

# FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL MAPPING POLICY AND CAPACITY FOR ARTIFICIAL INTELLIGENCE FOR DEVELOPMENT IN AFRICA – CENTRE

;  
;

© 2021, CIPIT



This work is licensed under the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/legalcode>), which permits unrestricted use, distribution, and reproduction, provided the original work is properly credited.

Cette œuvre est mise à disposition selon les termes de la licence Creative Commons Attribution (<https://creativecommons.org/licenses/by/4.0/legalcode>), qui permet l'utilisation, la distribution et la reproduction sans restriction, pourvu que le mérite de la création originale soit adéquatement reconnu.

Project Title: MAPPING POLICY AND CAPACITY FOR  
ARTIFICIAL INTELLIGENCE FOR DEVELOPMENT  
IN AFRICA – CENTRE

IDRC Project Number: 109307-002

Subtitle: ARTIFICIAL INTELLIGENCE (AI) POLICY CENTRE

Research Institution: CENTRE FOR INTELLECTUAL PROPERTY AND  
INFORMATION TECHNOLOGY LAW

Country: KENYA

Research Team Members: DR. ISAAC RUTENBERG  
DR. MELISSA OMINO  
DR. ANGELINE WAIREGI  
MITCHEL ONDILI  
FLORENCE OGONJO  
MERCY KINGORI  
JOSEPH KINGORI GITONGA  
MAGARET ZALO  
MILCAH KERUBO

Report Type and Number: FINAL TECHNICAL REPORT

Time Period: JANUARY 2020 TO SEPTEMBER 2021

Date of Presentation: 30<sup>TH</sup> OCTOBER 2021

Address of research institution: OLE SANGALE ROAD, MADARAKA ESTATE, P.O  
BOX 59857 00200, NAIROBI, KENYA

Contact information of research team: Email - [cipit@strathmore.edu](mailto:cipit@strathmore.edu)  
DR. ISAAC RUTENBERG  
DIRECTOR, CIPIT  
STRATHMORE UNIVERSITY

## Table of Contents

I. Executive Summary .....	2
II. The Research Problem:.....	3
III. Progress Towards Milestones:.....	4
IV. Synthesis of Research Results and Development Outcomes: .....	7
VI. Project Outputs: .....	9
VII. Problems and Challenges: .....	11

## **I. Executive Summary**

Due to Africa's unique geographical, cultural and political nature, the 4th industrial revolution is evolving differently from its global counterparts. The Centre for Intellectual Property and Information Technology Law (CIPIT) undertook research throughout 2020 and the first half of 2021 to better understand the landscape - technology, data infrastructure, developers, labor force, consumer base, laws, etc. - of Artificial Intelligence (AI) in Africa. CIPIT's mission is to provide information and information channels on issues of emerging technology that is freely available, reliable, and accessible to stakeholders. Thus, the overarching goal of the Artificial Intelligence for Development (AI4D) project was to build an academic body of work that was accessible to policymakers and could be used to inform and influence AI policy locally and regionally, and would enhance CIPIT's capacity, influence, and reputation among AI stakeholders. This was accomplished by determining: (i) whether AI developed in Africa is substantively different from AI developed elsewhere; (ii) whether AI is being used to help Africa mitigate the effects of climate change, and (iii) whether from a gender perspective, AI developed, and the process of this development, in Africa is different than elsewhere.

The primary findings of the project indicated that there is a difference in the motivations for developing AI, the development and adoption process and its impact compared to AI developed elsewhere. A study on the gender makeup of the emerging AI workforce determined significant gender disparity in all sectors, across all positions. Finally, the study on AI and climate change in Africa revealed emerging interest and use of AI tools to help mitigate the negative impacts of AI. Research findings were disseminated as follows:

