poverty refers to the structural inability to access, filter, and utilize relevant information for the improvement of social and economic status. In the framework of the SDGs, information and knowledge are the primary resources for evidence-based decision-making and real actions. Therefore, theoretically, strengthening digital literacy serves as a bridge from information poverty (capability limitations) to information richness (capability enhancement), which directly facilitates the achievement of sustainable development goals (Dhea, 2024).

Although the fundamental role of digital literacy in supporting the Sustainable Development Goals (SDGs) has been discussed in the literature, there remains a systematic gap in in-depth studies regarding how digital literacy serves as a mechanism for mitigating information poverty that is specific and multidimensional, rather than merely addressing the issue of access. This research aims to fill that gap and offer a comprehensive synthesis of the transformative mechanisms by which digital literacy changes the condition of information poverty into the empowerment of community capabilities within the framework of the SDGs. From this gap, the main research problem is how the specific role of digital literacy in addressing information poverty can optimize the achievement of the Sustainable Development Goals (SDGs).

The main objective of this study is to systematically analyze and synthesize the role of digital literacy in mitigating information poverty and its implications for enhancing the achievement of the Sustainable Development Goals (SDGs) thru a literature review. To achieve this goal, this article uses the literature review method (library study), a qualitative approach that involves the collection, evaluation, and synthesis of findings from various library sources (Darmalaksana, 2020).

2. RESEARCH METHOD

The research method used in this article's study employs a literature review approach (library study) with a qualitative method (Darmalaksana, 2020). A literature review is a highly effective method in qualitative research for identifying, evaluating, and synthesizing all relevant research findings on a specific topic (Nurhayati & Wijayanti, 2023a).

The data collection technique is from several reliable sources such as academic databases, using a combination of relevant keywords from three main variables: "Digital Literacy," "Information Poverty," and "SDGs." Second, a content analysis is conducted on each selected literature to identify in detail and depth. Next, the articles were limited to the 2021-2026 timeframe, and the collected articles were selected based on relevance and subjective quality. After reading and understanding the content of the articles, the author outlines the main ideas, key findings, and emerging interconceptual relationships. The author then composes a narrative that integrates personal understanding with literature findings, highlighting views or recommendations based on the synthesis conducted, and revises to ensure the smooth flow and clarity of arguments.

The process of selecting articles in this research was carried out thru five systematic stages to ensure the quality and relevance of the literature used. Starting with stage 1: the initial stage, the search was conducted in academic databases, using keywords related to digital literacy, information poverty, and SDGs, resulting in a total of 401,180 articles. In stage 2: Duplicate removal, data cleaning was performed using Mendeley and manual checks, leaving 355,760 articles. The next screening process in stage 3: title screening, where articles that do not explicitly discuss at least two of the three main variables were eliminated, resulting in an initial 252 matches. With inclusion criteria focused on research articles or literature reviews that explicitly discuss the intersection of digital literacy, information poverty mitigation, and SDG achievement targets. Here is a summary table of the screening process, resulting in 23 final articles.

Table 1. Criteria Analysis

No.	Author	Author Substance Analysis: Intersection of Digital Literacy, Information Poverty, and SDGs Targets	Database
1.	Darwin et al. (2026)	Evaluasi integrasi sistem informasi digital dalam tata kelola pesisir terpadu guna memitigasi buta informasi ekologis bagi masyarakat pesisir.	Google Scholar
2.	Sasso et al. (2026)	Eksplorasi desain antarmuka inklusif melalui integrasi penerjemah bahasa isyarat digital untuk memitigasi isolasi informasi pada penyandang disabilitas	Scopus
3.	Kusnandar et al. (2025)	Dekonstruksi peran institusi informasi dalam melestarikan memori kolektif digital untuk mengatasi marginalisasi budaya di era modern.	Google Scholar
4.	Annazali & Wahyudi (2025)	Investigasi efektivitas infrastruktur teknologi dalam mereduksi ketimpangan informasi hukum bagi	Google Scholar

