

# Greenwheel Insights

## Rage against the AI machine: the impact of AI on communities and end-users



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#### Executive Summary

Despite the benefits we can harness from artificial intelligence (AI), these systems carry human rights risks that can impact communities and end-users.

Communities face human rights risks across the entire AI value chain. New forms of human rights risks emerge for communities, particularly in the establishment of data centres and the development and deployment of AI systems.

“Data hungry” AI systems rely on vast amounts of data, which are required to train and verify AI models. Personal information and data may be bought, sold, and used without consent, which is a clear violation of the right to privacy.

We are only beginning to see the potential societal disruption that can be driven by AI. By 2023, AI-based tools had already been used to influence political processes in at least 16 countries, from the use of deepfakes to spread misinformation to discredit political opponents to using AI tools to intimidate and silence human rights defenders and journalists (Source: Freedom House, 2023).

AI systems may have built-in biases that could lead to discriminatory outcomes when AI systems determine

our access to essential services or employment opportunities.

Given the risks to communities and end-users, it is important for investors to consider the risks that AI can pose. Investors should consider the potential risk exposure in carrying out human rights due diligence in their pre- and post-investment processes:

- **Causing adverse impacts:** A company may develop an AI human resource system that ranks candidates with discriminatory results based on gender and ethnicity. If this happens, best practice is for the company to cease, prevent, and remedy the impact.
- **Contributing to adverse impacts:** If an AI system developer uses datasets from a provider that used copyrighted or sensitive information violating privacy rights, the company should cease or prevent the impact and use its leverage as a consumer to influence the data provider.
- **Directly linked to adverse impacts:** If an AI system service provider uses a cloud service provider that is linked to forced labour and child labour in its raw materials and hardware supply chains, the company should use its leverage to influence the cloud service provider to enhance its due diligence processes.

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## Mapping of key human rights risks for communities

	Raw materials	Hardware	Data centres and platforms	AI system providers	AI users
Right to a clean, healthy, and sustainable environment	✗	✗	✗	✗	✗
Land rights	✗	✗	✗		
Right to water	✗	✗	✗		
Right to free, prior, and informed consent	✗		✗		
Right to livelihood	✗				
Rights of human rights defenders	✗		✗	✗	✗
Freedom from violence and harassment	✗			✗	
Access to remedy	✗	✗	✗	✗	✗
Right to privacy			✗	✗	✗
Protection against discrimination	✗			✗	✗

Source: [LSE, 2022](#), [United Nations, 2023](#), and [EU, 2020 as of 2024](#); created by Greenwheel.

