

Fostering Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development

Kariuki Muigua

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Fostering Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development

Kariuki Muigua*

Abstract

Due to mounting problems facing the attainment of Sustainable Development including the triple planetary crisis of climate change, loss of biodiversity, and pollution, the world needs to embrace other approaches towards Sustainable Development. Utilising science, technology, and innovation can accelerate the achievement of Sustainable Development. One of the key tools under this approach that can foster Sustainable Development is Artificial Intelligence (AI). Harnessing the positive impacts of AI and other frontier technologies holds significant potential for supporting inclusivity, reducing inequalities, and fast-tracking the achievement of the SDGs. This paper critically explores the role of AI in Sustainable Development. It argues that AI can accelerate the realization of the Sustainable Development Agenda and therefore needs to be effectively harnessed. The paper defines AI and examines ways through which it can foster Sustainable Development. It also highlights some of the key concerns in AI and how to address such challenges. The paper proposes measures towards fostering secure and trustworthy AI systems for Sustainable Development.

1.0 Introduction

The idea of Sustainable Development seeks to ensure development that meets the needs of the present without compromising the ability of future generations to meet their own needs¹. This concept has been embraced as the global blueprint for development in order to address society's greatest challenges². These problems include environmental

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¹ World Commission on Environment and Development., 'Our Common Future.' Oxford, (Oxford University Press, 1987)

² Giovannoni. E., & Fabietti. G., 'What Is Sustainability? A Review of the Concept and Its Applications.' In: Busco, C., Frigo, M., Riccaboni, A., Quattrone, P. (eds) Integrated Reporting. Springer, Cham. Available at https://doi.org/10.1007/978-3-319-02168-3_2 (Accessed on 09/04/2024)

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challenges such as climate change, pollution, and loss of biodiversity together with issues of poverty, increasing disparity between societies and the tensions brought by social inequalities³. Sustainable Development envisages creating and maintaining the conditions under which humanity and nature can exist in productive harmony to support present and future generations⁴. It seeks to achieve this ideal by striking a balance between environmental conservation, economic development and social progress⁵.

The United Nation's *2030 Agenda for Sustainable Development*⁶ sets the global targets towards achieving the ideal of Sustainable Development. The Agenda envisions attainment of the ideal of Sustainable Development through 17 Sustainable Development Goals (SDGs) which seek to strike a balance between social, economic and environmental facets of sustainability⁷. At a continental level, *Africa Union's Agenda 2063*⁸ seeks to foster Sustainable Development in Africa. Agenda 2063 seeks to promote inclusive growth and Sustainable Development in Africa by addressing economic, social, and environmental problems in the continent⁹. At a national level, the *Constitution of Kenya*¹⁰ captures Sustainable Development as one of the national values and principles of governance¹¹. In addition, Kenya's *Vision 2030*¹² is the long-term development blueprint for the country which seeks to achieve Sustainable Development by transforming Kenya into a

³ Ibid

⁴ United States Environmental Protection Agency., 'What is Sustainability.' Available at <https://www.epa.gov/sustainability/learn-about-sustainability> (Accessed on 09/04/2024)

⁵ Fitzmaurice. M., 'The Principle of Sustainable Development in International Development Law.' *International Sustainable Development Law.*, Vol 1

⁶ United Nations General Assembly., 'Transforming Our World: the 2030 Agenda for Sustainable Development.' 21 October 2015, A/RES/70/1., Available at <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> (Accessed on 09/04/2024)

⁷ Ibid

⁸ Africa Union., 'Agenda 2063' Available at https://au.int/sites/default/files/documents/33126-doc-framework_document_book.pdf (Accessed on 09/04/2024)

⁹ Ibid

¹⁰ Constitution of Kenya., 2010., Government Printer, Nairobi

¹¹ Ibid, article 10 (2) (d)

¹² Government of the Republic of Kenya., 'Kenya Vision 2030' Available at <https://nairobi.aics.gov.it/wp-content/uploads/2019/01/Kenya-Vision-2030.pdf> (Accessed on 09/04/2024)

newly-industrializing, middle income country providing a high quality of life to all its citizens in a clean and secure environment¹³.

