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A policy framework on AI usage in developing countries and its impact

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Abstract

The rapid growth of Artificial Intelligence (AI) presents both significant opportunities and challenges for developing countries. A well-structured policy framework is crucial to maximize the benefits of AI while mitigating its risks. This review proposes a comprehensive AI policy framework tailored to developing countries, emphasizing the need for robust infrastructure, capacity building, ethical governance, and economic incentives. Key elements include the development of digital infrastructure, education and training programs to enhance AI literacy, and ethical guidelines to ensure fairness and transparency in AI applications. Data governance and privacy protections are critical, particularly in countries where regulatory frameworks are underdeveloped. Furthermore, international cooperation is highlighted as a necessity for aligning local policies with global AI standards, facilitating cross-border data sharing, and ensuring equitable access to AI innovations. The potential impact of AI on economic growth, job creation, healthcare, education, and public service delivery is profound, yet challenges such as workforce displacement, increased inequality, and the digital divide must be carefully managed. The proposed framework addresses these challenges, providing strategies to overcome barriers to AI adoption, including financial constraints, governance issues, and unequal access to technology. Moreover, it stresses the importance of fostering public-private partnerships and ensuring that AI development is inclusive, benefiting all segments of society. By implementing a comprehensive AI policy framework, developing countries can harness AI's transformative power to drive sustainable development, improve social outcomes, and strengthen their economic standing in the global landscape. This review concludes by recommending continuous policy evaluation and adaptation to keep pace with AI's rapid evolution.

Keywords: Policy Framework; Artificial Intelligence Usage; Countries; Review

1. Introduction

The creation of computer systems that are able to carry out operations that typically require human intelligence, such as speech recognition, visual perception, decision-making, and language translation, is known as artificial intelligence (AI) (Garg, 2021; Kaur *et al.*, 2022). Machine learning, natural language processing, robotics, and other subfields all fall under the umbrella of artificial intelligence (AI), which aims to improve machines' capacity for intelligent and autonomous operation (Samoili *et al.*, 2020; Abioye *et al.*, 2021). Artificial intelligence (AI) has been increasingly prevalent in recent times, revolutionizing various industries including healthcare, banking, manufacturing, and agriculture. AI is extremely relevant to the progress of the world, especially because it can help poor nations with their complicated problems (Mhlanga, 2021). These countries frequently struggle with problems including poverty, insufficient healthcare systems, restricted access to high-quality education, and ineffective farming methods. AI technology can aid in closing the gap by boosting service delivery, increasing productivity, and promoting sustainable

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development through creative solutions. For instance, AI-driven platforms in healthcare can optimize medical diagnoses and enable telemedicine services in rural areas. Similarly, in agriculture, AI-powered tools can assist farmers with predictive analytics to optimize crop yields, mitigate risks, and adapt to climate change (Hassan *et al.*, 2022). AI's potential for economic growth is particularly significant for developing countries. By automating repetitive tasks, enhancing productivity, and enabling better decision-making, AI can drive efficiency across various sectors. For example, AI can streamline manufacturing processes, reduce waste, and increase competitiveness in global markets. Furthermore, the adoption of AI technologies has the capacity to spur innovation, create new industries, and generate employment opportunities, fostering long-term economic growth (Song and Han, 2023). Social progress can also be achieved by utilizing AI to improve access to education, healthcare, and financial services, ultimately contributing to better living standards and societal advancement.

AI has the capacity to change the world, but its uncontrolled application in developing nations presents serious obstacles (Kalenzi, 2022). The infrastructure, legal structures, and knowledge required to properly regulate AI technology are lacking in many emerging nations (Sharma *et al.*, 2022). AI systems have the potential to worsen already-existing inequities, promote prejudices, and contribute to social and economic inequality if they are not properly regulated. For instance, underdeveloped AI algorithms may unfairly impact underprivileged communities more than others, producing unjust results in areas like hiring, credit scoring, and public service access. Furthermore, the lack of data governance structures and privacy laws might result in the misuse of personal information, endangering people (Viljoen, 2021). Another issue is that many developing nations lack the substantial computational power and dependable digital infrastructure needed for AI. Rural or underprivileged communities may fall farther behind as a result of this digital gap if they have unequal access to AI technologies (Isotani *et al.*, 2023). Furthermore, a shortage of qualified workers in AI development and administration may limit the potential advantages of AI solutions by impeding their safe and efficient deployment. To solve these issues and maximize the advantages of AI while lowering its risks, a well-organized framework for AI policy is necessary (Wirtz *et al.*, 2022). This kind of framework ought to offer standards for data governance, privacy protection, and ethical AI development, guaranteeing that AI systems are just, open, and accessible to everybody. Policies should also encourage the development of capacity so that local firms and governments can acquire the infrastructure and expertise needed to enable AI innovation. Furthermore, a well-crafted legislative framework can promote global collaboration by enabling developing nations to exchange best practices and expertise and to align their AI strategies with international norms (Dempsey *et al.*, 2022). Developing nations can benefit from a comprehensive AI policy framework that unlocks AI's revolutionary potential for social and economic advancement while reducing the risks associated with unregulated AI. Such a framework can direct the successful integration of AI into important areas including healthcare, agriculture, education, and public administration by encouraging responsible AI development, safeguarding individual rights, and encouraging innovation (Lescrauwaet *et al.*, 2022; Li *et al.*, 2023). Ultimately, AI holds the power to accelerate sustainable development in developing countries, but only if it is governed by a thoughtful and strategic policy approach.