- i. contributed a chapter for inclusion in the African Handbook of Climate Change Adaptation
- ii. published a paper in the Symposium COMTECDEV: Artificial Intelligence and Social Innovation Conference journal, Communication, technologies et Développement, detailing a novel theoretical conceptual framework to characterize the stakeholders involved in the African AI ecosystem;
- iii. held a panel at RightsCon 2021 conference, along with a multidisciplinary team from OpenAir, investigating the ethical implications of adoption of AI technologies to smallholder farmers in the East African region;
- iv. held a panel at RightsCon 2020 conference on the emerging AI ecosystem in Africa; leading a discussion on the uniquely African factors that motivate the development of AI technology; the ways in which AI platforms are utilized; characterizing the stakeholders in the ecosystem, and outlining the existing policies and policy gaps in legislating AI;
- v. will publish (September 2021) a paper in the 10<sup>th</sup> WeRobots 2021 Conference proceedings on the ethical implications of adoption of AI technologies to smallholder women farmers in the East African region;

In building the center's capacity to engage in substantive and impactful AI research and influence pertinent AI stakeholders in this emerging ecosystem, CIPIT worked collaboratively with OpenAir network on various proposals, publications and conference panels. The center also joined the Masakhane Lacuna consortium - a consortium focused on Natural Language Processing (NLP), specifically the creation of language datasets and algorithms relevant to the unique set of languages on the African continent, and worked with Gender@Work to incorporate gender-focused inquiries and inclusive outreach in all AI4D research projects.

## **II. The Research Problem:**

This research project was centered around the question “Does African AI differ substantively from AI developed elsewhere?”. AI impacts every sector - finance, national security, health care, criminal justice, transportation, smart cities, etc. - of private and public life. While development and adoption of AI technology occurred (and continues to proceed) relatively slowly in Africa, a vibrant AI ecosystem is developing on the continent. Unfortunately, perspectives on AI are still largely dominated by and centered on the West. African voices are largely absent from global dialogues on AI around issues of data, ethics, technology, policies and similar topics. This project aimed to increase the visibility of African AI, and add an African perspective, via our research, to the discussions around Responsible AI. These contributions would further diversify the global discussion on the development of AI policy, law, norms, and technology. To that end, the first aim of the project was to investigate AI development and adoption in Africa. Subsets of this aim involved inquiry into AI: (i) from the perspective of gender issues such as bias and sensitivity, and (ii) in regards to climate change adaptation and impact mitigation.

The specific objectives of the project were as follows:

### **i. Mapping and characterizing African AI projects**

A significant portion of this project involved aggregating existing research documenting African AI; mapping of existing technologies and development, and investigations into the current status of laws and policies on the continent. We assessed the current attitudes and approach of governments with respect to AI, and in particular their intended direction toward uses and government-level implementation of the technology. The results of this portion of the project informed the answer to the primary research question: whether African AI differs substantively from AI developed elsewhere; helped in explicitly defining the African AI ecosystem and its shareholders, and offered an overview of the law, policy and innovation landscape of AI for development in Africa. This data also informed the centre’s subsequent research on gender and climate change in the context of the African AI ecosystem.

### **ii. Gender bias in African AI systems and products**

Instances of AI bias at this point are well documented: gendered language in Natural Language Processing algorithms; recruiting AI platforms biased against women applicants; criminology software used to model recidivism biased against minority communities; medical AI applications that consistently provide sub-par care to minority patients, and many more. Without rigorous oversight, AI undoubtedly reproduces existing power dynamics. In Africa, multiple factors, including remnants of colonial social structures, biases and cultural mores, have hampered the participation of African women across multiple intersections of culture, race, gender, socio-economic, and political lines. While the global AI gender gap has been widely studied, the African AI landscape lies largely unexamined. We investigated the issue of gender bias in African AI systems and products, to determine whether similar biases are present, as well as how African developers are trying to minimize such biases. The study of gender bias in the African AI ecosystem focused on investigating women’s participation in the development process of AI in Africa, i.e., investigating gender parity in companies that develop AI on the continent. Additionally, we assessed the implications of not only the overall gender composition in these companies but also the implications of the observed gender distribution in different industries as well as management roles.

