Can Artificial Intelligence Protect or Harm Women's Rights? Empirical evidence from a developing country

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Abstract. This paper reports on the study of impact of artificial intelligence (AI) on protections of women's rights in Malawi, a developing country context. The study adopted an interpretive qualitative approach in which semi-structured interviews and documentary reviews were used to collect data. About 15 women from academics, civil society, private and public sectors were interviewed. The data collected was analysed thematically based on the objectives of the study. Permission to conduct the study was personally sought from participants. The findings revealed that women conceptualised AI in different perspectives, and showed a generalised notion of some characteristics of AI, such as automation, involving robotics, and the use of imagery, biometrics, machine learning and algorithms. However, they showed a low level of awareness of AI projects being implemented in Malawi. The participants believed that AI could promote their political, social, cultural and economic rights. Nevertheless, they feared that many AI initiatives being piloted in the country could cause more harm than good to their rights if legislative and regulatory frameworks are not revised to reflect the current AI regime. The participants suggested that AI is likely to violate women's rights such as privacy, equality, health rights, and education rights, among others, all of which are rights contained in the country's Constitution. Eventually, AI could perpetuate the already existing digital divide and digital inequalities that women are experiencing in the country. Therefore, the findings in this study have implications for the role of civil society, the private sector, academia and the government for understanding the impact of AI on human rights. The study was guided by Framing Theory as theoretical lens.

Keywords: Artificial intelligence, Framing theory, Human rights, Women rights, Malawi.

1 Introduction

Artificial intelligence (AI) is touted to have the potential to address some of the human rights issues facing women in the world today [1]. However, literature on the current debate is mostly dominated in the developed world [2], and few similar studies have been done in developing countries like Malawi. Consequently, there is lack of empirical evidence to substantiate how women conceptualise AI in the context of protecting their rights. This study uses framing theory to understand how Malawian women speak about the impact of AI on human rights. Previous studies suggest that the way people frame (or conceptualise) an object, affects the way they can engage and use it [3]. Therefore, if we know how women frame AI in their contexts, we can

understand the factors that shape how they engage with AI technologies, and deploy AI in manner that safeguards their rights. Key objectives of the study were to analyse how women potentially framed AI and human rights in Malawi; their awareness of AI initiatives in the country; and how the rights of women are understood to be impacted positively or negatively by AI. Given this, a set of recommendations were made for improving the level of participation of women in AI initiatives in the country.

1.1 Study context: Malawi

Malawi gained its independence from Great Britain in 1964. It borders Tanzania, Zambia and Mozambique. The country has an estimated population of 17.7 million people of which 85% live in rural areas [4]. The Gross Domestic Capital per Capita is USD 516.80 [4,5]. Most women are working in agricultural sector which is a backbone of Malawi's economy. Of those in non-agricultural waged employment, 21% are women and 79% are men and the numbers have remained the same over the years. The overall mobile penetration is estimated at 45.5% while internet is 6.5% [5, 27]. About 34.5% of women own a mobile phone, 0.6% own a desktop computer, 1.8% own a Laptop, while just 4.7 % of them have access to the internet [5]. The low rates of ICT penetration in Malawi is attributed the country's weak economy, high value added tax (VAT) imposed on importation of ICT gadgets, and other contextual factors [27, 28].

State of women's rights in Malawi

Section 24 of the Malawi's constitution [6] stipulates that "*women have the right to full and equal protection by the law, have the right not to be discriminated against on the basis of their gender or marital status*". These rights are also operationalised in Malawi's Gender Policy (2015), ICT Policy (2013) and Malawi Growth and Development Strategy III (2017) [7, 8]. Despite such policy interventions, women's rights in Malawi are largely curtailed. Patriarchal beliefs and attitudes still prevail and many of the traditional cultural practices are harmful to women's rights. The unequal status of women is further exacerbated by poverty and discriminatory treatment in the family and public life [14]. Malawi is ranked 173 out of 188 countries on UN's Gender Inequality Index [9].