## Mapping of key human rights risks for end-users

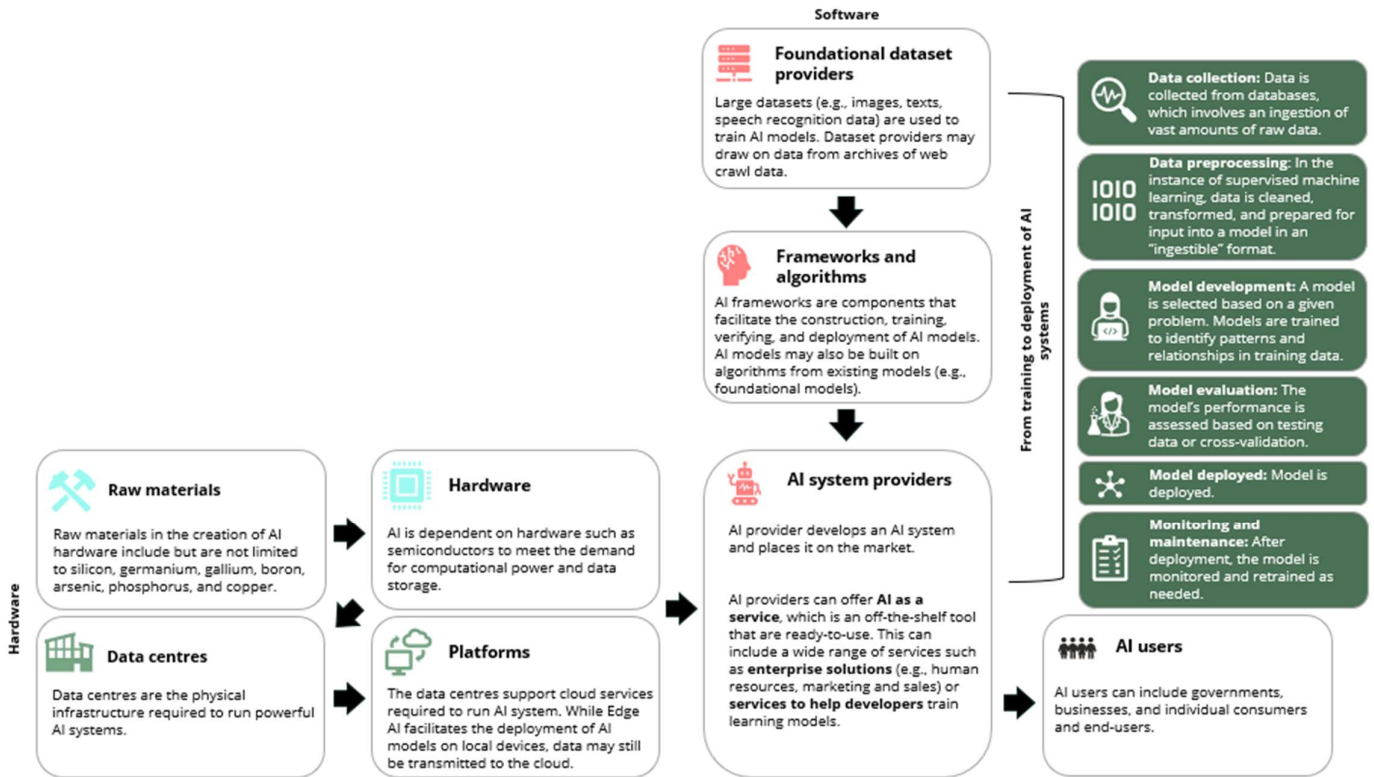
	Raw materials	Hardware	Data centres and platforms	AI system providers	AI users
Freedom of expression and access to information				✗	✗
Freedom of thought, religion, conscience, and opinion				✗	✗
Right to culture, art, and science				✗	✗
Protection against discrimination				✗	✗
Freedom from physical and psychological harm				✗	✗
Right to take part in public affairs				✗	✗
Right to work and just and favourable remuneration					✗
Right to own property				✗	✗
Right to privacy			✗	✗	✗
Access to remedy			✗	✗	✗

Source: [Human Rights Watch, 2023](#), [United Nations, 2023](#), and [EU, 2020 as of 2024](#); created by Greenwheel.

# 1. Impact of AI on communities and end-users

As the second paper of the Greenwheel Artificial Intelligence (AI) series, this piece maps the **human rights risks and impacts across the AI value chain for communities and end-users**, from hardware to the deployment of AI systems (Figure 1).