### **iii. Use of AI for climate change adaptation and impact mitigation**

Climate change, though a global phenomenon, is expected to impact Africa to a greater degree than the rest of the world. Incorporating AI algorithms into weather and climate

prediction models has shown significant promise, and widespread adoption of such technology is rapidly advancing. Unfortunately, these AI tools and models are largely developed outside of Africa, and may not take into account the specific nuances of culture, geography, and populations in the continent. It is unclear what impacts, if any, they will have on climate change in Africa. In this study, we sought to understand how AI will impact Africa's ability to cope with climate change. We mapped the projects that use AI in a way that specifically benefits Africa in climate change adaptation. These projects comprised of those undertaken physically in Africa as well as those that have Africa as their focus. We also explored African AI products and research that are specific to the issues of Climate Change. Finally, we determined the extent to which such research is adopted by policymakers, and the extent to which African has the capacity to carry out such activities.

### **III. Progress Towards Milestones:**

The following project milestones occurred during the grant period:

#### **i. Milestone I: First interim report, covering the first 12 months of Work (January 2020 – February 2021)**

The first interim report was submitted to IDRC on February 2021. The following activities were completed during that reporting period:

##### **a. Academic Research**

Using predominantly secondary data gathered from desktop research - accessing and analyzing open-access material, including news articles, websites, corporate documents, academic articles, NGO reports, expert submissions, and other public sources – we carried out studies in the three research areas outlined in the previous sections of this report. Sources were categorized into tiered levels of reliability and accuracy. First-tier sources included major print and news magazine outlets (such as the New York Times, Economist, Financial Times, and Wall Street Journal). Second-tier sources included major national media outlets, and third-tier sources consisted largely of web articles and blog posts. This information was supplemented, when possible, with primary data.

##### **b. Publications**

We contributed a chapter to the African Handbook of Climate Change Adaptation book based on our research on the use of AI for climate change adaptation and impact mitigation. We submitted a research paper to the Symposium COMTECDEV: Artificial Intelligence and Social Innovation Conference detailing a novel theoretical conceptual framework to characterize the stakeholder involved in the African AI ecosystem; a paper to the 4th AAI/ACM Conference on AI, Ethics, and Society (AIES) Conference investigating women's participation in the development process of AI in Africa; specifically, gender parity in companies that develop AI on the continent, and, finally, a proposal to the 10<sup>th</sup> WeRobots Conference on a project to investigate the ethical implications of adoption of AI technologies to smallholder women farmers in the East African region.

##### **c. Conference Panels**

We held a panel in July 2020 at the RightsCon 2020 conference on the emerging AI ecosystem in Africa; leading a discussion on the uniquely African factors that motivate the development of AI technology; the ways in which AI platforms are utilized; characterizing the stakeholders in the ecosystem, and outlining the existing policies and policy gaps in legislating AI. The session was remarkably well attended, with participants calling in from all over the globe and enriching the discussion by offering a multitude of

diverse perspectives. In January 2021, we submitted a panel proposal for the RightsCon 2021 conference on the ethical impacts of AI adoption to East African farmers.

**d. Public Engagement**

We held an AI4D gathering in 2019 - inviting dozens of AI developers and policy experts from across Africa to engage with one another on the pressing AI issues on the continent. We also participated in international efforts to engender ethical frameworks or policies for AI, including recently: WIPO efforts at developing AI and Intellectual Property guidelines; a World Bank regional consultation for the World Development Report 2021; and the UNESCO Africa Online effort at developing ethical frameworks for AI. During the World Bank consultation, we emphasized the necessity for mechanisms for introducing informed consent in data collection practices – tied to digital literacy, feminist data practices and participation in emerging digital democracies.

