

# FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL MAPPING POLICY AND CAPACITY FOR ARTIFICIAL INTELLIGENCE FOR DEVELOPMENT IN AFRICA - FINAL TECHNICAL REPORT, RESEARCH ICT AFRICA

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# Mapping Policy and Capacity for Artificial Intelligence for Development in Africa

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## 1. Synthesis

This project was a response to the research agenda proposed in the IDRC Whitepaper: *Artificial Intelligence and human development* on the ethical and equitable application of Artificial Intelligence (AI) in the Global South. The overall objective of the project is to improve understanding of Artificial Intelligence (AI) policy and capacity in Africa to support responsible artificial intelligence for development.

The AI in Africa Policy Project (AI4D) aimed to address the gap in African perspectives on AI as well as policy and regulatory readiness, by undertaking a mapping of AI usage, governance and societal impacts in Africa. In the context of RIA's ongoing work on digital inequality and digital inclusion, the project ascertains what measures have been or need to be taken within and by the public sector to ensure that as large numbers of people are exposed to AI, they are safeguarded from associated harms and identified risks mitigated.

AI4D considers data governance from a human rights and justice perspective that goes beyond traditional data protection and privacy compliance frameworks that dominate so called 'best practices'. Emerging from this is a dynamic set of recommendations for the design of policies that enable beneficial, inclusive and rights-based AI in developing countries, and specifically African, contexts.

This 18-month long project entailed mapping the application of AI on the continent in three thematic areas: (1) digital ID and biometrics, (2) computer vision and video surveillance, (3) capacity and workforce development. Each of the three thematic areas included consideration of the gender implications of developments in the field. A fourth thematic area examined trends in AI and fintech from a gender perspective.

The outputs of the project include a series of thematic policy papers covering the themes mentioned above. The dissemination strategy entails policy briefs available on RIA's website but also disseminated more widely through media releases, op eds and blogs; presentation of the research at forums and events, and through the RIA podcast.

## 2. The research problem and objectives

Artificial intelligence (AI) holds the dual potential to promote human development and introduce negative multipliers into society. Consequently, for AI to be beneficially deployed in Africa, public and private actors must establish appropriate local policy as well as regulatory and implementation frameworks that leverage benefits, whilst mitigating risks and harm. For example, policies on data protection, privacy, security, accountability and fairness are essential.

Furthermore, African input is needed in the ongoing discourse on Good AI (fairness, accountability and transparency) which, at present, is mainly driven by multinational corporations, international forums representing business interests, and analysts, researchers and activists in the Global North. Although multilateral organisations are increasingly taking up these issues, particularly in the context of AI ethics, the conversations still continue to be dominated by these voices from the Global North. The norms and principles for ethical and responsible AI should not be driven entirely by advanced economies, nor by the private sector, particularly in relation to voluntary compliance and self-regulation where corporations deliver global public goods. AI readiness dimensions can and should reflect different configurations and structures of power as well as independent accountability mechanisms. This, therefore, requires investigation and building evidence in the African context.

The AI for Development Project (AI4D) addresses the gap in African perspectives on AI as well as policy and regulatory readiness to deploy AI systems. The project undertook a mapping of AI usage, governance and societal impacts in the public sector in Africa. In the context of RIA's ongoing work on digital inequality and digital inclusion, the project ascertains what measures need to be taken by the public sector to ensure that as large numbers of people are exposed to AI, they are safeguarded from associated harms, and potential risks are mitigated.

These issues have been approached from a rights-based perspective, considering the legal and ethical frameworks needed not only to ensure compliance in terms of data protection and privacy but acknowledging the limitations of individualised notions of privacy, and existing notions of informed consent by data subject in achieving data justice. This perspective aided in developing recommendations for the design of policies that enable beneficial, inclusive and rights-based AI. Rather than working with the assumptions of universal access to data services and the availability of skills and resources to both leverage the opportunities offered by AI and safeguard data subjects from the risks, this project moves from the standpoint that (1) analogue rights cannot be assumed, (2) even rudimentary data protection frameworks may not be in place, and (3) countries may not have the institutional endowments to create opportunities for or safeguard the rights of citizens.

### **Project Objectives**

*General objective:* To support responsible AI for development by improving understanding of AI policy and capacity in Africa.