2. Current State of AI in Developing Countries

Recent technological advancements, a growing awareness of AI's potential to address urgent socio-economic issues, and the availability of more data have all contributed to the adoption of AI technologies in developing nations, as figure 1 and 2 (Costa, 2021; Rischke *et al.*, 2022). A number of industries, such as healthcare, education, and agriculture, have started to use AI to boost productivity, facilitate better decision-making, and promote sustainable growth (Mhlanga *et al.*, 2021).

AI is being used in agriculture to enhance pest control, maximize agricultural yields, and facilitate precision farming (Raj *et al.*, 2022). For example, businesses in Kenya such as AgriTech use machine learning algorithms to assess crop health, soil quality, and weather trends, giving farmers useful information to increase yield. Drones powered by AI are also being used to monitor crop health, which enables prompt responses and lowers the need for pesticides. Similar to this, CropIn uses AI in India to give farmers access to real-time market data so they can decide on crop choice and price. Another industry seeing a large use of AI is healthcare (Singh *et al.*, 2020). In countries like South Africa and Nigeria, AI technologies are being utilized to improve diagnostic accuracy and streamline patient care. For example, LifeQ in South Africa uses AI algorithms to analyze biometric data, providing insights into an individual's health status and potential risks. Additionally, AI-powered telemedicine platforms are emerging in rural areas, enabling patients to access healthcare services remotely (Pulimamidi, 2021). In addition to reducing the strain on medical facilities, this guarantees that underprivileged groups have prompt medical care. Artificial Intelligence is being used in education to improve learning results and offer individualized learning experiences. AI-driven systems that provide customized learning materials depending on the needs of individual students are being implemented in countries such as Ghana and Rwanda.

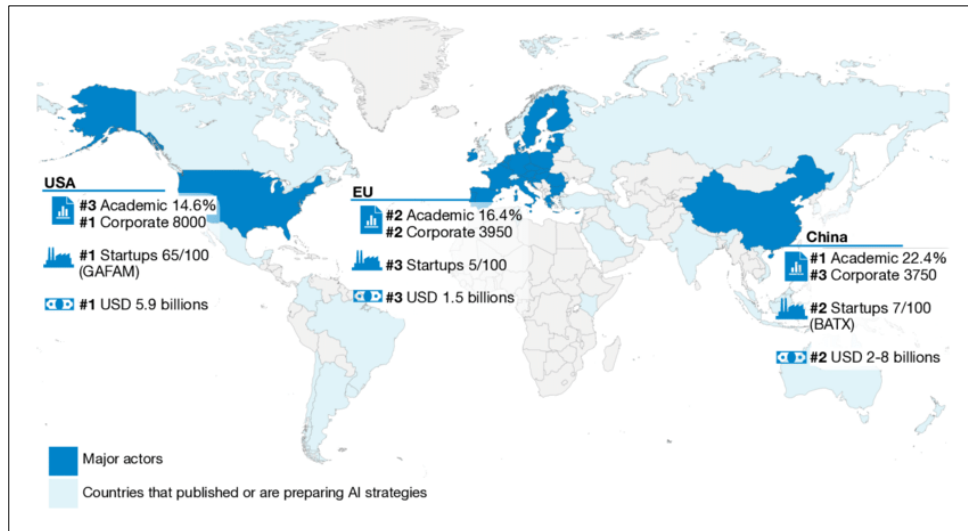


Figure 1 AI global situation (Costa, 2021)

