

# ARTIFICIAL INTELLIGENCE FOR DEVELOPMENT IN AFRICA (AI4D AFRICA) 2020–2024

Proposed AI4D initiative of  
International Development Research Centre (IDRC), Canada and  
Swedish International Development Agency (Sida), Sweden



Canada



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## EXECUTIVE SUMMARY

The Swedish International Development Cooperation Agency (Sida) and Canada’s International Development Research Centre (IDRC) propose a 4-year partnership to support policy, innovations, and expanded leadership to spur *responsible AI development* in Africa. The vision of the program is **one where AI empowers Africans to have a more inclusive, prosperous, and greener future**. Failure to invest in responsible AI development, which strives to be *inclusive, rights-based, and sustainable*, may lead to a future where AI exacerbates inequality, fragility, and the effects of climate change in Africa.

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*For this initiative, we are using the [OECD definition](#) of an AI system as a “machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments. AI systems are designed to operate with varying levels of autonomy.”*

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There is little doubt that AI applications will profoundly impact societies in low- and middle-income countries (LMICs). AI is an emerging class of technologies upon which other applications and solutions are being built in almost every domain of social and economic life. Fuelled by the increasing availability of computational power, improved connectivity, and data, AI applications offer interesting possibilities for promoting economic growth – through spurring new start ups, improving food systems, enabling higher quality education systems and tackling pressing health and climate challenges in Africa. The resulting impact will be massive and could well be revolutionary.

The tremendous potential of AI as a general-purpose technology, however, may not benefit everyone equally. AI makes possible innovative, data-driven, technical innovations to help address pressing social problems. However, like most new technologies, AI also has the potential to exacerbate existing social and economic problems and create new ones.

For example, AI can reinforce structural inequalities and bias, perpetuate gender imbalances, threaten jobs, and introduce other unknown risks and unintended consequences. AI can also be used to supercharge surveillance by governments

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*The AI4D Africa program envisions a future where AI empowers Africans to have a more prosperous, inclusive, and greener future.*

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and the private sector, disincentivizing free expression. Also, the amount of energy required to train new AI is alarming -- potentially contributing to increasing greenhouse gases emissions. Finally, AI can be equally applied to public “bads” -- such as the creation and targeted spread of disinformation to undermine democratic processes as we’ve seen in recent elections in Kenya and beyond.

The future of AI on the continent, however, is not yet written, and the policies and practices put in place now will greatly shape the flow of benefits and harms from AI. The roll-out of future AI applications requires a healthy critical perspective and an ongoing, informed public dialogue that represents a diversity of perspectives and positions. Concerted efforts are warranted to ensure the responsible development and deployment of AI in Africa. These efforts should focus on enabling African countries to take advantage of AI, so they can benefit from the immense value the technology can bring. At the same time, care and vigilance will be required to mitigate risks and to identify and respond to unintended harmful consequences. Such an approach is critical so as not to exacerbate inequalities and social instability.

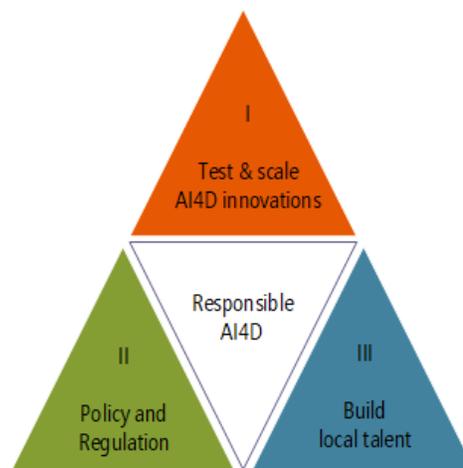
Building on consultations, baseline work, and other activities, the proposed four-year AI4D program (2020-2024) will seek to address the above challenges through supporting the African-led development of an AI

ecosystem engaged in the responsible development of AI. The program will target funding towards three critical pillars that will be needed to shape AI in Africa as a force for good:

- Scaling proven responsible AI innovations that address Africa’s different development challenges;
- Supporting policy research think and do tanks to establish responsible AI; and
- Academic capacity building to foster African talent and skills around AI.

Part and parcel of these activities will be supporting the development of local leadership and voice that can advocate for the responsible applications of AI.

Specific activities in the innovation will support *four, pan-African AI4D Innovation Research Networks*, each focused on a key development issue such as agriculture or languages. Each network will be coordinated by an African institution playing the role of the network hub. Each hub is expected to: develop and support a network of researchers and practitioners working on AI-based innovations; provide conceptual and technical support and guidance to network members; conduct research review and syntheses on AI innovations from both within and outside the research network; and contribute to the strategic guidance of the AI4D Africa program.



The key activity in the policy stream will be to support *two AI4D Research to Policy Think-and-do Tanks* that will engage in AI policy research to inform and facilitate the development of public policies and regulations that promote the inclusive benefits of AI, while mitigating the potential costs and risks. The think-and-do tanks will be distributed linguistically, one in an anglophone country and the other in a Francophone country.

The specific activities in the capacity stream will fund the development of *two multidisciplinary AI4D university labs* as well as *the African AI4D Scholarships Program* that will be open to machine learning PhD students and academics across the continent. The multidisciplinary AI4D labs will be distributed across public universities in Africa and aim to build capacity in lower resource settings, while the African AI4D Scholarship Program will provide financial and professional support for the next generation of PhD students and early career academics focused on responsible AI4D across the continent.