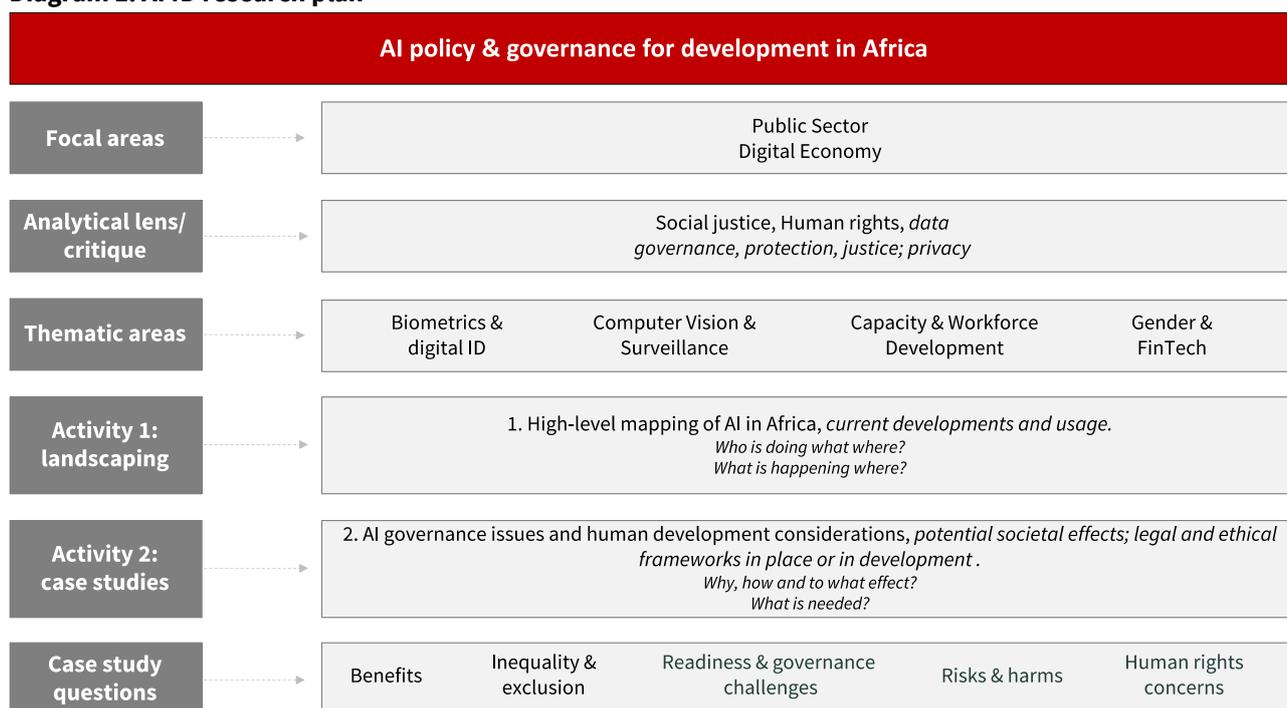
*Specific objective:* To deepen our understanding of AI usage and governance across Africa.

## **2.1. Methodology and Research Activities**

The research methodology consisted of a broad mapping of the thematic landscapes across the African continent and a number of case studies on AI deployment and the associated policy and governance implications in the four project thematic areas (see Diagram 1):

1. **Biometrics and digital identity** - This thematic area examined the role of AI in bio-identity systems in Africa, identified measures to combat related risks and harms and leverage existing systems to ensure that bio-ID systems are beneficial to all and abide by human rights standards. It examined issues such as social benefits delivery and financial inclusion, enabled or constrained by AI-related digital identity systems.
2. **Computer vision and surveillance** - This thematic area identified where video surveillance and facial recognition systems are being rolled out in Africa and how they use AI, the implications of public sector use of large amounts of data gathered by commercial entities, how bias in computer vision systems can be addressed and the human rights consequences of these systems.
3. **Skills capacity and workforce development** - This thematic area explored the landscape of AI skills education as well as how AI is being used to facilitate employment and workforce development.
4. **Gender** - This theme explored gender dimensions of the use of AI systems in the fintech industry in Africa.

**Diagram 1: AI4D research plan**



The mapping exercise took the form of a general online search for examples of public sector AI programs or initiatives in Africa. The mapping provided leads for the selection of case studies as follows:

**1. Biometrics and digital identity:**

- SOCPEN Database-SASSA in South Africa: SASSA manage social grant distribution In South Africa, utilizing the SOCPEN database, which includes biometric identity markers and national identity numbers.
- BACE API in Ghana: Promoted largely as providing a tool for financial inclusion and fraud prevention, BACE API is an example of an organisation using regionally created facial recognition software, which has been trained specifically with African faces.