The ideal of Sustainable Development is therefore well captured at the global, continental, and national levels. Various approaches have been embraced towards fostering Sustainable Development. This has largely involved legal, policy, and institutional interventions¹⁴. However, in light of mounting problems facing the attainment of Sustainable Development including the triple planetary crisis of climate change, loss of biodiversity, and pollution, the world needs to adopt other approaches towards Sustainable Development¹⁵. It has been suggested that science, technology, and innovation can accelerate the achievement of Sustainable Development¹⁶. One of the key tools under this approach that can foster Sustainable Development is Artificial Intelligence (AI)¹⁷. It has been pointed out that AI and other frontier technologies hold significant potential for supporting inclusivity, reducing inequalities, and fast-tracking the achievement of the SDGs¹⁸. Harnessing the positive impacts of AI can therefore enhance Sustainable Development.

This paper critically explores the role of AI in Sustainable Development. It argues that AI can accelerate the realization of the Sustainable Development Agenda and therefore needs to be effectively harnessed. The paper defines AI and examines ways through which it can foster Sustainable Development. It also highlights some of the key concerns

¹³ Ibid

¹⁴ Muigua. K., 'Embracing Science, Technology and Innovation for Sustainable Development' Available at <https://kmco.co.ke/wp-content/uploads/2023/08/Embracing-Science-Technology-and-Innovation-for-Sustainable-Development.pdf> (Accessed on 09/04/2024)

¹⁵ Ibid

¹⁶ Ibid

¹⁷ United Nations., 'Artificial Intelligence' Available at <https://unsceb.org/topics/artificial-intelligence#:~:text=Use%20and%20adoption%20of%20artificial,AI%20internally%20in%20its%20work> (Accessed on 09/04/2024)

¹⁸ Ibid

in AI and how to address such challenges. The paper proposes measures towards fostering secure and trustworthy AI systems for Sustainable Development.

2.0 Artificial Intelligence and Sustainable Development: Opportunities and Challenges

AI refers to technology that enables computers and machines to simulate human intelligence and problem-solving capabilities¹⁹. AI has also been defined as simulation of human intelligence processes by machines, especially computer systems²⁰. The concept of AI refers to a machine's ability to perform the cognitive functions associated with human minds, such as perceiving, reasoning, learning, interacting with the environment, problem-solving, and even exercising creativity²¹. It has been noted that AI systems work by ingesting large amounts of labeled training data, analyzing the data for correlations and patterns, and using these patterns to make predictions about future states²². AI systems have become important especially in the business world due to their potential to process large amounts of data at a much faster pace and make predictions more accurately than human capabilities²³. AI systems have the ability to perform tasks much better than humans particularly when it comes to repetitive and detail-oriented tasks²⁴.

The benefits of AI can be effectively utilized to unlock Sustainable Development²⁵. According to the United Nations, AI could open up tremendous opportunities for

¹⁹ IBM., 'What is Artificial Intelligence (AI)?' Available at <https://www.ibm.com/topics/artificial-intelligence> (Accessed on 10/04/2024)

²⁰ Laskowski. N., & Tucci. L., 'Artificial Intelligence (AI)' Available at <https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence> (Accessed on 10/04/2024)

²¹ McKinsey & Company., 'What is AI (Artificial Intelligence)?' Available at <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-ai> (Accessed on 10/04/2024)

²² Laskowski. N., & Tucci. L., 'Artificial Intelligence (AI)' Op Cit

²³ Ibid

²⁴ Ibid

²⁵ United Nations., 'Towards an Ethics of Artificial Intelligence' Available at <https://www.un.org/en/chronicle/article/towards-ethics-artificial-intelligence> (Accessed on 10/04/2024)

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achieving the SDGs set out in the 2030 Agenda for Sustainable Development²⁶. The United Nations notes that AI applications enable innovative solutions, improved risk assessment, better planning and faster knowledge sharing which are vital processes that can be harnessed for Sustainable Development²⁷.