Even if AI adoption is encouraging, there are still a number of obstacles preventing these technologies from being widely used in underdeveloped nations. The absence of digital literacy and infrastructure is one of the biggest problems. Inadequate internet connectivity is a problem for many developing countries, particularly in rural regions (Dridi *et al.*, 2020). Access to AI technology is restricted by this digital divide, which also hinders the effective application of data-driven solutions. Furthermore, a barrier to the successful application of AI is the general public's and businesses' inadequate grasp of the technology. People might not be able to use AI products to their full capacity if they are not given the necessary training and education (Johnson, 2020). Limited access to data and computational resources further complicates the AI landscape in developing countries. AI technologies thrive on large datasets for training and optimization, yet many countries lack the necessary data infrastructure to collect, store, and analyze information effectively. Additionally, concerns about data privacy and ownership may deter organizations from sharing data, further restricting the availability of quality datasets. Furthermore, computational resources required for AI applications, such as cloud computing platforms, can be costly and beyond the reach of many organizations in developing countries (Mustapha *et al.*, 2021).

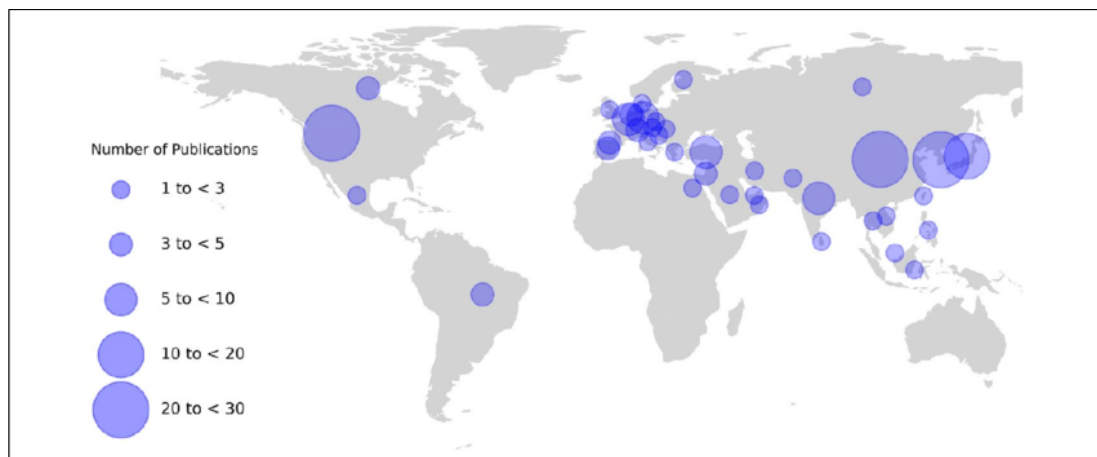


Figure 2 Global map containing dental reviews pertaining to artificial intelligence (AI) arranged by nation (depending on the affiliation of the initial author) (Rischke *et al.*, 2022)

Significant obstacles to the deployment of AI also come from ethical and regulatory issues. There are issues around liability, accountability, and data protection in many developing countries because to the absence of comprehensive legal frameworks to regulate the use of AI technologies (Gehl *et al.*, 2021). In the lack of explicit regulations, AI can be used in immoral ways, such as biased algorithms that disproportionately harm communities of color. Furthermore, individuals' resistance to the deployment of AI technologies may be heightened by worries about privacy intrusions and surveillance. As a result, the lack of trust in AI systems can hinder their acceptance and utilization, impeding potential

benefits. While the current state of AI adoption in developing countries presents numerous opportunities across sectors such as agriculture, healthcare explain in figure 3, and education, several barriers must be addressed to realize its full potential (Goel *et al.*, 2021).