**2. Computer vision and surveillance:**

- Huawei CCTV project in Botswana: A national government initiative deploying computer vision for surveillance.
- Vumacam Surveillance Networks project in Johannesburg: A private corporation initiative (with some municipal support). It aims to provide security from crime, a public good that is traditionally provided by the state.

**3. Skills capacity and workforce development:**

- Harambee Youth Employment Accelerator in South Africa: A social enterprise that seeks to tackle youth unemployment using data, innovation, and partnerships. Harambee is currently in the

early stages of using machine learning technology to assist employers to predict their skill needs and to match them with job candidates.

- Africa AI Accelerator in Ghana: an AI training and start-up incubator run by Ghana Tech Lab. The programme provides technical and business development support as well as seed funding to selected AI start-ups from Ghana, Rwanda, Uganda and South Africa.

4. **Gender and FinTech:** Examples were selected from Kenya, Ghana, Nigeria and South Africa to illustrate how AI systems are used in the financial services sector, while pinpointing ways in which they impact pre-existing inclusion barriers that African women face.

Methodologies for the case studies varied depending on the thematic area, but included:

- desk research (literature reviews, including academic research, databases, reports by regional and global organizations, media reports);
- desk review of legal, regulatory and policy documents (obtained online or through direct requests);
- social media and website analysis (company websites, Facebook pages, Twitter feeds, LinkedIn channels);
- company promotional materials;
- structured and semi-structured interviews;
- online surveys.

These cases were explored through six lenses:

- **Benefits:** How is AI being adopted in different public sector domains? What are the expected benefits, who benefits, and are any of these benefits already emerging? What does beneficial AI look like within the existing constraints in African countries?
- **Inequalities and exclusions:** To what extent does the deployment of AI systems contribute to deepening existing inequalities and creating new exclusions? How do systemic power imbalances, marginalisation and discrimination act as obstacles to the ability of particular groups to gain meaningful access to both public and private goods mediated by AI?
- **Governance challenges:** Are measures in place to govern AI systems in order to circumscribe their power and autonomy over human beings? What mechanisms are needed to prevent the use of AI by self-seeking actors to exercise control over others, especially the most vulnerable populations? Who owns and controls the data and algorithms underlying AI systems?
- **Readiness challenges:** To what extent do African countries have the infrastructural and human capacity to create and sustain their own AI systems? How can the formal openness of software and data be actualised so that the development of AI systems does not remain primarily in the hands of corporations and governments?
- **Human rights concerns:** Considering the political contexts, what are the human rights implications and realities associated with the use of AI in critical service? To what extent can the regulation of personal data protect human rights in AI? How can the negative consequences of AI deployment by states be challenged?
- **Risks and harms:** What risks and potential harms accompany the deployment of AI in Africa and how can they be mitigated? What are the implications of relying on AI systems for states, especially if those systems are provided by global corporations?

**Research challenges:** Overall the mapping activity took a longer period than planned and did not yield the anticipated comprehensive landscape. While there is a growing number of AI projects emerging on the continent (see for example, a fairly extensive [mapping](#) by the Centre for Intellectual Property and Information Technology Law), the project's focus on the public sector further limited the types of deployment that were relevant to be mapped. There were also a variety of other difficulties, including clarity on the definitions of AI, transparency of published information on AI deployment, blurred lines between public and private programmes, and the large number of countries in Africa. The project also encountered challenges in getting access to public sector officials and company executives/staff with authority to speak to researchers for the case studies. As a result, most of the case studies were highly dependent on desk research and publicly available information. Despite these challenges, the case studies generated significant amounts of information to build profiles of the selected AI initiatives and reflect on their socio-economic and human rights implications. These insights will form the basis of subsequent research agendas under the newly established AI Policy Centre.

### 3. Project outputs

#### Project page

- [AI in Africa Policy Project – AI4D project Brief: https://researchictafrica.net/wp/wp-content/uploads/2020/10/AI4D-project-brief-Final-AG.pdf](https://researchictafrica.net/wp/wp-content/uploads/2020/10/AI4D-project-brief-Final-AG.pdf) - Provides an overview of the AI4D project.

