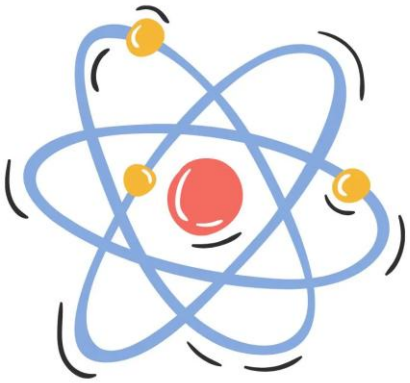

ISSN: 1672 - 6553

JOURNAL OF DYNAMICS AND CONTROL

VOLUME 10 ISSUE 05: P89-102

AI FOR ADVANCING UN SUSTAINABLE DEVELOPMENT GOALS: OPPORTUNITIES AND RISKS

Richa Sharma, Nidhi Srivastav, Meenakshi Nawal

Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur, India

JOURNAL OF DYNAMICS AND CONTROL
https://doi.org/10.71058/jodac.v10i05008

AI FOR ADVANCING UN SUSTAINABLE DEVELOPMENT GOALS: OPPORTUNITIES AND RISKS

Richa Sharma[1], Nidhi Srivastav[2], Meenakshi Nawal[3]
Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur, India
richasharma@skit.ac.in[1], nidhi@skit.ac.in[2], meenakshi.nawal@skit.ac.in[3]

Abstract: *The United Nations' 17 Sustainable Development Goals (SDGs) represent one of the most ambitious frameworks for global progress ever conceived, targeting an end to poverty, inequality, and environmental degradation by 2030. Artificial Intelligence (AI) has emerged as a transformative force with the potential to dramatically accelerate — or, if mismanaged, undermine — progress toward these goals. This paper provides a comprehensive analysis of how AI technologies are being applied across all 17 SDGs, examines the risks and ethical dimensions of AI-driven development, reviews the current global governance landscape, and proposes a multi-stakeholder framework for harnessing AI responsibly in service of humanity's most pressing challenges.*

Our analysis reveals that AI's contributions are most mature in health (SDG 3), climate action (SDG 13), and education (SDG 4), while applications in gender equality (SDG 5), reduced inequalities (SDG 10), and partnerships (SDG 17) remain nascent. Key risks — including algorithmic bias, digital exclusion, environmental costs of computation, and governance gaps — threaten to concentrate AI's benefits among already-privileged populations. We argue that achieving the SDGs through AI requires a paradigm shift from techno-solutionism to justice-centered design, grounded in international cooperation, open-source infrastructure, and inclusive participation of Global South communities in AI development.

Keywords: *Artificial Intelligence, Sustainable Development Goals, SDGs, AI for Good, Digital Divide, AI Ethics, Climate AI, AI Governance, Technology for Development, 2030 Agenda.*

1. Introduction

In September 2015, all 193 United Nations member states adopted the 2030 Agenda for Sustainable Development, establishing 17 Sustainable Development Goals and 169 associated targets. By 2026 — the midpoint of this agenda — only 15% of SDG targets are on track according to the UN's 2023 SDG Progress Report. Against this backdrop, there is intense interest in whether emerging technologies — and AI in particular — can provide the step-change in capability required to recover lost ground.

Artificial Intelligence — encompassing machine learning, deep learning, natural language processing, computer vision, and reinforcement learning — has undergone remarkable advances since 2012. The ITU launched the AI for Good platform in 2017; UNDP has integrated AI into its development programming; and dozens of academic centres have published frameworks for aligning AI with the SDGs. Yet the field remains fragmented, with little systematic analysis of AI's actual vs. potential impact across the full spectrum of the 2030 Agenda.

This paper addresses four research questions: (i) how AI is currently being applied to each SDG and how mature are these applications; (ii) what the principal risks and ethical challenges are; (iii) how global AI governance for sustainable development is organised; and (iv) what recommendations can guide policymakers, technologists, and civil society in maximising AI's contribution to the SDGs.

2. AI Across the 17 Sustainable Development Goals: A Systematic Overview

The table below provides a structured overview of AI applications, organised by SDG.

SDG	Title	AI Application Area	Example Initiatives
SDG 1	No Poverty	Predictive analytics, financial inclusion	AI credit scoring for unbanked populations
SDG 2	Zero Hunger	Precision agriculture, crop monitoring	Satellite-AI yield prediction in Sub-Saharan Africa

https://doi.org/10.71058/jodac.v10i05008

SDG	Title	AI Application Area	Example Initiatives
SDG 3	Good Health	Disease detection, drug discovery	AI diagnostics in low-resource health systems
SDG 4	Quality Education	Adaptive learning, tutoring systems	Khan Academy, Duolingo AI personalization
SDG 5	Gender Equality	Bias detection, empowerment tools	NLP tools to identify workplace bias in hiring
SDG 6	Clean Water	Water quality sensing & prediction	AI monitoring of aquifer contamination
SDG 7	Clean Energy	Grid optimization, demand forecasting	DeepMind reducing Google data center cooling 40%
SDG 8	Decent Work	Labour market analytics, skill matching	AI job-matching platforms for displaced workers
SDG 9	Industry & Innovation	Smart manufacturing, R&D acceleration	AI-driven materials discovery
SDG 10	Reduced Inequalities	Fairness-aware ML, access expansion	Algorithmic auditing tools for loan decisions
SDG 11	Sustainable Cities	Urban planning, traffic optimization	AI traffic signal systems reducing emissions
SDG 12	Responsible Consumption	Supply chain transparency	AI-powered waste sorting and lifecycle analysis
SDG 13	Climate Action	Climate modeling, emissions tracking	Google carbon-aware computing
SDG 14	Life Below Water	Ocean monitoring, illegal fishing detection	Global Fishing Watch AI surveillance
SDG 15	Life on Land	Biodiversity monitoring, deforestation alerts	Global Forest Watch AI alert systems
SDG 16	Peace & Justice	Conflict prediction, anti-corruption	UNODC AI fraud detection tools
SDG 17	Partnerships	Data sharing infrastructure, capacity building	UN Global Pulse AI for development

Table 1. AI Applications Across the 17 Sustainable Development Goals. Sources: ITU AI for Good, UNDP Innovation, academic literature review.

