PNAI report **DRAFT version** for consultation, 19.9.2023

[Working title:] Strengthening multi stakeholder approach to global AI governance, Protecting the environment and Human Rights in the era of generative AI

– A report by the Policy Network on Artificial Intelligence

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1. Introduction

In the 21st century, artificial intelligence (AI)[1] is considered a key driver of social and economic development and its applications are transforming every walk of life. From smart homes and digital assistants to personalized learning or identifying medical conditions in CT-scans, AI is rapidly impacting our lives. If developed and deployed responsibly, AI can be used to for example deliver more effective government services tailored to the needs of citizens, by improving transport services, health services, and infrastructure. Powered by quality data, AI contributes to cutting-edge innovations that aid technological development across sectors. Applications of AI and their impact transcend national boundaries and national or local interests. AI is an essential tool in tackling the global challenges and accelerating the progress towards reaching the goals of the 2030 Agenda for Sustainable Development. AI can accelerate action aimed at improving social welfare, environmental stewardship and sustainable economic growth.

While AI technologies can be of great service to humanity and all countries can benefit from them, rapid technological advances and accelerated society-wide uptake of AI raise fundamental ethical concerns. For instance, biases embedded in AI systems can potentially result in AI systems that sustain and amplify existing unjust biases in our society, reinforce discrimination and enable new levels of authoritarian surveillance. Without decisive action and concerted interventions, AI could exacerbate discrimination, inequality, digital divides, exclusion and environmental harms, and deepen socioeconomic divides.

AI can be leveraged to analyze climate data, predict climate patterns, and optimize energy use, that can identify vulnerable regions, assess risks, and develop strategies for climate adaptation, for the most vulnerable. Paradoxically, the environmental impact of AI in the context of data storage, computation, and energy consumption, is a growing concern.

Responsible AI and robust data governance can support climate adaptation and resilience efforts; For example, robust data governance can facilitate high-value diverse datasets, including climate data, socioeconomic data, and infrastructure information, which requires that software, data, foundation models, standards, and other digital content that are freely or openly available to the public as digital public goods. Effective AI policy for the environment requires a fine balance between data governance that ensures high-value global datasets are accessible for responsible data usage to support public interest decision-making while reducing the environmental footprint of AI systems.

1 There is no universally approved definition for AI, for the purposes of this report the writers draw from the AI definition developed by the OECD and used for example by UNCTAD and UNESCAP, that stresses the ability of machines and systems to acquire and apply knowledge to carry out intelligent behaviour. See for example: UNESCAP, Artificial Intelligence in Asia and the Pacific (Accessed 5.9.2023)

AI technologies have a great potential to be beneficial to the environment and society. However, for these benefits to be realized, the potential harms should not be ignored but addressed.

It is vital to guide AI technologies, their development, uptake and use, in a responsible direction. Many countries, regions and international organizations have developed AI strategies, policies, recommendations, regulations and initiatives to maximize the benefits but also to manage the risks.[2] As AI's development and impact are global, international dialogue and joint action is needed. There is a need to continue developing, strengthening, sharing and implementing international recommendations, for example standard-setting developed through a comprehensive approach. These should place human dignity and human rights in the center and be grounded in gender equality, justice and mental well-being, diversity, interconnectedness, inclusiveness, and social and economic development - while also taking into account environmental and ecosystem protection.

The Policy Network on AI (PNAI) addresses policy matters related to AI and data governance.[3] It is a global multistakeholder effort hosted by the United Nations' (UN) Internet Governance Forum (IGF)[4], providing a platform for stakeholders and changemakers in the AI field to contribute their expertise, insights, and recommendations. The primary goal of the Policy Network is to foster dialogue and contribute to the global AI policy discourse.[5] This report is the first output document of the PNAI. It is not intended to be a comprehensive assessment or analysis of policy questions on AI and data governance. Rather, this first report develops analysis and recommendations to start a conversation. It delivers fresh suggestions from the global multistakeholder community, and paves way for the PNAI's future work on AI-enabled technologies.

Recognizing the opportunities and risks AI presents, the UN is promoting ethical development and application of AI and has for example committed to support AI-related capacity building for developing countries and broader stakeholder engagement on AI. The UN Secretary-General's Roadmap for Digital Cooperation presented in 2020 notes a gap in international coordination, collaboration and governance on AI, and calls for enhanced international multi-stakeholder efforts to ensure AI benefits all.[6] In July 2023, the UN Security Council discussed threats of AI to international peace and security for the first time. The Secretary-General announced the formation of a new high-level meeting on AI to assess options for global AI

[2] For national strategies see for example OECD.AI repository of AI policy initiatives: OECD.AI, National AI policies & strategies repository (Accessed 19.9.2023)
[3] IGF, Policy Network on Artificial Intelligence information webpage, Accessed 2.9.2023
[4] The IGF is a global multistakeholder platform that facilitates the discussion of public policy issues pertaining to Internet governance. For more information on see: IGF, IGF webpage, 2023
[5] PNAI, PNAI Work Plan, May 2023
[6] UN, Roadmap_for Digital_Cooperation, June 2020

governance, as well as issuing new recommendations on AI governance to the UN Member States.

PNAI's work and this report contribute to the UN's Global Digital Compact, a forthcoming agreement that focuses on the impact of digital technologies and their role in achieving the Sustainable Development Goals.[7] PNAI's recommendations and report will be presented and discussed at the 18th annual IGF meeting in Kyoto, Japan, in October 2023.

1.1. The IGF Policy Network on AI

PNAI work focuses on AI and related aspects of data governance. The policy network seeks to learn from and elevate AI governance frameworks, principles and policies being developed in and for the Majority World and Latinate languages, and to bring the IGF's multi-stakeholder community together, gather and synthesize knowledge in the community.[8] Participation in and contribution to PNAI are open to everyone. As a Policy Network under the IGF, PNAI seeks to build in-depth understanding of the topic, raise awareness and prompt cooperation across regions and stakeholder groups. The impact lies in the ability to facilitate discussion across stakeholder groups, facilitating a common understanding and inspiring and informing decision makers.[9] A Multi-stakeholder Working Group, consisting of experts, supports transforming the PNAI community's perspectives into actionable measures and recommendations.[10]

PNAI emerged from the request of the community: the Messages from the 2022 annual IGF meeting held in Addis Ababa conclude that the "IGF could be used as a platform for developing cooperation mechanisms on artificial intelligence. A policy network on artificial intelligence could be considered for the upcoming work streams in order to review the implementation of different principles with appropriate tools and metrics."[11] PNAI was launched in May 2023. The PNAI's work on AI and related aspects of data governance builds on previous discussions, reports, and the wealth of knowledge within the IGF community. Over the past years, the IGF has discussed topics including AI use by social media platforms and content moderation, dangers such as manipulation, deception and mis- and disinformation, transparency needs in the operation and reporting of algorithmic systems, and necessary principles of rule of law, human rights, democratic values and diversity in the governance of AI.[12]

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[7] UN, Our Common Agenda Policy Brief 5 A Global Digital Compact an Open, Free and Secure Digital Future for All, May 2023
[8] PNAI, PNAI Work Plan, May 2023
[9] IGF, About the Internet Governance Forum, 2023
[10] PNAI, PNAI Multi-stakeholder Working Group information website, 2023 (Accessed 8.8.2023)
[11] IGF, Addis Ababa IGF Messages, 2022
[12] For IGF publications and reports on past IGF activities, see IGF website

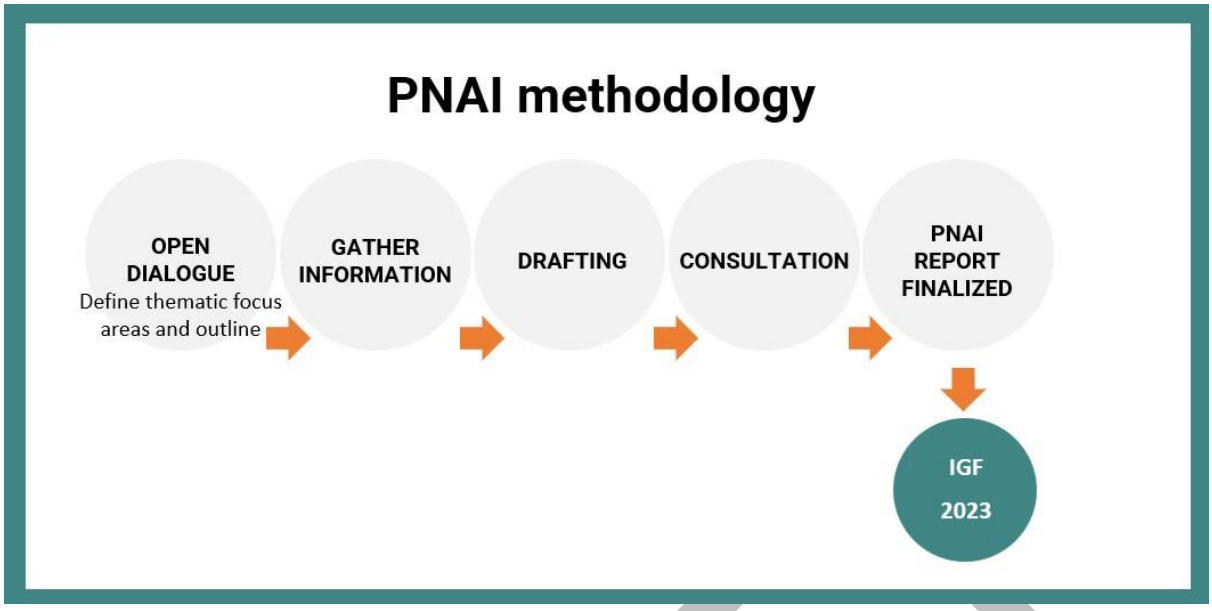
1.2. Multistakeholder process adopted to develop recommendations on AI

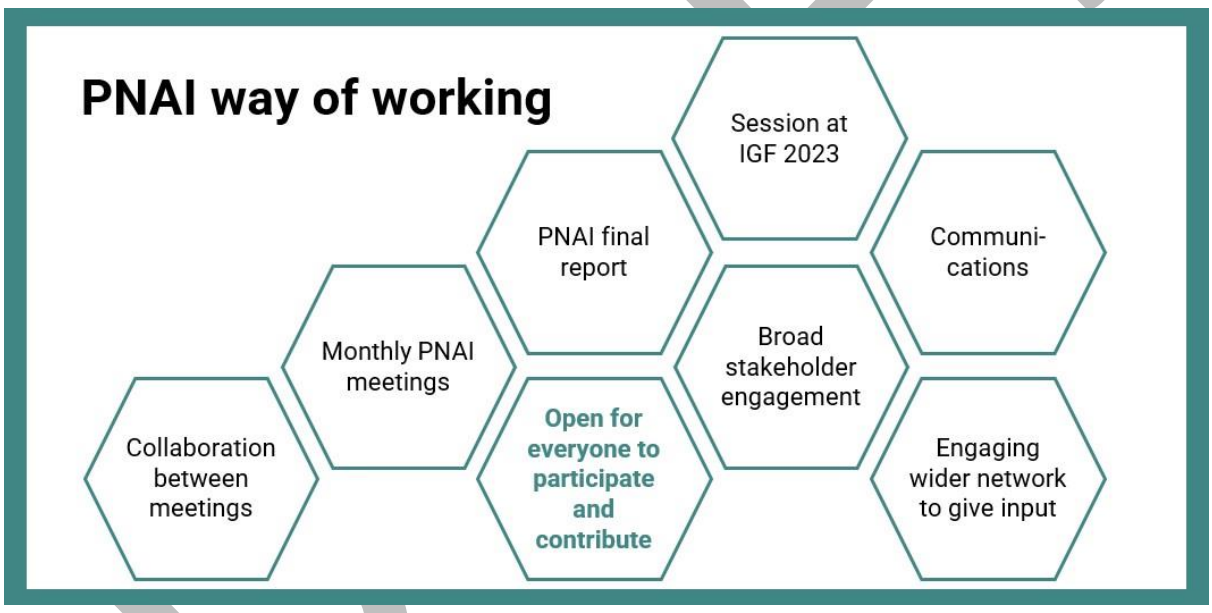
This report was developed through exploration and multi-stakeholder discussions in the PNAI community. The PNAI work and meetings are open for everyone to participate in. The information was shared through the PNAI website and open mailing lists. Invitations and updates were also shared widely through IGF mailing lists and social media channels as well as community updates through the IGF website. Further PNAI community members circulated invites and information of the work being done within their communities and stakeholder groups.