#### Policy Papers

- [AI4D - Digital and Biometric Identity Systems](#). This policy paper examines issues emerging around the deployment of Artificial Intelligence (AI) in Digital and Biometric Identities (BDI) being rolled out across Africa as a central part of digital strategies to meet the UN 2030 Sustainable Development Goals (SDGs). This paper draws on two cases studies – one in Ghana involving facial recognition software, and another in South Africa involving natural language processing – to add depth to these background findings on the complexities of BDI systems and AI in Africa.
- [Case Studies on AI Skills Capacity building and AI in Workforce Development in Africa](#). This paper analyses two case studies on AI and employment, namely 1) the Africa AI Accelerator – to examine its contribution towards building AI skills in Ghana, and assess whether the accelerator approach to entrepreneurship development represents a new model of human development; and 2) the Harambee Youth Accelerator programme which explores the benefits of incorporating AI for analytical tasks, the potential for this to mitigate or exacerbate social inequalities, and whether the South African environment is equipped to support successful outcomes of the programme's use of AI.

The following policy papers are currently being edited and planned to be published by the end of July 2021

- [A Gender perspective on the use of Artificial Intelligence in the African FinTech Ecosystem: Case studies from South Africa, Kenya, Nigeria, and Ghana](#).
- [Computer Vision and AI Surveillance in Botswana and South Africa](#).

#### Policy Briefs

- [An African perspective on gender and artificial intelligence needs African data and research](#) – (Araba Sey and Shamira Ahmed) Discusses the scarcity of data on gender and AI in Africa.

- [The public-private: a key legal nexus for South Africa's AI future](#) – (Gabriella Razzano) Examines public-private intersections in the deployment of AI systems and accountability measures to mitigate against the risk to citizens.
- [Africa's Expansion of AI Surveillance – Regional Gaps and Key Trends](#) – (Oarabile Mudongo) Discusses surveillance initiatives in Africa including the key partners and controlling entities, and the existence or not of oversight mechanisms such as AI governance structures, freedom of expression and data privacy.

### Conferences

- Shamira Ahmed delivered a paper at the International Telecommunications Society (ITS) 23rd Biennial Conference. The paper examined the fintech industry in Africa via four country case studies. The paper and the presentation can be downloaded through following links:
  - Conference Paper: [A Gender perspective on the use of Artificial Intelligence in the African FinTech Ecosystem: Case studies from South Africa, Kenya, Nigeria, and Ghana](#)
  - Conference Presentation: [A Gender perspective on the use of Artificial Intelligence in the African FinTech Ecosystem: Case studies from South Africa, Kenya, Nigeria, and Ghana](#)
- Gabriella Razzano presented at the Digital Rights in Africa Workshop, APC. The presentation was based on research undertaken under the AI4D project (biometric identity).

### Blog

[Good ID and Financial Inclusion: a call for context](#) – (Gabriella Razzano) Discusses the regional pushes (both external and internal) for the adoption of 'Good ID' across the African continent.

### Media Mentions

Magazine article, titled [Africa must move now to ensure it is not left out of the AI agenda conversation](#), written by Andrew Rens was published on Maverick Citizen

## 4. Overall assessment of project outcomes

The project sought to advance knowledge on AI usage and governance in Africa. The main outcomes have been contributions to knowledge and internal research capacity, although more outcomes are expected to unfold over time.

The mapping and case studies have enabled conceptualisations of the potential roles of AI in public service delivery and the aspects of governance that should be considered to ensure inclusive, equitable and rights-respecting outcomes. The key insights gained include:

- Early stage of most AI initiatives - across all case studies and thematic areas, it appears that the introduction of AI systems is very recent and, in some instances, only being considered on an experimental basis.
- Significant private sector involvement - most public sector AI deployments identified or examined seem to have a considerable component of private sector involvement. There is also a general trend of private sector entities providing products or services in domains (such as health, education, public safety, financial inclusion or agriculture) that would qualify as public sector-related due to their connection to social services or the Sustainable Development Goals.