Finally, in line with the [Government of Canada’s Feminist International Assistance Policy](#), and Sweden’s [Feminist Foreign Policy](#), IDRC will strive for an operationalization of AI4D that promotes gender equality and the empowerment of women and girls. For AI4D, this means including a cross-cutting concern for gender and inclusion in both programming and management. Ensuring gender responsiveness of grants, gender balance among participants, and sufficient gender expertise where required is a priority throughout the program.

# 1. INTRODUCTION

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Artificial Intelligence (AI) will have profound influence, both positive and negative, on the ability to achieve the 2030 Sustainable Development Agenda in low- and middle-income countries in Africa. Leveraging the rapid spread of communications infrastructure, gains in computational power, and the emergence of big data, AI offers exciting opportunities for promoting economic growth and addressing key development problems in the global south. Recent advances in specific machine learning techniques, such as deep learning, have greatly accelerated the power and scope of these applications.<sup>1</sup>

Across Africa, there is a burgeoning community of data scientists, computer scientists, and machine learning experts who are exploring the application of AI to solve local challenges. For instance, Zipline, an AI-enabled drone initiative, delivers blood to urgent medical situations, leading to reduced maternal mortality in Rwanda. Agrix Tech, a Cameroon start-up, launched in January 2020 to help African farmers detect plant diseases and offer both chemical and physical treatments as well as prevention measures. And M-Shule in Kenya uses AI and SMS to deliver personalized, accessible education to primary school students across Africa. The enthusiasm and breadth of applications are witnessed in the highly popular Deep Learning Indaba and Data Science Africa events that bring together hundreds of practitioners from across the continent to learn and share.

Alongside the enthusiasm and potential of AI to help contribute to novel solutions and approaches to local challenges is concern that if AI is applied in certain contexts without appropriate policies and safeguards, it can threaten human rights, exacerbate existing inequalities, and raise important ethical questions. These risks are increased in contexts where there is limited institutional capacity to govern and regulate AI to ensure the protection of fundamental rights like privacy. The situation is also challenged by a context of vastly uneven distributions of infrastructure, resources, and talent that limit the capacity for citizens impacted by AI to have a voice in making decisions about what applications are developed, how, and for whom. Uneven resources and capacities, and lack of voice, increases the likelihood of reinforcing existing structural inequalities and bias.

A key inequality, particularly between the global north and the global south, is the availability of relevant data sets for training machine learning (ML) algorithms. Without relevant data sets, most AI applications are meaningless. Thus far, researchers, practitioners, and businesses in North America, Europe, and parts of Asia have assembled the foundational datasets collected and used to train algorithms – many of which are proprietary for commercial purposes and therefore not available for public use. Openly available datasets contain the most easily available and collected data and are often shared with open licenses to reduce costs of collection and labelling. However, these datasets are often neither relevant for, nor representative of, the global south. For example, one ML algorithm provides less accurate diagnoses of skin cancer for people with darker skin.<sup>2</sup> In another example, [600,000 images are being removed from ImageNet](#), the foundational image recognition dataset, due to racial bias.<sup>3</sup> The consequence is that

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<sup>1</sup> To better understand the potential benefits and risks of AI, IDRC developed an [AI and Human Development](#) agenda in 2018.

<sup>2</sup> <https://www.theatlantic.com/health/archive/2018/08/machine-learning-dermatology-skin-color/567619/>

<sup>3</sup> See also: <https://www.businessinsider.com/viral-ai-selfie-classifier-imagenet-roulette-part-of-bias-project-2019-9>

aspiring Machine Learners must both create data sets and train locally relevant models, putting them at a significant disadvantage to other researchers considering the pace of innovation.

The increased power and sophistication of AI models are having an unintended impact on our environment. Some current models, such as new approaches to natural language processing, rely on exceptionally large computation resources that unfortunately have a huge energy cost – and thus, often a large carbon footprint.<sup>4</sup> For example, a recent experiment found that training one model can emit as much carbon as five cars during their lifetime.<sup>5</sup> Within the context of a climate emergency, this is an area of increasing concern in the field of AI, with some researchers calling for a push towards Green AI.<sup>6</sup> In contexts like Africa which has uneven access to energy resources, researchers are innovating new models of lower resource computing.

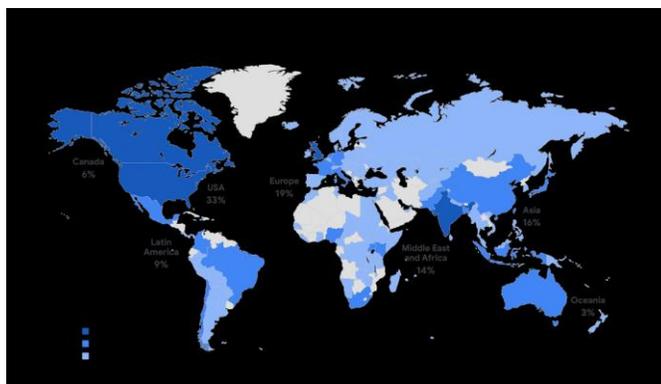
## 1.1 The AI4D Context

In 2019, IDRC and Sida organized regional consultations in Nairobi (April 2019) and Abidjan (December 2019) to develop and validate the proposed AI4D agenda from both the Anglophone and Francophone Africa perspectives. The consultations included a diverse set of AI stakeholders from Africa (Deep Learning Indaba, Strathmore University, Research ICT Africa), the private sector (Google Deep Mind, IBM Research, Element AI) and Canada (Canadian Institute for Advanced Research (CIFAR) and MILA).

The agenda and the consultations revealed that the foundations required for the *responsible* development of AI are still largely absent on the continent. Responsible AI development, at a minimum, strives to be *inclusive, ethical, rights-based, and sustainable*.<sup>7</sup> In particular, the consultation focused on three areas where targeted efforts can help build this foundation: innovation, policy, and capacity.