It has been noted that AI's unparalleled data-harnessing abilities allow it to be an invaluable tool for Sustainable Development²⁸. The intersection of AI and Sustainable Development can redefine humanity's collective response to urgent global challenges²⁹. It has been correctly asserted that with mounting environmental concerns including climate change, pollution, and loss of biodiversity, the call to accelerate our path towards Sustainable Development has become more urgent³⁰. It is therefore necessary to embrace AI not merely as a technological marvel but as a powerful force sparking positive transformation towards Sustainable Development³¹. There are immense opportunities to find solutions to pressing environmental, social, and economic challenges through AI towards Sustainable Development³². If AI is deployed effectively and harnessed responsibly, it promises to drive inclusive and sustainable growth, reducing poverty and inequality, advancing environmental sustainability, improving lives, and empowering individuals in all societies across all stages of development³³.

²⁶ Ibid

²⁷ Ibid

²⁸ World Economic Forum., '4 Ways AI Can Super-Charge Sustainable Development' Available at <https://www.weforum.org/agenda/2023/11/ai-sustainable-development/#:~:text=AI's%20unparalleled%20data%2Dharnessing%20abilities,large%20round%20to%20the%20cause> (Accessed on 10/04/2024)

²⁹ Ibid

³⁰ Ibid

³¹ Ibid

³² Ibid

³³ United States Department of State., 'Artificial Intelligence for Accelerating Progress on the Sustainable Development Goals: Addressing Society's Greatest Challenges' Available at <https://www.state.gov/artificial-intelligence-for-accelerating-progress-on-the-sustainable-development-goals-addressing-societys-greatest-challenges/> (Accessed on 10/04/2024)

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AI systems are useful in a number of key themes under the Sustainable Development agenda. For example, in the field of environmental governance, AI can help humanity use resources more efficiently and sustainably and reduce and manage waste more effectively³⁴. AI can help improve waste management by analyzing data on waste production, collection, and disposal³⁵. This approach can help cities and municipalities optimize their waste management systems, reduce waste, and increase recycling rates³⁶. AI can also enhance food security due to its potential to aid sustainable agriculture practices by analyzing soil data, predicting crop yields, and identifying pest and disease outbreaks³⁷. This can help farmers optimize their crop production while reducing the use of pesticides and fertilizers³⁸.

Further, AI systems are being utilized to fight biodiversity loss by analysing vast amounts of data, monitoring ecosystems and spotting trends over time³⁹. AI can foster the conservation of biodiversity by investigating data on species populations, habitats, and threats⁴⁰. This can strengthen conservation strategies and improve humanity's understanding of the complex relationships between different species and their environments⁴¹. AI can be harnessed for biodiversity conservation by employing advanced algorithms to analyze biodiversity data and track changes in ecosystems⁴². This

³⁴ Sustainability for All., 'The Alliance Between Artificial Intelligence and Sustainable Development' Available at https://www.activesustainability.com/sustainable-development/the-alliance-between-artificial-intelligence-and-sustainable-development/?_adin=02021864894 (Accessed on 10/04/2024)

³⁵ Genghini. L., '8 Ways Artificial Intelligence Can Contribute to Environmental Conservation' Available at <https://2030.builders/8-ways-ai-can-contribute-to-environmental-conservation/> (Accessed on 10/04/2024)

³⁶ Ibid

³⁷ Ibid

³⁸ Ibid

³⁹ Thompson. T., 'How AI Can Help to Save Endangered Species' Available at <https://www.nature.com/articles/d41586-023-03328-4#:~:text=Scientists%20are%20using%20artificial%20intelligence,and%20spotting%20trends%20over%20time.&text=An%20increasing%20number%20of%20researchers,efforts%20to%20help%20endangered%20species.> (Accessed on 10/04/2024)

⁴⁰ Genghini. L., '8 Ways Artificial Intelligence Can Contribute to Environmental Conservation' Op Cit

⁴¹ Ibid

⁴² Ibid

technology therefore has a crucial role in the conservation and protection of critical natural habitats and species⁴³. It can be effectively harnessed to monitor biodiversity and bolster efforts to protect endangered species⁴⁴. It has been asserted that unlike conventional conservation methods that can disrupt ecosystems or require considerable time, labour and resources, AI has the potential to quickly and effectively analyse vast quantities of real-time data⁴⁵.