- General absence of national frameworks for the equitable application of AI within and across borders - almost all countries examined do not have national AI strategies or policies, though some are in progress. Considering the high degree of commercial interests in these systems (even if presented as social enterprises), the lack of such frameworks leaves organisations unaccountable for ensuring their systems are ethically implemented and deliver benefits to all, irrespective of socio-economic status.
- Gender implications of AI - pre-existing social inequalities contribute to multi-dimensional barriers that exacerbate gender digital divides, gender disparities in the digital workforce and in digital entrepreneurship. AI technologies in these ecosystems are likely to learn existing behaviour and amplify these gender intersectional biases.
- Unclear evidence of direct or indirect impact on end-users - this is partly due to the nascent stage of initiatives, but also scarcity of impact data and the pervasive digital inequality that is likely to constrain low-income and other disadvantaged populations from accessing AI systems.

When RIA began work on the AI4D project, artificial intelligence was a relatively new area of research for the organization. Working on this project required team members to build or augment their knowledge on artificial intelligence, including building familiarity with definitions and existing literature. Team members with expertise on related topics such as ethics and human rights were able to support their peers with this knowledge to enable integration of perspectives on the social implications of artificial intelligence. Further capacity was built in junior researchers on the project, who received mentorship on research methodologies, analysis and writing.

Given the various thematic connections between the AI4D project and other ongoing projects in RIA, the AI4D project has enabled the team to feed some of the observations and lessons learnt into other projects including:

- the SADC PF Digital Economy Model Law;
- participation in international fora that have traditionally lacked an African perspective, such as
  - the f<a+i>r (feminist AI research) network
  - the Global Leadership Academy-International Training Centre (GLAC-ITCILO)'s Leading with Artificial Intelligence Lab
- the UNCTAD Digital Economy Report; and
- the Global AI Programme where RIA led one of the seven concept notes on data justice in AI.

Knowledge also fed into other RIA projects and engagements that were started during the 2019-2021 period. Examples include the development of a tool to evaluate biometric identity systems and the Digital New Deal for Africa project, which has a biometric identity component—both projects have team members also working on the AI4D project.

Partly due to the foundations being laid by the AI4D project, RIA has won funding to establish an AI policy for development centre for Africa. RIA is also participating in the Global Partnership for Artificial Intelligence, co-hosted by the governments of Canada and France. Alison Gillwald was nominated by UNESCO to serve on the Data Governance Working Committee. Both this project and the data governance research undertaken in the IDRC funded cyberpolicy thinktank, phases 1 and 2, have enabled RIA to contribute a much-needed global South lens to a very technical committee. Participation in the working group consisting of AI experts from different disciplines from around the world has also been extremely enriching for RIA as we chart our way in this new terrain. We now co-lead the Data Justice workstream which RIA proposed and prepared an initial concept note for and which was one of the two

selected from the 26 submitted for the two research workstreams that will inform the working groups over the next two years.

A full project evaluation will be conducted in July using the Designing Evaluation and Communication for Impact (DECI) tool for a summative evaluation of the research impact. Subsequent RIA evaluations will also endeavour to capture longer-term impacts after the end of the project.

## Recommendations

**Support early and ongoing development of strategic relationships.** More work is needed to create and maintain strategic connections with institutional players such as legislative committees, and to bring them into research processes at the design stage. This will increase the potential for policy impact by strengthening RIA's ability to align research and information sharing with specific policy agendas, take advantage of emerging policy windows, and assess the benefits and limitations of collaboration with policymakers at national and international levels.

**Enhance support for dissemination phase of projects.** Apart from cross posting on the a14d.ai website or other IDRC websites, IDRC could play an even more active role in supporting the outreach of funded research by creating opportunities for African (especially black African) researchers to talk about or write about their work on international and Global North platforms. Southern voices are often lost on international platforms; and black African researchers in particular lose agency in the process, as Global North representatives become experts on "developing world/Global South" issues. Dedicated support is needed for black African researchers to build their profiles on Global North platforms that discuss Global South issues and to foster Southern leadership on Southern issues.

**Fund long-term and expansive project evaluations.** Funders generally prioritise obtaining concrete results in the field and encouraging research institutions to produce high-quality research outputs. Less emphasis is directed towards assessing the financial and nonfinancial costs of projects. There is a need for cost-benefit approaches that capture dynamics of the variety of resources invested in the project (e.g., finances and time).

**Continue to support ambitious new research and policy agendas.** Research and policy agendas need to be as ambitious as the Sustainable Development Goals. African countries' development policies can only be viable if they are founded in local realities. These realities are complex and span multiple and diverse ecosystems; and thus, require equally complex, multidisciplinary research, and flexibility to adjust as the research and policy environments dictate.