2 Methodology

This study adopted a constructivist approach and used an interpretive paradigm [16].Therefore, qualitative method was employed to establish an in-depth understanding of the phenomena under investigation. Data for this study was collected using document analysis and semi-structured interviews. This study reviewed documents (secondary data) such as annual reports, published statistics and additional documents linked to ICTs, AI, and human rights. Semi-structured interviews were used to gather

data because it enabled the opportunity for immediate response and the opportunity to ask immediate follow-up questions [17].

About 15 women participants from the academic, government, and civil society, and private sectors participated in the interviews for this study. The author contacted them by phones and consent was made for face-to-face interviews. Some of the key questions that were posed to participants were as follows:

- What is your general understanding of AI?
- Can you describe some of the AI initiatives in the country that you know or have participated?
- How do you think AI is likely to impact women rights in the country?
- What policy/regulatory initiatives should be put in place to ensure women's rights are protected through the coming of AI regime?

Framing theory was adopted as a school of thought to analyse participants' views, opinions, and insights. Framing refers to the process by which people develop a particular conceptualisation of an issue or re-orient their thinking to an issue [10]. Different people view the world in different ways and place emphasis and importance on different issues. This then results in people sometimes framing the same issues differently. This implies that frames help us to interpret the world around us and represent that world to others [3]. The frames suggested by the participants interviewed helped to understand meanings that were attached to AI in relation to their rights.

2.1 Sampling Strategy

The objective of sampling is to understand characteristics of the subset of a population, making it probable to infer the properties of the population elements [18]. With non-probability sampling, only a particular group representative of the population is chosen [19].This study used purposive sampling technique. Purposive sampling was used to select participants who could offer the information and adheres to the selection criteria of the study [20].

A qualitative study with less than 20 participants assists the researcher to develop and keep a close relationship, improving the open exchange of information [21]. This could also assist with mitigating the bias and validity flaws in qualitative studies [22]. This study followed the recommendations of Crouch and McKenzie [21] and Galvin [22]. Table 2 provide a profile of 15 women who took part in the study.

Table 1: Profile of the sector and type of work of the research participants

Pseudonym	Position	Industry
Resp1	Lawyer	Government
Resp2	Human Rights Activist	Civil Society
Resp3	Gender specialist	Civil society
Rep4	ICT Expert	Government
Resp5	ICT Expert	Private
Resp6	ICT Lecturer	Academia
Resp7	AI Lecturer	Academia

Resp8	Computer Engineering Student (Level 4)	Academia
Resp9	ICT Student(Level 3)	Academic
Rep10	ICT Education Student (Level 2)	Academia
Rep 11	Physician	Government
Resp 12	Nurse	Private
Resp13	Policy Expert	Academia
Resp14	Entrepreneur	Private
Resp 15	Parliamentarian	Government

2.2 Confidentiality, Ethics and Approval

To ensure that participants' privacy and confidentiality are protected, all recordings and transcripts were stored securely. Pseudonyms were used to protect their identities. Research participants were informed that their involvement in the study was voluntary [23]. Permission to conduct the study was obtained from the individual research participants.

2.3 Data Analysis Procedure

Thematic Analysis was used to analyze the data collected from this study. It is a technique used for recognizing and analyzing patterns of significance and meaning in a data set [24]. Thematic analysis was used due to its ability to condense important attributes of large amounts of data and to recognize and analyse patterns of significance and meaning in a data set [25]. Thematic analysis was also used because of the ability to describe the themes and produce a report and other additional advantages [26]. Data was collected between 10 June to 27 July, 2019. Each interview was transcribed into a Microsoft Word document to simplify the process of analysing the data with the aim of identifying themes. The feedback was also transcribed within 24 hours of the interview to mitigate the issue of data loss.

3 Findings

3.1 Defining AI and human rights

The majority of participants conceptualised AI into different contexts. For instance, to a lawyer, AI was understood as an automatic machine that can work independent of a human being, while other participants defined AI as a robotic, automatic machine, machine learning, sensor or a biometric device '*its where biometrics or sensors are automatically able to capture data in a computer" [*Resp. 9]; '*I think is when a computer is able to think like a human being'* [Resp. 3]. '*It can be defined as a machine or computer that reason like a human being"* [Resp. 5]. From the definitions, it was clear

that while none of the participants was able to capture the comprehensive definition of AI, their responses showed a basic awareness of AI that is in line with lay people's definitions of the technology.