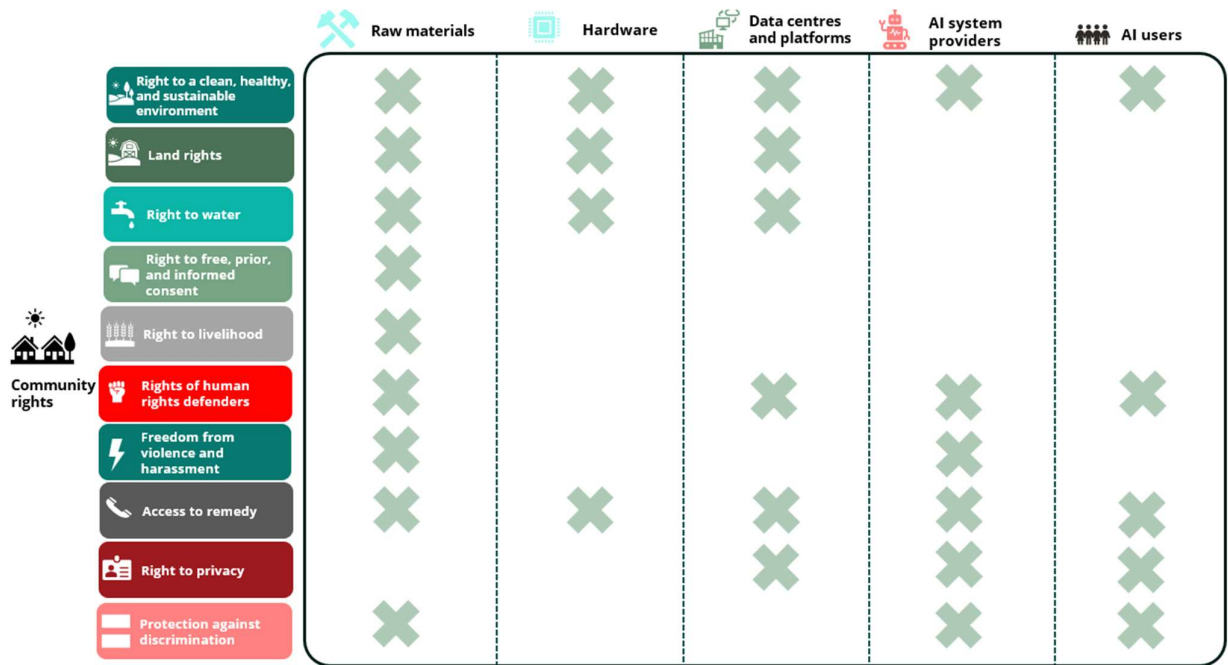
**Figure 1: Recap of the AI value chain**



**Source:** [Argus, 2023](#), [BMC, 2021](#), [Eckerson Group, 2023](#), [Hash Collision, 2023](#), [IBM, 2020](#), [IBM, 2024](#), [McKinsey, 2018](#), [Technology Magazine, 2024](#), and [The Forecast - Nutanix, 2023](#). as of 2024; created by Greenwheel. The information shown above is for illustrative purposes only and is not intended to be, and should not be interpreted as recommendations of advice.

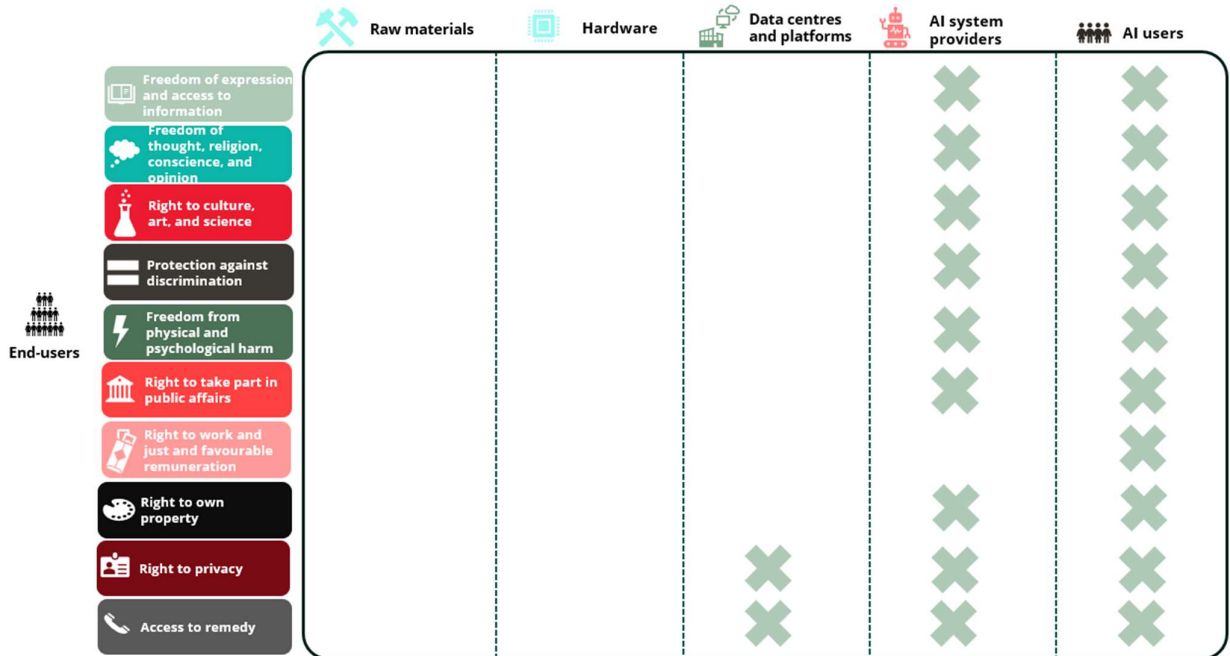
The **adverse human rights impacts for communities are identified for the entirety of the AI value chain**, beginning with the upstream processes in the extraction of raw materials to the deployment of AI systems (Figure 2a-b). For end-users, adverse impacts can be mapped to data centre processes but the **majority of impacts are related to the development and deployment of AI systems**.