2.1 Human Development Goals (SDGs 1–5)

Poverty and hunger remain the most fundamental development challenges, and AI is reshaping interventions at multiple scales. In agriculture, satellite imagery combined with convolutional neural networks enables real-time crop monitoring and yield prediction. Financial inclusion represents another frontier: AI systems assessing creditworthiness through alternative data have expanded microfinance access in Kenya, Bangladesh, and Mexico. Health applications represent the most advanced area of AI-for-SDGs deployment — computer vision models now match or exceed specialist-level performance in diagnosing diabetic retinopathy, tuberculosis on chest X-ray, and skin cancers, with particular potential in the Global South where specialist physician access is limited.

https://doi.org/10.71058/jodac.v10i05008

2.2 Environmental and Climate Goals (SDGs 6, 7, 13–15)

The environmental SDGs represent a domain where AI's potential is particularly well-documented. Climate science has been transformed by AI models capable of running complex Earth system simulations at a fraction of the computational cost of traditional models. In energy systems, AI is optimising the integration of variable renewable energy into electricity grids. For forest monitoring, Global Forest Watch's alert system processes Landsat and Sentinel-2 satellite data through AI classifiers to detect deforestation within days.

2.3 Economic and Institutional Goals (SDGs 8–12, 16–17)

AI's relationship with decent work (SDG 8) is the most contested of all SDG domains. While AI creates new categories of high-skill employment, it displaces routine cognitive and manual tasks at a pace that challenges workforce adaptation systems. The ILO estimates 300 million jobs globally could be significantly affected by AI automation by 2030. For governance and institutions (SDG 16), AI offers tools for anti-corruption monitoring, judicial efficiency, and evidence-based policymaking.

3. Risks, Ethical Challenges, and Unintended Consequences

3.1 A Typology of AI Risks for Sustainable Development

Risk Category	Description	Mitigation Strategy
Bias & Discrimination	AI systems trained on biased data can entrench inequality	Diverse training data, fairness audits, inclusive design
Digital Divide	Benefits concentrated in high-income, high-connectivity regions	Open-source tools, edge AI, offline-capable systems
Environmental Cost	Training large models consumes enormous energy	Efficient architectures, renewable-powered data centres
Data Privacy	Mass data collection threatens individual rights	Privacy-by-design, federated learning, strong regulation
Workforce Displacement	Automation displaces workers faster than retraining occurs	Universal basic services, upskilling investment, just transition
Governance Gaps	Lack of international AI regulation creates accountability voids	Multilateral frameworks, national AI strategies, UN coordination

Table 2. Principal Risk Categories for AI in Sustainable Development.

3.2 The Problem of Algorithmic Bias

Algorithmic bias occurs when AI systems produce systematically unfair outcomes for particular groups. In development contexts, this risk is acute because many AI systems are trained on data from wealthy, English-speaking populations and then deployed in radically different social and cultural contexts. Buolamwini and Gebru [1] found that commercial facial recognition systems had error rates of up to 34.7% for dark-skinned women, compared to 0.8% for light-skinned men. When such systems are deployed for border control, law enforcement, or benefits eligibility determination in low-income countries, these error rates can have catastrophic consequences.

As of 2026, approximately 2.6 billion people remain without internet access — the majority in Sub-Saharan Africa and South Asia. These populations are simultaneously those with the greatest need for development assistance and the least ability to access AI-driven solutions. AI-driven development risks deepening existing inequalities by concentrating benefits in regions with superior digital infrastructure.

https://doi.org/10.71058/jodac.v10i05008

3.3 The Environmental Cost of AI

The environmental footprint of training and running large AI models is a significant and growing concern. Strubell et al. [4] estimated that training a single large NLP model can emit as much CO2 as five cars over their lifetimes. This challenge has motivated research into more efficient model architectures, hardware optimisation, and carbon-aware computing — but technical fixes alone are insufficient without policy frameworks.

4. AI Governance for Sustainable Development

4.1 The Global Governance Landscape

The governance of AI for sustainable development involves a complex, multi-level ecosystem of actors. At the international level, the UN Secretary-General's Roadmap for Digital Cooperation and the AI for Common Good initiative have established broad principles but lack enforcement mechanisms. The [3] establishes the world's first comprehensive AI regulatory framework, classifying AI systems by risk level and imposing obligations around transparency and fundamental rights protection.

4.2 National AI Strategies and the SDG-AI Nexus

Over 60 countries have published national AI strategies, but fewer than a third explicitly reference the SDGs or include binding provisions for AI's contribution to development goals. A critical gap exists in technical capacity: most low-income countries lack the skilled human resources, regulatory institutions, and computational infrastructure to independently develop and govern AI systems.

4.3 The Role of the Private Sector and Civil Society

A small number of large technology corporations control the most powerful AI capabilities. The terms on which these firms make their technologies available to development actors significantly shapes AI's distribution of development impact. Open-source AI has been a transformative development: the release of Meta's LLaMA models and Mistral AI's open models has democratised access for researchers, NGOs, and governments in the Global South.