What was evident was that the majority of the informants attempted to define AI according to their own understanding, suggesting some measure of appropriation of the technology at a conceptual level. Likewise, on human rights, the majority of women confidently defined human rights as entitlements that any person including women are supposed to enjoy from birth: *"human rights are entitlements that women and any other person should enjoy from birth such as right to life, opinion, freedom of expression, just to name a few'* [Resp. 2]. It was also encouraging that some participants went further to categorised human rights as economic rights, social rights, cultural rights and sodality rights.

3.2 Awareness of AI initiatives in Malawi

Most of the participants expressed ignorance of AI initiatives being implemented in the country, only few women (from academia and the private sector) were able to mention any. This suggests that while a general awareness of AI can be found amongst the public, specific examples that demonstrate a practical knowledge of the implementation of AI are less readily available.

A review of AI initiatives showed that they are at different maturity levels. Table 2 presents key AI initiatives in the country.

Table 2: Summary of major AI initiatives in Malawi

AI Initiative	Description	Implementer/Funder
Data Intelligence [4]	-Also known Planning, predication, prompting and podding for change (4P2C) -Uses geo-spatial and data analytic tools -Provides accurate and real-time information for women and children and their families. -Used for monitoring and decision-making in development and humanitarian processes	- UNICEF Malawi in partnership with the Malawi Government
Drones Lab [4]	- It provides a controlled platform for universities, private sector and other expert organizations to explore how unmanned aerial vehicles (UAVs) can be used to deliver services that will benefit women and children in disadvantaged communities. -To make the project sustainable, UNICEF teaches local Malawians on how to make drones and train local pilots rather than relying on expatriate	- Launched in June, 2017 by UNICEF Malawi and Malawi Government.

IBM Digital-Nation Africa Project (D-NA) Project [11]	-The project offers training to students on emerging technologies such AI and Cognitive; Cloud computing; Data Science and Analytics; Brock chain and Security; and Internet of Things (IoTs) [11] -It has three platforms: (i) Watson Artificial Intelligence: It communicates with the user to build a profile and gives an overview of current job markets and suggest multiple learning paths; (ii) New Collar Advisor: A tool that performs skills gap analysis for users and helps in job matching; (iii) the Innovators: help users explore, design and leverage Cloud computing and AI services to build applications like Chatbot	-In December, 2018, International Business Machines (IBM) partnered with Malawi University of Science and Technology (MUST).
AI for Patient Diagnosis Project [12]	-It is an AI-powered digital pathology microscope slide scanner. -The AI-powered system turns a microscope into a manual slide scanner and magnifies images of blood so that they can be linked to a computer or mobile phone and beamed across the world. -It is anticipated that over 28,000 children admitted with blood cancer are going to benefit from the initiatives. The AI- microscope has improved pediatric services at the QECH.	-A group of computing scientist and Medics from Newcastle University in the United Kingdom partnered with Queens Central Hospital (QECH) in Malawi
Missing Maps Project [13]	-Uses AI-powered maps to filter out the 97% of the terrain that is inhabited. This has helped to educate and reach over 100,000 houses to educate them about measles and rubella vaccines in Malawi	-Facebook, Red Cross, and Malawi Government
National Identity Registration Project	-It is a civil registration of national identities. It uses barometric and sensors	- Malawi National Registration Bureau (NIB)

Table 2, indicates that AI projects in Malawi include machine learning algorithms, drones, imagery, biometrics, and sensors, amongst many others. None of the participants had participated in an initiative using AI. This could be an indication of how women are neglected not only on ICT sector in the country, and particularly from innovative future-thinking projects.

3.3 Framing the positive impact AI on women's rights

The participants felt that AI had the potential to improve women's social and economic well-being if deployed using ethical standards and based on human rights principles: '*I believe that AI is very broad and, as women, we can benefit both directly and indirectly as they affect our rights'* [Resp. 6]. For example, they stated that AI is likely

to benefit women in the areas of education, healthcare, environmental management, and good governance. As one participant put it, there are few areas on the economy where the use of AI will not impact on women, highlighting the need for the rights of women to be foregrounded in AI initiatives: "*You know, women are represented in all sectors of the economy. Therefore, any area that AI is going to touch, women are always there. For example, if a company uses AI in banks, women are there, in agriculture, women are there, you name it…. in all these areas our rights must be protected and our voices be heard'* [Resp. 7].