The work towards the report was structured in five phases: The first phase of the work was 'open dialogue', where the group defined three thematic focus areas for the report and agreed on a report outline. Early discussions on the PNAI held in spring 2023 highlighted the importance of focusing the dialogue and work on selected topics rather than striving to cover all areas relevant to AI. For the PNAI's first output report to bring value to the global AI dialogue, the aim should be to provide deep-dives areas that are central to fostering responsible AI development globally. Through an open brainstorming exercise, analysis and several commenting and input rounds the following thematic areas emerged: (i) Interoperability of global AI governance; (ii) AI gender and race; and (iii) AI and environment. The PNAI set up three sub-groups each dedicated to developing and drafting one of the three topical chapters of this report.

Once the topics were selected, the "information gathering" phase began. This took place through desktop research, engaging with invited expert speakers in the PNAI monthly calls[13] and by tapping in the expertise of PNAI members. 'Drafting the report' phase consisted of writing and editing the report together. The thematic drafting teams led the way and shared progress for comments and suggestions in the broader policy network meetings. The fourth phase of the process was 'consultation' where the draft PNAI report was shared with the wider IGF community for comments and suggestions. Finally, after editing based on the consultation input, the report was finalized and published to be discussed in the IGF 2023 annual meeting in October 2023.

[13] See summaries, presentations and meeting materials of all PNAI meetings on the PNAI website: PNAI, Materials information webpage, 2023 (Accessed 5.9.2023)





1.3. Structure of the report

The following chapter ‘Exploring AI and related aspects of data governance’ sets the scene and presents the Global South lens selected for the report. The chapter also describes the emergence of generative AI. The remainder of the report is structured around three thematic chapters each addressing one key topic relevant to AI and related data governance issues. Each chapter presents and assesses existing policy measures relevant to the topic, proposes next steps, and shares recommendations based on the multistakeholder discussions.

The first topical chapter, ‘Interoperability of AI governance’, delves to study the convergence and divergence among the different AI regulations being drafted by countries and regions; identify the AI development and policymaking gap and the challenges in strengthening global interoperability of AI governance towards AI that is security, reliable, robust, fair, accountable and respecting human rights and innovation. It compares and identify good practices and bottom-up initiatives that foster interoperability in AI governance, and proposes eight steps for further actions.

The following chapter, ‘Framing AI Lifecycle for gender and race inclusion’, focuses on AI and gender, as well as AI and race. Do AI systems and harmful biases reinforce racism, sexism, homophobia and transphobia in society? Under which circumstances could AI be a force for good at improving gender and racial equality? What could be done to ensure that today’s AI systems are a positive force in achieving that equality?

The third topical chapter ‘Governing AI for a Just Twin Transition” takes a deep dive into the nexus of AI, data governance, and the environment, through the lens of two case studies. The purpose of this chapter is to comprehensively delve into the intricate interplay of AI, data governance, and the environment.

The concluding section of the report summarizes the conclusions and recommendations of the Policy Network on AI.

2. Exploring AI and related aspects of data governance

The PNAI community selected AI and related aspects of data governance as the topic of this report and the group's dialogues in the first months. The interdependence between AI and data is a critical nexus for addressing key societal challenges related to interoperability of AI governance, gender equity throughout the AI lifecycle, and environmental sustainability. Effective policies should strike a balance between fostering AI innovation and safeguarding the rights and well-being of individuals and the planet. By recognizing and acting upon this interdependence, we can harness the full potential of AI while ensuring a more equitable and sustainable future for all. Furthermore, robust data governance is needed to mitigate information asymmetries, ensure data quality, and address multidimensional power dynamics to drive informed climate adaptation, resource management, and conservation efforts, essential for addressing the biggest challenges of our time.

PNAI's work on this report started from the observation that there is a plethora of AI governance frameworks, ethical AI policy approaches, documents, strategies and forums, but the vast majority of these have been developed in or for the Global North.[14] The policy network set as one of its goals to look at AI and related aspects of data governance from the Global South Perspective. Inspired by the leaps in technological development that have dominated the headlines at the time of writing this report, PNAI decided to dive deeper into the world of generative AI technologies. Setting the scene for the report and its recommendations, this chapter presents the Global South lens selected for the report, and provides an introduction to the world of generative AI.

2.1. Viewing AI policy debates through the Global South lens

The Roadmap for Digital Cooperation issued by the United Nations Secretary-General in 2020 noted a lack of representation and inclusiveness in the international coordination and collaboration on AI.[15] The Roadmap's call for diverse stakeholder participation in global digital cooperation is particularly relevant if we consider the underrepresentation of Global South[16] countries in the drafting of AI principles. A 2019 study by ETH Zurich researchers[17] found that the USA, UK and Japan alone were responsible for most of the 84 ethics and AI documents identified for analysis. Although the sample analyzed then does not represent the current

[14] IGF Multistakeholder Advisory Group, Proposal for an IGF 2023-2024 Policy Network: Policy Network on Artificial Intelligence, February 2023

[15] UN, Road map for digital cooperation: implementation of the recommendations of the High-level Panel on Digital Cooperation, May 2020

[16] As synthesized Haugh: "As a meta category, the 'Global South' has taken on a variety of meanings. It refers not just to landmasses and waters south of the equator, the strictly defined hemispheric south. Instead, the term has been a general rubric for decolonised nations roughly south of the old colonial centres of power.". For more details on the main meanings connected to the concept of Global South, see: Sebastian Haug, What or where is the 'Global South'? A social science perspective, September 2021

[17] Anna Jobin, Marcello Ienca and Effy Vayena, The global landscape of AI ethics guidelines, Nature Machine Intelligence, September 2019

landscape of AI standards and guidelines, it is clear that certain countries and regions are responsible for most of the global dialogue and development in this area. AI ethics principles do shape policy debates at global, regional and national levels, but oftentimes, such supposedly "global" processes ignore contextual particularities including concerns and needs of the Global South.

In addition to the underrepresentation of Global South in AI policy documents identified at global level, it is important to shed light to the questions of inclusiveness and representation when developing AI policies in and for regions or countries. Evidence from Latin America, for instance, shows that public participation was limited in the drafting processes of national AI strategies. The processes in general failed to involve the groups which can be most affected by such technologies. This is the finding of a 2022 study that describes the scant participation of women and the failure of government institutions to provide disaggregated data which would demonstrate the representation of priority groups.[18]

The findings of the studies are in stark contrast with the ongoing vibrant discussions on global AI governance, numerous initiatives to develop AI grounded in justice and equality and the research undertaken on the topic in Global South countries. It also doesn't take into account the key role such countries play across the AI value-chains, for example as providers of minerals that are fundamental for the development of their infrastructure, energy to sustain data centers, data and workforce[19] to train algorithms or as final users of systems. The exclusion of Global South countries from policy debates on AI invisibilizes key priorities from discussion.

Global South participation in global AI policy debates is key. As highlighted in several international standards, AI governance, development and deployment should be discussed in different organizations, groups, parts of the world by experts, enthusiasts and laymen with different backgrounds. According to the UNESCO's AI Ethics Recommendation, participation of different stakeholders throughout the AI system life cycle is necessary for inclusive approaches to AI governance, enabling the benefits to be shared by all, and to contribute to sustainable development.[20] Otherwise, global inequalities between North and South tend to increase, as the AI industry is concentrated in a few developed countries and their systems are built from the extraction of value from less developed regions, including Africa and Latin

[18] See research report by Derechos Digitales: Laura Hernández, María Paz Canales and Michel de Souza, Artificial Intelligence and Participation in Latin America: the national AI strategies, 2022

[19] See for instance the precarious work conditions of people training AI systems in Global South countries: TIME magazine article by Niamh McIntyre, Rosie Bradbury and Billy Perrigo, Behind TikTok's Boom: A Legion of Traumatized, $10-A-Day Content Moderators, October 2022; BBC News Mundo article by Veronica Smink, Los cientos de miles de trabajadores en países pobres que hacen posible la existencia de inteligencia artificial como ChatGPT (y por qué generan controversia), March 2023

[20] See the ethical AI framework that has been adopted by 193 countries: UNESCO, Recommendation on the Ethics of Artificial Intelligence, 2022

America. Thus, building frameworks which guarantee sustainable, human rights-compliant AI requires both North-South and South-South collaborations.

The PNAI community seeks to learn from and elevate AI governance frameworks, principles and policies being developed in and for the Global South and non-latinate languages. With our growing global network, we can bring value to the AI dialogue by leveraging Global South perspectives, which are vital but typically missing or under-represented on AI policy debates. Hatched under the IGF network, PNAI can build on two decades of experience organizing global, multistakeholder discussions on digital governance. It can also benefit from the IGF's concrete mechanisms for engaging the Global South through its more than 155 national and regional initiatives.[21]

At the same time, PNAI acknowledges the several imbalances that prevent Global South stakeholders from having a meaningful participation even in spaces built for inclusive worldwide participation, such as the IGF. These include limited funding to travel and precarious connectivity conditions to participate in events, the prioritization of English as the main language, among others. Global multilateral organizations committed to opening spaces for multistakeholder participation should take into account such inequalities in their design in order to foster true global dialogue and to ensure Global South perspective is included.

2.2. In the wake of generative AI

As stated, AI has significantly transformed, and continues to transform, our society. Recently, generative artificial intelligence has emerged to form one of the most promising and, at the same time, most controversial areas in AI development. Until recently, machine learning was mostly limited to predictive models (analyzing data to make predictions) while generative AI is a specialized branch of AI that focuses on learning from various data patterns with the purpose of creating new content. Systems powered by generative AI, such as Open AI's ChatGPT and GPT-4, Anthropic's Claude, or Google's Bard, create texts, images, videos, music, software design, or scripting for test codes based on prompts by the user.

Due to its versatility, generative AI is increasingly employed across different areas including economy, social interaction, business, arts, and academia. Moreover, these tools can tackle repetitive tasks swiftly and efficiently, leading to a significant boost in productivity. Generative AI is expected to increase productivity across sectors, estimates show it could add USD 2.6 to 4.4 trillion annually to the global economy.22

Generative AI carries the potential to benefit or harm vulnerable groups and communities. On the one hand, it makes possible personalized solutions. Generative AI can for example help

[21] IGF, About the Internet Governance Forum, 2023
[22] McKinsey, Economic potential of generative AI, June 2023

teachers create personalized lesson plans for each student.[23] It assisting blind or low-vision people by turning images into text interpretation in numerous languages.[24] These and many other linguistic or cultural adaptations make services more accessible. However, if the data used to train generative models is not representative, Generative AI could perpetuate stereotypes and biases, exacerbate discrimination, and increase inequality. AI developers and society in general must make a conscious effort to ensure that generative AI is developed and used in ways that empower underprivileged groups, rather than further marginalize them.

In the case of generative AI and Gender, there are high expectations to design algorithms that allow raising awareness on this topic. Therefore, the objective should be not only to use generative AI as a tool for the study, analysis, and promotion of gender issues but also to guarantee that these systems are trained with accurate and representative data linked to awareness, avoiding false content or information with discriminatory visions, thus contributing to a broader and fairer understanding of gender issues in today's society.

The ability of Generative AI to generate content, such as text and images, raises serious ethical concerns. It can be used for disinformation and other forms of digital manipulation. Speaking to the Security Council in July 2023, the UN Secretary-General highlighted the capabilities of new generative AI models, and warned about the risks that the advent of generative AI can bring, for example for disinformation and hate speech.[25] Furthermore, the integrity of the information and the protection of personal data and individual privacy are at risk. It is essential to establish clear limits and regulations that protect individuals from possible abuse, without going against innovation.

Generative AI has the potential to democratize digital services, as it allows the creation and adaptation of content in an automated way. However, if not managed properly, it could lead to digital monopolies where a few companies control access to and use of generative technology. A truly open and free digital future demands that generative AI be developed and distributed in a transparent, equitable and accessible manner.

The digital age has led to the emergence of new challenges, especially manipulation, deception, and misinformation on the Internet. Therefore, generative AI emerges as a double-edged tool in this context. Although it can be a potential source of problems, it also presents itself as a viable solution to combat these same challenges. One of the most promising areas is generative AI's ability to detect manipulations in digital content. While it is true that systems building on this technology are used to create text, images, or videos, they can also be developed and trained to identify anomalies or inconsistencies in the data. This can help detect false information, for example fake news, generated by this powerful technology.

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[23] Kevin Roose, Don't Ban ChatGPT in Schools. Teach With It article in New York times, January 2023
[24] OpenAI, Be My Eyes customer story information webpage, March 2023 (Accessed 12.9.2023)
[25] UN, Secretary-General Urges Security Council to Ensure Transparency, Accountability, Oversight, in First Debate on Artificial Intelligence press release, July 2023

Disinformation can spread and influence public opinion at an alarming speed, therefore such tools need to be urgently developed and implemented.