### 1.1.1 AI innovations for development

The [Google AI Impact Challenge](#), which kicked off in October 2018, was an open call to organizations around the world to submit their ideas for how they could use AI to help address societal challenges. Figure 2 shows the percentage of the 2602 proposals from each region. African proposals were significantly under-represented, with South Africa, Nigeria and Kenya representing the majority of inputs.



However, we have found that Africa has a fast-growing body of AI innovations and AI innovators– that is not showing up on the Google map. This is evidenced first by home-grown activities that reveal a vibrant and growing community

Figure 1: Global distribution of responses to Google AI Impact Challenge.

<sup>4</sup> Energy and Policy Considerations for Deep Learning in NLP: <https://www.aclweb.org/anthology/P19-1355.pdf>

<sup>5</sup><https://www.technologyreview.com/s/613630/training-a-single-ai-model-can-emit-as-much-carbon-as-five-cars-in-their-lifetimes/>

<sup>6</sup> Green AI: <https://arxiv.org/pdf/1907.10597.pdf>

<sup>7</sup> For more on ‘responsible AI development’ see [the Montreal Declaration for the development of Artificial Intelligence](#). These principles of responsible AI development include: well-being, protection of privacy and intimacy, equity, diversity inclusion, and sustainability, among others. Rights-based implies that the existing universal human-rights framework is suited to ensure the responsible developing and application of AI.

of ML researchers and practitioners. For example, the emergence of the Deep Learning Indaba community, which hosts week-long events with upwards of 500 people from across the continent, illustrates the growing interest and capacity in the region. These Deep Indaba events have spawned a whole series of shorter, country focused [Deep Learning IndabaX](#) events across the continent that act as boot camps (see Figure 3). Many of the participants are working on their own innovations and are younger than the average European or North American primary investigator (in keeping with the generally younger demographics on the continent), and without the necessary resources or experience to compete in a global call of the size and reach of Google's. A smaller call for AI4D innovations put out by IDRC in mid-2019 received a wide number of interesting applications from across the continent, further validating our observation.



However, the African innovation ecosystem suffers from three main weaknesses. First, innovations are often conceived and developed without the necessary interdisciplinary expertise to ensure relevance and feasibility. Second, there is a paucity of key datasets necessary for development of machine learning solutions, and the monetary and time costs of dataset development and maintenance can be high. Indeed, in response to the IDRC innovations call in 2019, two winning proposals focused on the development of datasets. Third, there are significant challenges in bringing these innovations to scale, including resource constraints in poorly serviced settings, weakness in related infrastructure (data sharing, computing resources, energy, etc.), cultural and governance practices in specific sectors, and other related factors.

Figure 2: Map of countries hosting the IndabaX 2019 events.

To address these challenges, the AI4D innovation stream will work directly with the emerging ML community in Africa through targeted support and mentorship. AI innovations will be tested, and those that are proven to support the 2030 Agenda for Sustainable Development and their social impacts will be scaled. We will encourage a multi-disciplinary approach and partnerships that bring together subject matter experts and ML experts to experiment, and also do analysis of the impact and anticipated benefits of these innovations on specific domains and industries.

### 1.1.2 AI policy and regulation

As demand for, and implementation of, AI technologies increases, policy makers in governments, research organizations, and society must contend with the intended benefits and unintended consequences of AI technologies, which are often complex and interdisciplinary. In Africa there is a relative lack of policy readiness for AI (as well as in much of both the developing and developed world). For example, the [AI readiness index](#) showed that as of 2019:

- Only two countries on the continent have AI strategies (Kenya and Tunisia - currently under development);
- Over half of African countries do not have explicit privacy or data protection laws; and
- There are only 14 signatories and four ratifications to the African Union Convention on Cybersecurity and Personal Data Protection (the Malabo Convention).

The Nairobi workshop identified the need to design adaptable regulatory frameworks and facilitate regulatory learning within the African context, focusing on key metrics like AI strategies, data protection and privacy laws, and how to shape responsible AI in Africa. These frameworks should help build trust through enhanced transparency and accountability of algorithms. Finally, there is need to develop methodologies to quantify the potential harms that could result from the unethical use of AI by governments and by industry in the absence of ethical frameworks to govern AI (for example, discriminatory algorithms and predatory data collection for cybercrime). Key forums for influencing and incentivizing policy adoption could include The African Free Trade Area (AfCFTA), AUDA-NEPAD, and the Policy and Regulation Initiative for Digital Africa (PRIDA).

The AI4D policy stream will work with southern governments, think tanks, academia and multilateral institutions to support global, regional and national strategies, policies, and regulations that ensure AI is responsibly developed and deployed.

### 1.1.3 AI capacity

To take advantage of the opportunity AI presents for Africa and the developing world in general, there is growing demand for technically competent AI practitioners in Africa. As one of the demographically youngest populations in the world, Africa has a huge potential to support a generation of highly skilled scholars and practitioners who can contribute to the local economy, develop new start ups and industries, and drive innovation more broadly. Industry has projected demand for up to 500 PhDs in the next five years.

Supporting AI applications in a development context begins with fostering a collaborative network of academics and graduates who can work across disciplines and with multiple stakeholders to understand and diagnose social problems and then design, develop, test, adapt, and eventually scale responsible AI4D solutions. Stakeholders in Africa identified the goal of strengthening the AI offerings of African public universities as part of a long-term, sustainable approach to developing and nurturing local talent. Such an approach responds to the capacity requirements of both the public and private sector. Additionally, there is the opportunity to explore scalable education innovations that can support AI skill building at low cost. Finally, there is a pressing need to address the persistent gender disparities in the field, by prioritizing the attraction and recruitment of a more diverse group of academics and practitioners.