**e. Collaborative Projects**

We actively sought to build networks with robust institutions capable of supporting our research activities in AI. To that end, in partnership with colleagues from the OpenAir network, we submitted a proposal to the CIFAR – IDRC Solutions network for funding for an innovative team of cross-sectoral, interdisciplinary experts who will design and develop responsible and beneficial AI governance solutions for the African continent. We joined the Masakhane Lacuna consortium; a consortium focused on Natural Language Processing (NLP), specifically the creation of language datasets and algorithms relevant to the unique set of languages on the African continent, which seeks to leverage its shared partners’ skill sets to fulfil a diverse array of functions. Finally, the assistance of Gender@Work, and using knowledge gained from our engagement with the Feminist AI Research Network, we incorporated gender-focused inquiries and inclusive outreach in our research projects

**ii. Milestone II: First financial report, covering the first 12 months of Work (January 2020 – December 2020)**

<i>First Interim Budget</i>			
<b>Budget Line</b>	<b>Budgeted (Kes)</b>	<b>Expenditure (Kes)</b>	<b>Remaining Budget (Kes)</b>
Personnel	3,938,200	2,374,360	3,532,940
Consultants	2,000,000	2,116,490	583,510
Evaluation	0	0	0
Equipment	0	0	0
International Travel	1,515,000	0	1,515,000
Training	375,000	190,439	409,561
Research	1,700,000	105,336	2,744,664
Indirect Costs	1,170,000	622,261	1,127,739
<b>Total</b>	<b>10,183,200</b>	<b>5,408,886</b>	<b>9,913,414</b>

**iii. Milestone III: Final interim report (January 2021 – June 2021)**

The following activities were completed in the period between submission of the first interim report and preparation of the final report:

**a. Publications**

The research paper submitted to the Symposium COMTECDEV: Artificial Intelligence and Social Innovation Conference detailing a novel theoretical conceptual framework to characterize the stakeholder involved in the African AI ecosystem was accepted and published in the conference journal, Communication, technologies et Développement, in June 2021. Unfortunately, the paper submitted to the 4th AAAI/ACM Conference on AI, Ethics, and Society (AIES) Conference investigating women’s participation in the development process of AI in Africa; specifically, gender parity in companies that develop AI on the continent was not accepted for publication. In July 2021, we published a paper on utilizing AI to reduce case backlog in the Kenyan Environment and Land court in the LegalAIIA 2021 conference proceedings. Finally, the proposal submitted to the 10th WeRobots Conference on a project to investigate the ethical implications of adoption of AI technologies to smallholder women farmers in the East African region was accepted. The paper on that proposal is nearing completion and will be submitted to the WeRobots Conference publication team shortly.

**b. Conference Panels**

The panel proposal submitted for the RightsCon 2021 conference on the ethical impacts of AI adoption to East African farmers was accepted. The session was held in July and engendered a lively discussion on the topic.

**c. Other Outputs**

The center created 2 interactive online dashboards depicting the primary findings of the study on the gender disparity in the AI workforce and the AI applications created on the continent.

**iv. Milestone IV: Final financial report (January 2021 – June 2021)**

<i>Second Interim Budget</i>				
<b>Budget Line</b>	<b>Budgeted</b>	<b>Expenditure</b>	<b>Remaining Budget</b>	<b>Intended use for unutilized funds</b>
Personnel	3,532,940	2,418,140	1,114,800	Pay for the AI Research lead on project until the completion of the reports for the Facial Recognition and Ethical Framework projects.
Consultants	583,510	3,350,000	(2,766,490)	N/A
Evaluation	0	0	0	
Equipment	0	0	0	
International Travel	1,515,000	0	1,515,000	N/A: Excess funds were used to engage consultants on the Gender, Facial Recognition



				and Ethical Framework projects.
Training	409,561	16,200	393,361	N/A: Excess funds were used to engage consultants.
Research	2,744,664	1,429,939	1,314,725	Dissemination of reports and proposed round tables
Indirect Costs	1,127,739	937,856	189,883	
<b>Total</b>	<b>9,913,414</b>	<b>8,152,135</b>	<b>1,761,279</b>	