Another concern to consider is fragmentation on the Internet, where algorithms personalize and limit the information that users have access to. This distinction can be counterproductive, as it reinforces existing opinions and limits exposure to diverse perspectives. Generative AI can be trained and used, to analyze broader patterns and understand context. Moreover, it can contribute to the creation of more balanced filters that present information in a more impartial way.

Finally, human rights can be affected or violated by misinformation or the construction of misleading narratives. To avoid these harmful practices, Generative Artificial Intelligence can be used to create content and verify its authenticity to ensure that the truth prevails. However, there is a risk of using this technology as a surveillance or repression tool by authoritarian regimes. Therefore, it is necessary to design an ethical framework and its implementation.

Generative AI has the potential to transform industries and society, to boost innovation across diverse fields, from arts to scientific research and empower individuals including marginalized groups. To ensure generative AI contributes towards a positive future, it is crucial to prioritize responsible design and release practices from the beginning. As generative AI continues to advance at an unprecedented pace, there is a need for collaboration among stakeholders to ensure that AI serves as a force for good. The IGF Policy Network on AI promotes the debate on how to increase international cooperation among the stakeholders on the use of generative AI and related aspects of data governance.

2.3. Global multistakeholder dialogue is crucial in getting global AI governance right

Understanding AI's future impact on societies is very difficult. It is known that governing and regulating a technology in development is always difficult but it is even more difficult later when the technology becomes deeply entrenched and its effect on society is better understood. Under these circumstances, making effective and informed decisions on AI is complex. Bringing in diverse perspectives and expertise can enhance understanding of the implications of AI in a holistic manner,[26] it is necessary for developing relevant and applicable policy for the national and international context. Multistakeholder approach facilitates the development of inclusive AI policies that help decision makers to consider diverse viewpoints and expertise, prevent capture by vested interests, and co unteract polarization of policy discourse.

[26] UNESCO and i4, Multistakeholder AI Development: 10 building blocks for inclusive policy design, 2022

The multistakeholder dialogue is crucial for addressing AI's policy evolution. But it is not easy to create spaces for truly global AI dialogue or reach stakeholder groups, including those with limited financial, grass-root organizations, from developing countries. Already in 2020 there were over 160 organizational, national and international sets of AI and governance principles worldwide[27] but so far no common platform to bring these initiatives together. At the time of writing this report, PNAI is in its early stages, but is already bringing value to dialogues on AI governance as it is an open forum that brings diverse stakeholders from across the world together for timely discussions on AI. The impact of IGF's intersessional activities, such as PNAI, comes from facilitating global discussion across stakeholder groups.[28]

The private sector, the technical community and civil society should be involved from the beginning when making decisions on digital topics.[29] Involving stakeholders across technical and non-technical communities, promoting inclusivity, and respecting the different cultural backgrounds are key components for designing a system approach to global AI governance. Multistakeholder engagement furthermore should meaningfully address concerns of various actors and consider power asymmetries between them.[30] This PNAI report is developed by the PNAI multi-stakeholder community through a transparent process and an open consultation.[31]

[27] UN, Road map for digital cooperation: implementation of the recommendations of the High-level Panel on Digital Cooperation, May 2020
[28] IGF, About the Internet Governance Forum, 2023
[29] UN, Road map for digital cooperation: implementation of the recommendations of the High-level Panel on Digital Cooperation, May 2020
[30] Cecilia Cabanero Verzosa and Thomas R. Fiutak, The "How" of Multistakeholder Engagement, ADB government brief, 2019
[31] PNAI, PNAI Work Plan, May 2023

3. Interoperability of AI governance

There are several approaches to regulating AI globally. The European Union's (EU) AI Act to regulate development and use of AI is currently under negotiation to be adopted.[32] China has been fast to turn proposals into rules, and countries including Brazil, Canada, and the United States are actively making plans and pursuing their strategies to govern AI.[33] Approaches to regulate AI take different forms, for example international treaties, multi-stakeholder approaches, regulatory sandboxes, sectoral approaches, ethical guidelines, national legislation, private standards, technological solutions, open source collaborations, industry self-regulation, and technological neutrality.

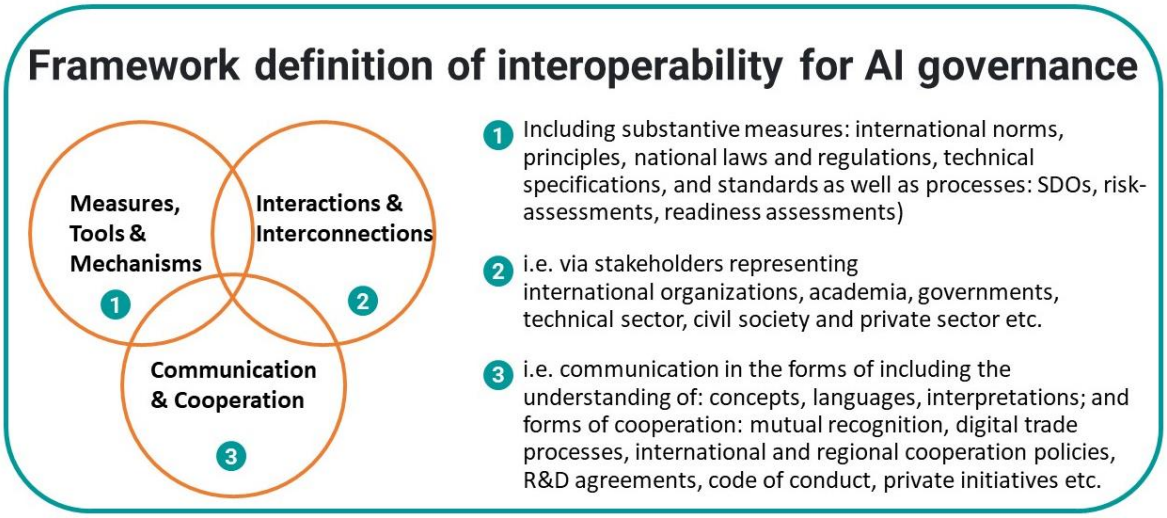
Interoperability is often understood as the ability of different systems to communicate and work seamlessly together. In this chapter, we explore interoperability of AI governance in the global level. As noted in the introduction, AI and its societal impact transcend boundaries of countries and regions. We argue that more emphasis should be put in analysing if and how the different initiatives to regulate and govern AI across the world could work together and through that become more impactful. This chapter explores interoperability of AI governance from a multi-stakeholder view.

We start by defining interoperability in the context of AI governance. This is a critical step in clarifying the focus and scope of our multi-stakeholder writing team's work. Further, a clear definition is needed to integrate both the technical and non-technical elements to the discussion. We recognise the need to support effective cooperation and communication that is needed for building trust and a shared understanding.

Our definition of interoperability in AI governance is a framework that brings together of three key aspects: (1) the substantive tools, measures and mechanisms involved in guiding and developing AI, (2) multistakeholder interactions and interconnections, and, (3) agreed ways to communicate and cooperate. All three are necessary to support a common understanding, interpretation and implementation of transborder governance of AI. The definition and our interpretation of interoperability in this context is not based on a systematic survey but was developed through consensus in our group consisting of team members from civil society, technical experts, government officials and private sector representatives.

[32] European Parliament, EU AI Act: first regulation on artificial intelligence information website, June 2023 (Accessed 10.9.2023)
[33] Harvard Business Review, Who Is Going to Regulate AI?, 2023

Figure: Defining interoperability of AI governance



When it comes to the interoperability of AI governance, there are a number of challenges we need to face and address, including: **Ethical and regulatory Considerations** – Interoperability in AI governance raises ethical concerns related to bias, fairness, transparency, and accountability. Different jurisdictions may have varying regulations that impact data sharing, privacy, and algorithmic behavior. **Standardization** – The absence of universally accepted standards, principles and norms for interoperability in AI governance complicates efforts to create a cohesive framework. **Semantic Interoperability** – Beyond technical compatibility, AI systems must also achieve semantic interoperability. This involves a shared understanding of the meaning, intent, nuances, and context of data and actions.

We live in a globally interconnected world and to unlock the full potential of AI we need increased interoperability in global AI governance. Ensuring harmonious coexistence among AI systems has the potential to revolutionize industries, enhance human capabilities, and drive innovation towards a more connected future.

3.1. Existing policy measures

In this section, we provide examples of international policies that have addressed interoperability of AI governance. We then move on to describe interoperability policies and projects in the Global South to understand and demonstrate the commonalities and differences in technology development as well as AI governance capacity between the South-South and North-South.

Our aim is to illustrate the most prevalent types of policies, practices, and issues. The examples we present are not exhaustive, and this report chapter is not meant to provide a full picture of the current situation globally. In this report chapter, we seek to go beyond the most

cited examples of national and regional activities in governing and regulating AI, and draw from the wide expertise in our multistakeholder group to highlight regions and countries at different stages on their AI path.[34] We recognize there are disparities between different regions and countries in terms of activities relevant to our topic, and we use the term "maturity level" to describe different stages of AI development and governance.[35]

3.1.1. Examples of international initiatives supporting interoperability of AI governance

United Nations Secretary General. The latest developments on the level of the United Nations were voiced in July 2023, when the United Nations Secretary-General supported proposals to establish an international agency akin to the International Atomic Energy Agency for AI in his remarks to the UN Security Council[36]. The organization would for example establish mechanisms of monitoring and governing AI. In August 2023 the first steps were taken to establish a UN high-level AI advisory body on AI. The group will undertake analysis and advance recommendations for the international governance of AI. This could include ways to ensure AI development and governance is in line with human rights, the rule of law, and the common good. The group is expected to report back on the options for global AI governance by the end of 2023.[37]

UNESCO's Recommendations on the Ethics of AI emphasize multistakeholder and adaptive governance. They call for the adoption of open standards and interoperability to facilitate collaboration and meaningful participation by marginalized groups, communities, and individuals. Moreover, the recommendations champion the rule of law as the underlying principle of AI governance[38] and promote capacity-building for judicial operators[39] and civil servants[40]. Coupled with funds and equal regional participation, this capacitation is essential to empower multiple stakeholders to coordinate among themselves and engage in meaningful debate. Ultimately, these measures can enhance cooperation, the uptake of interoperable governance tools and the legitimacy of governance fora including standard development organizations, industry fora, national legislatives and international organizations.

[35] Despite strong regulatory action in some regions, the institutional shape and capacities of governments diverge significantly. See: UNESCO, Readiness assessment methodology: a tool of the Recommendation on the Ethics of Artificial Intelligence, 2023
[36] UN, Secretary-General's remarks to the Security Council on Artificial Intelligence, July 2023
[37] UN, High-Level Advisory Body on Artificial Intelligence information webpage, 2023 (Accessed 10.9.2023)
[38] Paragraphs 47, 60 and 63: UNESCO, Recommendation on the Ethics of Artificial Intelligence, 2022
[39] UNESCO, AI and the Rule of Law, 2023
[40] UNESCO, Digital Capacity Building for Governments, 2023

The **OECD** works to promote interoperability of AI risk management frameworks.[41] OECD published a note on Interoperability of privacy and data protection frameworks in 2021.[42] The study found commonalities at the level of principles across privacy legal regime and convergence within and between legal instruments but noted that the approaches to data regulation vary significantly across countries and types of data. Measures to foster and promote interoperability of governance can include international and bilateral trade agreements, mutual recognition agreements, regional and international cooperation policies, research and development agreements between countries, codes of conduct, and private sector initiatives, binding corporate rules, and certificates.