		kelompok rentan.	
5.	Alqirem & Al-Smadi (2025)	Studi adopsi teknologi seluler sebagai katalisator kecerdasan finansial untuk memutus rantai kemiskinan ekonomi sistemik.	Scopus
6.	Amalia et al. (2025)	Analisis strategi pengurangan hambatan informasi pasar pada pelaku usaha mikro di wilayah rural melalui pemberdayaan teknologi.	Google Scholar
7.	Mayyora, Sholihah, et al. (2025)	Tinjauan sistematis mengenai dampak digitalisasi terhadap inklusivitas informasi dan pembangunan infrastruktur desa berkelanjutan.	Google Scholar
8.	Muhammad Isa Asyrofuddin (2025)	Urgensi literasi etika dan keamanan data sebagai proteksi atas risiko eksploitasi informasi di kalangan generasi muda.	Google Scholar
9.	Wahhaj et al. (2025)	Optimasi layanan sumber daya informasi digital untuk meminimalisir kesenjangan akses edukasi pada kelompok <i>digital native</i> .	Google Scholar
10.	Fajri (2025)	Transformasi sektor agrikultur melalui penguasaan teknologi cerdas untuk mengatasi kemiskinan informasi teknis petani.	Google Scholar
11.	Khafif et al. (2025)	Eksplorasi korelasi antara kecakapan digital dengan daya serap tenaga kerja sebagai mekanisme pengentasan kemiskinan.	Scopus
12.	(Liu et al., 2025)	Mekanisme mitigasi kemiskinan multidimensi melalui penguatan literasi keuangan berbasis teknologi dan penguatan aspek psikologis.	Scopus
13.	Akpan, Offodile, Akpanobong, et al. (2024)	Komparasi hambatan teknologi instruksional dan ketimpangan akses informasi pendidikan di wilayah Global South.	Scopus
14.	Qisty Kamil et al. (2024)	Peran kecakapan digital sebagai instrumen pemberdayaan masyarakat dalam mewujudkan kemandirian informasi berkelanjutan.	Google Scholar
15.	Toyese Oyedokun (2024)	Analisis kerentanan infrastruktur informasi terhadap ancaman siber dan implikasinya pada stabilitas data pembangunan.	Scopus
16.	Plaza de la Hoz et al. (2024)	Tinjauan teoritis keterkaitan antara digitalisasi pendidikan dan reduksi angka kemiskinan di kawasan Amerika Latin.	Scopus
17.	Devi Widiyanti et al. (2024)	Internalisasi kompetensi informasi pada pendidikan dasar sebagai langkah preventif terhadap kesenjangan pengetahuan global.	Google Scholar
18.	Dhea Adinda Syafitri et al. (2024)	Strategi adaptasi masyarakat terhadap disrupsi digital guna memastikan akses informasi yang merata dan berkeadilan.	Google Scholar
19.	Zhang et al. (2024)	Dampak penguasaan literasi informasi digital terhadap	Scopus

		peningkatan taraf hidup dan kesejahteraan ekonomi rumah tangga rural.	
20.	Lee et al. (2023)	Bukti empiris mengenai pengaruh inklusi keuangan digital dalam memitigasi keterbatasan modal dan informasi.	Scopus
21.	Pitrianti et al. (2023)	Pemetaan tingkat literasi digital lokal sebagai upaya mengatasi isolasi informasi pada komunitas pedesaan.	Google Scholar
22.	Fourie et al. (2022)	Studi perilaku informasi keseharian masyarakat terpinggirkan sebagai dasar perumusan kebijakan mitigasi <i>information poverty</i> .	Scopus
23.	Jaelani & Hanim (2021)	Integrasi instrumen digital dalam pengelolaan destinasi wisata untuk mendukung keberlanjutan ekologi dan ekonomi lokal.	Google Scholar

To answer the research question regarding the role of digital literacy in mitigating information poverty to achieve various sustainable development goals, this literature review is conducted thru three systematic stages. First, analyzing the literature that examines the effectiveness of digital literacy as an instrument to reduce information access barriers for marginalized groups and rural communities. Second, evaluating studies that highlight the integration of information technology in the economic empowerment and education of communities to address systemic information vulnerabilities. Third, reviewing the tangible contributions of digital literacy practices to specific SDG indicators, such as poverty alleviation, quality education, and global partnerships. In the analysis process, articles that meet the criteria are synthesized using content coding techniques based on thematic categories regarding information poverty mitigation, digital competence, and SDG achievement targets. Next, an identification of the similarities and differences in research findings is conducted to produce a deep and focused synthesis. Thru this literature review approach, this study aims to provide a comprehensive understanding of how digital literacy serves as a key catalyst in breaking the chain of information poverty and promoting global sustainability inclusively.

