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The role of artificial intelligence in achieving the Sustainable Development Goals

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Abstract

The emergence of artificial intelligence (AI) and its progressively wider impact on many sectors requires an assessment of its effect on the achievement of the Sustainable Development Goals. Using a consensus-based expert elicitation process, we find that AI can enable the accomplishment of 134 targets across all the goals, but it may also inhibit 59 targets. However, current research foci overlook important aspects. The fast development of AI needs to be supported by the necessary regulatory insight and oversight for AI-based technologies to enable sustainable development. Failure to do so could result in gaps in

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Bookmarks

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- Documented connections between AI and the SDGs
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- An assessment of the collected evidence on the
- Research gaps on the role of AI

Fig. 2 Detailed assessment of the impact of AI on the SDGs within the Society group. Documented evidence of positive or negative impact of AI on the achievement of each of the targets from SDGs 1, 2, 3, 4, 5, 6, 7, 11, and 16 (https://www.un.org/sustainabledevelopment/). Each block in the diagram represents a target (see the Supplementary Data 1 for additional details on the targets). For targets highlighted in green or orange, we found published evidence that AI could potentially enable or inhibit such target, respectively. The absence of highlighting indicates the absence of identified evidence. It is noteworthy that this does not necessarily imply the absence of a relationship. (The content of this figure has not been reviewed by the United Nations and does not reflect its views).

that may act as inhibitors on SDGs 1, 4, and 5. This duality is reflected in target 1.1, as AI can help to identify areas of poverty and foster international action using satellite images². On the other hand, it may also lead to additional qualification requirements for any job, consequently increasing the inherent inequalities¹⁹ and acting as an inhibitor towards the achievement of this target.

Another important drawback of AI-based developments is that they are traditionally based on the needs and values of nations in which AI is being developed. If AI technology and big data are used in regions where ethical scrutiny, transparency, and democratic control are lacking, AI might enable nationalism, hate towards minorities, and bias election outcomes²⁰. The term "big nudging" has emerged to represent using big data and AI to exploit psychological weaknesses to steer decisions—creating problems such as damaging social cohesion, democratic principles, and even human rights²¹. AI has been recently utilized to develop citizen scores, which are used to control social behavior²². This type of score is a clear example of threat to human rights due to AI misuse and one of its biggest problems is the lack of information received by the citizens on the type of analyzed data and the consequences this may have on their lives. It is also important to note that AI technology is unevenly distributed: for instance, complex AI-enhanced agricultural processing, have been found to exacerbate existing gender stereotypes². In addition to the lack of diversity in datasets, another main issue is the lack of gender, racial, and ethnic diversity in the AI workforce²³. Diversity is one of the main principles supporting innovation and societal resilience, which will become essential in a society exposed to changes associated to AI development²⁴. Societal resilience is also promoted by decentralization, i.e., by the implementation of AI technologies adapted to the cultural background and the particular needs of different regions.

AI and economic outcomes. The technological advantages provided by AI may also have a positive impact on the achievement of a number of SDGs within the Economy group. We have identified benefits from AI on 42 targets (70%) from these SDGs, whereas negative impacts are reported in 20 targets (33%), as shown in Fig. 1. Although Acemoglu and Restrepo¹ report a net positive impact of AI-enabled technologies associated to increased productivity, the literature also reflects potential negative impacts mainly related to increased inequalities^{25–29}. In the context of the Economy group of SDGs, if future markets rely heavily on data analysis and these resources are not equally available in low- and middle-income countries, the economic

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