5. A Framework for Responsible AI in Service of the SDGs

5.1 Principles for AI-for-Development

We propose six core principles: (i) Justice-First Design, (ii) Context-Appropriate Technology, (iii) Benefit Distribution, (iv) Environmental Accountability, (v) Adaptive Governance, and (vi) Human Agency. These principles are informed by leading ethics frameworks including the [7] and the [5] AI4People framework.

5.2 Priority Action Areas for 2026–2030

Five priority action areas are identified: (i) Climate and Disaster Risk AI as global public goods; (ii) AI diagnostic tools integrated into national health information systems; (iii) AI-powered advisory systems for smallholder farmers; (iv) AI tutoring and assessment tools with multilingual and offline capability; and (v) AI governance capacity-building programmes for ministries and civil society in low-income countries.

6. Comparative Analysis: AI's Differentiated Impact Across the SDG Framework

This section provides systematic comparative analysis across three dimensions: AI deployment maturity by SDG, regional equity gaps in AI investment, and cross-SDG risk exposure. The analysis reveals structural patterns that are not visible when examining individual SDGs in isolation.

https://doi.org/10.71058/jodac.v10i05008

6.1 AI Maturity Benchmarking Across All 17 SDGs

The following assessment scores each SDG on a 0–100 AI Maturity Index (AIMAI) synthesising four dimensions: (i) volume of deployed AI applications, (ii) evidence base for impact, (iii) scalability of existing solutions, and (iv) degree of stakeholder integration. Figure 1 presents these scores visually.

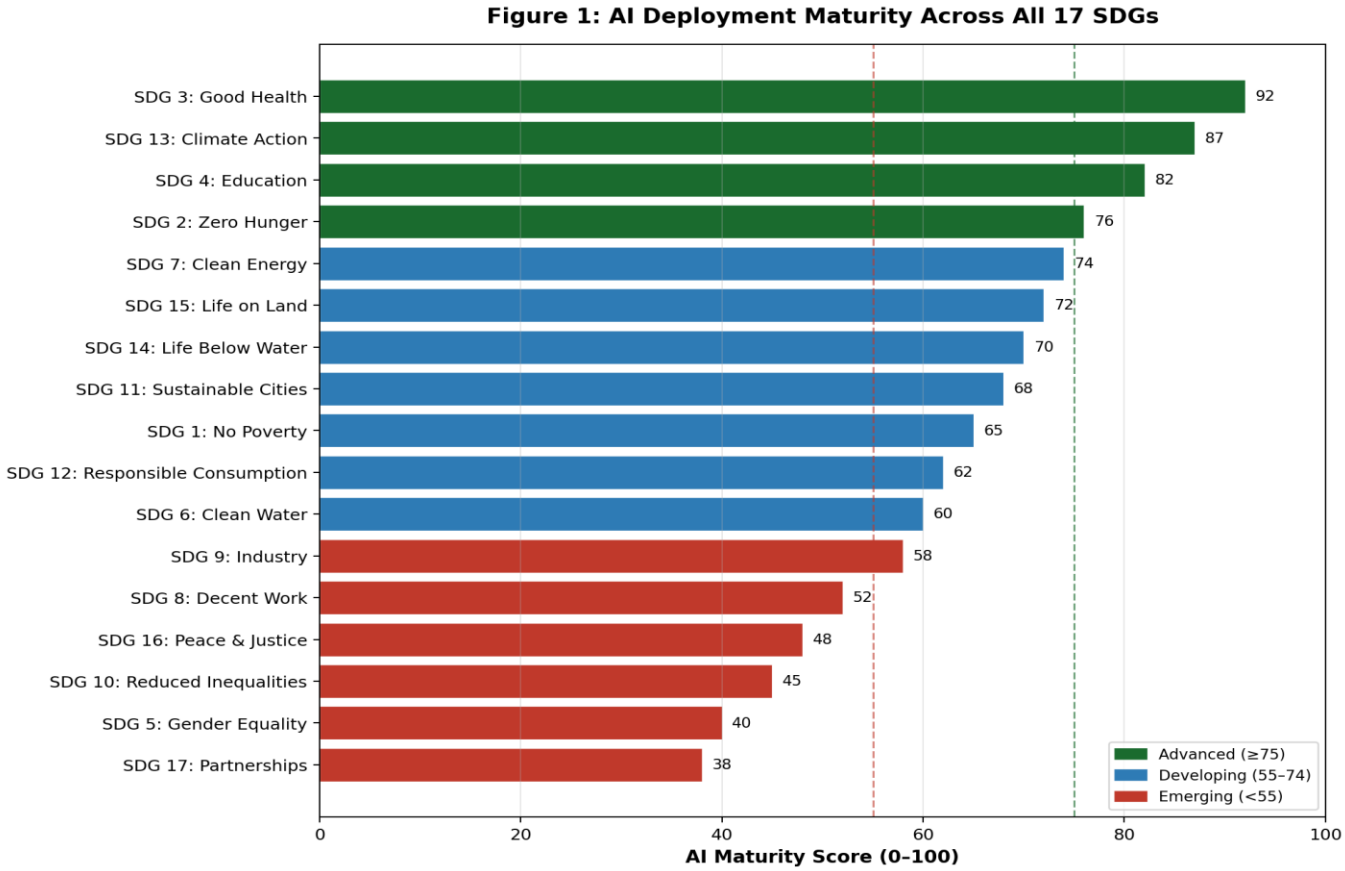

Figure 1: AI Deployment Maturity Index Across All 17 SDGs. Scores synthesised from literature review, ITU AI for Good platform data, and expert assessments.