The capacity stream will support the development of the next generation of AI4D academics and practitioners, through scholarship support for the machine learning community in Africa alongside investments in building institutional capacity in public universities for sustained AI4D research and innovation in Africa.

## 1.2 Goal and outcomes

*The AI4D program envisions a future where AI empowers Africans to have a more prosperous, inclusive, and greener future.* To contribute to achieving this vision, the proposed five-year AI4D program (2020-2024) will support the development of an AI-ecosystem engaged in responsible, African-led, AI for development and application that contributes to sustainable development outcomes such as better financial security, health, governance, and inclusion.

More specifically, the initiative will target funding towards achievement of the following three specific objectives:

- Catalysing the responsible development and scaling of AI innovations that solve development challenges;

- Increasing evidence-informed AI policy and regulations that support responsible AI development at sub-national, national, and regional levels; and
- Building the talent and capacity that supports the local design, development, and deployment of responsible AI4D innovations at the appropriate scale.

## Impact Pathway

Figure 3 below lays out a high-level impact pathway of the AI4D Africa program and how it seeks to achieve the above vision and objectives. The impact pathway lays out the types of expected outcomes that are part and parcel of what it means in terms of behaviour change to achieve the above objectives.

An important logic of the AI4D Africa program is the systems approach that simultaneously looks at shaping and catalysing innovation, while addressing the governance (i.e. rules and regulations) of these innovations and addressing the capacity constraints to ensure AI is shaped for and by Africans. In our experience working in information and communication technologies for development: long-term, sustainable change does not come about without these three pillars sufficiently established.

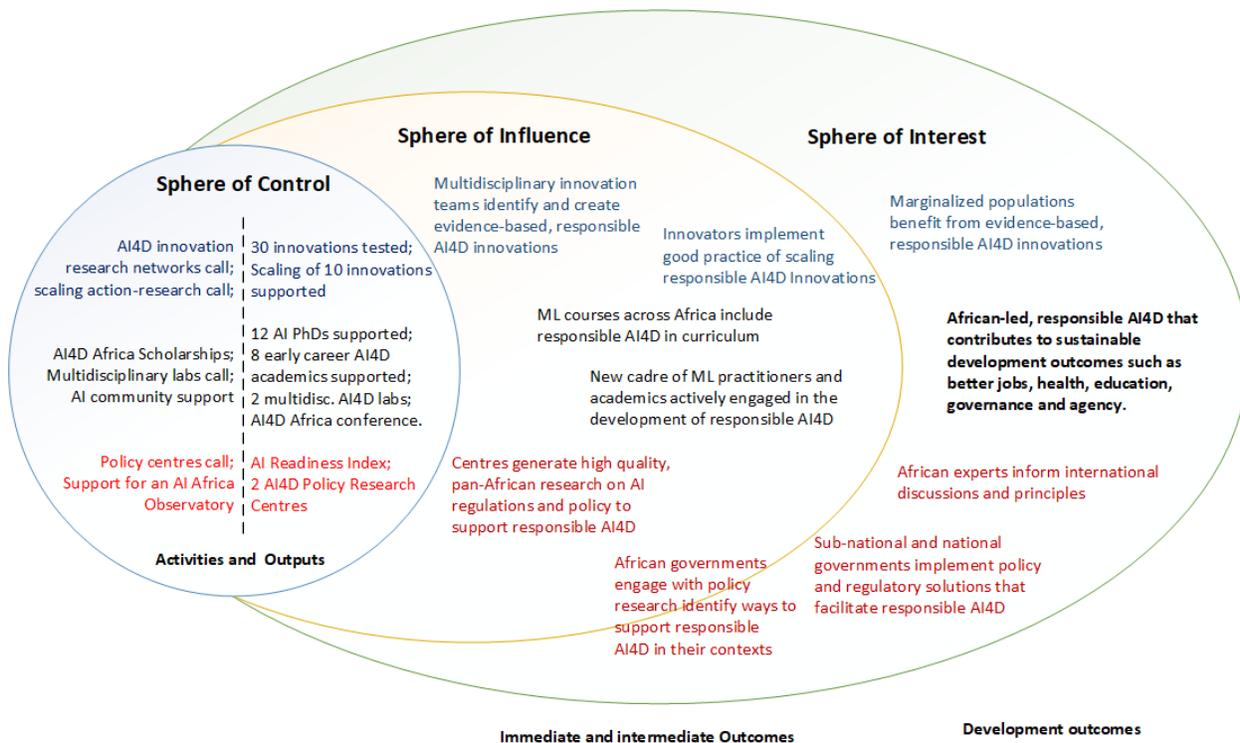


Figure 3: AI4D Africa Impact Pathway. The impact pathway shows AI4D’s sphere of control (activities and outputs), as well as the outcomes in the sphere of influence to which AI4D aims to contribute, toward the overall goal that AI4D Africa aims to support in the sphere of interest. Note that there is a significant gap in time and depth of impact between the sphere of influence and the sphere of interest. The overall goal is not something that AI4D Africa alone can achieve, but it remains in the impact pathway as the overall direction to which its efforts are aimed.

The AI4D program also emphasises the following elements in its design:

- *Ongoing gender and inclusion mentorship*: Experience from information and communication technology for development work over the last twenty years shows that unless there is a concerted emphasis on gender and inclusion issues, innovators and researchers will tend to overlook them. One-off workshops and training are not sufficient, and thus ongoing, targeted, and timely mentorship is required across all elements of the program, including ensuring that experts are consulted in the design of projects.
- *Multidisciplinary*: Machine learning and data science expertise are not sufficient for the development and implementation of responsible AI4D. Sector specific expertise (such as in agriculture, health, languages, and gender), as well as policy and regulatory experts (such as law, ethics, and economics) are necessary complements to machine learning/computer science/data science expertise.
- *Scaling action research*: Scaling innovations is itself a different research and implementation activity than the development. The program will take an improvement science approach to supporting the process of scaling that will enable the necessary learning and adaptation necessary for success.