G7 countries recognise the importance of interoperability in building trust in digital economies, creating open and enabling environments for responsible AI innovation. The countries support inclusive stakeholder participation in international standards. G7 countries aim to raise awareness and strengthen capacity building among stakeholders who participate in international AI technical standards development efforts and encourage adoption of international AI standards. G7 intend to collaborate with international organizations and initiatives (including the OECD, the Global Partnership on Artificial Intelligence GPAI, and UNESCO) and enhance engagement with developing and emerging economies to adopt and implement the OECD AI Principles to reinforce human rights and fundamental freedoms. They encourage collective efforts to promote interoperability between AI governance frameworks around the world for supporting AI innovation globally.[43]

Some notable examples of established regional initiatives with international impact include:

At the **Council of Europe** (CoE), its Committee on Artificial Intelligence (CAI) is drafting a legally binding instrument for the development, design and application of AI systems based on the CoE's standards for human rights, democracy and the rule of law[44], and to promote innovation[45]. The latest draft version of the document was published in July 2023 to serve as the basis for further negotiations of the Framework Convention on Artificial Intelligence, Human Rights, Democracy and the Rule of Law.[46]

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[41] Celine Caira, OECD.AI work promoting interoperability of AI risk management frameworks, presentation at PNAI meeting, 18 July 2023

[42] Lisa Robinson, Kosuke Kizawa and Elettra Ronchi, "Interoperability of privacy and data protection frameworks", OECD Going Digital Toolkit Notes, No. 21, December 2021

[43] G7,G7 Digital and Tech Track Annex 5 G7 Action Plan for promoting global interoperability between tools for trustworthy AI, 2023

[44] CoE, CAI - Committee on Artificial Intelligence information webpage (Accessed 19.9.2023)

[45] CoE, The Council of Europe & Artificial Intelligence, March 2023

[46] CoE CAI, Consolidated working draft of the framework convention on artificial intelligence, human rights, democracy and the rule of law, July 2023

The EU is finalizing its AI Act and has also been active in international dialogue with partners outside the EU. An example of a cooperation mechanism is **the EU-US Trade and Technology Council** (TTC). It was established in 2021 as a transatlantic forum to foster cooperation in trade and technology.[47] TTC's Joint Roadmap for Trustworthy AI and Risk Management published in 2022 establishes tools, methodologies, and approaches to promote its trustworthy use of AI to support democratic values and human rights. TTC pledges to advance shared and interoperable terminologies and taxonomies (for example developing interoperable definitions of 'trustworthy' or 'bias'), cooperate in developing international technical standards and tools for trustworthy AI and risk management, and, share knowledge in monitoring and measuring existing and emerging AI risks. In addition to the TTC, a successful EU interoperability framework is the European Digital Innovation Hubs (EDIH) network[48] that is built up bottom-up driven by regional stakeholders. It provides digital support and interoperability in governance (not only technologically) of services throughout the EU. Federation of services via marketplaces are becoming the *de facto* standards for AI services. This way, cooperation frameworks in the EU are shaping indeed interoperability in future AI services and applications.[49]

3.1.2. Policies and projects in the Global South on interoperability of AI governance

China. In recent years, China has conducted explorations and practices in the field of AI governance. It has established a policy framework and regulations covering R&D and ethics including the principles of "harmony and friendship, fairness and justice, inclusive sharing, respect for privacy, security and control, shared responsibility, open collaboration, and agile governance" of AI development.[50] The China academy of information and communications technology (CAICT) drafted the "Self-discipline Convention for AI" based on analysis of domestic and foreign AI ethics, laws, and strategies.[51].The Chinese government's position

[47] European Commission, Digital in the EU-US Trade and Technology Council information webpage, May 2023 (Accessed 10.9.2023)

[48] European Commission, European Digital Innovation Hubs information webpage (Accessed 12.9.2023)

[49] Regarding AI governance and interoperability, not only the AI Act, but also the Data Act and the Digital Services Act are top level regulations for the aforementioned cooperation models, both fed by public private partnerships, organizations and institutions across Europe.

[50] National Governance Specialist Committee for the New Generation Artificial Intelligence, Governance Principles for the New Generation Artificial Intelligence--Developing Responsible Artificial Intelligence, 2019; The Standardization Administration of China, et al, Guidelines for the Construction of a National New Generation Artificial Intelligence Standards System, 2020; National Governance Specialist Committee for the New Generation Artificial Intelligence, New Generation of Artificial Intelligence Ethics Code, 2021; National Artificial Intelligence Standardization Group, Guidelines for the Standardization of Artificial Intelligence Ethical Governance (2023 edition), 2023; The Ministry of Science and Technology et al, Measures for Ethical Review of Science and Technology (Trial), 2023; Cyberspace Administration of China, Regulations on Algorithm Recommendation Management of Internet Information Services, 2021; Regulations on Deep Synthesis Management of Internet Information Services, 2022; and; Interim Measures on the Management of Generative Artificial Intelligence Services, 2023

[51] China academy of information and communications technology (CAICT), Self-Discipline Convention for AI, 2019; ibid. White Paper on Trustworthy Artificial Intelligence, 2021

paper on Strengthening Ethical Governance of Artificial Intelligence[52] advocates the concepts of "people-oriented" and "intelligence for good" and ensuring all countries shared benefits of AI.[53]: China encourages transnational, multi-cultural as well as multi-disciplinary exchanges and collaboration in AI, and promote participation of all countries in the major international AI ethics discussion and in international rule-making. China sees that governments should strengthen the ethical supervision of international cooperative research in AI. The position paper further calls for an international agreement on the ethics of AI to be formed on the basis of universal participation, and for the formulating an international AI governance framework, standards and norms with broad consensus while fully respecting the principles and practices of AI governance in different countries.

In August 2023, the **BRICS** group announced their intention to establish an AI study group to monitor AI's development and progress, expand cooperation and information exchange on AI, develop an AI governance framework to ensure the safety, reliability, controllability, equality of the AI technology.[54]

India. In recent years, various government Committees, Ministries and bodies in India have released reports and white papers to regulate and standardize AI. The 2020 Indian Artificial Intelligence Stack discussion paper identifies a need to develop uniform standards, such as various interface standards and India's AI stack. The stack will be structured across all sectors[55] and use standards developed in line with internationally agreed principles to ensure a healthier and safer environment for the evolution of AI. Two white papers by NITI Aayong (think tank of the Government of India) on responsible AI highlight that the principles for responsible AI should be grounded in the nation's values and should be compatible with international standards.[56] They should ensure a flexible approach to promote innovation and be identified based on relevant social, economic, political and cultural factors. International standards may be leveraged when the goals are common. Private sector and research institutions will create frameworks for compliance with AI standards and devise cost effective compliance with AI standards.[57]

ASEAN. The 10-member Association of Southeast Asian Nations (ASEAN) has announced the development of an ASEAN Guide on AI Governance and Ethics.[58] The guide is expected to be adopted in 2024. In its 2025 Digital Masterplan[59], ASEAN focuses on the interoperability

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[52]Ministry of Foreign Affairs of China, China's Position Paper on Strengthening Ethical Governance of Artificial Intelligence, 2022

[54] Gigwatch, BRICS announces formation of AI study group, 2023
[55] AI Standardization Committee, Indian Artificial Intelligence Stack, 2020
[56] India.AI, NITI Aayog launches first of two-part approach paper on responsible AI adoption, news article, February 2021
[57] India.AI, Responsible AI: Part 2 - Operationalizing Principles for Responsible AI, August 2021
[58] Fanny Potkin and Panu Wongcha-um, Exclusive: Southeast Asia to set 'guardrails' on AI with new governance code, news article for Reuters, June 2023
[59] ASEAN, ASEAN Digital Masterplan 2025, 2021

of data sharing frameworks within and beyond the region (for example cooperating with APEC or looking in to the European GDPR). Also improving the interoperability of e-government services is a key aim of ASEAN, especially in digital ID and e-commerce services.

Pan-Asia Initiatives. In June 2023 Singapore launched the AI Verify Foundation to harness the collective power and contributions of the global opensource community to develop AI testing tools for the responsible use of AI. The Foundation (and its more than 60 general members from across the globe) aim to foster an open-source community to contribute to AI testing frameworks, code base, standards and best practices and create a neutral platform for open collaboration and idea-sharing on testing and governing AI. In September 2022, the Technology for Sustainable Development Goals Alliance for Asia (Tech4SDG) was established[60] as a non-profit, non-governmental international organization. It aims to build regional consensus on areas including AI ethics and tech standards, through cross-sectoral exchanges and cooperations in Asia.

Africa. Globally, Africa still catching up to many parts of the world when it comes to designing AI strategies, governance frameworks, and AI regulation.[61] Tortoise Global AI index uses "government strategy" as one of its pillars contributing to the global ranking. In the 2023 edition of the index, several African countries appear in the top 62 for government strategy, including for example South Africa, Tunisia, Morocco, Egypt, Kenya, and Nigeria.[62] In 2021, Smart Africa, an AI initiative in collaboration with the German Agency for International Cooperation (GIZ), published a blueprint for the development of AI strategies in Africa. In the same year, the African Commission on Human and Peoples Rights (ACHPR) adopted a resolution urging governments to 'work towards a comprehensive legal and ethical governance framework for AI technologies', and 'develop a regional regulatory framework that ensured that these technologies respond to the needs of the people of the continent'.[63]

In 2023, the African Union (AU) Development Agency (AUDA-NEPAD) and the AU High-Level Panel on Emerging Technologies (APET) drafted the "African Union Artificial Intelligence (AU-AI) Continental Strategy for Africa". As countries progress in AI implementation at different levels, the role of AUDA-NEPAD Agency will be to monitor the developments and ensure that all member states are moving towards a common goal in the AI sector. This is important as it would enable countries to pool resources, develop common frameworks and standards and share access to data. Furthermore, global cooperation will also be needed to ensure that Africa's policies and strategies are aligned with other parts of the world.[64]

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[60] Tech4SDG, Technology for sustainable development goals alliance for Asia, 2022
[61] Ganiu Oloruntade and Faith Omoniyi, Where is Africa in the global conversation on regulating AI?, 2023; ALT Advisory, AI Governance in Africa, September 2022
[62] Serena Cesareo and Joseph White, The Global AI Index, 2023
[63] Diplo, Artificial intelligence in Africa: Continental policies and initiatives (Accessed 19.9.2023)
[64] AUDA-NEPAD Artificial Intelligence for Africa: Harnessing Artificial Intelligence for Africa's Socio-economic Development, 2021

Caribbean. AI adoption is low even among the large digital leaders in the region. [65] Caribbean countries are in the embryonic stage of planning AI strategies and policies, as most are concentrating their resources on data governance, including privacy and data protection. The Caribbean realizes the deployment of AI will bring efficiencies to existing industry sectors and new industry opportunities. The Caribbean SIDS's (Small Island Development States) are aware of the risks and harms of AI to human-rights, culture, every-day existence and industry and see that AI governance should be centered around "do no harm" principle and enhancing safety.[66] A policy roadmap was produced by the Caribbean AI Initiative (conducted by the UNESCO Cluster Office for the Caribbean and the Broadcasting Commission of Jamaica (BCJ) with the support of UNESCO IFAP) prepared a policy roadmap in 2021.[67] It proposed that Caribbean SIDs should take a multi-stakeholder regional approach to establishing regional common values and principles. It is also proposed that cross-border regulations be developed and executed. As to interoperability, the policy roadmap recommends the formation of national and regional AI Governance bodies to manage and monitor the development of standards, code of conduct, procurement, supply guidelines, and design principles. To strengthen legislation and regulations, the roadmap also proposes an AI Appeal Court and Online Dispute Resolution System.

Latin America. The Latin American context related to AI governance and regulation is diverse and in the early stages of development. Multiple countries made progress in adopting or drafting AI strategies. A first wave in 2019 and 2020, included Argentina, Brazil, Colombia, Chile, Uruguay, Mexico and Peru. Some strategies (for example Argentina, Chile, and Colombia) did not reach normative status and were dismissed after political changes.[68] There is no regional consensus for a common AI strategy and governance for Latin America. The governance landscape is very fragmented, with different levels of maturity and implementation. Latin America faces challenges in terms of regional coordination and struggles to present a unified voice in international forums.[69]

3.2. Cooperation policies and initiatives suggestions

The previous pages were dedicated to already existing policies and showed that laws and regulations form a heterogeneous framework and an interoperability divide. In this section, we present policies and collaboration advice that could facilitate or advance interoperability in the governance of AI for the Global South. In contrast to the previous sub-chapter which looked at each country individually, in the following pages we grouped together countries and regions that face similar challenges. Cooperation is a key component for interoperability. In addition

[65] Incusservice, Incus Services State of AI in the Caribbean Survey (Accessed 19.9.2023)
[66] UNESCO, Caribbean AI Roadmap, 2021
[67] Ibid.
[68] ILDA, Centro Latam et al., Proyecto EmpatIA, Reporte de Política Pública: Argentina, 2021
[69] Miriam Wimmer, Foreword: Advancements and challenges for Latin American AI and data governance, Computer Law & Security Review, November 2022

to state policies and regulations, bottom-up and collaborative initiatives may become de facto standards and regulation boosters.

Internationally, we observe a wave of development in interoperability frameworks of AI governance. This is mainly driven by the OECD, UN, regional alliances as well as Standard Developing Organizations. Multistakeholder cooperation and collaboration, capacity building, and international standard adoptions are the key elements endorsed by them for enhancing interoperability. An emphasis is placed on convergence at the level of principles and legal instruments but divergence in approaches of regulation in AI interoperability. Other divergences include scope of cooperation and the role given to industry or private sector. The proposals we assessed range from creating new independent international bodies specifically dedicated to AI to advocating for more regional or bilateral partnerships. Or the establishment of a global observatory70, incorporating a blend of existing resources and frameworks with fresh initiatives. UN proposed a global AI watchdog in July 2023.[71] While private sector/industries expertise and insights are invaluable, we need to remain cautious in allowing them to dominate norm-setting or enforcement processes to prevent potential regulatory capture.