Figure 2a: Key human rights risks facing communities



Source: [LSE, 2022](#), [United Nations, 2023](#), and [EU, 2020](#) as of 2024; created by Greenwheel.

Figure 2b: Key human rights risks facing end-users



Source: [Human Rights Watch, 2023](#), [United Nations, 2023](#), and [EU, 2020](#) as of 2024; created by Greenwheel.

## The social considerations in the “hardware of AI”

The environmental practices of the mining operations can impact **the right to a clean, healthy, and sustainable environment, right to water, and right to livelihood of local communities**, with a disproportionate effect on certain vulnerable groups (e.g., indigenous peoples, women, rural rightsholders). Land rights disputes and the lack of respect for the right to free, prior, and informed consent can lead to friction and conflict between mine operators and local communities, which can escalate to the violation of the rights of human rights defenders and violence and harassment.

Given the chemicals used in electronics and semiconductor manufacturing, **communities surrounding factories may be exposed to hazardous chemicals**, which can affect their right to a clean, healthy, and sustainable environment and the right to water.<sup>1</sup> As semiconductor production is water intensive, communities may be more prone to water shortages.

**The environmental impacts of data centres can lead to adverse human rights impacts for surrounding communities.**<sup>2</sup> Data centres are notoriously water-intensive; particularly when data centres are located in drought-prone areas, communities are forced to compete with data centres for access to water.<sup>3</sup> Data centres may also increase the cost of electricity for host communities that have to cost-share the required infrastructure.<sup>4</sup> Communities hosting data centres may experience noise pollution that can lead to mental and physical harm including increased cortisol, hypertension, and insomnia.<sup>5</sup>

In addition to the physical risks to local communities, **data centres may impact the right to privacy**, especially if those rights are not protected by countries that host data centres. Depending on the jurisdiction, data centre providers may have to surrender “unlawful” content at the request of authorities, which may disproportionately target human rights defenders and political dissidents.<sup>6</sup>

## The social considerations in development of AI systems

### Big data, big challenges to human rights

AI models generate outputs based on vast amounts of data. The amount of data required for newer models such as Generative AI (GenAI) far exceeds older predictive models.<sup>7</sup> **Given that the large datasets can be obtained through web-scraping, end-users may not be able to give their full and informed consent**; this data may be further bought and sold without consent. In some cases, datasets may include personally identifying information or other types of private information.<sup>8</sup> Sensitive personal data may also be extracted from GenAI models through “model inversion”.<sup>9</sup>