## 2. OPERATIONALIZING AI4D AFRICA

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For this initiative to have impact and achieve its vision, AI4D will use several modalities each chosen depending on its stated purpose: AI innovation, policy formulation, and talent building.

### 2.1 Foster and scale responsible AI4D innovations

This stream of work will support the development of AI innovations and a surrounding innovation ecosystem that uses AI innovation techniques to address development challenges. It will do so through increasing evidence-informed AI policy and regulations that support responsible AI development at sub-national, national, and regional levels.

The AI4D program will employ two modalities to address these issues: innovation networks and scaling action mentorship and research.

#### 2.1.1 *AI Innovation research networks*

The AI innovation research networks will consist of interdisciplinary networks designed to incubate (design, pilot, and evaluate) and then scale responsible AI4D innovations. The networks will focus on supporting the mentorship and exchange of knowledge and good practices in relevant domains. The networks will provide support for each case for key activities such as human-rights impact assessments, ensuring a strong gender and inclusion consideration, and social impact evaluations.

The AI innovation research networks will focus on four (4) distinct thematic areas of innovations – the details of which will be determined following further consultations with stakeholders in Africa and international partners.

The research network will seek to build knowledge at two levels:

- AI4D Innovation: How, to what extent, and for whom does an AI4D innovation bring social, economic, physical, or learning impacts? What does it take so that the innovation works sustainably?
- AI4D Scaling: What are the central pathways to scale AI innovations in specialized research domains? How will scaling the AI4D innovation contribute to larger systems change?

Note that all innovation work will seek to uphold the [Principles for Digital Development](#). These principles have been endorsed by Sida.

#### 2.1.2 *Scaling AI Action Research*

The Scaling AI Action Research activity will support innovators from the four research networks to design, develop, and implement with scale in mind. This support will come from the beginning as considerations of scale need to begin early in the design process. This first support will come in a relatively light-touch manner, providing tools and frameworks for thinking about and assessing scalability in design.

As specific innovations emerge and provide evidence of effectiveness, they may be selected to join a cohort of cases for more concerted support and research. This activity will help these innovations in the scaling process.

Finally, the scaling AI action research will research the process of scaling, from design onwards. The goal of this is to develop a deeper understanding of how to successfully scale AI4D innovations in different domains.

The Scaling AI Action Research project will seek answers to the following proposed questions:

- How can we adapt and apply effective approaches to the scaling of AI innovations in different domains?
- How can policy makers, civil society, and the private sector most effectively work together to scale AI innovations?

#### Indicative Outcomes: Foster and scale responsible AI4D innovations

- Multidisciplinary AI4D innovations that follow good practice for the development and scaling of responsible AI4D innovations.
- A deepened understanding of the social impacts (positive and negative) of AI innovations.
- A deepened understanding of good practice in how to design and scale responsible AI4D innovations in the African context.
- At least 10 evidence-based and proven responsible AI4D innovations that benefit marginalized populations.

## 2.2 Improve African policy and regulation to promote responsible AI4D

The vision of this line of work will be to strengthen policy and regulatory frameworks that stimulate responsible AI innovations (i.e., that are inclusive, ethical, rights-based, culturally relevant, and green, and that minimize potential harms such as to human rights, increased social and inequities, etc.) emerging from the application of AI technologies.

The key activity to strengthen the governance of AI will be to support **two AI4D Research to Policy think-and-do tanks**, geographically spread out to represent Francophone (West) Africa, as well as East and Southern Africa. These think-and-do tanks will engage in policy research on intellectual property regimes, regulatory frameworks, data, privacy, innovation and more to stimulate innovation while minimizing harms to civil liberties. The institutions will be encouraged to develop networks of research collaborators to strengthen influence.

Each AI4D think-and-do tank will propose and implement their own regionally relevant research and policy influence agenda. Anticipated activities include:

- Conduct research and develop case studies exploring policy and governance role in shaping responsible AI4D in Africa and develop methodologies and policy tools to assess harm and impact of AI technologies;
- Build capacity of African policy makers to respond to emerging issues around responsible AI4D through fellowships, workshops and other mechanisms;
- Support and incentivize responsible AI policy approaches through local, regional and global mechanisms, including regulatory entities, new advisory bodies, and funding agencies through technical support, workshops, research inputs and ongoing dialogues;
- Engage with the African Union to inform and refine its pan-African AI policy; and

- Enable African AI experts to be meaningfully involved and leaders in global AI conversations, helping Africans to shape global AI norms and standards by strengthening government readiness, regulation, and policy capacity in AI and related innovation, data, and other fields.

We anticipate the think-and-do tanks will explore the following questions:

- What policy and regulatory factors can support AI innovation in Africa, and through what mechanisms can governments support the development of responsible AI4D innovations through AI strategies and other policy frameworks (such as data availability, privacy, and intellectual property innovation)?
- What are the implications of gender and intersectional analysis in AI policy making, and what tools can inform more inclusive and responsive policy making and outcomes?
- What regulatory models are effective to address the risks of AI across a variety of sectors? What existing regulation can be adapted, and what new regulations can be developed that are appropriate in the African context?
- What approaches are effective to address challenges around liability, accountability and redress in AI-based decision making in Africa and globally - what measures in terms of transparency, accountability and human accountability could be implemented and in what contexts and how are these linked to trust and accountability?
- How are AI technologies and their inputs intersecting with human rights, and what tools are necessary in the context of AI policy, design, and operation (such as rapid response mechanisms and impact assessments)?