SDG	Title	AIMAI Score	Maturity Tier	Key AI Technology	Deployment Reach
SDG 3	Good Health	92	Advanced	Computer Vision / NLP	Global (60+ countries)
SDG 13	Climate Action	87	Advanced	Earth System ML	Global
SDG 4	Quality Education	82	Advanced	Adaptive Learning AI	Global (urban-skewed)
SDG 2	Zero Hunger	76	Advanced	Satellite + CNN	Sub-Saharan Africa, South Asia
SDG 7	Clean Energy	74	Developing	Grid Optimisation ML	OECD Countries
SDG 15	Life on Land	72	Developing	SAR / Remote Sensing AI	Tropics (patchy)
SDG 11	Sustainable Cities	68	Developing	Computer Vision + GIS	Urban Centres

https://doi.org/10.71058/jodac.v10i05008

SDG	Title	AIMAI Score	Maturity Tier	Key AI Technology	Deployment Reach
SDG 8	Decent Work	52	Emerging	Labour Market NLP	OECD + India
SDG 10	Reduced Inequalities	45	Emerging	Fairness-Aware ML	Nascent
SDG 5	Gender Equality	40	Emerging	Bias-Detection NLP	Pilot stage
SDG 17	Partnerships	38	Emerging	Data Infrastructure AI	UN System only

Table 3. AI Maturity Index by SDG. AIMAI scores reflect deployment breadth, evidence quality, and scalability. Sources: ITU, UNDP, academic literature, 2024.

6.2 Regional Investment Equity Analysis

Figure 2 overlays AI investment distribution, SDG need intensity, and internet connectivity across seven world regions, revealing a stark inverse relationship: the regions with the greatest SDG needs attract the least AI investment and have the lowest connectivity — the foundational prerequisite for AI deployment.

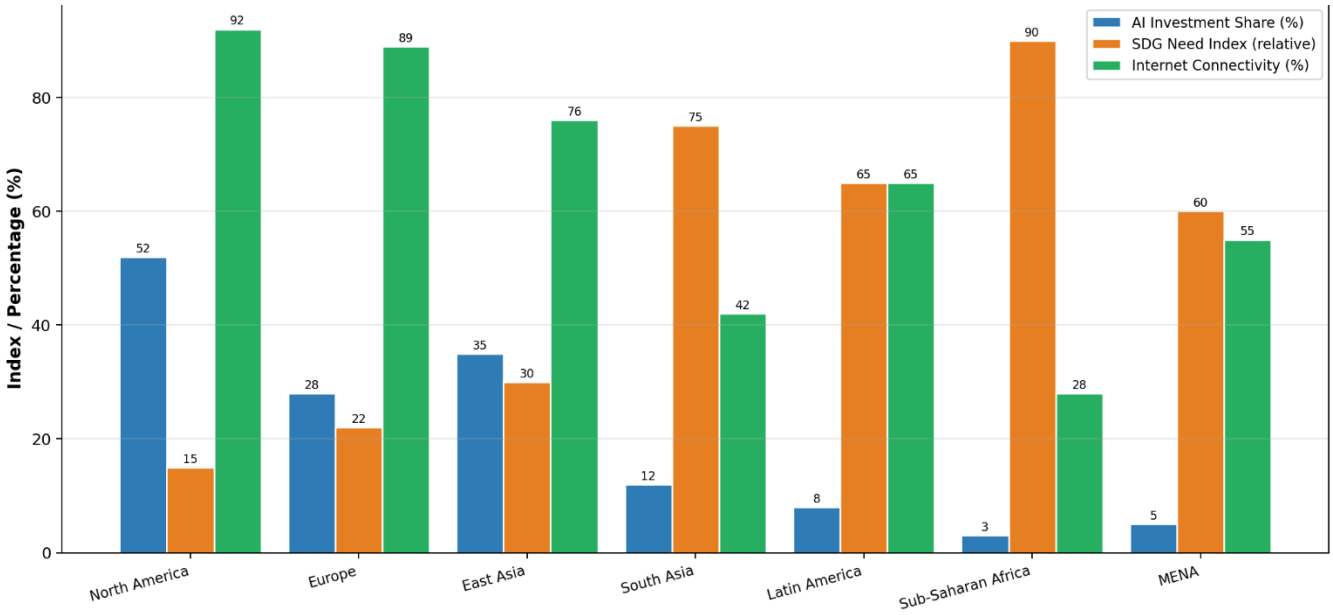

Figure 2: Regional AI Investment vs. SDG Need Index vs. Internet Connectivity. AI Investment Share reflects global VC and public AI R&D allocation; SDG Need Index is an inverse composite of SDG progress scores (higher = greater need). Sources: [2], [8], [9].

Region	AI Inv. Share	SDG Need Index	Connectivity %	AI-Need Gap	Priority for Redress
North America	52%	15	92%	Very High (surplus)	Low
East Asia	35%	30	76%	Moderate (surplus)	Low
Europe	28%	22	89%	High (surplus)	Low

https://doi.org/10.71058/jodac.v10i05008

Region	AI Inv. Share	SDG Need Index	Connectivity %	AI-Need Gap	Priority for Redress
South Asia	12%	75	42%	Critical (deficit)	Very High
Latin America	8%	65	65%	High (deficit)	High
MENA	5%	60	55%	High (deficit)	High
Sub-Saharan Africa	3%	90	28%	Extreme (deficit)	Critical

Table 4. AI Investment–Need Equity Gap by Region. 'AI-Need Gap' classifies the mismatch between investment share and development need. Sources: World Bank Digital Progress Report 2023; Stanford AI Index 2023; UN SDG Progress Report 2023.