Latin America, Africa and Caribbean countries. To assess the scenario of the interoperability of AI governance in Latin America, we need to remember that the discussion on regulating AI is in its early stages. Interoperability of AI governance can be considered a second-order discussion, given the lack of maturity of AI public policies in the region. Latin American governments will meet in October 2023 in Santiago de Chile to discuss regional measures regarding AI ethics and governance.[72] The meeting will be organized by UNESCO and the Development Bank of Latin America and the Caribbean (CAF)[73] and could be the beginning of a regional initiative to determine the future of AI governance in the region and to foster collaboration among different countries and organizations. Six concrete ways are suggested by academics to strengthen regional collaboration and promote AI governance interoperability, and an AI Alliance in Latin America is also recommended.[74] In the Latin American context, the discussion on AI principles has included some civil society perspectives. Still, the processes of implementing such recommendations or coming up with harder regulatory approaches lack a robust CSO perspective. Moving forward, a more inclusive multisectoral approach is needed for the region.

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[70] Carnegie Council, The Case for a Global AI Observatory (GAIO), July 2023
[71] The New York Times, U.N. Officials Urge Regulation of Artificial Intelligence, 2023
[72] Elisabeth Sylvan and Armando Guio Español, Generative AI: What Should Governments in Latin America Do?, 2023
[73] CAF, About CAF, information webpage (Accessed 12.9.2023)
[74] Elisabeth Sylvan and Armando Guio Español, Generative AI: What Should Governments in Latin America Do, 2023

In **Africa**, there are initial approaches to regional and global cooperation and joint strategies, but concrete results have yet to be achieved. It will be interesting to see how the AU member states will review and validate the current draft of the African Union Artificial Intelligence Continental Strategy for Africa. A continentally adopted version is expected to be launched at the AU Summit of African Heads of State and Government in January 2024.[75]

China, India and Asia. Technologically capable countries in Asia are relatively advanced in AI policymaking, initiating bottom-up cross-country and cross-sector R&D projects, as well as participating in international standard settings. Like their African counterparts, they also call for balancing the individual countries' domestic practices, values and principles in the building of consensus on interoperability of AI governance at the global level. Compared with the hard law approach, the R&D research exchanges or collaborations in the development of self-regulatory code (soft law) seem to be more flexible and feasible in facilitating and advancing the interoperability of global AI governance for those countries. However, the various rapid developments of global policies and initiatives in interoperability means that they need to strengthen their participation in regional and global regulatory AI discussions and development processes. Regulators, researchers and enterprises should be incentivized by programmes such as funding, rewards, training etc. to participate in international regulation-making.

3.3. Recommendations on interoperability of AI governance

In the context of the continued and rapid development of generative AI, we acknowledge the strategic importance of strengthening the interoperability of AI governance and at the same time fostering a pro-innovation environment for. In addition to that, we need to avoid an "out-of-control race", in the development of AI technology itself and in the governance of AI.

Our multi-stakeholder group proposes eight steps to increase interoperability of AI governance:

- **Accurately define** and agree on, what needs to be addressed on global level. This could include already as well as emerging risks related to AI, with focus on issues that have occurred or been observed in practice. To achieve interoperability in AI governance, we propose that the development of regional and/or global regulatory policies, guidelines and principles should be agile, reflexive, and inclusive, and evolve according to the AI maturity level.

- **Encourage public and private investment in governance infrastructure**. Research institutions, NGOs and enterprises should be encouraged to conduct international research on technologies, tools that will improve security, reliability, robustness,

[75] AUDA-NEPAD, Artificial Intelligence is at the core of discussions in Rwanda as the AU High-Level Panel on Emerging Technologies convenes experts to draft the AU-AI Continental Strategy, 2023

interpretability, fairness, and accountability of AI. This can be done for example via dedicated funding programs. International funding programs with focus on interoperability of AI governance should be established.

- **Strengthen legislative cooperation**. This can be achieved using various instruments that promote international cooperation. National regulators should strengthen cross-border and pan-industry cooperation. They should ensure AI governance frameworks facilitate inclusiveness and a level playing field for all to benefit of AI. Unnecessary costs and fragmentations due to different regional requirements should be avoided as far as possible. AI legislation should always be in line with human rights principles, norms and international standards.

- **Foster regional multi-stakeholder initiatives and interlink them globally.** In this way, both regional and global cooperation will be strengthened. We need to allow different speeds of cooperation based on different levels of maturity and public policy needs. We should not lose sight of the goal of increased interoperability of AI governance.
- **Strengthen capacity building**. Providing training opportunities for stakeholders through workshops, conferences and online courses can help speed up the knowledge-building. This is necessary to help meaningful participation in AI governance discussions.

- **Reduce regional disparities to encourage increases in maturity level.** This requires a comprehensive political, scientific and industrial exchange and cooperation. Proven best practices from regions (for example, national or regional AI strategies, research programs, industry guidelines or frameworks) should be selected with interoperability in mind for adaptability and usability for regions with lower levels of maturity.

- **Monitor and evaluate progress in reaching policy goals** set on national, regional and global levels to advance interoperability of AI governance. It is essential to continuously track progress made against goals set out earlier, identify areas requiring improvement, adjust strategies accordingly, and evaluate overall effectiveness of implemented measures.

- **Uphold and strengthen the Internet Governance Forum (IGF) process**, its regional and global multistakeholder initiatives including the Policy Network on AI. We need to foster spaces for open, transparent, inclusive and transborder consensus and capacity building of AI governance.

Figure: Recommendations on interoperability of AI governance

Acknowledge importance of interoperability and innovation		
Interactions and Interconnections	**Communication and Cooperation**	**Tools, Measures, and Mechanisms**
Continuous focus on definition, scope, and approach	Reduce regional disparities l via comprehensive exchanges and best practices sharing	Regional and global consensus and capacity buildings
Continuous monitoring, evaluation, and action	Foster regional multistakeholder initiatives and interlink them globally	Strengthening of legislative cooperation
Encourage regional and global multistakeholder investments in AI governance infrastructure		

4. Framing AI Lifecycle for race and gender inclusion

When AI systems were first created in the 1950s, the teams behind this innovation were predominantly composed of white men. More than seventy years later, this is still often the case. In this chapter, we address this and other gender-related issues relevant to AI as well as issues of race in the context of AI. When developed and deployed responsibly, AI systems have the potential of helping to improve gender and racial equality in our societies. AI systems biases can also reinforce or generate new ways to operationalize racism, sexism, homophobia, and transphobia in society and harm marginalized groups. Race and gender are interconnected and intersect in multiple ways. We address this intersectionality and its relevance in AI context in the third part of this chapter. Gender and race are complex multifaceted concepts that encompass a wide range of identities and experiences. Gender, race, ethnical biases are often embedded in AI and data governance systems, which can lead to significant challenges for example for individuals who do not conform to traditional gender norms. The relationship between gender bias and AI should be better understood since AI technologies are too often seen as neutral.[76]

Understanding and identifying gender and race biases in AI and data governance is essential to mitigating their impact on individuals and society. Racial or gender biases in AI applications have caused harm across sectors, for example in hiring, policing, judicial sentencing, and financial decision-making.[77] We need to acknowledge biases and vulnerabilities that lead to gender biases and racial disparities experienced by people across industries and around the world.[78] To address these biases, it is necessary to take an intersectional, transdisciplinary and multistakeholder approach to ethical AI and carefully consider questions of gender, race, ethnicity, sexual orientation, regionality and socioeconomic status.[79]

Gender, race biases in AI and data governance can cause harm, but it is possible to address these issues and use AI to promote equity and inclusion. Conscious, continued and ambitious action to debias AI systems is needed to guarantee basic human rights.[80] Data governance can play a critical role in overcoming these challenges by promoting fairness, transparency, accountability, and ethical decision-making. By increasing our efforts to address gender and race biases in AI and data governance, we can create a more equitable and just society for all.

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[76] Sinead O'Connor and Helen Liu, Gender bias perpetuation and mitigation in AI technologies: challenges and opportunities, AI & Society, May 2023

[77] *Artificial intelligence and bias: Four key challenges*. (n.d.) Retrieved August 11, 2023, from www.brookings.edu

[78] *Webinar: Addressing the gender bias in artificial ….* (n.d.) Retrieved August 11, 2023, from oecd.ai/en/webinar-gender-bias-artificial-intelligence-data

[79] *Addressing Gender Bias to Achieve Ethical AI*. (n.d.) Retrieved August 11, 2023, from theglobalobservatory.org.

[80] *How can we manage biases in artificial intelligence systems*. (n.d.) Retrieved August 11, 2023, from www.sciencedirect.com/science/article/pii/S2667096823000125

4.1. Race

The UN Human Rights Council has stated that "Technology is a product of society, its values, its priorities and even its inequities, including those related to racism and intolerance".[81] The next pages of this report focus on race issues in the context of AI. The general society has low understanding of racial discrimination. There is social pressure for historically marginalized people to be responsible alone for solving the problems that are consequence of discrimination. There is also a tendency to understand technologies and technologic fields developing them as neutral and objective. These three phenomena add up to the problems we face when we want to discuss AI and ethnic-racial discriminations.

AI systems learn and reproduce what humans have taught them. Therefore, if the person or data responsible for programming/training the system is intentionally or unintentionally racist, the system will have similar tendencies. Biases, defined as "*outcomes which are systematically less favorable to individuals within a particular group and where there is no relevant difference between groups that justifies such harms*"[82], are inherent to AI systems. The definition of race is based on an ideology and a historical social construct used to group people. This notion was created with the aim of hierarchizing different individuals, thus creating the relational idea that if some people are superior, others are consequently inferior. Oftentimes, race divides human beings into groups based on their physical appearances, social factors, cultural backgrounds, and descent. As a social construct, race is often used by dominant groups in society to continue establishing a system of power over other categories., which is a factor that leads to racial inequalities. UN's International Convention on the Elimination of All Forms of Racial Discrimination defines racial discrimination as "*any distinction, exclusion, restriction or preference based on race, color, descent, or national or ethnic origin which has the purpose or effect of nullifying or impairing the recognition, enjoyment or exercise, on an equal footing, of human rights and fundamental freedoms in the political, economic, social, cultural or any other field of public life*."[83] There remains much to be done in pursuing equity and respect for people regardless of how their bodies are read and racially classified.

Humans do not receive enough quality and full-spectrum training, this means there is not enough attention paid to gender, racial and ethnic biases AI systems can develop. Most of the AI developers belong to historically privileged groups. Therefore, the persons targeted by the racial biases rarely present when AI systems are developed. This can eventually be used to

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[81] United Nations Human Rights Council, Racial discrimination and emerging digital technologies: a human rights analysis A/HRC/44/57, paragraph 13, June 2020

[82] See Algorithmic bias detection and mitigation: Best practices and policies to reduce consumer harms | Brookings

[83] Article 1(1) UN, International Convention on the Elimination of All Forms of Racial Discrimination, UN General Assembly resolution 2106, December 1965

their disadvantage. Including marginalized people in the development and creation processes can help underline problematic aspects that could lead to a wider full spectrum inclusion of AI systems. It is clear that we need for example more women, gender-diverse individuals, and Black people working in the development of AI. A diverse team can bring different perspectives and experiences to the table, which can help identify biases and create more comprehensive solutions.

Moreover, another factor leading to racial discrimination is that the AI systems we have nowadays are mostly based on how they were created years ago. Therefore, if a system created in the 1970s is based on stereotypes and certain power balances and racial inequities of that time, this is still the foundation of a system in use today. Indeed, "*the problem is not surveillance technology itself, but the ways technology is deployed to reinforce pre-existing power disparities*"[84]. Ideally, building blocks of such AI systems should be broken to down completely and created anew. However, this is not a feasible solution, since starting from scratch with AI systems would delay technical development. Instead, we need to focus on changing the biases that the AI systems have developed and learned from humans over the years. This would mean teaching the AI systems differently. This needs to be done rapidly, before the system understands certain biases as permanent, which would be detrimental to many persons belonging to racial and ethnic minorities.

Algorithmic racism is defined by Milner and Traub[85] as "the use of Big Data in ways that, intentionally or not, reproduce and spread racial disparities, shifting power and control away from Black and brown people and communities". This type of racism appears in many different areas of life, may it be facial recognition, medical examinations or more basic tasks such as washing our hands, where for instance some automatic faucets do not recognize certain skin tones. This underlines the daily impact that AI systems have on people's lives. AI systems help spread stereotypes in society by, for instance, identifying people of color as janitors or criminals[86], this reinforces acts of discrimination and racism. AI should represent development and innovation; it shouldn't bring us back to a society where minorities are excluded and repressed.