#### Indicative Outcomes: Improve African policy and regulation to promote responsible AI4D

- A deepened understanding of AI policy and regulations to support responsible AI in different African contexts.
- African governments engage with policy research to identify ways to support responsible AI4D in their contexts
- Sub-national and national governments implement policy and regulatory solutions that facilitate responsible AI4D
- African experts inform international discussions and principles on AI design, development, and deployment.

## 2.3 Foster AI capacity in Africa

This stream will focus on building up capacity, particularly within and through universities in Africa. The funds will develop **two multidisciplinary AI4D university labs and establish African AI4D scholarships** that will support machine learning PhD students and provide project-based scholarships for academics in public universities.

### 2.3.1 Supporting responsible AI4D Labs in African public universities

These investments will focus on strengthening the ability of African public universities as a long-term, sustainable approach to developing and nurturing local talent that responds to the capacity requirements of the public and private sector. This will happen through support for the development of two African public university multidisciplinary labs to work on responsible AI4D over a three-and-half-year period. The focus will be on ensuring that these labs are distributed across Africa and build capacity in lower resource settings.

### 2.3.1 Project based scholarship support for public universities

The program will set up an AI4D Africa Advanced Scholars fund which is a project-based scholarship fund. Academics from African public Universities are eligible to submit project proposals with inbound scholarship opportunities for graduate students in AI4D. The fund will support up to 8 early career academics in public universities, providing support for their projects that have a minimum length of 2 years.

### 2.3.2 Support for next generation of ML practitioners and academics

This set of activities will provide a variety of support for a new generation of PhD students. These will include:

- Support scholarships for PhD students to attend public universities to gain the skills to contribute to responsible AI4D, with a goal of at least 12 new graduates (50% of which will be women) over three and a half years. Support will include tuition, a small stipend, and some research cost and professional development support.

### 2.3.3 Strengthen the AI4D community in Africa

This set of activities will:

- Support the maturation of a pan-African Machine Learning community of practice through support for existing African-led events, travel support, and a platform for engagement and sharing;
- Strengthen linkages with industry, civil society, and government by seeking partnerships to support the development of institutional infrastructure (computing labs etc.), seed and scale funds, internships, exchanges, and interdisciplinary training;
- Launching an AI4D “think and do” conference to promote academic and practitioner exchange on responsible AI4D. We anticipate the conference happening every two years but could make it annual depending upon demand;
- Continuing to build the pan-African Machine Learning community of practice through support for existing events (e.g., Deep Learning Indaba, Data Science Africa) and other networking activities;
- Hosting an ongoing AI4D webinar series with GiZ and Mozilla;
- Continuing to strengthen formal linkages between AI4D and other regional and global initiatives on AI (including UN initiatives such as the ITU’s AI for Good, and the Global Partnership on AI (GPAI));
- Strengthening the online knowledge platform for AI4D Africa (ai4d.ai); and
- Hosting an ongoing AI4D webinar series.

#### Indicative Outcomes: Foster AI4D capacity in Africa

- Public universities across Africa with strong machine learning programs supporting high-level African-led innovation and research, with 2 new multi-disciplinary AI4D labs.
- A new cadre of ML graduates and academics actively engaged in the development of responsible AI4D, with up to 12 PhD level students and up to 8 early career academics supported in public universities across Africa.
- An inclusive AI workforce on the continent across multiple sectors and with diverse skills including data scientists, machine learning engineers, and humans in the loop of AI systems.

## 2.4 Knowledge Synthesis and the African AI Observatory

Knowledge synthesis will be a key feature of AI4D. Synthesis serves a variety of functions: it helps identify what evidence currently exists, and what is missing, around a policy challenge or area for innovation; it helps situate how new knowledge fits into what is already known; and helps move from specific studies to more generalizable conclusions. IDRC will launch a series of global activities designed to further support knowledge mobilization and uptake, leveraging the existing investments and activities within AI4D.

The first activity is to support the development of an AI Observatory to be hosted at an African institution. The African AI Observatory will develop an AI4D Africa research and synthesis agenda which it will execute. Example outputs to be developed by the Observatory are:

- **Call-to-Action:** By year 2 of the program, AI4D Africa will publish a Call-to-Action for funders and other stakeholders as a key global reference point for key AI challenges to tackle, required datasets, key research questions, and other actions to take to support sustainable development through AI on the continent. In the first instance, the call-to-action will build on baseline work described above and further consultation with AI ecosystem. This is envisaged as the first in a series of calls-to-action that will be updated every two years.
- **Benchmark *State of AI in Africa* reports:** From year 2 of the program, AI4D will develop a publication entitled “State of AI in Africa”, which will compile data from AI4D’s activities (including the AI readiness index) and seek to be the go-to publication for governments, civil society, and the private sector in Africa.

The Observatory will also provide strategic and intellectual input into the other knowledge synthesis activities that will take place within AI4D.

The AI4D Africa Program, in collaboration with lead institutions, the observatory, and with IDRC’s support, will engage in syntheses of research supported by the program. Example syntheses includes:

- **Thematic-based syntheses:** Each innovation network will conduct at least two knowledge syntheses of relevant AI4D research and activities in their specific domain of activity; one at the start of the network to inform network activities, and one at the end that brings together the lessons learned from the cases supported by the network.
- **Scaling AI4D innovations:** A key output of the action research on scaling AI4D innovations will be a meta-synthesis of lessons learned across the supported cases. This is expected to be the first such treatment of the issue of scaling AI4D innovations.