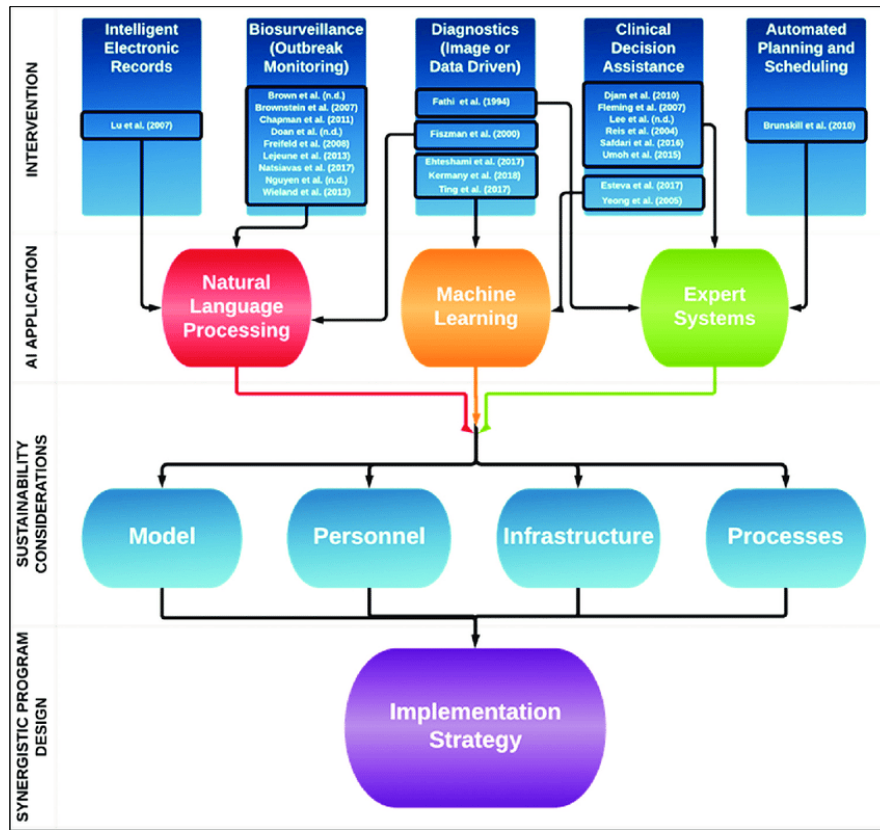


Figure 3 A procedure for creating a worldwide health initiative powered by artificial intelligence (Hadley *et al.*, 2020)

Enhancing infrastructure, promoting digital literacy, improving data access, and establishing robust regulatory frameworks are crucial steps needed to facilitate the responsible and effective deployment of AI technologies. By overcoming these challenges, developing countries can leverage AI to drive sustainable development, improve social outcomes, and enhance economic growth. A strategic approach to AI adoption, supported by policymakers, stakeholders, and communities, will be essential to ensuring that the benefits of AI are equitably distributed and accessible to all (Elliott *et al.*, 2021; Yigitcanlar *et al.*, 2021).

2.1. Key Components of an AI Policy Framework for Developing Countries

The need for a comprehensive policy framework is becoming more and more evident as Artificial Intelligence (AI) continues to advance and permeate numerous industries, especially in developing nations (Thowfeek *et al.*, 2020; Radu, 2021). A structure like this is necessary to optimize AI's advantages while reducing its risks and difficulties. An efficient AI policy framework for developing nations is outlined by the following essential elements, which prioritize infrastructure and capacity building, data governance and privacy, regulatory and ethical AI development, economic policies and incentives, and global collaboration and standards.

Building a strong digital infrastructure is a fundamental part of any AI policy framework (Ashok *et al.*, 2022). To support AI applications, this entails making investments in data centers, cloud computing infrastructure, and high-speed internet connectivity. Access to AI technologies requires stable internet connectivity, especially in poor and rural areas where digital divides are common. To ensure that all citizens may profit from the digital economy, governments must give the construction of telecommunications infrastructure top priority (Hanna, 2020). Education and training initiatives are essential for creating a workforce with the necessary skills to use AI, in addition to infrastructural investments. To promote an understanding of AI principles and applications, developing nations should use AI literacy initiatives at all educational levels, from primary schools to universities. Vocational training and online courses in data science, machine learning, and programming can equip individuals with the necessary skills to engage with AI technologies. Collaborations with international organizations, universities, and tech companies can enhance these

educational efforts, providing technical assistance and resources to bolster local capacity (Thomas *et al.*, 2021; Zhuang and Liu, 2022).

Responsible AI development and application depend heavily on effective data governance. To empower people and safeguard their rights, developing nations must create explicit regulations about data ownership and sovereignty (Oguamanam, 2020). These entails establishing access controls for data and guaranteeing that people maintain control over their personal data. Governments ought to endeavor to enact comprehensive data protection rules that take local circumstances into account and conform to international norms. It is crucial to make sure that data is collected and used ethically. Since AI systems rely largely on data for training and optimization, data practices need to be governed by ethical standards. This includes obtaining informed consent from individuals before collecting their data and ensuring transparency in how data is used. Additionally, protecting citizen privacy in AI systems is crucial. Robust privacy regulations should be enacted to prevent misuse of personal information, ensuring that AI technologies do not infringe upon individuals' rights (Greenstein, 2022).