CASE: Facial recognition

Facial recognition is an instrument that has become more ubiquitous, may it be on our personal phones, but also in security mechanisms. A facial recognition software at the MIT in the USA was incapable of recognizing the faces of Black students, who were forced to wear

[84] See Data Capitalism and Algorithmic Racism | Demos
[85] See Demos_ D4BL_Data_Capitalism_Algorithmic_Racism.pdf
[86] See AI Can Be Racist: Let's Make Sure It Works For Everyone (forbes.com)

white masks on their faces in order to gain access to different areas. The team creating the software was composed of white men. They were no tests run on different skin colors to ensure that the system worked on all persons.

A number of studies have underlined that AI systems are less capable of generating and recognizing faces of Black people.[87] For example, when AI systems are asked to recognize the gender of a face, they have an error rate of 35% for Black women, compared to an error rate of only 1% when it comes to white men.[88] This is an enormous gap. It can be explained by the fact that AI systems have not been created with the understanding of nuances of Black people's features. Many AI systems are based on stereotypical views of minorities, since the systems have not been trained well enough.[89] As a concrete example, systems sold by Microsoft and Amazon did not recognize iconic people, such as Michelle Obama and Serena Williams, correctly.[90]Facial and biometric recognition play an important role in police forces, notably in China and the USA. In China, the Uighur ethnic minority was forced to be biometrically recognized in order to be tracked and identified. This led to a restriction in their movements and activities, which goes against equality and non-discrimination rights, therefore violating a number of human rights.[91] In the USA, police agents are equipped with body cameras. Facial recognition softwares in the cameras are trained with a database of pictures including mugshot photos, in which Black people are overrepresented[92]. This leads to a disproportionality in their representation, which in run could translate to more arrests of Black people.[93] Amazon, one of the big companies involved in creating facial recognition softwares, has shifted the blame to the people who created these databases instead of addressing the racial bias in their products.[94]

AI systems have proven to be less effective in precisely recognizing the face of Black people many times. Such systems can be highly dangerous and discriminate against certain groups. Robert Williams, was wrongfully arrested after a facial recognition software identified him as the thief in a burglary.[95] It was then proved that it was not him and the software had been mistaken.

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87 See Artificial Intelligence Has a Racial and Gender Bias Problem | Time
88 See Artificial Intelligence Has a Racial and Gender Bias Problem | Time
89 See Black Artists Say A.I. Shows Bias, With Algorithms Erasing Their History - The New York Times (nytimes.com)
90 See Artificial Intelligence Has a Racial and Gender Bias Problem | Time
91 A/HRC/44/57 Report, para 39.
92 See The Bias in the Machine: Facial Recognition Technology and Racial Disparities · Winter 2021 (pubpub.org)
93 See Racial Discrimination in Face Recognition Technology - Science in the News (harvard.edu)
94 See Racial Discrimination in Face Recognition Technology - Science in the News (harvard.edu)
95 See Police Facial Recognition Technology Can't Tell Black People Apart - Scientific American

AI is used to spread racist speech and incitement to discrimination, as well as violence targeted at certain groups.[96] Social media platforms have been criticized for not being able to recognize instances of racism and letting them proliferate. But is the issue really companies and developers not being able to identify such instances, or simply that they are not motivated to recognize racism in their platforms? Identifying racist hate online requires resources that are most likely put in tasks that are considered more important in the company's view.[97] Examples of racist speech on Facebook include white supremacist groups rallying and coordinating their actions on the platform. Meta's Chief Executive Officer admitted that the platform's AI systems were unable to detect problematic hate speech in certain contexts, such as this one.[98] It is problematic that the creators have not noted the problems or taken them into account when creating the platform. A 2021 update stated that Meta's AI systems are responsible for detecting 97% of hate speech on Facebook, which is an improvement compared to previous years.[99] This lack of change has caused a number of Black, Indigenous and people of color (BIPOC) users to quit the platform, which has had a direct economic impact on Meta[100]. Perhaps if companies lose profits, they might take action to tackle racist speech and incitement to discrimination in their platforms.

There is an array of existing policy measures to tackle racism in AI. The United Nations' International Convention on the elimination of All Forms of Racial Discrimination states that States shall prevent racial discrimination, take effective measures where laws and policies have a discriminatory effect and conduct analyses and research to understand the causes and potential solutions to the issue of racism. However, many countries fail to collect data that could help reveal the disparate impacts of emerging technologies.[101] Implementing more research projects and increasing funding could be a step closer to objective and complete analyses on the racial problem with regard to AI.

A number of policy groups and associations are combatting algorithmic racism and hate speech. The Algorithmic Justice League[102] was created by Dr Joy Buolamwini (the same woman who faced difficulties with MIT's facial recognition system) to raise awareness about impacts of AI on minorities, to open dialogues with researchers and policymakers, and to give a voice to the victims of AI. As stated by the AJL, "*we want the world to remember that who codes matters, how we code matters, and that we can code a better future*".

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[96] A/HRC/44/57 Report, para 24.

[97] See The algorithms that detect hate speech online are biased against black people - Vox

[98] See www.commerce.senate.gov/2018/4/facebook-social-media-privacy-and-the-use-and-abuse-of-data

[99] See Update on Our Progress on AI and Hate Speech Detection | Meta (fb.com)

[100] See Facebook knew its algorithms were biased against people of color - The Washington Post

[101] United Nations, Racial discrimination and emerging digital technologies: a human rights analysis Report of the Special Rapporteur on contemporary forms of racism, racial discrimination, xenophobia and related intolerance A/HRC/44/57, June 2020

[102] See Algorithmic Justice League - Unmasking AI harms and biases (ajl.org)

Although there are many negative examples of how companies are not addressing racial discrimination and biases in their AI systems, some have owned up to their mistakes and changed their way of doing. This is the case of X, (formerly known as Twitter) that removed a photo-cropping feature they had introduced on their platform, which did not recognize Black faces correctly. Twitter admitted that there was a racial bias, and therefore discrimination, which led to eliminating the feature.

In terms of race, highlighting the lack of F.A.T.E (fairness, accountability, transparency, and ethics) is another approach that addresses the detection of biases more obliquely, with accountability measures designed to identify discrimination in the processing of personal data. Numerous organizations and companies as well as several researchers propose such accountability. Therefore, having the difficulties of foreseeing AI technologies outcomes as well as reverse-engineering algorithmic decisions, no single measure can be completely effective in avoiding perverse effects. Thus, where algorithmic decisions are consequential, it makes sense to combine measures that should be taken to work together. Advance measures such as F.A.T.E., combined with the retrospective checks of audits and human review of decisions, could help identify and address unfair results. A combination of these measures can complement each other and add up to more than the sum of the parts. This also would strengthen existing remedies for actionable discrimination by providing documentary evidence that could be used in litigation, creating new laws and policies, and frameworks, and developing a deeper understanding of the social implication of the different AI technologies and how we could use those results to improve them or not longer use them. Nevertheless, we need to hold companies that develop AI systems accountable for them to take appropriate measures. Without some kind of economic constraint, companies will not allocate resources and time to make the needed changes in their AI systems.

4.2. Gender

AI can be a powerful tool for women, girls and gender diverse people's empowerment. At the same time, AI can also hinder the progress towards equality if issues including representation, bias, and discrimination issues are not adequately addressed. We find that the increased development and use of AI systems, including generative AI, has magnified already existing obstacles for reaching global gender equality goals.

According to the World Health Organization, gender refers to the characteristics of women, men, girls, boys, and others that are socially constructed. This includes norms, behaviors, and roles associated with being a woman, man, girl, boy, or diverse expressions and identities, as well as relationships with each other. As a social construct, gender varies from society to society and can change over time.[103] Gender is different from sex, which refers to the different

[103] Gender and health - World Health Organization (WHO). https://www.who.int/health-topics/gender

biological and physiological characteristics of females, males, and intersex persons.[104] Gender identity refers to a person's deeply felt, internal, and individual experience of gender, which may or may not correspond to the person's physiology or designated sex at birth.[105]

Gender biases in AI and data governance have become a concerning issue in recent years. These biases can arise in various stages, from data collection to algorithm design and decision-making.[106] The biases can be unintentional and reflect existing societal norms and stereotypes[107]. Women and gender-diverse people globally face unique challenges, which lead to underrepresentation and misrepresentation of certain groups in AI development.[108] [109] The biases can also stem from how data is collected, stored, and processed.[110] Gender biases in AI and data governance can have negative consequences, such as discrimination and unfair treatment. Data governance needs to be adequate to promote gender equality. Despite balanced datasets, gender biases still exist in AI technologies[111]. Algorithms being used need to be constantly checked for potential biases related to gender.

Studies suggest that AI can help reduce gender bias in decision-making by eliminating or minimizing the influence of biased information in the decision-making process. For instance, AI systems can be designed to exclude irrelevant information from the decision, such as a person's gender, race, or other characteristics that might introduce bias.[112] Additionally, AI can be employed to analyze large datasets and detect patterns of bias, enabling decision-makers to take measures to mitigate the impact of bias.[113] AI is already harnessed to reduce or mitigate inequalities. Examples that deserve to be celebrated include an initiative of Women's World Banking and Mujer Financiera[114] that uses machine learning to champion financial inclusion for women in Latin America and to supports women in managing their personal finances.

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[104] GENDER | English meaning - Cambridge Dictionary. https://dictionary.cambridge.org/dictionary/english/gender.

[105] Gender Definition & Meaning - Merriam-Webster. https://www.merriam-webster.com/dictionary/gender.

[106] Gender bias: perpetuation and mitigation in AI technologies: challenges and opportunities. (n.d.) Retrieved August 11, 2023, from link.springer.com/article/10.1007/s00146-023-01675-4

[107] Ibid

[108] Ibid

[109] Gender bias: perpetuation and mitigation in AI technologies: challenges and opportunities. (n.d.) Retrieved August 11, 2023, from link.springer.com/article/10.1007/s00146-023-01675-4

[110] (n.d.) Retrieved August 11, 2023, from theglobalobservatory.org

[111] Gender bias: perpetuation and mitigation in AI technologies: challenges and opportunities. (n.d.) Retrieved August 11, 2023, from link.springer.com/article/10.1007/s00146-023-01675-4

[112] A Simple Tactic That Could Help Reduce Bias in AI - Harvard Business Review. https://hbr.org/2020/11/a-simple-tactic-that-could-help-reduce-bias-in-ai.

[113] CAN ARTIFICIAL INTELLIGENCE REDUCE BIAS IN HUMAN DECISION-MAKING .... https://dosi.duke.edu/integrity-insights/can-artificial-intelligence-reduce-bias-human-decision-making.

[114] Women's World Banking, Women's World Banking announces finalists for second annual Making Finance Work for Women Fintech Innovation Challenge press release, September 2020

Absence of AI regulations in many parts of the world, the low transparency regarding AI use in different social contexts, as AI's impact on underrepresented social groups, such as women, can raise concerns. These concerns are not limited to deepening existing inequalities, but we are concerned that AI can also create new inequalities. It is clear that we need to address harmful practices in the application and development of AI. Attention needs to be paid also in situations where, AI-powered solutions help achieving notable positive results, but there still remains a need to improve the impact on historically marginalized groups, including women. A recent case and example of using automation to handle large volumes of data took place in Brazil during the Covid-19 pandemic. "Emergency Aid" is a case that sheds light on how automated processes can be a powerful tool for processing large volumes of information and making rapid decisions. The case also underscores the importance of continually improving these systems to ensure that they are fair, transparent, and capable.

Case: Automated Emergency Aid program in Brazil

Women were among those most negatively affected by the pandemic, and the Brazilian Government created an Emergency Aid program with a special focus on women. The goal of the program was alleviating the economic and social effects of the pandemic, and allowing the most vulnerable part of the population to maintain access to consumer goods, especially food. People applied for the Aid remotely through a mobile application developed by the government. To register, they were asked to provide personal information including full name, date of birth, CPF personal credit number, family composition, work conditions, and income. The algorithm made the decision to grant or deny of the benefit automatically without human involvement. Beneficiaries were selected through cross-referencing data from citizens registered in CadÚnico (Brazil's system for social program registration), and the public that registered through the app, with the program's eligibility criteria.

People trying to access and use Emergency Aid through the app faced difficulties. The created algorithm could not handle recent changes in income and personal situations, as the databases it had access to were not consistent with the current situation of the people. This resulted in a significant portion of people who needed assistance not receiving the aid. Due to the lack of administrative ways to review the automated decision, the judicial system was the primary means of contestation and requesting human analysis for granting the benefit. This created a new problem due to the limitations of the State in offering legal assistance to the most vulnerable population. But despite all the limitations and access problems, the automated system made it possible for the benefit to reach a significant portion of the Brazilian population rapidly. Research suggests that (at least in relation to the initial rounds of Emergency Aid) the

benefit had a positive impact on the income levels of Brazilians facing situations of great vulnerability.[115] This would not have been feasible for humans at that moment.