**There have been cases of AI developers obtaining data in a way that violates the right to privacy.**<sup>10</sup> Clearview AI, a facial recognition product for law enforcement, scraped image data from across the internet including online services that prohibit this practice. Currently, Clearview AI is banned in the European market due to the violation of General Data Protection Regulation (GDPR).<sup>11</sup> In 2023, an investigation by the Italian Data Protection Authority found that ChatGPT was using data from user conversations and information on payments by subscribers, which violates the GDPR.<sup>12</sup>

Big data can also affect an individual's right to own property. **Datasets may contain protected work and the outputs of AI systems especially GenAI may constitute an unauthorised use and reproduction of the work of the "original author(s)"** leading to potential cases of copyright infringement.<sup>13</sup>

## **The deployment of AI**

### **AI may contribute to fake news, disrupt political processes, and incite violence**

**AI systems can deepen existing social divisions and exacerbate forms and patterns of violence in society.** Algorithmic systems that offer personalised content that are bespoke to individual end-users can perpetuate biases, particularly in driving more extremist views that can lead to violence.<sup>14</sup> Similarly, there are emerging concerns that new AI technologies such as GenAI can further compound the divisions and patterns of violence through the creation of disinformation.

**AI systems can be used to perpetuate existing forms and patterns of violence in society, particularly gender-based violence.**<sup>15</sup> AI has enabled new forms of gender-based violence through image-based abuse (e.g., deepfake videos), online harassment, and surveillance and stalking. This new digital form of abuse can amplify harm and impacts for victims-survivors as violence can be perpetuated across distances, speeds, and rates, and where perpetrators can shield their own identities.<sup>16</sup>

**Algorithmic systems can drive group-based violence.** Meta's algorithmic systems have contributed to ethnic violence in Myanmar and Ethiopia due to the built-in preference for maximum engagement that can favour inflammatory or hateful content. In Ethiopia Meta's systems supercharged the spread of harmful rhetoric against the Tigrayan community which led to the killing of a university professor.<sup>17</sup> In Myanmar, hateful anti-Rohingya echo chambers were formed inciting violence and discrimination, amplifying hate speech against Rohingya people.<sup>18</sup>

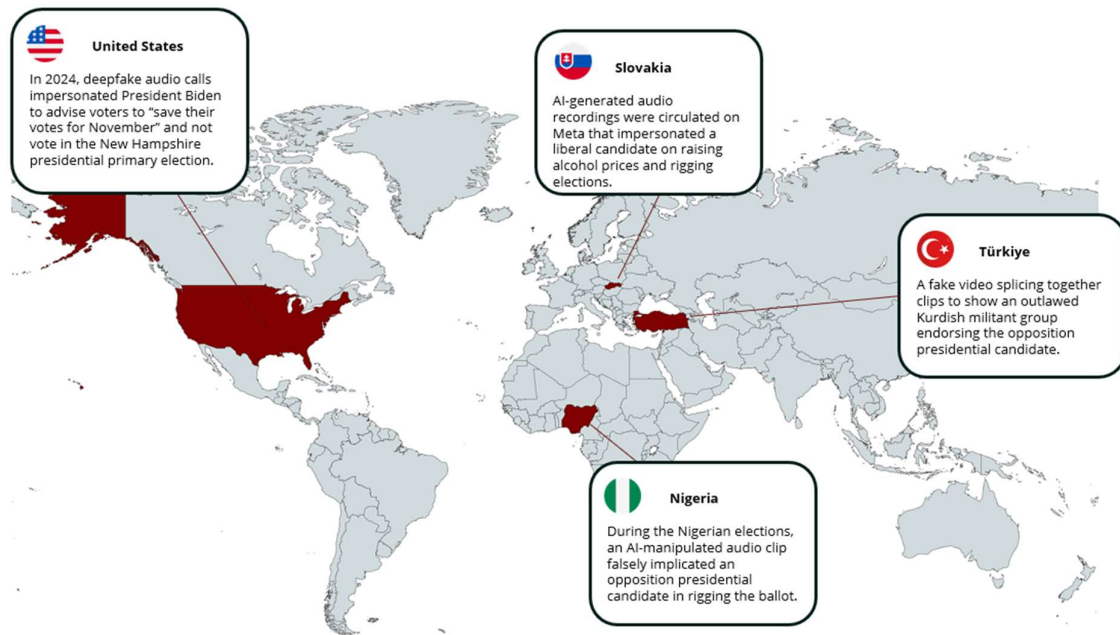
However, not all recommendation algorithms perpetuate biases in the same way. Contrary to popular belief, a study on YouTube's recommendation algorithm found that it only contributes to a mild echo chamber (i.e., liberals see more liberal-leaning videos), though this does not preclude individuals from seeking out or accidentally stumbling upon harmful content.<sup>19</sup> Where individuals do encounter extremist content (whether intentionally or accidentally), they are subsequently recommended more extremist videos.