Development of ethical AI is greatly aided by regulation. AI technology can be created and used responsibly if explicit ethical standards are established for AI applications. In order to foster a cooperative approach to AI governance, governments should involve stakeholders in the development of these rules, such as academia, business, and civil society (Ulnicane *et al.*, 2021). Fairness and preventing biased algorithms are important issues for AI systems. Establishing frameworks to evaluate and reduce algorithmic bias is crucial for policymakers to guarantee that AI applications do not disproportionately impact underrepresented populations. This could entail using a variety of datasets to train algorithms and conducting routine audits of AI systems. Moreover, AI safety and risk mitigation strategies are essential for safeguarding citizens against potential harms associated with AI technologies (Falco *et al.*, 2021). This includes developing protocols for the safe deployment of AI applications and ensuring that adequate measures are in place to address any unintended consequences or failures.

Developing nations should establish economic policies and incentives that encourage entrepreneurship in the AI industry in order to promote indigenous innovation in AI businesses. This can entail setting up financial resources to support the expansion of companies engaged in artificial intelligence, like grants and venture capital programs. Governments might also encourage AI research and development by offering tax breaks and subsidies to businesses that invest in cutting-edge technology (Shao and Chen, 2022). Creating incentives for private sector AI investment is equally crucial. The development of AI can be significantly accelerated via public-private partnerships, which capitalize on the advantages of both industries. Governments should facilitate collaborations between businesses, research institutions, and government agencies to promote knowledge sharing, resource pooling, and technology transfer.

In an increasingly interconnected world, aligning national policies with global AI standards is essential for effective governance. Developing countries should engage with international bodies and organizations to stay informed about emerging AI trends, ethical considerations, and best practices (Schiff *et al.*, 2020). Working together with foreign partners can facilitate the sharing of knowledge and capacity-building related to AI governance. Harmonizing AI methods and establishing cross-border data-sharing agreements are also essential. By establishing frameworks for data sharing, poor nations can ensure that they have access to crucial resources and knowledge for collaboration on AI initiatives and research (Larson *et al.*, 2020). Global norms that support justice, accountability, and transparency in AI technology can also be shaped by taking part in international talks on AI ethics and governance. For developing nations to fully utilize AI's revolutionary potential while tackling its inherent problems, a comprehensive framework for AI policy must be established. By focusing on infrastructure and capacity building, data governance and privacy, regulation and ethical AI development, economic policies and incentives, and international cooperation, these nations can create an enabling environment for responsible AI adoption. A collaborative and strategic approach to AI governance will not only drive economic growth and social progress but also ensure that the benefits of AI are equitably distributed, fostering inclusive development in the digital age (Aderibigbe *et al.*, 2023; George, 2023).

2.2. Impact of AI Policy Framework on Developing Countries

The development and implementation of a comprehensive AI policy framework can significantly influence the trajectory of developing countries (Feijóo *et al.*, 2020). A strong AI policy framework can harness the potential of AI technologies to promote sustainable development and enhance citizens' quality of life by tackling important areas including economic growth, social and cultural effect, and ethical and legal ramifications. This analyzes the framework's complex effects, emphasizing job creation and economic growth as well as social, cultural, ethical, and legal ramifications.

AI has the ability to boost productivity across a range of industries, which might serve as a driver for economic growth in emerging nations. For example, AI-driven agricultural systems can forecast weather patterns, manage crops more

effectively, and allocate resources more efficiently. These advancements may result in reduced production costs and increased yields, which would increase the agriculture sector's GDP contribution. AI can improve supply chain management, automate repetitive tasks, and predict maintenance in the manufacturing and industrial sectors, increasing productivity and competitiveness (Javaid *et al.*, 2022; Fasuludeen *et al.*, 2022). Furthermore, the emergence of AI-driven companies offers chances for employment growth in emerging nations. As new startups emerge in sectors such as fintech, healthtech, and edtech, they can generate employment opportunities that may not have existed previously. For example, AI-based platforms can facilitate financial inclusion by providing microloans to underserved populations, while AI in healthcare can create roles for data analysts and AI specialists. However, the transition to an AI-driven economy is not without challenges. Workforce displacement is a significant concern, as automation may lead to job losses in certain sectors. Therefore, it is imperative to establish reskilling and upskilling programs that equip workers with the necessary skills to thrive in an AI-enhanced job market. By investing in education and training, developing countries can help mitigate the negative impacts of workforce displacement and ensure a smooth transition to an AI-driven economy (Mikic and Malala, 2021).