According to the United Nations Environment Programme, AI can play a role in tackling environmental challenges, from designing more energy-efficient buildings to monitoring deforestation to optimizing renewable energy deployment⁴⁶. One approach that has been embraced towards fostering energy efficiency is the International Methane Emissions Observatory (IMEO) which leverages AI to revolutionize monitoring and mitigating methane emissions⁴⁷. UNEP notes that reducing the energy sector's methane emissions is one of the quickest, most feasible, and cost-effective ways to limit the impacts of climate change and reliable data-driven action will play a big role in achieving these reductions⁴⁸. AI can also aid in the development of renewable energy sources such as wind and solar power by predicting energy output, optimizing performance, and improving maintenance⁴⁹. In addition, AI systems can help create smarter energy grids by analyzing data from sensors, meters, and other devices⁵⁰. This can help utilities better manage the supply and demand of electricity, reduce energy waste, and improve reliability⁵¹. AI is therefore vital in the energy transition.

⁴³ Ibid

⁴⁴ Thompson. T., 'How AI Can Help to Save Endangered Species' Op Cit

⁴⁵ Ibid

⁴⁶ United Nations Environment Programme., 'How Artificial Intelligence is Helping tackle Environmental Challenges' Available at <https://www.unep.org/news-and-stories/story/how-artificial-intelligence-helping-tackle-environmental-challenges> (Accessed on 10/04/2024)

⁴⁷ Ibid

⁴⁸ Ibid

⁴⁹ Genghini. L., '8 Ways Artificial Intelligence Can Contribute to Environmental Conservation' Op Cit

⁵⁰ Ibid

⁵¹ Ibid

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AI is also a vital tool in the global response towards climate change⁵². AI systems can help predict weather patterns therefore helping communities and authorities to better plan how to adapt to climate change and mitigate its impacts⁵³. It has been noted that through AI, improved modelling and predicting climate change patterns can help communities and authorities to draft effective adaptation and mitigation strategies⁵⁴. In addition, it has been asserted that as extreme weather events unfold with more frequency and intensity, AI can help communities around the world to better brace for climate disasters⁵⁵. For example, in areas susceptible to landslides, mapping can help local authorities plan and implement Sustainable Development measures, reduce risks and ensure the safety of residents in vulnerable communities⁵⁶. In addition, leveraging the benefits of AI can ensure that everyone on the planet is protected from hazardous weather, water or climate events through early warning systems⁵⁷.

AI systems can also strengthen climate change mitigation and adaptation measures by unlocking sustainable climate finance⁵⁸. It has been observed that finance plays a vital role in climate action by enhancing the mitigation and adaptation capabilities of countries especially in the developing world⁵⁹. Climate finance refers to local, national, regional and global financing of public and private investment that seeks to support mitigation of and adaptation to climate change⁶⁰. It has been argued that AI-powered tools stand out as invaluable instruments for analyzing vast datasets, including climate and financial

⁵² World Economic Forum., '9 ways AI is Helping Tackle Climate Change' Available at <https://www.weforum.org/agenda/2024/02/ai-combat-climate-change/#:~:text=The%20use%20of%20artificial%20intelligence,the%20World%20Economic%20Forum%20says.> (Accessed on 10/04/2024)

⁵³ Ibid

⁵⁴ United Nations., 'Explainer: How AI Helps Combat Climate Change' Available at <https://news.un.org/en/story/2023/11/1143187> (Accessed on 10/04/2024)

⁵⁵ Ibid

⁵⁶ Ibid

⁵⁷ Ibid

⁵⁸ World Economic Forum., '4 Ways AI Can Super-Charge Sustainable Development' Op Cit

⁵⁹ Steckel. J. C., 'From Climate Finance toward Sustainable Development Finance.' *WIREs Climate Change*, 2017

⁶⁰ Hong. H., Karolyi. G. A., & Scheinkman. J.A., 'Climate Finance.' *Review of Financial Studies*, Volume 33, Issue 3 (2020)

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data, to identify climate risks and investment opportunities in the field of climate finance⁶¹. AI can make it possible to quantify climate risks and opportunities in financial terms towards unlocking climate finance⁶².