3. RESULTS AND DISCUSSION

This section presents a deep synthesis of various scientific literatures to elucidate the specific role of digital literacy in addressing information poverty to optimize the achievement of the Sustainable Development Goals (SDGs). The results and discussion emphasize the mechanisms by which digital literacy in tackling information poverty can optimize the achievement of the SDGs.

Information Poverty as a New Dimension of Structural Poverty in the Context of the SDGs

Information poverty is no longer viewed merely as a technical issue, but has shifted into a new dimension of structural poverty. In the context of sustainable development, individuals who lack access to or the ability to process information will be trapped in a cycle of powerlessness that hinders social mobility. This phenomenon creates a divide between groups that can utilize data for welfare and those who are digitally isolated. Mitigation of information poverty becomes crucial because access to relevant information is the main prerequisite for society to participate in the global agenda (Kamil et al., 2024). Without literacy intervention, information poverty will continue to reinforce existing structural inequalities, thereby hindering the achievement of inclusivity principles in the SDGs.

The results of the literature review consistently underscore that information poverty, often equated with the digital divide, has evolved into a significant and multidimensional structural barrier to the successful implementation of the 2030 SDG agenda (Sasso, Evangelista, & Carrozzino, 2026), providing strong econometric justification by introducing the concept of ICT Poverty, which has been shown to have a significant correlation with the absolute poverty index in various regions of the Global South and Global North. This phenomenon emphasizes that the lack of access, or more crucially, the inability to utilize Information and Communication Technology (ICT), is not merely an inconvenience, but rather a form of social and economic exclusion that hinders the achievement of SDG 1 (No Poverty).

Furthermore, the structural impact of fragmented Information Poverty on key sectors, as clearly seen in education in developing countries. (Akpan, Offodile, & Akpanobong, 2024) found that the severe digital divide, especially in the Global South, poses a fundamental barrier to the utilization of virtual educational technology systems (e-learning). This condition directly undermines efforts to achieve SDG 4 (Quality Education) because vulnerable populations cannot access enriched digital educational resources, thereby widening the gap in knowledge and skills. Therefore, information poverty must be understood as a systematic failure to transform the potential of digital technology into added value and active participation for individuals, which ultimately demands specific interventions thru the strengthening of digital literacy.

Based on the above findings, the author argues that the phenomenon of information poverty is no longer viewed narrowly as merely the absence of devices or physical infrastructure. On the contrary, this issue is a form of systemic failure in the mechanism of knowledge distribution in society. If material poverty can conventionally be intervened thru cash assistance or physical subsidies, then information poverty demands a much more substantive and in-depth approach, namely thru strengthening cognitive capacity based on digital literacy. The author views digital literacy as a primary mitigation instrument that serves as a catalyst for change. Thru the strengthening of digital literacy, society, which was initially only "passive consumers of technology," can transform into "active participants" capable of independently overcoming social exclusion. Without a focus on strengthening human capacity, the provision of massive information technology infrastructure risks becoming a wasted investment, as it fails to create real added value for individuals trapped in information poverty.

The Role of Functional Digital Literacy and Economy in Promoting Inclusion (SDG 1 & 8)

The specific role of digital literacy in optimizing the achievement of SDGs is primarily thru its function as a functional bridge connecting individuals with economic opportunities provided by digitalization, especially those related to SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth). This mechanism is primarily focused on digital financial inclusion. Patra et al., (2025) in their systematic review, concluded that digital financial literacy should be viewed as a necessary prerequisite for society to effectively use digital financial services (FinTech) (Patra et al., 2025). the availability of smartphones and internet connections (addressing the first stage of the digital divide) becomes meaningless if individuals do not possess the functional skills to operate FinTech applications for transactions, saving, or investing. In this context, digital literacy transforms the potential of technology into real economic behavior, thereby directly facilitating financial inclusion, which is key to sustainable economic growth (Alqirem et al., 2025).