#### **IV. Synthesis of Research Results and Development Outcomes:**

The overarching conclusion from findings across multiple studies within the project is that there is enough difference in the motivations, development and adoption process of AI in Africa for it to be considered significantly different, in development, adoption and impact, to AI developed elsewhere on the globe. The primary findings of the project, for each research objective, are outlined, in a more granular level, below:

**i. Deepen understanding of the innovation, policy, and capacities ecosystem with respect to the use of AI to mitigate or adapt to climate change in Africa**

Africa’s heavy reliance on the agricultural sector, amongst other factors, lead many experts to conclude that the impact of climate change will be greater on the continent than in other parts of the world. Climate change models are currently using AI to improve accuracy on weather pattern predictions, but these are largely developed outside of Africa, and may not take into account the specific nuances of culture, geography, and populations in Africa. Mapping of the current practices of AI in mitigating climate change factors in Africa show nascent use by some countries. Ethiopia, for example, launched its first observatory satellite into space in 2019; a 70-kilogram remote sensing satellite to be used for agricultural, climate, mining and environmental observations. This satellite will allow the region to collect data and improve its ability to plan for changing weather patterns. This is in line with the mandate by the African Union of an African space policy, which calls for the development of a continental outer-space program and the adoption of a framework to use satellite communication for economic progress.

**ii. Explore the nature of gender bias in AI systems made in Africa**

While the global AI gender gap has been widely studied, the gender gap in the African AI landscape lies largely unexamined. We investigated the issue of gender bias in African AI systems and products, to determine whether similar biases are present, as well as how African developers are trying to minimize such biases. Encouraging and valuing women’s contribution in the AI workspace is one approach to increasing gender parity in AI. Thus, we studied gender bias in the African AI ecosystem by investigating women’s participation in the development process of AI in Africa, i.e., investigating gender parity in companies that develop AI on the continent. The study found significant gender disparity across all sectors and positions of companies developing AI technology in the continent. It seems that with the development of technology and with the advance in AI women are still “left

behind” or “barely considered”. This is demonstrated not only within the industry but also within the users of the products or actual uses of the tech developed. The implications are that the gender gap continues to widen even as other areas of discrimination such as race, class and even religion are addressed. Admitting more women into tech might be seen as a prima facie solution but it must be taken into account that patriarchy may still be perpetuated by women, therefore, knowledge building and awareness must take precedence to ensure that the gender disparity is addressed. The primary results of the study were also published as a graphic booklet and in the form of an interactive dashboard uploaded to the CIPIT website easily accessible by the general public and policy makers.

**iii. Better understand the law and policy landscape as pertains to AI and development**

The first step in mapping and understanding the AI governance was the creation of a novel Stakeholder Framework. This conceptual framework will be used to characterize the parties involved in the African AI ecosystem. i.e., the African AI stakeholder in future projects, including the policy and governance stakeholders. Identification of these stakeholders will aid in determining their interests, responsibilities and accountability and will provide a basis for the development and implementation of an equitable AI ecosystem. The paper detailing the Stakeholder Framework was published in the Symposium COMTECDEV: Artificial Intelligence and Social Innovation Conference journal, Communication, technologies et Développement.

We also investigated the most effective way of utilizing AI to improve the efficiency of the Environment and Land Court (ELC) in the Kenyan Judiciary. The number of land disputes in Kenya continues to increase with population and economic growth. In 2013, the judiciary established the Environment and Land Court (ELC) to hear disputes relating to environment and land. Unfortunately, the ELC is plagued with the same problems affecting Kenya’s other courts; chief amongst these is an extensive backlog of cases. A computational analysis of the current state of the ELC determined that there are in excess of 14,000 backlogged cases (cases in the court for more than a year) and the average case duration is 3 years. Past attempts by the judiciary to eliminate this backlog have met with varying degrees of success. We outlined four ways in which AI could assist with case backlog: AI in legal research for land dispute cases; AI for speech recognition and transcription; predictive analysis on case duration and dismissals, and online dispute resolution.