Further, AI is of utmost importance in education which is one of the key themes under the Sustainable Development agenda⁶³. According to the United Nations, education is already being profoundly transformed by AI⁶⁴. The acquisition of digital skills now stands at the centre of most education programmes around the world⁶⁵. AI is being widely embraced in education to improve operational processes and provide equitable access to resources among other opportunities⁶⁶. By using AI-powered tools and strategies, educators can personalize learning, improve student outcomes, and better prepare students for success in the digital age⁶⁷. It has been noted that AI tools such as advanced chatbots could be used as powerful classroom aids that make lessons more interactive, teach students media literacy, generate personalized lesson plans, and save teachers time⁶⁸. It is therefore necessary to embrace AI in order to achieve SDG 4 which seeks to ensure inclusive and quality education for all⁶⁹.

Another key theme under the Sustainable Development agenda that can be strengthened by AI is conflict management. Managing conflicts effectively has been identified as a prerequisite for realising Environmental, Social and Governance (ESG) tenets of the

⁶¹ World Economic Forum., '4 Ways AI Can Super-Charge Sustainable Development' Op Cit

⁶² Ibid

⁶³ United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

⁶⁴ Ibid

⁶⁵ Ibid

⁶⁶ Ibid

⁶⁷ AI for Education., 'Artificial Intelligence is Poised to Change Teaching and Learning Forever' Available at <https://www.aiforeducation.io/> (Accessed on 10/04/2024)

⁶⁸ Heaven. W. D., 'ChatGPT is Going to Change Education, Not Destroy It' Available at <https://www.technologyreview.com/2023/04/06/1071059/chatgpt-change-not-destroy-education-openai/> (Accessed on 10/04/2024)

⁶⁹ United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

Sustainable Development agenda⁷⁰. Conflicts are inherent within any social group and the need to perceive, analyse and manage them is crucial in order to move towards Sustainable Development⁷¹. AI can strengthen conflict management processes⁷². For example, AI systems are revolutionizing the frontier of peace and mediation⁷³. Digital solutions are being embraced to facilitate conflict management where human intervention is not feasible such as in war situations or travel restrictions as was witnessed at the peak of the COVID-19 restrictions⁷⁴. It has been noted that AI transforms conflict management by analyzing root causes through pattern recognition, enhancing communication with real-time feedback, and generating diverse solutions via simulations⁷⁵. AI can also streamline agreement implementation through automated tasks and monitoring adherence to agreements⁷⁶. In addition, it has been noted that learning from AI's feedback refines conflict management skills⁷⁷. It is therefore necessary to embrace AI for effective conflict management.

Embracing AI can also strengthen democracy and governance⁷⁸. It has been noted that AI techniques can potentially improve the policy-making process, including optimization

⁷⁰ Muigua. K., 'Understanding the Place of Conflict Management in Sustainable Development Agenda' Available at <https://kmco.co.ke/wp-content/uploads/2022/09/Understanding-the-Place-of-Conflict-Management-in-Sustainable-Development-Agenda.pdf> (Accessed on 11/04/2024)

⁷¹ Martinez-Martin. R., & Lozano-Martin. A., 'Sustainability and Conflict Management in the University Environment. Analysis of Students of the Degrees in Labour Relations and Human Resources, and Social Work at the University of Granada (Spain)' Available at <https://www.mdpi.com/2071-1050/13/23/13431> (Accessed on 11/04/2024)

⁷² Pietromarchi. V., 'Can AI Mediate Conflict Better than Humans?' Available at <https://www.aljazeera.com/news/2024/2/29/can-ai-mediate-conflict-better-than-humans#:~:text=%E2%80%9CGroundbreaking%20technological%20advancements%20are%20revolutionizing,among%20other%20war%2Drelated%20tasks.> (Accessed on 11/04/2024)