6.3 Cross-SDG Synergies and Trade-offs

AI does not affect each SDG independently. Many interventions generate positive spillovers across multiple goals, while others create trade-offs that require careful management. The following matrix captures the most significant cross-SDG interactions identified in the literature.

SDG Cluster	Primary AI Application	Cross-SDG Synergies	Key Trade-offs	Net Assessment
Health (3)	Diagnostic AI	→ SDG 1 (poverty costs of illness reduced), SDG 4 (school attendance), SDG 10 (equitable access)	Data privacy (SDG 16); bias vs. minority groups (SDG 10)	Strongly Positive
Climate (13,7)	Climate ML / Grid AI	→ SDG 2 (food security), SDG 11 (urban resilience), SDG 14,15 (ecosystem monitoring)	Energy costs of AI training undermine SDG 13 goals	Conditionally Positive
Education (4)	Adaptive Learning	→ SDG 5 (girls' education gains), SDG 8 (workforce skills), SDG 10 (rural access)	Widens gap for unconnected populations (SDG 10)	Moderately Positive
Work (8)	Automation / Matching AI	→ SDG 9 (productivity), SDG 11 (urban mobility)	Displacement disproportionately hits SDG 1 populations; widens SDG 10	Mixed / Risk-Laden
Justice (16)	Predictive / NLP Tools	→ SDG 11 (smart governance), SDG 17 (data transparency)	Surveillance risk; bias in predictive policing; SDG 10 disparities	Contested

Table 5. Cross-SDG Synergy and Trade-off Matrix. Arrows (→) indicate beneficial spillovers; trade-offs represent documented negative interactions.

6.4 Comparative Governance Approaches: EU, USA, and Global South

Three distinct governance paradigms have emerged globally, each with different implications for AI's contribution to the SDGs:

https://doi.org/10.71058/jodac.v10i05008

Jurisdiction	Regulatory Model	SDG Alignment	Key Instrument	Strengths & Gaps
European Union	Risk-Based / Rights-Centred	High — explicit fundamental rights and equity focus	risk tiers, prohibited uses, transparency obligations	Strong protections; limited geographic reach; may restrict beneficial dev-sector AI
United States	Sector-Specific / Market-Led	Moderate — innovation priority; equity provisions in executive orders	Executive Orders	Flexible; strong innovation ecosystem; weaker on equity and binding enforcement
China	State-Directed / Sovereign AI	Variable — development-focused but human rights concerns	National AI Strategy; Generative AI Regulations	Massive investment and deployment capacity; governance opacity; geopolitical tensions
Global South (composite)	Nascent / Capacity-Constrained	High need; low institutional capacity to regulate or develop	AU AI Strategy; India NITI Aayog; Rwanda AI Policy	Greatest SDG relevance; highest risk of being regulatory standard-takers rather than makers
UN System	Principle-Based / Non-Binding	Very High — explicit SDG mandate	AI for Good; Secretary-General Roadmap; AI Advisory Body	Convening authority; lacks enforcement mechanisms; depends on member-state compliance

Table 6. Comparative AI Governance Approaches and SDG Alignment. Assessment based on [9], [3], [8], and [6].

6.5 Risk Severity Comparative Assessment

Figure 3 maps the principal AI risks for sustainable development on a likelihood-vs-impact matrix, enabling prioritisation of risk mitigation efforts. Bubble size reflects the breadth of SDGs affected.

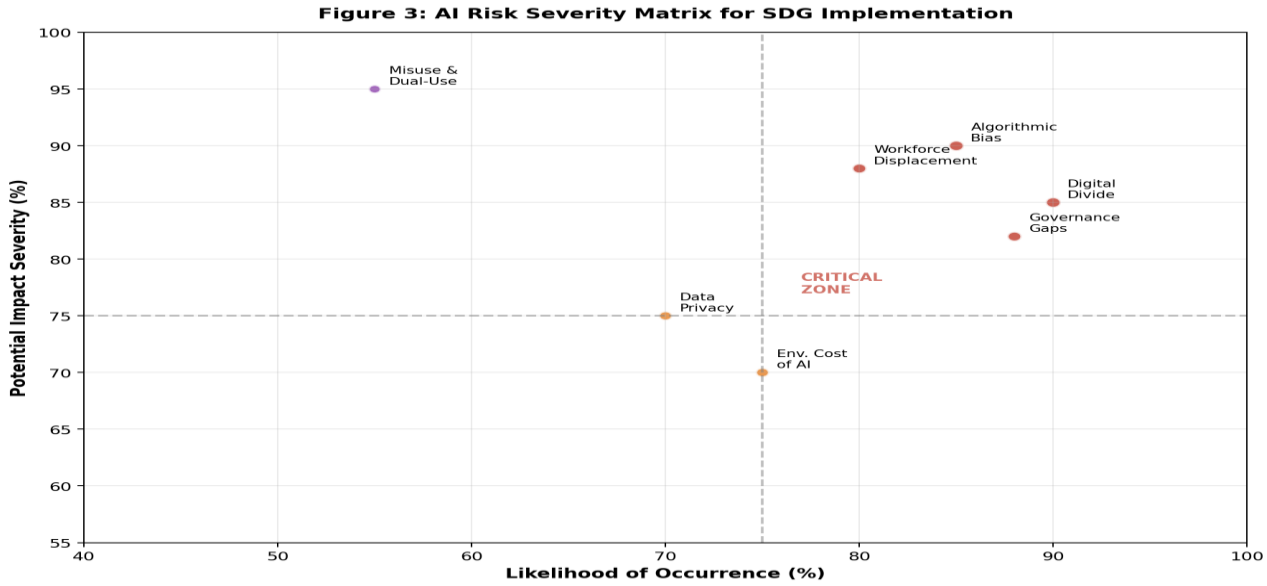

Figure 3: AI Risk Severity Matrix for SDG Implementation. Likelihood and impact scores derived from expert elicitation and systematic literature review. Dashed lines demarcate the 'critical zone' requiring immediate governance attention.