Although AI has evolved significantly in recent years, women around the world still have less access to education and training for digital technologies and AI specially. They are still underrepresented in AI research and development and in the boardrooms of the most influential AI companies. Recent studies have found that only 18% of authors at leading AI conferences are women, and more than 80% of AI professors are men[116]. This disparity is extreme in the AI industry, for example at Facebook and Google women comprise only 15% and 10% of AI research staff in the companies[117]. In 2019, women represented only 18% of C-suite leaders in AI companies and top start-ups globally. Women's participation in key decision-making on AI is limited.[118]

AI can also perpetuate and amplify existing biases if not designed and used carefully[119]. For example, if AI systems are trained on historically biased data, they may make decisions that discriminate against certain groups[120]. Additionally, when the data used to train the AI system contains biases, such as historical discrimination against certain groups, the AI system may perpetuate and amplify these biases.[121] It is important for developers of AI systems to be aware of these potential biases and take steps to mitigate them. Additionally, we find it is important for companies, governments, civil society organizations, and multi-stakeholder initiatives to work together towards a more comprehensive view of AI fairness covering all its[122]. We need to increase collaboration between scholars from the worlds of technology, gender studies, and public policy to develop a shared language to assess and strengthen inclusion of women and gender diversity in all stages of AI lifecycle.

Finally, we need to acknowledge that while AI systems can potentially correct discrimination, the realization of this potential requires awareness, transparency, and oversight[123]. It is

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[115] [Source to be added here]

[116] Artificial intelligence and gender equality: key findings of ... - UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000374174.

[117] Ibid

[118] See https://oecd.ai/en/wonk/closing-the-gender-gap.

[119] A conversation on artificial intelligence and gender bias. https://www.mckinsey.com/featured-insights/asia-pacific/a-conversation-on-artificial-intelligence-and-gender-bias

[120] Ibid

[121] AI Bias: Where Does It Come From and What Can We Do About It?. https://blogs.ischool.berkeley.edu/w231/2021/06/18/ai-bias-where-does-it-come-from-and-what-can-we-do-about-it/

[122] The Ethics of AI: How Can We Ensure its Responsible Use?. https://becominghuman.ai/the-ethics-of-ai-how-can-we-ensure-its-responsible-use-35ac3cf76ae5

[123] Navigation. (n.d.) Retrieved August 11, 2023, from www.coe.intGender: what it is, Biases, Challenges and Opportunities in AI and Data Governance

essential to acknowledge that pre-existing biases can affect the development and implementation of AI and data governance systems, as biased social norms and practices can introduce biases into Machine Learning (ML) systems through data[124].

Many Governments are currently developing legislation to put in place mandatory artificial intelligence audits, which need to integrate a gender perspective. The development of voluntary ethical frameworks is another way to guide the behaviors and actions in developing and using AI. Most frameworks have no safeguards which can undermine their application and oversight. Self-governance systems put in place by companies have been underpowered, including many internal human rights or ethical AI teams and bodies. Many companies continue to ignore harms their AI-powered products and services cause, or they are underinvesting in efforts to address them.

4.3. Exploring the Intersectionality of Gender and Race in AI

Intersectionality refers to the overlapping and interconnected nature of social identities, such as race and gender, and how they can lead to unique experiences of discrimination and bias. Intersectionality is a critical framework for improving fairness in AI by addressing the intersection of oppression, such as racism and sexism. The interconnected nature of social categories such as race, gender, and how they relate to systems of oppression and privilege, are at the heart of the notion of intersectionality.[125] However, the exclusive focus on identity categories in AI may divert attention from structural oppression that causes unfairness between subgroups. For instance, black women are oppressed because of the intersecting structure of racism and sexism, not just because they have intersecting identities of "black" and "women".[126]

Ethical AI requires taking an intersectional approach when addressing questions around gender, race, and ethnicity.[127] One area of concern is the intersectional discrimination faced by women, and gender-diverse people of color in the field of AI. For instance, AI algorithms exhibit bias when they perform better on recognizing men than women, and people with lighter skin tones than people with darker skin tones. There is an intersection of gender and race discrimination which results in lower accuracy recognizing women and gender diverse people with darker skin tones.[128] These discrepancies are problematic because they may lead to misidentification or bias against certain groups of people. Therefore, intersectionality is a

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[124] Exploring gender biases in ML and AI academic research through systematic literature review. (n.d.) Retrieved August 11, 2023, from www.ncbi.nlm.nih.gov/pmc/articles/PMC9593046/.

[125] Intersectional Fairness in AI? A Critical Analysis. (n.d.) Retrieved September 3, 2023, from feminism-social-justice-ai.org

[126] Ibid

[127] (n.d.) Retrieved September 3, 2023, from theglobalobservatory.org

[128] Intersectional Fairness in AI? A Critical Analysis. (n.d.) Retrieved September 3, 2023, from feminism-social-justice-ai.org

critical framework to measure fairness, and AI algorithms are considered fair if probabilities of outcomes are the same or similar across different combinations of attributes such as gender and race.[129]

Considering intersectionality in the AI lifecycle processes helps ensure that AI systems are fair and just for all people. One strategy for improving diversity is to ensure a diverse group of individuals is involved in the entire AI lifecycle, from data collection to algorithm design to implementation. This includes people from various disciplines, cultures, genders, and backgrounds, as well as individuals with disabilities. Another strategy is to use inclusive design practices to ensure that AI systems are accessible to all individuals, regardless of their abilities or background. This approach involves end-users throughout the development process to ensure that the system is designed to be inclusive from the start.

4.4. Recommendations on AI and gender/race

In conclusion, policy measures are still rather sparse, and we need to accelerate the progress in the fields of racial and gender discrimination in AI systems. Some feel that is that it is too late to solve the issues of gender and race, as they are too embedded in the AI systems. Changing the course is still possible, we just need to increase our efforts in erasing stereotypical views, diversifying teams working in AI and much more.

It will be hard to achieve an unbiased AI, but multistakeholder approach could offer a holistic way to understand, embody, and code the experiences of women, gender diverse, minorities, BIPOC into AI and other data-driven new technologies. Global cooperation and multistakeholder dialogue are vital in ensuring AI is a force for good also in the context of gender and race. We need to mitigate potential risks, and design paths that prioritize the well-being and security of historically marginalized groups and society at large in the age of AI.

Based on our work and discussions, here are our key statements and recommendations:

- We need to have clear policies and regulations in place that promote diversity and inclusion in AI. These policies should mandate that diversity and inclusion are taken into account during every stage of the process, and should encourage F.A.T.E. We need to promote obligatory human rights assessments of potentially risky AI applications.

- It is vital to include mainstream gender in national AI policies. We need to include time-bound gender-specific targets, allocation of resources, increased coherence to remove

[129] Ibid

the multidimensional and discriminatory barriers faced by women, girls; and gender diverse people.

- We need to integrate a gender-responsive approach into the development, review and implementation of laws, policies and programs relevant for the digital age to combat new risks, gender stereotypes and bias in the fields of artificial intelligence, predictive algorithms and robotics.

- AI systems should be regularly audited to detect any biases that may have slipped through the cracks, and to ensure that they are functioning fairly and equitably.

- Any AI framework that aspires to be fair, accountable, transparent, and ethical must incorporate theories, perspectives from marginalized and underrepresented communities into all stages of AI lifecycle.

- We need to fund, support, and empower grassroots work and advocacy to foster inclusive dialogues on if and how gender, sexuality, race, ethnicity and other aspects of identity should be used in datasets and AI systems. Civil society and advocacy groups play an important role in uniting the voices of minorities to be heard by companies and institutions still promoting algorithmic racial discrimination.

- Governments should be obligated to conduct impact assessments and collect data on racial discrimination in AI. A voluntary approach is not sufficient.

- Meaningful inclusion and representation of impacted communities' representatives needs to be ensured in corporate committees. This also includes committees of national authorities or oversight bodies elected by a community or sector. Diversity and inclusion are cornerstones for developing safe and reliable AI.

- We need to step up our efforts in ensuring diversity, quality, and accuracy when building and curating datasets.

- It is vital to provide transparency, explainability, and accountability mechanisms for the whole AI lifecycle. This is especially important in the context of automated decision-making that could lead to discriminatory outcomes and harmful impacts on the fundamental and human rights of individuals.

By implementing these actions we take one step closer to ensuring that AI systems are building a society that is fair, equitable, and accessible to all individuals.

5. AI and environment

The convergence of AI, data, and environmental concern forms a dynamic nexus that holds immense promise for addressing pressing global challenges[130,131]. Frontier technological capabilities can be leveraged to conserve and protect the environment — ultimately supporting a just green-digital transition, that fosters shared prosperity for people and the planet.

However, accelerated digital transformation (DX) creates both challenges and opportunities for the global green agenda. Digital solutions create new data-driven innovations for the common good. At the same time, accelerated DX can harm the environment[132]. The disproportional global effects of climate change[133] have led to increasing calls for a "just green transition". This refers to transitioning to a environmentally sustainable and climate-friendly economy that benefits all members of society. Intensifying datafication of societies, DX and the green transition are increasingly intertwined processes. We observe high levels of optimism that AIcan be harnessed to accelerate progress towards a greener and more sustainable future, ultimately mitigating the global polycrises[134].

However, most of the hype on green-digital transition is mainly from countries in the Global North (GN), which (based on previous industrial revolutions) are better positioned to leverage positive impacts of technological disruptions[135]. These countries typically have relatively higher capabilities to combine the potential of accelerated DX with AI.[136] Many GN countries have the awareness and needed resources and prerequisites to optimize and implement data-innovations that in turn improve mitigation, adaptation, and monitoring of the triple planetary crises[137],. This GN techno-optimism often fails to capture the complexities of data-innovation ecosystems of low- and middle-income countries (LMICs), most which are based in the Global South (GS). These countries are plagued by persistent and multidimensional structural inequities[138], including an AI divide[139] which will most likely hinder these countries' efforts towards successful twin transition[140].

Advances in AI, including the recent leaps made in generative AI, show significant for environmental conservation. One notable example is the use of generative models, such as Generative Adversarial Networks and Variational Autoencoders, for generating synthetic data.

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[130] Climate Change and AI: Recommendations for Government Action. (GPAI).2021
[131] Three Shifts for a Sustainable Planet in the Digital Age. CODES. (2023)
[132] The Impact of Digital Transformation on Environmental Sustainability. Truong T.C. (2022)
[133] A critical review of disproportionality in loss and damage from climate change. Dorkenee. K., et al. (2022)
[134] We're on the brink of a 'polycrisis' – how worried should we be?. Torkington.S. (2023)
[135] Technology and Innovation Report. UNCTAD (2021)
[136] ibid
[137] A Green Deal Industrial Plan for the Net-Zero Age. European Commission (2023)
[138] ibid
[139] The 'AI divide' between the Global North and the Global South. Yu. D. (2023)
[140] AI and the Circular Economy in Africa: Key considerations for a Just Transition. Ahmed. S (2022)

Such data can aid in environmental research and conservation efforts[141]. Paradoxically, models such as ChatGPT, Hugging Face, and Google Bard, demand significant computing power. Enormous amounts of energy are needed to train and support user queries, ultimately resulting in increased greenhouse gas (GHG) emissions[142] and societal harms[143]Natural resource consumption of AI compute infrastructure is a critical aspect to consider as AI technologies become more prevalent and powerful. Other challenges connected to increased development and uptake of AI systems include ecological disruptions and human rights violations associated with the mineral value chains that supply the increased demand for hardware devices that bridge the gap between offline and online worlds[144].

Without robust data governance, AI can amplify or create intersectional inequities, particularly for the GS. Robust data governance (RDG) plays a pivotal role in shaping how environmental data is collected, stored, shared, and used for a wide range of applications such as advancing digital twin enabled innovation, informing climate-related policies, and scenario forecasting[145]. The responsible management of data is vital if we want to ensure that AI technologies are harnessed for the betterment of the environment. We need to ensure transparency, accountability, security, privacy, and foster data-innovations that support the social contract for data[146].

RDG can also play a significant role in mitigating the environmental impact of AI. RDG is crucial for collecting high-value data that is needed to assess the environmental impact of AI[147]. However, collecting data that aligns to the principles of data justice[148] is difficult because AI technologies and applications develop constantly, and many data ecosystems in the GS are inefficient. Collaboration among different stakeholders is essential to address these environmental concerns effectively.