AI can play a transformative role in improving access to healthcare, education, and public services in developing countries. Through the use of AI in telemedicine, patients can receive medical consultations without having to travel far, thus expanding access to healthcare in distant locations (Haleem *et al.*, 2021). Additionally, by offering individualized learning experiences that are tailored to each student's needs, AI-driven platforms can improve educational outcomes. To enhance learning outcomes for a variety of groups, AI algorithms, for example, can evaluate student performance data to customize courses and resources. However, the uneven distribution of AI technologies raises worries about rising socioeconomic inequality. Disparities now present could worsen if wealthy communities are the only ones with access to AI technologies and resources, leaving underprivileged populations behind. Policymakers must ensure that AI initiatives are designed with inclusivity in mind, prioritizing equitable access to technology and training for all citizens (Robinson, 2020). Furthermore, the cultural implications of AI-driven systems cannot be overlooked. As AI systems become more integrated into daily life, they may influence societal norms and values. It is crucial to engage diverse stakeholders in the development of AI applications to ensure that cultural sensitivities are respected and that technology aligns with local values.

The implementation of AI technologies in developing countries also raises ethical and legal considerations that must be addressed through a well-structured policy framework (Dara *et al.*, 2022). One of the critical challenges is ensuring social equity by addressing biases inherent in AI systems. Algorithms trained on biased data can perpetuate discrimination and inequality, undermining the very goals of social progress. Policymakers must establish guidelines for data collection and algorithm development that prioritize fairness and transparency, ensuring that AI systems do not reinforce existing biases (Modi, 2023). AI-related legal issues are also crucial, especially those pertaining to accountability and liability. As AI technologies grow more self-sufficient, concerns about accountability surface around AI systems that injure people or make poor choices. Building trust in AI technology and promoting their responsible usage requires the creation of precise legal frameworks that define liability and accountability (Varošaneć, 2022). Last but not least, striking a balance between human rights protection and AI advancement is a key challenge that needs serious thought. Legislators need to make that AI programs uphold people's rights to nondiscrimination, privacy, and freedom of speech. In order to protect citizens from potential abuses of AI technologies, notably in surveillance and data collecting, legislative measures must be established.

The impact of an AI policy framework on developing countries is multifaceted, with significant implications for economic growth, social equity, and ethical considerations (Benefo *et al.*, 2022). By harnessing the potential of AI to boost productivity and create jobs, while simultaneously addressing challenges such as workforce displacement and inequality, developing countries can pave the way for sustainable development. Furthermore, a focus on the ethical and legal dimensions of AI can help ensure that the benefits of these technologies are equitably distributed and aligned with human rights (Fukuda-Parr and Gibbons, 2021). Ultimately, a comprehensive AI policy framework is essential for leveraging AI's transformative potential while safeguarding the interests and rights of all citizens in developing nations.

2.3. Challenges in Implementing AI Policy Frameworks

There are many obstacles to overcome before implementing AI policy frameworks in underdeveloped nations, which may prevent AI technologies from being adopted and used effectively (Feijóo *et al.*, 2020). These difficulties arise from a number of causes, such as differences in technology, budgetary limitations, and problems with politics and governance. It's imperative to overcome these challenges if AI is to support sustainable development and raise living standards in these areas.

One of the most significant challenges in implementing AI policy frameworks is the limited political will or understanding of AI's importance among policymakers and government officials (Guenduez and Mettler, 2023). In many developing countries, leaders may lack a comprehensive understanding of how AI can drive economic growth, enhance public services, and address social issues. This gap in knowledge can lead to insufficient prioritization of AI initiatives within national development agendas. Without strong political support, the necessary resources and commitment to create and implement AI policies may be lacking, resulting in stagnation in AI adoption. Additionally, corruption and bureaucratic inefficiencies can further impede the establishment of effective AI policy frameworks (Adam and Fazekas, 2021). In environments where corruption is prevalent, the allocation of funds for AI initiatives may be mismanaged or diverted for personal gain. Bureaucratic hurdles can slow down the decision-making process and lead to delays in project implementation, exacerbating the challenges faced by AI policy frameworks. To overcome these issues, it is essential to foster transparency and accountability within government institutions and to engage a diverse range of stakeholders in the policymaking process.