**V. Methodology:**

All studies carried out in this project were done predominantly using secondary data gathered from desktop research - accessing and analyzing open-access material, including news articles, websites, corporate documents, academic articles, NGO reports, expert submissions, and other public sources. Sources were categorized into tiered levels of reliability and accuracy. First-tier sources included major print and news magazine outlets (such as the New York Times, Economist, Financial Times, and Wall Street Journal). Second-tier sources included major national media outlets, and third-tier sources consisted largely of web articles and blog posts. Analysis of datasets was done using Excel.

## VI. Project Outputs:

The following outputs were generated from the activities carried out during the project:

No.	Project Activity	Output(s)
1.	<b>AI4D Project Design:</b> We completed design of the first phase of AI4D research project including: development of sub-projects to meet the overall project objective; development of research methodology and creation of the AI team task with carrying out the research.	<ul style="list-style-type: none"> <li>• Project budget and timeline.</li> <li>• Updated survey tool platform, AirTable.</li> <li>• Inception and regular follow-up team meetings.</li> </ul>
2	<b>Initial interviews and discussions with AI experts:</b> We are in the process of conducting interviews with various AI shareholders across the continent. A sampling of the interviews conducted so far include interviews with: employees of Google Lab Ghana; Fastagger – a company that tags satellite images for use in AI platforms; NLP researchers, and field agents tasked with collecting data for the creation of a language dataset. A slew of interviews are scheduled for 2021.	<ul style="list-style-type: none"> <li>• Development of AI Data Collection Questionnaires. This activity was not completed. Preliminary data from various stakeholders is needed to inform the final content of the questionnaires.</li> <li>• Generation of research output from interviews and questionnaires. This portion of the study was not completed. The travel restrictions in Kenya due to the COVID 19 pandemic have hampered interviews.</li> </ul>
3	<b>Visits to AI labs in Africa:</b> Unfortunately, due to the COVID - 19 pandemic this particular activity has been postponed indefinitely. Once travel restrictions are lifted this objective will be revisited.	<ul style="list-style-type: none"> <li>• This portion of the project could not be undertaken; the travel restrictions in Kenya due to the COVID 19 pandemic made travel to AI labs across Africa unfeasible.</li> </ul>
4	<b>Evaluative and empirical research activities:</b> <ol style="list-style-type: none"> <li>i. Creation of a conceptual Stakeholder Framework</li> <li>ii. Determination of gender parity in Africa’s emerging AI workforce</li> <li>iii. Determination of the efficacy of using AI to improve Efficiency of the Environment and Land Court in the Kenyan judiciary</li> <li>iv. Mapping of AI applications created in Africa</li> </ol>	<ol style="list-style-type: none"> <li>i. Journal publication and graphic booklet</li> <li>ii. Graphic booklet and creation of AI Gender Dashboard</li> <li>iii. Publication of paper in LegalAIIA 2021 conference proceedings</li> <li>iv. Creation of AI Application Dashboard</li> </ol>

	v. Determination of the AI landscape as it pertains to climate change in Africa	v. Published chapter in African Handbook of Climate Change Adaptation
5	<b>Dissemination of research output:</b> Research dissemination occurred in a variety of methods as appropriate to the research objective.	i. Various conference and journal publications (listed earlier in this report) ii. Blogs on AI issues iii. Conference panel discussions (listed earlier in this report)
6	<b>Technical and other support and administration by IDRC</b> i. G@W – Gender at work: We implemented practices in our team meetings that create a more collaborative space and encourage input from all the team members regardless of roles within the CIPIT hierarchy on the advice of the Gender at Work mentor.	i. A workshop on Reflective Research Practices ii. Report on best research practices to generate inclusive research environment and projects (in progress).
7	<b>Generation of policy briefs and recommendations:</b>	i. AI4D gathering in 2019 - inviting dozens of AI developers and policy experts from across Africa to engage with one another ii. Participated in WIPO efforts at developing AI and Intellectual Property guidelines iii. Participated in a World Bank regional consultation for the World Development Report 2021 iv. Participated in the UNESCO Africa Online effort at developing ethical frameworks for AI v. Participated in a World Bank consultation, where we emphasized the necessity for mechanisms for introducing informed consent in data collection practices – tied to digital literacy, feminist data practices and participation in emerging digital democracies