GS countries are often characterized by diverse ecosystems, rich biodiversity, and unique environmental challenges. But GS is often not included as a critical player in the development of “consensus based” technical standards, norms, and regulation on the triple planetary crises, and increasingly for global AI governance[149]. For example, we know that open free, global, interoperable, reliable, and secure internet is a prerequisite for data free flow with trust, that

[141] ibid
[142] Is generative AI bad for the environment? A computer scientist explains the carbon footprint of ChatGPT and its cousins. Saneko.K
[143] The hidden cost of the AI boom: social and environmental exploitation Gordan. A, et al. (2023)
[144] Conflict minerals: the bloody truth behind your smartphone. European Parliament. (2017)
[145] ibid
[146] World Development Report 2021: DATA FOR BETTER LIVES. World Bank. (2021)
[147] Measuring the environmental impacts of artificial intelligence compute and applications.OECD (2022)
[148] Data Justice in Practice: A Guide for Impacted Communities. GPAI. (2022)
[149] Why the G20 Should Lead Multilateral Reform for Inclusive Responsible AI Governance for the Global South. Ahmed et al., (2023)

supports innovations such as AI and strengthens respect for democratic values. Still, LMIC's are late internet adopters and not able to reap the benefits.

GS grapples with more environmental vulnerabilities and would benefit from innovative solutions facilitated by the digital revolution. We need to highlight the intersection of AI, data governance, and the environment for devising effective strategies that cater to local needs and challenges. Meaningful global cooperation for data[150] and the environment is needed to address these multidimensional and interdependent challenges. We need to ensure AI's net environmental impact is positive for the GS.

Our report's focus lies on the Global South, but it is worthwhile to draw ideas from new initiatives on data governance being formulated in the EU. We need to discuss which elements could be adapted to formulate broader data governance framework(s) that can benefit the GS.

The purpose of this chapter is to dive in this interplay of AI, data governance, and the environment. We will present two case studies that demonstrate the importance of robust data governance (RDG) and responsible AI deployment in: (i) Food security and community resilience; and (ii) Climate disaster management. The following pages are a result of an iterative process that included open multi-stakeholder dialogue, collaborations and feedback from diverse experts.

5.1. Case Studies

This chapter goes beyond mere analysis; it aspires to provide practical insights and recommendations on the technological environmental societal and governance (TESG) challenges related to climate change and digitalisation. The selected cases illustrate the power of effective responsible AI governance.

5.1.1. Case Study 1: Data Governance and AI for Food Security and Community Resilience

Food security analysis and forecasting: A machine learning case study in southern Malawi.

The case study reveals that AI holds a significant role in the transformation of food systems and in combatting food and nutrition insecurity[151]. Within the agricultural sector, AI can contribute in various ways. It can optimize or even automating certain human tasks like planting and harvesting, and make utilization of natural resources more efficient.

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[150] Towards an international data governance framework. MacFeely. S. et al., (2022)
[151]

However, when harnessing AI capabilities to increase food security, policy coherence and systems thinking should be used to reap potentials and mitigate risks. For example, small and medium-sized agricultural production units would need to make significant complementary investments, for instance in specialized infrastructure for collecting and transferring data. This means that beyond robust data governance, complimentary infrastructure policies and skills upgrading are crucial to support small holder farmers and stakeholders' digital capabilities and access to frontier technologies.

In the GS, there must be concerted efforts to ensure that formulating data governance frameworks for AI, and in particular for AI deployment aiming at increased food security in the face of climate change, important consideration is the affordability and accessibility of the data infrastructure and the information technology network, whereas this would imply ensuring availability of large data sets with high variability and high quality for GS contexts, and provided these data are findable, accessible, interoperable and reusable (FAIR).

Ideally, AI-enabled precision farming contributes to food security via improving yields while conserving valuable resources, such as water. The goal is to optimize amounts of fertilizer and herbicide based on level of soil nutrients, expected temperatures and wind speeds across farmland, establish ideal depths to plant seeds or required irrigation given a particular soil moisture, and handle different crops and adjust practices towards keeping carbon sequestered in the soil. Hence, data and AI are supposed to optimize harvests and minimize the input of resources, including water and fertilizer. This can only be achieved in the GS, if high-quality local data is available for analysis. It is fundamental that the creation of data ecosystems is done in an inclusive manner, set to solidify community resilience.

However, it is also fundamental to avoid that precision farming unevenly contributes to the expansion of monoculture farming practices leaving small-scale farms behind upon which multiple communities in the GS rely on, and to avoid generating new dependencies where farmers are locked into unfavourable commercial relationships with technology and services providing firms.

5.1.2. Case Study 2: Data Governance and AI for Climate Disaster Management

Sagar Vani is an intelligent AI app by the Indian government that has released mobile applications of and India Quake to spread information about earthquakes and other natural catastrophes. The two key mobile applications "India Quake" and "Sagar Vani" are intended to handle seismic events and marine safety, respectively. These applications are one of India's proactive approaches to utilizing intelligent technology for disaster management and maritime safety. The "India Quake" app is a cutting-edge effort in earthquake preparedness and response. This app provides real-time alerts regarding seismic activities in India and surrounding locations, ensuring that users have the information they need in time to make

decisions during earthquake occurrences. Users of this program have access to real-time weather forecasts, predictions of the ocean's status, and notifications about large waves, which are crucial for conducting safe maritime operations.

The "India Quake" app was released by the National Centre for Seismology, which is under the Ministry of Earth Sciences, India. This software will provide the public with access to earthquake information in real-time. The "Sagar Vani" utilizes multiple communication channels through voice calls, mobile apps (User/Admin modules), multilingual SMS, audio advisories, social media such as Twitter and Facebook, GTS, email, fax, IVRS, radio and television transmission equipment, cloud channels, digital display boards, and digital display boards. It allows users to receive notifications when earthquakes occurred in various parts of the country. The app provides comprehensive information on the location, magnitude, and duration of the earthquake. This app's objective is to inform users about seismic activity and warn them to take safety measures in the case of an earthquake.

The intelligent "India Quake" and "Sagar Vani" apps have been created to offer the public essential information and services, particularly in the fields of maritime safety and earthquake preparedness. The India Quake apps, which concentrate on earthquake monitoring and early warning, aim to deliver several important outcomes so that users can receive messages and alerts for earthquakes in real-time. People can take urgent precautions to safeguard themselves during seismic events thanks to this early warning system that utilizes AI through historical earthquake data. It promotes preparedness and aids people in understanding the science behind earthquakes. Several other environmental data such as weather forecasts, statistics on the state of the ocean, tidal wave alerts, and other nautical data are all provided via the Sagar Vani apps.

The Sagar Vani and India Quake applications demonstrated India's commitment to using technology for the benefit of its people, the protection of its natural resources, and the incorporation of artificial intelligence in the application, the apps exemplify the critical role of data governance in harnessing AI and technology for disaster management and maritime safety. These applications rely on a vast array of data sources, demanding meticulous data collection, validation, and quality assurance. Data privacy and security are paramount, ensuring user information remains protected. Collaborative data sharing protocols and interoperability standards enable seamless communication between various agencies. Ethical data usage is enforced to maintain trust, while transparency and accountability are crucial for user confidence. Inclusivity ensures information reaches a diverse audience. These apps showcase India's commitment to utilizing technology for public benefit, safeguarding natural resources, and effectively incorporating Ai into practical applications, all guided by robust data governance principles.

5.2. Key Considerations for Responsible AI Use in the Environmental Sector

Multidimensional divides between the Global South and Global North. There are Multidimensional divides between the Global South and Global North on data governance, technical standards and norms, and resource allocation for environmental data and AI use. Promoting global digital public goods can play a pivotal role in addressing these divides and in advancing sustainable development, particularly in LMICs. Its primary objective is to advocate for and facilitate the discovery, development, utilization, and investment in digital public goods. The significance of open-source software, open artificial intelligence, open data, free systems, and other forms of digital content that are freely accessible to the public is widely acknowledged on a global scale.

While the Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction 2015-2030, and the Paris Agreement, emphasize the importance of public engagement, improved access to information, and the availability of easily accessible and up-to-date data. The growing accessibility of open-access data and digital resources extends the potential for broader populations to derive benefits from their use, that supports a just transition[152], in domains such as disaster prevention, disaster management, and disaster risk reduction.

Lack of contextualization and enforcement of ethical AI standards to suit GS. Climate change cannot be addressed without addressing systematic injustices such as colonialism, racism, and uneven global power structures. The lack of contextualization and enforcement of ethical AI standards poses a significant challenge at the intersection of AI data governance and environmental sustainability, with implications for gender equality.

While AI holds immense potential to address environmental concerns, inadequate consideration of context-specific environmental challenges and the incorporation of gender perspectives can result in biased or incomplete solutions. Failure to recognize the gendered impacts of environmental issues, such as access to resources, can perpetuate inequalities. Additionally, without robust ethical standards, there's a risk of environmental data being misused or exploited, potentially harming marginalized communities and ecosystems. RDG and responsible AI the environmental sector should prioritize a nuanced understanding of local contexts, gender disparities, and ethical principles to ensure that AI-driven solutions not only protect the environment but also promote gender equity and social justice.

Adopting a holistic approach that acknowledges and confronts systematic injustices that are deeply entrenched in our global systems is necessary when addressing climate change within the context of AI, data governance, and environmental sustainability necessitates a. Climate change is not just an isolated environmental issue; it is intrinsically connected to historical injustices, including colonialism and racism, which have led to uneven global power structures.

[152] ibid

To effectively combat climate change, we must recognize and address these interconnected challenges. Only by addressing these systematic injustices can we hope to create equitable and sustainable solutions to combat climate change and safeguard our environment for future generations.

5.3. Recommendations on AI and environment

This chapter provided real-world examples of AI projects that have made a significant impact on climate-related efforts in the Global South. It also identified obstacles and difficulties in the adoption and integration of AI in sectors relevant to climate action, and that reflect the contextual realities of the Global South. Reformed multilateralism and collaborative efforts are needed to address the complex challenges at the intersection of AI, data governance, and the environment in the Global South.

The case studies highlight that while there are pockets of excellence in leveraging AI for the environment, there is a pressing need for the development of robust data governance and interdependent investments in human capital, digital infrastructure, increased research funding. We need to increase the efforts in supporting deployment and incorporation of responsible AI throughout the AI lifecycle. International collaboration, knowledge exchange, access to digital public goods, and coordinated funding for initiatives that utilize AI to address climate-related issues should be accelerated and fostered as they are of utmost importance.

Here are the recommendations and conclusions based on the discussions and work of the multi-stakeholder group:

Ensure a decolonial informed approach to data free flows with trust

- Develop policies that ensure equitable management and access to high value data sets and other digital public goods, to enable sharing of digital dividends and to promote effective just data value creation, particularly for AI use cases where there is a history of resource exploitation, that harms local communities.
- Promote transparency and accountability through each phase of the AI life cycle by developing practical and contextually relevant responsible AI and RDG frameworks.
- Reform multilateralism to dismantle the status quo and ensure international collaboration promotes, meaningful participation, fair consensus on technical, standards, norms, and agreements, and responsible resource management.

Climate-Resilient Technology Adoption and Capacity Building

- Consider a decolonial informed approach for less predatory investments, loans, and financing mechanisms to improve the adoption of climate-resilient technologies and

local expert lead data ecosystems in the Global South, that reflects a decolonial informed approach, through contextually relevant incentives and capacity-building programs, including to leverage AI-driven solutions.

- Support technology transfer and international collaboration for access to Recommendation on the Ethics of Artificial Intelligence climate technologies.

- Invest in educational and skill development programs to build local capacity in data science and AI.

Gender-Responsive Environmental Policies and Data Governance

- Formulate and implement gender-responsive climate and environmental policies, integrate considerations of intersectionality into leveraging data driven-AI solutions.

- Empower women and marginalized communities in decision-making processes related to environmental conservation, data governance, and AI, at all stages of the AI lifecycle.

- Ensure that AI and data governance diversity in development of solutions prioritize inclusivity in decision making (governing), and equitable access to environmental data.

Mitigate Environmental Risks and Invest in Sustainable Data Economy infrastructure

- Mitigate environmental risks of AI deployment through assessments, energy-efficient algorithms, and responsible AI practices.

- Ensure a just transition for data centres and other AI related infrastructure investments and to ensure sustainable digital development by adopting renewable energy, managing e-waste, and promoting circular economy principles, based on contextual realities while considering overlapping structural inequalities

- Mandate monitoring and reporting of the environmental impact of AI and data operations, to create empirical evidence for informed policy-making and to encourage transparency and accountability.

These recommendations collectively offer a framework for public policymakers in the Global South to promote interoperable AI governance interventions, that harness the potential of AI and data technologies for sustainable digital development while addressing, historical injustices, promoting gender equity, and minimizing environmental harm.