In other words, although end-users with neutral or mixed views are not being exposed to recommendations for extremist content, existing consumers of extremist content are more likely to be recommended further similar channels and videos.<sup>20</sup> **This can lead to an increase in political polarisation and in extreme cases, incite violence.**

**With the rise of GenAI, disinformation can be compounded through the creation of deepfakes with new generative technologies** that can erode public trust in democratic processes, drive polarisation, and ultimately impact a person's right to information.<sup>21</sup> **States have misused AI products beyond their intended purposes to attack, intimidate, and suppress human rights defenders, journalists, and political opponents.** As of 2023, at least 16 countries have used AI-based tools to sow doubt, attack opponents, or influence public debate.<sup>22</sup>

**AI technology can enable assist automated “bot” accounts in spreading false narratives and information that can be used to disrupt elections** (Figure 3).<sup>23</sup> GenAI tools can enhance the tactics used to negatively impact a person’s right to vote freely through the creation of deepfakes.<sup>24</sup> This is particularly concerning in 2024 as it is a historical election year with elections taking place in 50 countries with 2 billion voters heading to the polls.<sup>25</sup>

**Figure 3: Deepfakes are affecting the right to take part in public affairs globally**



**Source:** [Financial Times, 2024](#), [The Journalist’s Source, 2024](#), [Freedom House, 2023](#), as of 2024; created by Greenwheel using [Mapchart](#).

### **Discriminatory AI through a biased feedback loop**

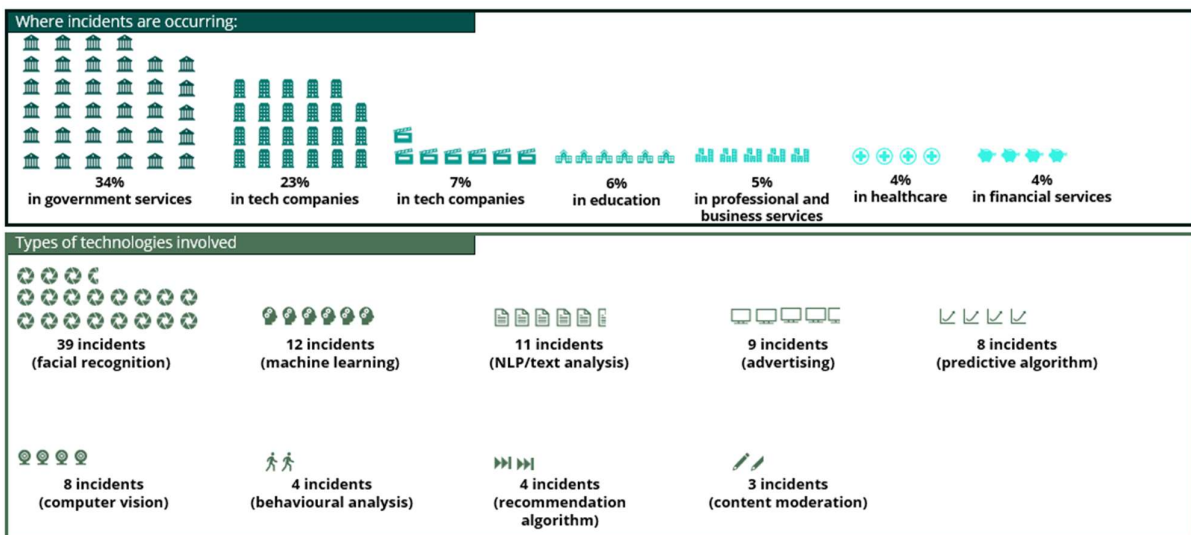
**AI systems may produce outputs that perpetuate and reinforce existing stereotypes in society.** Existing biases are transferred into AI systems through poor quality datasets (Figure 4).<sup>26</sup> In addition to using biased data to train and verify AI models, AI systems developers could also have biases that can permeate into the algorithmic design, testing, and deployment, as developers are influenced by their own choices, preferences, and backgrounds. The built-in biases in an AI system can lead to injustices and discriminatory results that can exacerbate existing inequalities (Figure 5).<sup>27</sup>