The list of publications related to the studies in the project are listed below:

1. **“The use and impact of artificial intelligence on climate change adaptation in Africa”**, (2021), Rutenberg, I., Gwagwa, A. and Omino, M. In: Leal Filho W., Oguge N., Ayal D., Adeleke L., da Silva I. (eds) African Handbook of Climate Change Adaptation. Springer, Cham. [https://doi.org/10.1007/978-3-030-45106-6\\_80](https://doi.org/10.1007/978-3-030-45106-6_80)
2. **“AI in Africa: Framing AI through an African Lens”**, (2021), Wairegi, A., Omino, M. and Rutenburg, I., Communication, technologies et développement [Online], 10 | 2021, Online since 20 May 2020, connection on 27 May 2021. URL: <http://journals.openedition.org/ctd/4775> ; DOI: <https://doi.org/10.4000/ctd.4775>
3. **“Utilizing AI to Improve Efficiency of the Environment and Land Court in the Kenyan Judiciary: Leveraging AI Capabilities in Land Dispute Cases in the Kenyan Environmental and Land Court System”**, (2021), Ogonjo, F., Gitonga, J.T., Wairegi, A., and Rutenberg, I., In: Proceedings of the Second International Workshop on AI and Intelligent Assistance for Legal Professionals in the Digital Workplace (LegalAIIA 2021), held in conjunction with ICAIL 2021, June 21, 2021, Sao Paulo, Brazil
4. **“Smart Farming versus Traditional Knowledge: Mapping the Impacts of AI Automation on East African Smallholder Female Farmers”**, (2021), Foster, L., Szilagyi, K., Wairegi, A., Oguamanam, C., de Beer, J., In: Proceedings of the 10<sup>th</sup> WeRobots Conference (paper in progress; expected publication September 2021)

There are 2 outstanding studies from the project: (i) a study on the efficacy of utilizing AI for facial recognition programs in Africa, and (ii) application of the Stakeholder Framework developed in an earlier study to various Ethical Frameworks. The study on AI and facial recognition is developing a novel method of optimizing the racial ratio in training datasets to improve accuracy of facial recognition algorithms. The project is nearing completion; the research paper from the study is expected to be submitted for publication by the end of November 2021. The study applying our Stakeholder Framework to various Ethical Frameworks seeks to determine stakeholder responsibilities and accountability given different provisions outlined in Ethical Frameworks. The expected submission date for the paper resulting from this work is January 2022.

## **VII. Dissemination of Output**

In accordance with the IDRC grant agreement, all publications resulting from the above studies were and will be published in open source publication platforms. Furthermore, all research papers will be uploaded to the CIPIT online site (<https://cipit.strathmore.edu/>), accessible to the general public. All project outputs, e.g., reports, booklets, dashboards, are also available (or will be made available) to the public on the CIPIT website.

## **VIII. Problems and Challenges:**

The COVID pandemic is still disrupting regular research activities and work practices. The AI4D team is working from home which has entailed ensuring all our team members have adequate access to the internet to fulfill their research duties. The pandemic also disrupted our initial project

schedule. We did manage to complete most of the tasks outlined in the initial schedule but travel restrictions made some of the tasks, such as visits to international AI labs, unfeasible.

**IX. Administrative Reflections and Recommendations:**

While we are adjusting to this new normal, flexibilities in the timelines for the activities and milestones from IDRC grant administration would be ideal. Flexibility in the budget would also be welcome to provide unexpected provisions, internet access, for example, for researchers working from home. Moreover, certain research activities have been hindered by travel restrictions and may require an extension of project timelines to be completed in a satisfactory manner.