## 2.5 Communications

### 2.5.1 Strategic Program Communication

Strategic communications planning will use an appropriate framework, such as the [RAPID Outcome Mapping Approach](#), to support policy engagement and influence. During implementation, the AI4D Africa team will engage in ongoing communications, monitoring, evaluation, and learning to ensure quality and usefulness.<sup>8</sup>

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<sup>8</sup> The AI4D team will employ a MEL framework such as the [RAPID MEL Framework](#).

Strategic communications will happen at two levels:

1. IDRC will develop a strategic communications team within *six* months following the launch of AI4D. This communication team will focus on promoting the AI4D program, as well as in supporting the knowledge mobilization and peer learning processes within AI4D.
2. Grant level: All grants should include a plan for communicating the process and products of the grant to relevant stakeholders and users.

All outputs generated through AI4D funding will:

1. Be made freely available in accordance with [IDRC's open access policy](#);
2. Respect the branding and visual identity requirements of IDRC and Sida; and
3. Be required to recognize the support of IDRC and Sida, by including the following acknowledgement in all publications and communications materials: "This work was carried out with financial support from Canada's International Development Research Centre and the Swedish International Development Agency".

IDRC will also encourage and support making the data from AI4D-funded research openly available as per IDRC's [Open Data Statement of Principles](#).

### 2.5.2 IDRC and Sida Learning Events

The AI4D Africa will host learning events, sponsored by IDRC and Sida. The intention of these learning events is to leverage the interdisciplinarity and research of the AI4D Africa program to inform strategy and programming. These learning events will most likely be thematic-based discussion with the goals of providing useful insights and lessons to inform the use of AI techniques within domain specific programming.

These events will strive to use virtual tools where possible to reduce potential travel costs, health risks, and carbon footprint.

## 2.6 Gender and Inclusion

In line with the [Government of Canada's Feminist International Assistance Policy](#), IDRC will strive for an operationalization of AI4D that promotes gender equality and the empowerment of women and girls. The approach to integrating gender throughout AI4D is through the dual-prong approach of mainstreaming and side-streaming. [See text box for a discussion of the programs approach to Anglophone and Francophone Africa.]

Successful mainstreaming of gender will mean that partners across AI4D are actively ensuring gender and inclusion considerations in their work. Achieving this will require these partners receive ongoing mentorship support that accompanies their active learning through direct application in their work. To support this, IDRC will work with gender experts who will provide targeted training and mentorship to partners across the three

### Anglophone and Francophone Africa

The program will work to ensure the equitable engagement of researchers, practitioners, institutions, and governments from Francophone and Anglophone countries, and reach out to Lusophone countries as well.

Consultations have revealed that the preference is for combining Anglophone and Francophone activities rather than treating them as two separate communities of practice. This will include, for example, that all calls will be launched in both languages and selection criteria will consider the desire for equal participation.

pillars building their skills and confidence relating to the incorporation of a gender and inclusion perspective.

To accelerate and deepen our learning on gender, it is imperative that AI4D also side-streams gender and inclusion through a direct focus as an area of inquiry and innovation. From our experience working in technology and development issues, there will be few proposals in response to open calls that will focus directly on gender and inclusion issues. Consequently, we will ensure that, across the key AI4D activities, there are activities directly focused on gender and inclusion, and that there is space to share key learnings and ensure that the work is addressing historical imbalances.

#### *2.6.1 Innovation*

One of the four innovation networks will focus specifically on gender and inclusion. This network will support innovations that directly seek to promote the achievement of SDG5 (Gender Equality), as well as through addressing persistent barriers to equality and inclusion (with anticipated topics including gender-based violence, sexual and reproductive health, economic empowerment, cultural norms, etc.). The network will also seek innovations that address the challenge of potential gender and other biases within machine learning algorithms themselves.

#### *2.6.1 Policy*

The AI4D research to policy think-and-do tanks will directly explore questions of gender and inclusion related to policy and regulatory issues. For example, they would tackle what gender sensitive AI policy might look like, focusing on creating gender responsive approaches and instruments.

#### *2.6.2 Capacity building*

These efforts would proactively push to increase the enrollment of women in AI programs, or increase the number of women participating in the AI community such as through AI conferences and as publishers of new papers. AI4D partners will commit to both building talent and enabling environments that support the success of African leaders who are both women and men.

#### *2.6.3 Monitoring, evaluation and synthesis*

IDRC will ensure that there is a gender and inclusion perspective strongly incorporated into monitoring and evaluations (both formative and summative) conducted as part of the program. IDRC already has a gender and inclusion lens incorporated into standard program and project appraisal and monitoring activities (for example, through the Research Quality + assessment tool). Lessons drawn from both monitoring and evaluation activities regarding gender in inclusion will serve the dual purpose of continuous improvement in ensuring a successful integration of a gender and inclusion lens, as well as the sharing of good practice more broadly to academics, practitioners, and policy makers alike.

### 3. PROGRAM EVALUATION

AI4D will implement a utilization-focused approach to evaluation. Evaluations will specify who will use the evaluation and how, tailoring questions, methodology, timing and scope to those uses. The terms of reference for external evaluations will be developed by the AI4D team. AI4D will maintain IDRC's approach to evaluation in donor partnerships, as described in [Evaluation at IDRC](#).

See table below for proposed evaluation activities.

<i>Year</i>	<i>Evaluation activities</i>
1	Further articulate baselines, refine the evaluation framework, and feed into detailed processes for monitoring the impact pathway, assumptions, and key contextual variables.
3	Mid-term learning studies
4	External, independent, accountability-oriented evaluation of the program.