AI can save women lives in times of disaster.

Women stated that the use of AI that predicted extreme weather could help to respond to natural disasters in which the loss of lives of women and children could be prevented. '*If we have AI that can tell us about bad weather to come or any disaster, it may help to save the lives of women. We had a disaster of Cyclone Idai in Malawi; you will find that the majority of people who lost their lives through floods were women'* [Resp. 3].

Improve women's agricultural livelihoods.

In Malawi, 79% of agricultural activities are done by women. The participants stressed that the use of satellite images to collect weather data together with AI applications could provide information for women farmers to improve crops yields, diagnose and treat crops and animal diseases. This may better the social and economic rights of women through improved livelihood outcomes: *'In our country, we depend on natural rain fed for our crops to grow, and women are majority smallholder farmers. If we could have AI which predicts in time the occurring of crop pests and diseases, it means women farmers can use this information to control and prevent such pests and diseases. In the long run, they will improve their livelihoods such as increased income, improved crop and livestock yields, and be able to manage and deal with vulnerabilities'* [Resp. 8].

Women's social and economic inclusivity.

Despite research suggesting that the use of AI in financial services can increase institutional bias, the participants felt that the use of AI applications such as credit scores for disbursement of loans can help to reduce gender bias*: 'The majority of women do not have access to financial credits in Malawi because sometimes they are biased due gender stereotypes. If we have AI credit scores that do not bias on selection, it means many women may qualify for credits and loans'* [Resp. 10]. From the comment, it was clear that AI, with the appropriate ethical standards, can be used to challenge discrimination experienced by women when trying to access credit and loans, enabling the social and economic rights of women.

Promote the health rights of women.

Participants observed that if they had AI technologies that could help to predict, diagnoses and prevent the outbreak of diseases, the access to healthcare for marginalised and vulnerable women located in remote areas would be significantly improved. AI would enable health workers to intervene and contain any disease before spreading sporadically. AI could also be used to screen patients for diseases, and help improve medical services during pregnancy: *'I expect in Malawi to have AI that could screen cervical cancer, help in surgery of pregnant women during delivery… because so many pregnant women die during delivery time due to inadequate midwifery professionals in our health facilities. We may reduce maternal and neonatal death by 2030 by using such technologies'* [Resp. 15].

Equality in education and employment opportunities.

Participants expressed optimism that the use of AI for hiring workers could help more women get high-paying jobs without bias. In addition, some participants believed that AI could allow more young girls enroll in top universities in the country such as the University of Malawi and Malawi University of Science and Technology*: 'AI may help young girls to enroll at University of Malawi which is currently very competitive and many girls are left out' [Resp. 7]; 'When you go to an interview, maybe it is a technical job, and they see you as a woman, the likelihood that you will be picked becomes very low, even if you have the right qualification. I hope that if we can have an AI technology that interviews job applicants without asking gender and other affiliations, it may promote gender equality'* [Resp. 9].

Fair criminal justice.

Participants also felt that AI could be used to promote fair trials in courts. In particular, it may help to provide women access to the justice system without bias and discrimination against gender: *'Sometimes we have our court judges who are very corrupt, so when you have an AI technology that can provide a ruling or determination fairly, it means people may have trust in our justice systems. I do not know if this technology may work in Malawi……'* [Resp. 11]

3.4 Framing the negative impact of AI on women's rights

Although women felt that the use of AI technologies could help them exercise and enjoy their social, political, cultural and economic rights both online and offline [1, 14], they also observed that all aspects of human interaction with ICT in general are gendered. While AI can contribute to women rights, a predominant concern was that a violation of rights such as privacy, and through discrimination that reinforce existing inequalities. They suggested that proper legislation and regulations were necessary to counteract this potential. The following were some of the concerns expressed by the participants:

Discrimination against women.

In general, the use of facial or speech recognition software tools can surveil and identify women and discriminate against them. AI can be used to create and disseminate disinformation, political and socio- economic propaganda. The targets of these campaigns are often likely to be women and other vulnerable individuals. One participant expressed a concern that AI would exacerbate the objectification of the women that was already felt online: *'Already the current ICTs have exacerbated privacy concerns for women, we see more nudes for women in social media platforms, YouTube etc. than males, so how AI will protect us from such embarrassments?'* [Resp. 3].