⁷³ Ibid

⁷⁴ Ibid

⁷⁵ Holmes. N., 'What are the Best Practices for Using AI in Conflict Resolution?'. Available at <https://www.linkedin.com/advice/3/what-best-practices-using-ai-conflict-resolution-kutte#:~:text=AI%20transforms%20conflict%20resolution%20by,generating%20diverse%20solutions%20via%20simulations.> (Accessed on 11/04/2024)

⁷⁶ Ibid

⁷⁷ Ibid

⁷⁸ Sharma. G., Yadav. A., & Chopra. R., 'Artificial Intelligence and Effective Governance: A review, Critique and Research Agenda' Available at <https://www.sciencedirect.com/science/article/pii/S2666188819300048> (Accessed on 11/04/2024)

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and decision support techniques, data and opinion mining, game theory, and agent-based simulation⁷⁹. AI can promote good governance by streamlining administrative processes, improving decision making, enhancing customer support services, predicting the needs of citizens, and improving the management of resources⁸⁰. AI can also strengthen election processes by ensuring integrity and correctness of election systems⁸¹. Fostering secure and trustworthy AI systems can therefore promote good governance for Sustainable Development.

From the foregoing, it emerges that AI is of utmost importance in the Sustainable Development agenda. AI is vital in a number of key themes under the Sustainable Development agenda including environmental sustainability, climate change, energy, education, conflict management, and governance⁸². Embracing AI can therefore accelerate progress towards the SDGs.

The role of AI in Sustainable Development has been recognized by the United Nations General Assembly whose *Resolution*⁸³ urges all countries to seize the opportunities of safe, secure and trustworthy AI systems for Sustainable Development. According to the Resolution, safe, secure and trustworthy AI systems have the potential to accelerate and enable progress towards the achievement of all 17 SDGs and Sustainable Development in its three dimensions – economic, social and environmental – in a balanced and integrated manner; promote digital transformation; promote peace; overcome digital divides between and within countries; and promote and protect the enjoyment of human

⁷⁹ Ibid

⁸⁰ Ibid

⁸¹ Ibid

⁸² United States Department of State., 'Artificial Intelligence for Accelerating Progress on the Sustainable Development Goals: Addressing Society's Greatest Challenges' Op Cit

⁸³ United Nations General Assembly., 'Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development' A/78/L.49., Available at <https://documents.un.org/doc/undoc/ltd/n24/065/92/pdf/n2406592.pdf?token=96jPMb6t2eR5RDhXIy&fe=true> (Accessed on 11/04/2024)

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rights and fundamental freedoms for all, while keeping human beings at the centre⁸⁴. The Resolution sets out the need to bridge the AI and other digital divides between and within countries in order to foster Sustainable Development⁸⁵. It urges all countries to promote safe, secure and trustworthy AI systems in order to accelerate progress towards the full realization of the 2030 Agenda for Sustainable Development⁸⁶. The Resolution further seeks to enhance the capacity and participation of all countries, in particular developing countries, in digital transformation to harness the benefits and effectively participate in the development, deployment and use of safe, secure and trustworthy AI systems for Sustainable Development⁸⁷. It also aims to increase funding for Sustainable Development Goals related research and innovation related to digital technologies and safe, secure and trustworthy AI systems especially in developing countries⁸⁸. Further, the Resolution urges all countries to ensure that human rights and fundamental freedoms are respected, protected and promoted throughout the life cycle of AI systems⁸⁹. The Resolution also urges all countries to ensure effective governance of AI systems for Sustainable Development⁹⁰. It is necessary to implement this Resolution in order to ensure safe, secure and trustworthy AI systems for Sustainable Development.

AI therefore has a crucial role to play in the Sustainable Development agenda. Harnessing the opportunities of safe, secure and trustworthy AI systems can accelerate progress towards the SDGs and the 2030 Agenda for Sustainable Development⁹¹. However, there are some key concerns that need to be addressed in order to effectively embrace AI for Sustainable Development. It has been noted that AI systems and algorithms can infringe fundamental human rights from privacy and data confidentiality

⁸⁴ Ibid

⁸⁵ Ibid

⁸⁶ Ibid

⁸⁷ Ibid

⁸⁸ Ibid

⁸⁹ Ibid

⁹⁰ Ibid

⁹¹ United Nations General Assembly., 'Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development' Op Cit

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to freedom of choice and freedom of conscience⁹². In addition, social and cultural stereotypes can be replicated in AI programming, notably when it comes to gender discrimination, racial and other forms of discrimination⁹³. There are also challenges relating to the regulation and governance of AI systems⁹⁴. Further, the digital divide between developed and developing countries means that the latter lack capacity to effectively harness AI for development⁹⁵. It is necessary to address these challenges in order to foster secure and trustworthy AI systems for Sustainable Development.