Initial learning questions that could be explored through evaluations stem from the AI4D impact pathway and our risk assessment:

- To what extent is AI4D producing high quality outputs and contributing to its intended outcomes? How well is AI4D's knowledge sharing, capacity development, and knowledge mobilization gaining initial traction in policy dialogues at country level?
- Is AI4D-supported research and knowledge-sharing of good quality? What is it contributing that is of relevance to national/regional concerns and to global debates?
- How well are AI4D outputs and outcomes integrating and supporting gender equity and social inclusion?
- How well is the AI4D program incorporating Francophone country participation?
- How effective and efficient are the AI4D governance and management structure and processes?

The initial consideration is that IDRC will employ the [Outcome Mapping approach](#) to build learning and reflection into the AI4D Africa Program. This process would involve the ten lead institutions (see the Implementation Group in section 4.3) and it would serve as a key input process that would drive for program planning and strategic decision-making.

AI4D Africa will commission independent consultants to undertake external evaluations. As per IDRC's procurement rules, any contract over CAD100,000 will be competitively sourced through an open call for proposals, managed through IDRC Procurement staff. IDRC may provide initial suggestions on methodologies to address evaluation questions based on our knowledge of available data and the priorities of users, and then hand over responsibility to independent evaluators to develop rigorous designs and methodologies. IDRC's Policy and Evaluation division specialists will provide technical support and quality assurance for AI4D's evaluations. Evaluations will be publicly available.

## 4. PROGRAMMATIC MANAGEMENT AND GOVERNANCE

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### 4.1 IDRC as AI4D Africa program manager

The AI4D Africa team within IDRC will administer the program in accordance with IDRC's financial regulations and other applicable rules, procedures, and practices.

Among other responsibilities, IDRC will:

- Administer, issue, and oversee all grants;
- Select and manage the Independent Assessment Panel(s);
- Hire and supervise program staff, external consultants, and experts, as required;
- Monitor progress of all grants, provide appropriate feedback, and assist in mentoring;
- Contract and manage the technology provider, responsible for designing and developing the digital exchange and related digital tools;
- Build knowledge mobilization and sharing into grant development and implementation processes, commission and guide the action research on scaling innovations, and lead cross-grant synthesis and evaluation.

IDRC takes an active, hands-on grant management approach, particularly through the activities of program officers. IDRC program officers are subject matter experts with expertise in research as well as in knowledge mobilization and grant making. Grant-making activities include responsive, ongoing technical support and capacity strengthening in all aspects of the grant process, facilitating connections with other relevant actors, supporting organizational capacity development, and resource mobilization, among other activities.

The AI4D program staff has the following responsibilities:

- Develop communications strategy;
- Develop annual workplans;
- Develop and manage monitoring, evaluation, and learning strategy and activities, including terms of reference for external evaluation(s);
- Convene and facilitate the Implementation group.

### 4.2 Executive Management

AI4D's governance arrangement includes an Executive Committee (EC) – also called the “annual parties” in the agreement - comprised of senior level representatives from Sida and IDRC. The EC will oversee the programmatic direction and strategy for AI4D. EC membership includes:

- From IDRC, a Director or Vice-President of Programs level representative in Ottawa, with the Regional Director of an IDRC Regional Office in sub-Saharan Africa as an alternate.
- Sida's representatives and alternate.

The EC may grow in membership if a new funder financially invests in the initiative in a sufficiently substantial manner. New members to be will be based on consensus decision taken by the EC.

There will be two (2) meetings of the EC within the first 12 months. Subsequent years will entail one annual meeting (either virtual or face-to-face). Meetings will be up to two (2) hours in length and all documentation for the meeting will be provided one (1) week in advance. Travel just for an Executive

Committee meeting will be avoided, unless necessary. Meetings may also be held on an as-needed basis, at the call a member, with two (2) weeks prior notice. The roles and responsibilities of the Executive Committee will be:

- Monitoring whether the program is on track, and recommending adjustments;
- Providing strategic advice;
- Acting as ambassadors for AI4D, facilitating relationships with governments, donors, and relevant international development organizations; and
- Reviewing and approving the terms of reference for the final evaluation of AI4D.

### **4.3 The Implementation group of 8 (IG-8)**

The mandate of the Implementation group of 8 is to:

- 1) Ensure African leadership of the program;
- 2) Strengthen alignment with the goals of the program; and
- 3) Promote cross-program sharing and learning.

The Implementation group of 8 (IG-8) consists of representatives from the 8 lead organizations implementing the program: 2 multidisciplinary research labs, 2 policy think-and-do tanks, and the 4 innovation research networks.

The IG-8 will meet, either F2F or virtually, twice a year for each year of the program, starting within six months of the 8 organizations being selected. Ideally, these meetings will piggy-back on other regionally based events, such as the yearly AI4D conference, reducing costs and travel.

### **4.4 Advisory Group**

The AI4D program will consider constructing an AI4D Africa Advisory Group. The mandate of the Advisory Group is to provide advice on AI4D Africa programmatic direction and contribute to the legitimacy of the AI4D Africa Program. The Advisory Group will be comprised of (4) to six (6) experts in applied AI and social development issues, and with a focus on Africa.

The Advisory Group will review key documents and strategies, providing advice and recommendations for consideration by the AI4D Africa team. Example topics for potential input include:

- Annual workplan;
- Global Call-to-Action reports;
- Playing the role as AI4D ambassador, including at international fora and events;
- Identify priorities, opportunities, and challenges that could inform further strategic orientations, ensuring that global efforts are built from the bottom up; and
- Undertake additional activities, as determined by the Advisory Group.