Censoring dissent.

Law enforcement agencies can use AI such as facial recognition to monitor the women activists who provide dissenting views to government. This may also violates rights of women such as freedom of expression, opinion, movement, assembly, privacy and data protection. '*If you are a woman political activist and you are regarded to be critical of government operations, you may be targeted. We had general elections Malawi on 21 May, 2019. We saw some women being victimized and others arrested at Kamuzu International Airport jus because they commented on social media about evils being committed by ruling political party'*[Resp. 3]

Right to equality in the work place and in education.

Despite expressing the view that AI could neutralise bias in work opportunities or enrolment in universities, some participants acknowledged that the opposite could also be true. AI used for hiring workers could promote bias and discriminate against women based on gender, race, and ethnic backgrounds, among others. In addition, using AI to create credit scores for enrolling into a top college or university may discriminate against more deserving young girls who perhaps did not have the appropriate credit scores due to poor access to basic quality education.

Right to life and to health.

Participants expressed some fear of AI technology. For instance, they feared that the use of drones in conflict situations may result in more death and injury to women and children. Hospital patients undergoing surgery using AI such as robotics might die of the systems failure, something that could be avoided if human was performing the surgery. *'What about when robotic used for surgery has failed. Should I blame or sue the robotics or the surgeon?* [Resp. 15].

Family and marriage rights.

AI technologies that are used for reproductive screening were seen as good because they allowed women know their reproductive status, but they may affect women's rights to get married if it was revealed that they were unable to conceive.

4 Conclusion

Although not comprehensive, this study provides an empirical evidence on how women in developing countries like Malawi frame AI in the context of human rights. The women interviewed conceptualised AI in a simplistic way, and showed a generalised notion of some characteristics of AI, such as automation, involving robotics, and the use of imagery, biometrics, machine learning and algorithms. However, they suggested a low level of awareness of AI projects being implemented in Malawi. The participants believed that AI could promote their political, social, cultural and economic rights.

Nevertheless, they feared that many AI initiatives being piloted in the country could cause more harm than good to their rights if legislative and regulatory frameworks are not revised to reflect the current AI regime. The participants suggested that AI is likely to violate women's rights such as privacy, equality, health rights, and education rights, among others, all of which are rights contained in the country's Constitution. Eventually, AI could perpetuate the already existing digital divide and digital inequalities that women are experiencing in the country

A review of policies such as Malawi's National Gender Policy [7], the ICT for Development Policy [15], and ICT Policy [8] show that gender equality and other women's rights are policy priorities for the government. However, there are no specific targets in place to monitor how such rights can be measured and achieved. Therefore, the findings in this report have implications for the role of civil society, the private sector, academia and the government for understanding the impact of AI on human rights.

Civil society should lobby for transparency and accountability in the deployment of AI so that these initiatives are more inclusive of women. This will also ensure that women are more aware of different AI deployments and be in a position to assess the risks those AI technologies are likely pose to their rights. The government should review current policy frameworks such as the ICT Policy so that it is aligned with the new wave of AI technologies being implemented in the country. Government should work with the private sector and the academia through public-private-partnerships to deploy AI technologies that are beneficial to all citizens, including women. The government should also develop an affirmative action plan for women so that more young women are enrolled in AI technology and other STEM (Science, Technology, Engineering, and Mathematics) graduate courses in our universities and colleges.

In summary the following policy recommendations are necessary for Malawi: The government should develop an AI strategy, with a strong focus on the role of women; data protection legislation, regulations and standards should be developed by government, the private sector and the civil society organisation; the government should use the public-private-partnership approach in the deployment of AI projects to ensure transparency and accountability; human rights risk assessments should be conducted before AI technologies are deployed in the country; regulatory or policy frameworks that fund and incentivise local women AI innovators need to be established; there should be investment in training and research into AI that includes women; affirmative action is necessary to ensure more women participate and enroll in AI and other related

ICT courses; and civil society should build knowledge and capacity amongst women's groups and organisations on AI.

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