A major obstacle to the effective adoption of AI policy frameworks in underdeveloped nations is a lack of funding (Kumar *et al.*, 2021). Building AI infrastructure and developing training programs can be prohibitively expensive, especially in countries with tight budgets and conflicting agendas. Financing for hardware, software, and employee training is necessary for investments in AI technology, but in many emerging nations, this capital may not be easily accessible. Furthermore, relying too much on foreign assistance or money may present new difficulties. Reliance on outside funding can raise sustainability issues even while international aid and investment can be quite helpful in advancing AI programs (Galaz *et al.*, 2021). Ongoing AI projects may find it difficult to continue operating if donor funding is stopped or curtailed. To address financial constraints, developing countries need to explore innovative funding mechanisms, such as public-private partnerships, to leverage private sector investment and reduce dependence on external aid. Establishing local funding sources and fostering entrepreneurship in the AI sector can also help create a more sustainable financial ecosystem for AI development (Moşteanu, 2020).

Another major obstacle that makes it more difficult to establish AI policy frameworks in poor nations is the technological and digital gap (Jamil, 2021). The lack of infrastructure and essential AI tools in many rural locations can impede the mainstream deployment of AI technologies. These areas lack computing power, dependable internet access, and digital literacy initiatives, which leads to inequities that impede fair access to the advantages of AI. Because of this, AI may develop quickly in urban regions while underserving rural communities continue to exist, escalating already-existing disparities. Moreover, the uneven allocation of AI resources and prospects among nations may provide supplementary obstacles (ÓhÉigeartaigh *et al.*, 2020). Wealthier regions or urban centers may attract more investment in AI technologies and talent, while marginalized communities may be left behind. This concentration of resources can limit the ability of developing countries to harness the full potential of AI, as benefits become concentrated in specific areas rather than being shared equitably across society (Kitsara, 2022). To address these challenges, policymakers must prioritize investments in digital infrastructure and access to technology in underserved areas. Creating initiatives that promote digital literacy and training programs can help bridge the gap, ensuring that all citizens have the opportunity to engage with AI technologies. Additionally, fostering collaboration between government, private sector, and civil society organizations can help address the digital divide by pooling resources and expertise to expand access to AI tools (Bühler *et al.*, 2023).

The problems involved with adopting AI policy frameworks in developing nations are diverse, originating from political and governance issues, financial limits, and technological divides (Maragno *et al.*, 2023). Governments, businesses, and civil society organizations must work together to create political will, obtain long-term funding, and resolve inequalities in technology access in order to overcome these challenges (Moallemi *et al.*, 2020; Mondschein *et al.*, 2021). By addressing these issues, developing nations may foster the adoption of AI and take advantage of its potential to boost GDP, increase public services, and improve people's quality of life in general. In order to steer this process and guarantee that the advantages of AI are distributed fairly throughout society, effective frameworks for AI policy will be essential (Leslie, 2020).

2.4. Future Trends

Developing nations need to take the initiative to make the most of artificial intelligence (AI) as its potential develops, taking into account the particular difficulties they encounter and maximizing its advantages (Nishant *et al.*, 2020; Borges *et al.*, 2021). Effective AI policy frameworks can be shaped by a number of future trends and recommendations, which will help traverse this changing landscape with success. This talks on how important it is to build public-private partnerships, encourage inclusive AI research, and put in place reliable monitoring and assessment systems.

To ensure that the benefits of AI advancements reach all segments of society, particularly marginalized and rural populations, inclusive AI development must be prioritized (Birhane *et al.*, 2022). This involves creating AI solutions tailored to the specific needs and contexts of underserved communities. For example, AI applications in agriculture can significantly enhance food security by optimizing crop yields and improving access to market information for smallholder farmers. By involving local stakeholders in the design and implementation of AI technologies, developers can ensure that solutions are culturally relevant and address the unique challenges faced by these communities (Crockett *et al.*, 2021; Madaio *et al.*, 2022). Furthermore, capacity-building initiatives aimed at enhancing digital literacy and technical skills among marginalized groups are essential. Educational programs that focus on AI skills development can empower individuals in rural areas to engage with AI technologies actively. This empowerment will not only facilitate job creation in emerging AI sectors but also foster a sense of ownership and agency among underserved populations, enabling them to leverage AI for their development as explain figure 4 (Sey and Mudongo, 2021; Jumani, 2021; Rodrigues *et al.*, 2022).