**Figure 4: How biases are created and replicated in an AI feedback loop**



Source: [Business Insider](#), 2019, [British Medical Journal](#), 2021, [University of Berkley School of Information](#), 2021, and [WEF](#), 2024 as of 2024; created by Greenwheel.

**Figure 5: A snapshot of AI incidents to date**



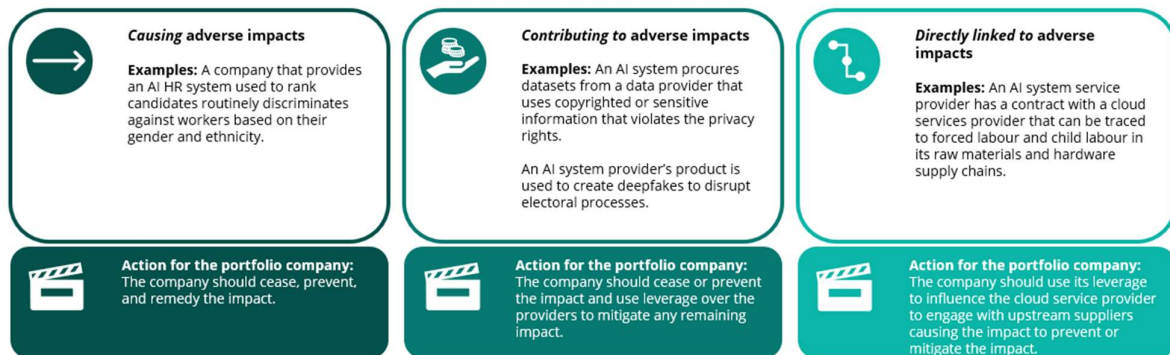
Source: [Ramírez Sánchez et al., 2023](#) as of 2024; created by Greenwheel. The information shown above is for illustrative purposes only and is not intended to be, and should not be interpreted as recommendations of advice.



**When biased systems are used to determine access to essential services, the consequences can be severe, especially without proper mitigation mechanisms in place (i.e., human verification).** This can impact the enjoyment of fundamental social and economic rights including but not limited to the right to health (e.g., denied access to insurance), right to education (e.g., AI systems to judge admission to educational opportunities), right to employment (e.g., discriminatory hiring tools), and right to a livelihood (e.g., access to financial services). For instance, in Austria, the Public Employment Service deployed a system that helped predict a job seeker’s prospects. The System gave lower scores to women over 30, women with childcare responsibilities, and migrants even if they have the same qualifications as men.<sup>28</sup> Similarly, an AI recruitment product can replicate historical biases in job market data leading to unequal treatment of candidates.<sup>29</sup>

## 2. Possible Implications for investors

**Figure 6: How investors are exposed to human rights risks through their portfolio companies<sup>30</sup>**



**Source:** Created by Greenwheel. The information shown above is for illustrative purposes only and is not intended to be, and should not be interpreted as recommendations of advice.