3.0 Way Forward

In order to foster secure and trustworthy AI systems, it is necessary to ensure appropriate governance of AI⁹⁶. In light of the rapid development and deployment of AI and other frontier technologies, the need for appropriate governance of these powerful technologies is vital⁹⁷. The United Nations General Assembly Resolution urges all countries to develop and support regulatory and governance approaches and frameworks related to safe, secure and trustworthy use of AI⁹⁸. The Resolution requires all countries to promote the development and implementation of domestic regulatory and governance approaches and frameworks, in line with their respective national, and where applicable subnational, policies and priorities and obligations under international law, to support responsible and inclusive AI innovation and investment for Sustainable Development, while simultaneously promoting safe, secure and trustworthy AI systems⁹⁹. Responsible use and governance of AI is vital in ensuring secure and trustworthy AI systems¹⁰⁰. It is therefore necessary to enhance responsible governance of AI through approaches such as

⁹² United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

⁹³ Ibid

⁹⁴ United Nations General Assembly., 'Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development' Op Cit

⁹⁵ Ibid

⁹⁶ United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

⁹⁷ United Nations., 'Artificial Intelligence' Op Cit

⁹⁸ United Nations General Assembly., 'Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development' Op Cit

⁹⁹ Ibid

¹⁰⁰ Ibid

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efficient legal and regulatory frameworks and partnership between governments, private sector and other stakeholders in order to maximize the opportunity of using AI as a catalyst to meet SDGs¹⁰¹.

In addition, it is vital to embrace an ethical approach towards AI that fosters human rights¹⁰². It has been noted that AI can impact fundamental human rights including privacy and data confidentiality to freedom of choice and freedom of conscience¹⁰³. It is therefore necessary to ensure that AI is developed through a humanist approach, based on values and human rights¹⁰⁴. It has been suggested that there is need to regulate AI developments and applications so that they conform to the fundamental rights that frame our democratic horizon¹⁰⁵. According to the United Nations, AI systems must be grounded in human rights¹⁰⁶. It further points out that human rights must be embedded in AI's entire lifecycle from the collection and selection of data; as well as the design, development, deployment and use of the resulting models, tools and services¹⁰⁷. Embracing a human rights framework towards AI provides an essential foundation that can strengthen efforts to exploit the enormous potential of AI, while preventing and mitigating its enormous risks¹⁰⁸. The United Nations General Assembly Resolution urges all countries to ensure that AI systems are human-centric, reliable, explainable, ethical, inclusive, in full respect of promotion and protection of human rights and international law, privacy preserving, Sustainable Development oriented, and responsible¹⁰⁹.

¹⁰¹ The Role of AI in Achieving Sustainable Development Goals., Available at <https://vasscompany.com/en/insights/blogs-articles/the-role-of-ai-in-achieving-sustainable-development-goals/> (Accessed on 11/04/2024)

¹⁰² United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

¹⁰³ Ibid

¹⁰⁴ Ibid

¹⁰⁵ Ibid

¹⁰⁶ Office of the United Nations High Commissioner for Human Rights., 'Artificial Intelligence Must be Grounded in Human Rights, says High Commissioner' Available at <https://www.ohchr.org/en/statements/2023/07/artificial-intelligence-must-be-grounded-human-rights-says-high-commissioner> (Accessed on 11/04/2024)

¹⁰⁷ Ibid

¹⁰⁸ Ibid

¹⁰⁹ United Nations General Assembly., 'Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development' Op Cit

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According to the Resolution, secure and trustworthy AI systems protect the enjoyment of human rights and fundamental freedoms for all, while keeping human beings at the centre¹¹⁰. It is therefore necessary to ensure that AI systems are grounded in the human rights framework in order to foster Sustainable Development.