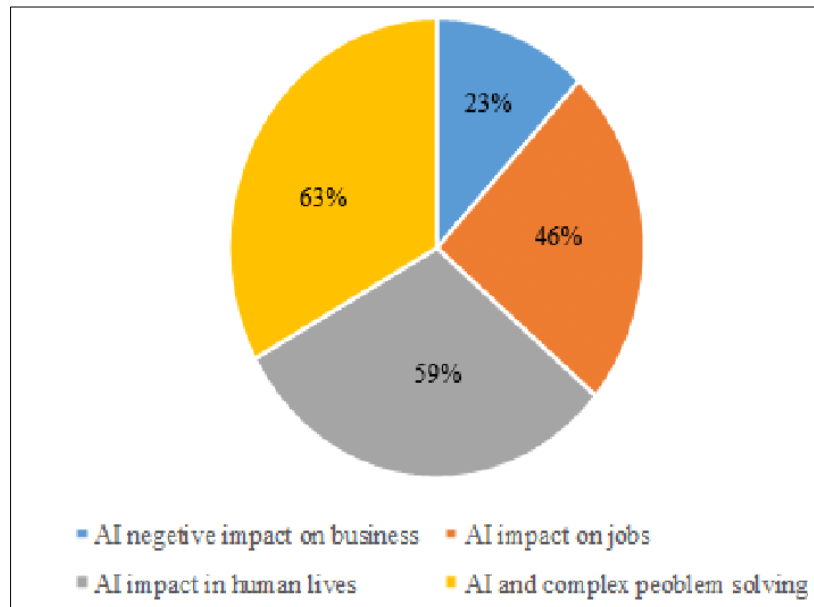


Figure 4 AI and its future impact (Jumani, 2021)

Governments, universities, and the private sector must work together to promote public-private partnerships (PPPs). Developing nations can establish an ecosystem that fosters AI innovation and growth by utilizing the resources and knowledge of multiple stakeholders (Wang *et al.*, 2023). By establishing a supportive legislative framework that promotes private sector investment in AI research and development, governments may play a critical role. The creation of innovation hubs and incubators that assist entrepreneurs focusing on AI solutions for regional problems can result from collaborative efforts. These partnerships can also facilitate knowledge sharing between academic institutions and industry, ensuring that research is aligned with real-world needs. Additionally, engaging the private sector in policymaking processes can help identify emerging trends and challenges, allowing for the co-creation of effective AI policies (Panori *et al.*, 2021).

Establishing robust monitoring and evaluation mechanisms is essential to assess the impact of AI policies continually. Developing countries must implement frameworks that enable regular assessments of AI initiatives, tracking their effectiveness in achieving desired outcomes (Chowdhury *et al.*, 2023). These mechanisms should focus on measuring not only economic indicators but also social impacts, such as improvements in health care, education, and overall quality of life. To keep pace with rapid technological changes, policymakers must remain adaptable and willing to revise AI policies based on evaluation findings. This adaptive approach will allow for timely responses to emerging challenges and opportunities in the AI landscape. Engaging stakeholders in the evaluation process can provide valuable insights and foster a culture of accountability and transparency in AI governance (Birkstedt *et al.*, 2023).

The potential for artificial intelligence (AI) in developing nations is enormous, as long as inclusive development, public-private collaboration, and strong monitoring mechanisms are given top priority (Alami *et al.*, 2020). Developing public-private partnerships will also encourage innovation and help local governments match AI initiatives with needs. Lastly, putting in place efficient monitoring and evaluation mechanisms will allow governments to continuously improve AI

policies and make sure they stay relevant in an ever-changing technological landscape (Yaseen, 2022; Alliou and Mourdi, 2023). By adopting these trends and recommendations, developing nations can take advantage of AI's transformative power to promote sustainable development and improve the lives of their citizens.

3. Conclusion

In conclusion, the establishment of a comprehensive AI policy framework is paramount for harnessing the transformative potential of artificial intelligence in developing countries. Such frameworks provide the necessary structure to guide the responsible development, deployment, and regulation of AI technologies, ensuring they align with national priorities and societal needs. A well-crafted policy framework can address critical issues, including data governance, ethical considerations, and the promotion of inclusivity, thereby fostering an environment conducive to innovation while mitigating risks.

The potential for AI to drive sustainable development in developing countries is immense. From enhancing agricultural productivity and improving healthcare access to optimizing educational resources, AI can serve as a catalyst for economic growth and social progress. By effectively leveraging AI technologies, developing nations can address pressing challenges, such as poverty, inequality, and climate change, paving the way for a more resilient and sustainable future.

However, to realize these benefits, policymakers must prioritize AI governance as a critical component of national development strategies. This call to action emphasizes the need for collaborative efforts among governments, private sectors, and civil society to create and implement AI policies that are adaptive, inclusive, and forward-looking. By investing in AI governance today, developing countries can position themselves to reap long-term benefits, ultimately transforming AI from a potential threat into a powerful tool for achieving their developmental goals. The time for decisive action is now, as the future of AI holds the promise of a better, more equitable world for all.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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