By identifying the different risks and impacts companies across different parts of the AI value chain may have on communities and end-users, investors are better equipped in carrying out due diligence in addition to addressing potential controversies should adverse impacts occur (Figure 6).

Aside from the more obvious cases of direct impact on communities where companies have due to their environmental practices (e.g., mining operations, semiconductor factory, data centres), **investors may be exposed to companies that are causing human rights impacts in the design and deployment of AI systems.** For instance, flawed AI systems that prevent individuals from accessing key services including health care, education, and financial services can cause adverse impact. Because of the potential social harm, these systems are considered “high-risk” in the recent EU AI Act, which will be further addressed in a separate Greenwheel research paper.

**Investors may also be exposed to human rights risks in a less direct way when companies are contributing to adverse human rights impacts.** While a GenAI product is not sufficient, in and of itself, in causing political disruptions or perpetrating violence, the lack of safety measures may enable end-users in creating harmful content such as deepfakes. As such, a company is

materially increasing the likelihood of disruptions and other types of human rights violations can *contribute to adverse human rights impacts*.

**An AI solutions provider may be *directly linked* to adverse human rights impacts through its hardware supply chain.** Suppose a holding company uses a cloud services provider that is linked to forced labour and child labour in its raw materials and hardware supply chain. Although the AI solutions provider is not directly impacting the affected workers, their business relationship with the cloud services provider exposes them to linkages to adverse impacts; hence, the AI solutions provider is expected to use their leverage on their cloud services provider to strengthen their human rights due diligence processes, particularly their supply chain practice.

<sup>1</sup> [Fortune, 2024](#).

<sup>2</sup> Note that Greenwheel will publish a separate piece on the environmental impact of data centres.

<sup>3</sup> [LSE, 2022](#).

<sup>4</sup> [Bloomberg, 2018](#).

<sup>5</sup> [Popular Science, 2022](#).

<sup>6</sup> [Human Rights Watch, 2023](#).

<sup>7</sup> [King and Meinhardt, 2024](#).

<sup>8</sup> [UN B-Tech, 2023](#).

<sup>9</sup> [HM Government, 2023](#).

<sup>10</sup> [King and Meinhardt, 2024](#).

<sup>11</sup> [BBC, 2022](#).

<sup>12</sup> [BBC, 2024](#).

<sup>13</sup> [UN B-Tech, 2023](#).

<sup>14</sup> [Shin et al., 2022](#).

<sup>15</sup> [IADB, 2023](#).

<sup>16</sup> [The Global Partnership for Action on Gender-Based Online Harassment and Abuse, 2023](#).

<sup>17</sup> [Amnesty, 2023](#).

<sup>18</sup> [Amnesty, 2022](#).

<sup>19</sup> [Brown et al., 2022](#).

<sup>20</sup> [Chen et al., 2022](#).

<sup>21</sup> [Freedom House, 2023](#).

<sup>22</sup> [Freedom House, 2023](#).

<sup>23</sup> [Freedom House, 2023](#).

<sup>24</sup> [Financial Times, 2024](#).

<sup>25</sup> [WEF, 2023](#).

<sup>26</sup> [University of Berkley School of Information, 2021](#) and [National Institute of Standards and Technology, 2019](#).

<sup>27</sup> [University of Berkley School of Information, 2021](#).

<sup>28</sup> [National Institute of Standards and Technology, 2019](#).

<sup>29</sup> [Ramírez Sánchez et al., 2023](#).

<sup>30</sup> A company causes an adverse impact when its activity materially increases the risk of a specific impact; the company's activity is sufficient, in and of itself, in leading to the impact. A company contributes to an adverse impact where its activity materially increases the risks of an impact even if it is not sufficient, in and of itself, in leading to the impact. A company is directly linked to an impact when a mutually and commercially beneficial relationship is established with a state or non-state entity that materially increases the risk of impact.

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