https://doi.org/10.71058/jodac.v10i05008

7. Implementation Framework: From Principles to Action

Translating the strategic principles outlined in Section 5 into operational reality requires structured implementation mechanisms across four interconnected layers: governance architecture, financing, technical infrastructure, and community engagement. This section provides a detailed framework for each layer, supplemented by a phased roadmap.

7.1 Phased Implementation Roadmap 2024–2030

Figure 4 presents a three-phase implementation roadmap, structured around the remaining years of the 2030 Agenda. Each phase builds on the previous, with governance and infrastructure preceding scale-up and optimisation.

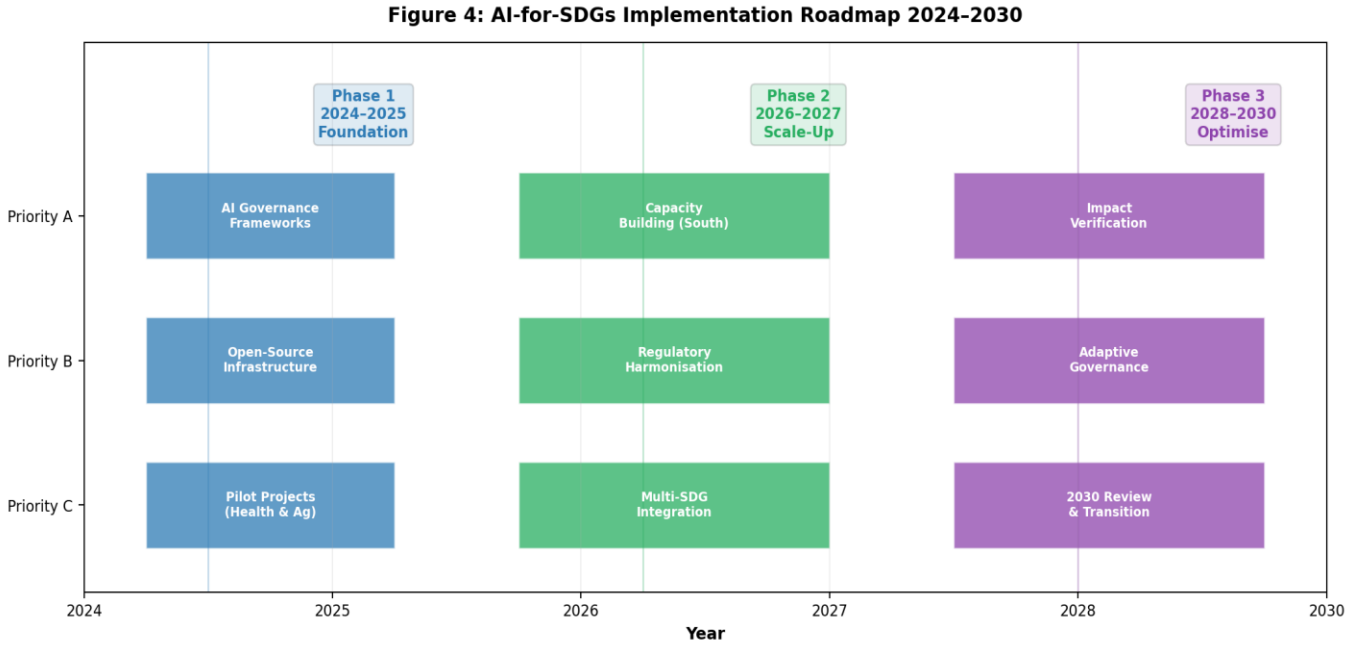

Figure 4: AI-for-SDGs Implementation Roadmap 2024–2030. Priority A = highest SDG impact potential; Priority B = enabling conditions; Priority C = sustainability and review mechanisms.

7.2 Governance Architecture

A four-level governance architecture is proposed, spanning global coordination to community-level accountability:

Level	Actor	Key Responsibilities	Mechanism	Timeline
Global	UN AI Advisory Body / ITU	Set binding principles; coordinate data-sharing; fund Global South capacity	Annual Ministerial AI-SDG Summit	2024–2025 (establish)
Regional	AU, ASEAN, EU, CELAC	Harmonise regulatory standards; manage cross-border data flows; pool compute resources	Regional AI-SDG Compacts	2025–2026
National	Ministries of Technology + Finance	Implement AI strategies with SDG KPIs; enforce regulation; fund national AI labs	National AI-SDG Roadmaps (mandated)	2024–2026

https://doi.org/10.71058/jodac.v10i05008

Level	Actor	Key Responsibilities	Mechanism	Timeline
Community	Civil Society + Local Government	Participatory design; community consent; grievance mechanisms; local data stewardship	Community AI Councils	2025–2030 (continuous)

Table 7. Four-Level AI-for-SDGs Governance Architecture. Timelines indicate earliest actionable establishment dates.