Finally, it is imperative to bridge the digital divides between and within countries¹¹¹. It has been noted that developing countries face unique challenges in keeping pace with this rapid acceleration and development of AI which cause obstacles in realizing Sustainable Development¹¹². It has been noted that AI products that come out have biases and are primarily designed in the Global North¹¹³. For example, to function correctly, these services need to be fed with good local data¹¹⁴. Such data must be available in sufficient quantities and properly annotated¹¹⁵. It has been noted that both conditions still need to be met for emerging countries, which already suffer from a lack of access to connectivity, which is essential for their economic growth¹¹⁶. AI systems may therefore not function properly in such environments. Further, developing countries often lack the necessary financial, technical, and human capacity to foster innovation and development of AI systems suitable to their local conditions¹¹⁷. The United Nations General Assembly Resolution sets out the importance of narrowing the existing disparities between developed and developing countries in terms of conditions, possibilities and capacities in AI by stressing the urgency of strengthening capacity building and technical and financial assistance to developing countries while also supporting developing countries' effective, equitable and meaningful participation and representation in international

¹¹⁰ Ibid

¹¹¹ Ibid

¹¹² Ibid

¹¹³ Bridging or Widening the Digital Divide: The Challenge of AI in Africa., Available at <https://hellofuture.orange.com/en/bridging-or-widening-the-digital-divide-the-challenge-of-ai-in-africa/> (Accessed on 11/04/2024)

¹¹⁴ Ibid

¹¹⁵ Ibid

¹¹⁶ Ibid

¹¹⁷ Ibid

processes and forums on the governance of AI systems¹¹⁸. It is therefore necessary for developed countries to support the development of AI in developing countries through financial and technical assistance in order to ensure that all countries are able to harness the benefits of AI in the Sustainable Development agenda¹¹⁹.

Through the foregoing among other measures, it is possible to foster secure and trustworthy AI systems for Sustainable Development.

4.0 Conclusion

AI can be effectively utilized to unlock Sustainable Development¹²⁰. AI applications enable innovative solutions, improved risk assessment, better planning and faster knowledge sharing which are vital processes that can be harnessed for Sustainable Development¹²¹. The unparalleled data-harnessing abilities of AI allow it to be an invaluable tool for Sustainable Development¹²². AI systems are being increasingly embraced in a number of key themes under the Sustainable Development agenda including environmental sustainability, climate change, energy, education, conflict management, and governance¹²³. Embracing AI can therefore accelerate progress towards the SDGs. The United Nations General Assembly vide a Resolution¹²⁴ urges all countries to seize the opportunities of safe, secure and trustworthy AI systems for Sustainable Development. However, the adoption of AI can result in several concerns including human rights infringements, entrenchment of social and cultural stereotypes, regulation and governance challenges, and digital divide between and within

¹¹⁸ United Nations General Assembly., 'Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development' Op Cit

¹¹⁹ Ibid

¹²⁰ United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

¹²¹ Ibid

¹²² World Economic Forum., '4 Ways AI Can Super-Charge Sustainable Development' Op Cit

¹²³ United States Department of State., 'Artificial Intelligence for Accelerating Progress on the Sustainable Development Goals: Addressing Society's Greatest Challenges' Op Cit

¹²⁴ United Nations General Assembly., 'Seizing the Opportunities of Safe, Secure and Trustworthy Artificial Intelligence Systems for Sustainable Development' Op Cit

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countries¹²⁵. It is necessary to address these problems in order to foster secure and trustworthy AI systems for Sustainable Development. This can be realized through ensuring appropriate governance of AI¹²⁶; embracing an ethical approach towards AI that fosters human rights¹²⁷; and bridging the digital divides between and within countries¹²⁸. Fostering secure and trustworthy AI systems for Sustainable Development is an ideal that should be pursued and realized in both developed and developing countries.

¹²⁵ United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

¹²⁶ Ibid

¹²⁷ United Nations., 'Towards an Ethics of Artificial Intelligence' Op Cit

¹²⁸ Ibid

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