More practically, functional digital literacy plays a mechanical role in transforming that potential into tangible results thru productivity. In the agrarian sector, for example, the functional

ability of farmers to operate smart farming technologies such as soil sensors and automatic irrigation has been proven to increase land productivity by up to 25% (Fajri, 2025). On a macro level, mastery of digital literacy enables rural communities to access inclusive financial services (digital inclusive finance), which impacts psychological empowerment as well as real income improvement (Liu et al., 2025). This shows that functional digital literacy is key to addressing the challenge of economic marginalization by providing instruments for communities to empower themselves independently.

More deeply, digital literacy encourages entrepreneurship and market participation. Shafira (2024) positions digital literacy as an inclusive development strategy designed to open new economic opportunities (Shafira, 2024). The empirical case study conducted by Nurfathiyah et al. (2024) shows how the digital literacy gap among ornamental plant farmers hinders their participation in e-commerce, but this gap can be bridged thru social media-based interventions and strengthening digital literacy (Nurfathiyah et al., 2024). This proves that digital literacy provides market capacity to marginalized groups, enabling them to transform from mere local producers to players in the vast digital market, and concretely supports the poverty alleviation targets mandated in the SDGs.

The author's analysis shows that functional digital literacy acts as a mitigation instrument against "opportunity poverty." The author argues that without functional skills, digital transformation in the economic sector is at risk of widening the gap. This is because marginalized groups will only position themselves as objects or consumers of technology, not as productive economic actors. The author synthesizes that the mitigation of information poverty here is not merely about the dissemination of market price data, but rather about empowering communities to manage that information into economic assets independently. This argument emphasizes that digital literacy intervention is a preventive mitigation strategy; it prevents small business operators from being isolated from the global supply chain and mitigates the risk of financial exclusion due to technical ignorance.

The connection of this point to the overarching title of the research lies in the acceleration of achieving SDG 1 and SDG 8. The author concludes that functional digital literacy is the driving force that transforms information into well-being. With the fulfillment of this literacy, the targets of poverty alleviation (SDG 1) and the creation of decent jobs (SDG 8) are no longer merely a top-down agenda from the government, but rather a bottom-up movement where the community has information resilience to build their own economic independence amidst the uncertainties of the digital economy.

Critical Digital Literacy: Building a Shield Against Digital Threats and Protecting SDG (SDG 16)

After information poverty is addressed at the level of access and functional utilization, a more complex and dangerous challenge emerges, namely the digital threat that has the potential to reverse SDG progress, which demands the dimension of Critical Digital Literacy. This specific role is crucial in the context of SDG 16 (Peace, Justice, and Strong Institutions). The increase in digital access must be accompanied by critical digital literacy as a protective shield against cyber risks. Critical literacy goes beyond technical skills as it encompasses a deep understanding of digital ethics and personal data protection. This is crucial for vulnerable groups such as teenagers to prevent cybercrimes like phishing and identity theft (Baihaqi, 2025).

The urgency of this protection is also evident in the implementation of digital welfare programs. Ahmad Haqqi Annazali (2025) explicitly highlights the risk of data exploitation faced by poor groups in the implementation of digital welfare programs in Indonesia. Amid the imbalance of information power, critical digital literacy becomes the only tool that vulnerable communities can use

to protect themselves from data misuse. In line with that, Oyedokun (2024) asserts that digital threats, including misinformation and cyberattacks, significantly disrupt efforts to achieve the SDGs (Oyedokun, 2024). Data security in this context is not just about individual privacy, but it is the foundation for peace in cyberspace.

The author argues that critical digital literacy is a form of "cognitive shield" that transforms mitigation from merely technical to strategic. The author synthesizes that if functional literacy opens the door to economic opportunities as described above, then critical literacy is the gatekeeper to ensure individuals do not fall into exploitation. The author's argument emphasizes two specific roles as follows: Therefore, the specific role of critical digital literacy is:

- a. **Realizing Individual Data Sovereignty:** Transforming passive individuals into smart and risk-aware users. The author views that mitigating data misuse is a prerequisite for ensuring that human dignity remains at the core of sustainable digital welfare, so that technology does not become a new tool of oppression for the information-poor.
- b. **Building resistance to disinformation:** providing analytical skills to verify sources, distinguish fact from fiction, and avoid the spread of hoaxes that can disrupt social, political stability, and even public health initiatives important for the SDGs. The author concludes that the ability to verify information is a preventive mitigation against hoaxes that can undermine economic, social, and political stability. Without this information resilience, public health initiatives and social justice, such as the goals of the SDGs, will be difficult to achieve due to the loss of public trust.