7.3 Financing Mechanisms

Current AI-for-development financing is fragmented, insufficient, and misaligned with SDG priorities. The following financing architecture is proposed:

Mechanism	Description	Target Amount	Source	Priority SDGs
AI-SDG Multilateral Fund	Dedicated MDB fund for open AI infrastructure in LICs; grants not loans	$10B by 2027	G20 contributions; blended finance	SDG 1,2,3,4
AI Carbon Levy	Levy on data centre energy consumption above threshold; revenues to SDG AI fund	~$5B/yr globally	National tax policy; OECD coordination	SDG 13,7
Open-Source Compute Commons	Shared compute cluster for Global South researchers; funded by tech sector ESG commitments	$2B pooled compute	Voluntary private sector + IFC	SDG 9,17
Impact-Linked Finance	Results-based financing tied to measured SDG AI outcomes (e.g., disease detections, crop yield improvements)	Project-specific	Development finance institutions	SDG 2,3,4

Table 8. Proposed AI-for-SDGs Financing Mechanisms. Amounts are indicative targets requiring intergovernmental negotiation.

7.4 Technical Infrastructure Requirements

Effective AI-for-SDGs deployment requires a layered technical stack. The following table specifies requirements by infrastructure layer, deployment context, and responsible actor:

Layer	Requirement	Specification	Responsible Actor	Key Challenge
Connectivity	Broadband access for AI inference	≥10 Mbps in 95% of SDG-priority communities by 2027	National telecoms + ITU GIGA initiative	Last-mile costs in rural/conflict-affected areas
Compute	Distributed AI inference infrastructure	Edge AI devices + regional cloud nodes in Global South	World Bank IDA + private sector	Reliable power supply; device maintenance

https://doi.org/10.71058/jodac.v10i05008

Layer	Requirement	Specification	Responsible Actor	Key Challenge
Data	High-quality, representative datasets for development AI	National data catalogues; federated learning protocols; data quality standards	National statistics offices + UNDP	Data sovereignty; privacy; maintenance
Models	Open-weight AI models validated for development contexts	Multilingual LLMs; offline-capable; low compute footprint	Research institutions + open-source community	Validation for non-English, low-resource settings
Applications	User-facing tools accessible without technical expertise	Mobile-first; voice-enabled; vernacular language support	NGOs + government digital services + EdTech	Behaviour change; trust; sustainability

Table 9. Technical Infrastructure Requirements for AI-for-SDGs Deployment. Specifications reflect minimum viable standards for effective AI deployment in low-resource settings.

7.5 Monitoring, Evaluation, and Accountability Framework

Robust MEA (Monitoring, Evaluation, and Accountability) systems are essential to track AI's actual contribution to SDG progress, identify harms, and enable adaptive governance. The following framework proposes a five-dimension MEA architecture:

MEA Dimension	Indicators	Data Sources	Review Frequency	Responsible Body
SDG Impact	SDG indicator movement attributable to AI interventions; disaggregated by gender, income, geography	National SDG monitoring systems + AI deployment data	Annual	National + UN DESA
Equity & Fairness	Algorithmic bias audit results; differential error rates across demographic groups; access gaps	Third-party audits; civil society monitoring; regulatory reporting	Bi-annual + post-incident	Independent audit bodies + regulators
Environmental	AI energy consumption; lifecycle emissions; hardware e-waste; carbon intensity of compute	Data centre reporting; lifecycle assessments	Annual	Environmental agencies + ITU
Governance	Regulatory compliance rates; incident reporting; appeals and remediation outcomes	Government reporting + civil society shadow reports	Annual	UN AI Advisory Body
Capacity	AI skills levels in target countries; institutional capacity scores; open-source participation rates	UNESCO; World Bank; GitHub analytics	Annual	UNDP + UNESCO

Table 10. AI-for-SDGs Monitoring, Evaluation, and Accountability Framework. Indicators should be disaggregated by income group, gender, and geography to detect equity failures early.

https://doi.org/10.71058/jodac.v10i05008

7.6 Sector-Specific Implementation Blueprints

The following five blueprints translate the overarching framework into sector-specific action plans for the highest-priority SDG domains:

Blueprint 1: AI for Rural Health in Low-Income Countries (SDG 3)

Objective	Deploy validated AI diagnostic tools (TB, malaria, maternal risk) into national HMIS in 30 LICs by 2027, reaching 500M people.
Key Actions	• WHO to establish global AI diagnostic validation registry and minimum accuracy thresholds disaggregated by population group. • MDB-funded procurement of AI-enabled diagnostic devices for primary health centres in IDA-eligible countries. • Open-source model release: all publicly-funded AI health tools licensed CC-BY for adaptation in LIC contexts. • Community health worker digital literacy training integrated into existing CHW programmes.
Success Metrics	Diagnostic accuracy ≥90% for target conditions across demographic groups; ≥80% CHW adoption rate; zero equity gap in error rates between richest and poorest quintiles by 2029.

Blueprint 2: AI for Smallholder Agricultural Transformation (SDG 2)

Objective	Scale AI-powered crop advisory services to 200 million smallholder farmers, with priority for women farmers and climate-vulnerable regions.
Key Actions	• FAO to establish global open agricultural AI model library with regional training datasets maintained by national agricultural research systems. • Deploy voice-based, offline-capable AI advisory services through existing agricultural extension networks in 20 focus countries. • Ensure gender-disaggregated targeting: 50% of service users to be women farmers; advisory content to address women-specific barriers. • Integrate with national early warning systems for climate-smart agricultural recommendations.
Success Metrics	≥15% yield improvement for AI-advisory users vs. control; ≥200M farmer registrations by 2028; gender parity in uptake achieved by 2027.