Institutional Digital Literacy: Strengthening the Education System and Partnerships (SDG 4, 10, & 17)

At the institutional level, digital literacy becomes the driving force behind the transformation of the education system and strategic partnerships that collectively optimize the achievement of the SDGs. Digital literacy is not just an individual skill, but a mechanism for institutional strengthening that connects the government, educational institutions, and society. Ramadani (2024) found that government initiatives aimed at improving digital literacy have made a significant contribution to enhancing public service standards, particularly in the health and education sectors (Ramadani, 2024). The integration of digital literacy into government policies strengthens cross-sector collaboration and ensures more transparent and efficient partnerships. This aligns with the SDG 17 agenda (Partnerships for the Goals), where digitally literate citizens can actively participate in digital feedback mechanisms and ensure the accountability of public institutions.

This transformation is also clearly evident in information-providing institutions such as libraries. In the era of Society 5.0, digital libraries play a central role as providers of democratic information access for the digital natives generation, which directly supports the creation of quality and inclusive education (Wahhaj et al., 2025). The role of librarians must also transform from mere collection managers to information analysts capable of managing public knowledge infrastructure to reduce access gaps (Nurhayati & Wijayanti, 2023). Libraries now not only address information poverty by providing resources but also actively become centers for digital literacy training that function as agents of social inclusion to meet the targets of SDG 4 and SDG 10 (Devi et al., 2024; Dhea et al., 2024).

Furthermore, to ensure the sustainability of this impact, digital literacy must be integrated as a core component of the education curriculum from the elementary level. This step is crucial to prepare the younger generation to face complex digital challenges while reducing the socio-

economic disparities underlying the digital divide (Devi et al., 2024; Dhea et al., 2024). The authors conclude that thru strong partnerships between the government, educational institutions, and libraries, institutional digital literacy becomes a collective means that ensures the social foundation for sustainable development is more inclusive. With the fulfillment of this institutional capacity, the mitigation of information poverty is no longer done partially, but rather becomes a systemic movement that accelerates the achievement of SDG 4, SDG 10, and SDG 17 in an integrated manner.

The author argues that this institutional transformation marks a paradigm shift in mitigating information poverty, from a charitable approach of merely providing access to an empowerment approach that is structural in nature. By integrating digital literacy into public policy and formal curricula, the state is actually building "information immunity" at the systemic level. The author synthesizes that the success of SDG 4, 10, and 17 greatly depends on the extent to which institutions like libraries and schools can position themselves not just as physical buildings, but as adaptive knowledge nerve centers to the dynamics of technology.

More deeply, the author emphasizes that without strengthening at the institutional level, advancements in digital technology risk becoming a "double-edged sword" that widens the gap for those who are not reached by the formal education system. Therefore, the author concludes that institutional digital literacy is the most crucial investment in soft infrastructure. This investment ensures that digitalization is not only enjoyed by a handful of information elites but also becomes an instrument of inclusion that guaranties the right to information for all layers of society, in line with the spirit of equitable sustainable development.

4. CONCLUSION

Based on the results of the analysis and synthesis of the literature, it can be concluded that digital literacy is an essential strategic competence for converting access to technology into inclusive and safe sustainable development impacts. This research shows that the role of digital literacy in mitigating information poverty operates hierarchically at three main levels. First, at the functional level, digital literacy is absolutely necessary to transform technological limitations into real economic opportunities, particularly in supporting digital financial inclusion aligned with the targets of SDG 1 and SDG 8. Second, at the critical level, digital literacy serves as a defense mechanism or "cognitive shield" against cyber threats and data exploitation, ensuring the sustainability of digital welfare programs in accordance with the mandate of SDG 16. Third, at the institutional level, digital literacy acts as a driver in strengthening education and public service systems thru strategic partnerships, directly optimizing the achievements of SDG 4, 10, and 17. Overall, mitigating information poverty thru strengthening digital literacy marks a paradigm shift from an approach that merely provides access assistance to one that empowers communities structurally. By building "information immunity" at the systemic level, digital literacy ensures that digitalization is not only enjoyed by a handful of information elites but also becomes an instrument of inclusion that guaranties the right to information for all layers of society to realize a more just and sustainable future.

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