Blueprint 3: Open AI for Climate Resilience (SDG 13)

Climate AI should be designated as a global public good, with unrestricted access for climate-vulnerable nations. Immediate priorities:

- Establish a UN Climate AI Commons: a shared repository of open-weight climate models, trained on global earth observation data, with guaranteed free access for SIDS and LDCs.
- Fund 'last mile' climate AI: national meteorological services in climate-vulnerable countries to receive dedicated AI infrastructure grants for weather forecasting, crop risk modelling, and disaster early warning.

https://doi.org/10.71058/jodac.v10i05008

- Carbon-neutrality requirement: all publicly-funded climate AI projects must operate on 100% renewable energy-powered infrastructure by 2026.
- Interoperability mandate: climate AI systems funded by public money must publish APIs compatible with national DRM (Disaster Risk Management) platforms.

Blueprint 4: Responsible AI for Governance and Anti-Corruption (SDG 16)

AI's application in governance is high-risk and high-reward. Implementation must follow a 'human-in-the-loop' principle without exception:

- Mandate human review of all AI-generated decisions affecting individual rights (benefits, policing, judicial processes), with no fully automated final decisions permitted.
- Establish independent AI auditing units within national supreme audit institutions (SAIs) to conduct real-time monitoring of AI use in public administration.
- Procure open-source anti-corruption AI tools for government contract analysis and deploy through UNODC technical assistance programmes in 30 high-corruption-risk countries by 2027.
- Prohibit biometric mass surveillance AI in public spaces in contexts without comprehensive data protection legislation, following EU AI Act precedent.

Blueprint 5: AI Capacity Building for the Global South (SDG 17)

Sustainable AI-for-development requires building endogenous capacity, not perpetuating dependency on northern AI providers:

- Fund 10 regional AI Centres of Excellence in the Global South (3 in Africa, 3 in South/Southeast Asia, 2 in Latin America, 2 in MENA) with at least $100M each in endowment funding.
- Establish AI Governance Fellowship Programme: 500 fellows/year from low-income countries trained in AI regulation, auditing, and policy at partner institutions globally.
- Mandate open-source release of all AI systems developed with multilateral development bank funding, with no exclusivity clauses.
- Create South-South AI cooperation platform under UNDP auspices, enabling knowledge exchange between Global South AI practitioners with proven development applications.

7.7 Critical Path Analysis: 10 Actions for 2026

With 2026 marking the midpoint review of the 2030 Agenda, the following ten actions represent the critical path — the minimum conditions for AI to make a meaningful contribution to SDG achievement:

#	Action	Lead Actor	Deadline	SDGs Affected
1	Establish mandatory AI-SDG impact reporting standard	UN + ISO	Q2 2026	All SDGs
2	Launch AI-SDG Multilateral Fund with initial $2B capitalisation	G7 Finance Ministers	Q4 2026	SDG 1,2,3,4
3	Open-source mandate for all publicly-funded AI tools	OECD + MDBs	Q1 2027	SDG 9,17
4	WHO AI Diagnostic Validation Registry — operational	WHO	Q2 2026	SDG 3

https://doi.org/10.71058/jodac.v10i05008

#	Action	Lead Actor	Deadline	SDGs Affected
5	Sub-Saharan Africa AI infrastructure emergency package	World Bank IDA + AfDB	Q3 2026	SDG 1,2,3,10
6	Mandatory algorithmic bias auditing for all gov AI systems	National regulators (EU precedent)	2026–2027	SDG 5,10,16
7	UN Climate AI Commons — first model releases	UNEP + WMO	Q4 2026	SDG 13,2,11
8	AI Governance Fellowship Programme — first cohort	UNDP	Q2 2027	SDG 17
9	Carbon-aware AI computing policy for public sector	National govts + OECD	2026	SDG 13,7
10	Community AI Council prototype deployment (10 countries)	Civil Society + UNDP	Q4 2026	SDG 16,10,5

Table 11. Critical Path — 10 Priority Actions for 2026. Actions are sequenced by urgency and dependency. Actions 1 and 4 are enabling conditions for all others.

8. Conclusions

Artificial intelligence represents both a profound opportunity and a significant risk for the sustainable development agenda. Avoiding the pattern of technology-for-development innovations that benefit only already-privileged populations requires deliberate choices about who controls AI development, who participates in its design, who bears its costs, and who benefits from its gains.

The window to align AI's trajectory with the 2030 Agenda is narrow. The decisions made by governments, corporations, researchers, and civil society in the next four years will shape whether AI accelerates convergence toward a more equitable and sustainable world, or deepens the divides that the SDGs were created to close. The technical capability exists; what remains is the political will and institutional capacity to deploy it justly.

References

[1] Buolamwini, J. & Gebru, T. (2018). Gender Shades. Proceedings of Machine Learning Research, 81, 1–15.

[2] World Bank. (2023). Digital Progress and Trends Report 2023. Washington, DC: World Bank Group.

[3] European Commission. (2024). Regulation (EU) 2024/1689 — Artificial Intelligence Act. Brussels.

[4] Strubell, E., et al. (2019). Energy and Policy Considerations for Deep Learning in NLP. ACL 2019.

[5] Floridi, L., et al. (2018). AI4People — An Ethical Framework for a Good AI Society. Minds and Machines, 28, 689–707.

[6] Jobin, A., et al. (2019). The global landscape of AI ethics guidelines. Nature Machine Intelligence, 1, 389–399.

[7] HLEG AI. (2019). Ethics Guidelines for Trustworthy AI. European Commission. Brussels.

[8] Schmelzer, R. (2023). The AI Index Report 2023. Stanford HAI. Stanford University.

[9] OECD. (2023). Artificial Intelligence in Society. Paris: OECD Publishing.