AI and environmental sustainability: What's the outlook?

Firebrand Training
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Can AI help us solve environmental issues and to what degree? PWC, Microsoft, Google, IBM and Blue River Technology are focused on using "AI for good" so what's preventing the more widespread use of sustainable AI?

The diminishing health of our environment needs to be urgently addressed, and AI technologies could play a critical role in resolving them. From agriculture and energy, to transport and water, AI could act to lower GHG emissions, and have an impact on water quality, air pollution, deforestation, degradation and biodiversity. The benefits of AI could also extend to the economy.

According to a recent **PWC and Microsoft** report, "How AI Can Enable a Sustainable Future" AI-powered environmental applications could reduce greenhouse gas emissions by 1.5 to 4% by 2030, and boost **global GDP by 3.1 to 4.4**% (relative to "just doing nothing").

But while the potential is huge, progress is slow. As the report notes

"Today as we sit at the intersection of the Artificial Intelligence (AI) age and the Anthropocene age, not enough has been done yet to bring these two worlds together."

Applications of AI in the environmental sector:

Here are some practical ways AI can help to build a more sustainable future:

- AI can analyse satellite data, and ground-based sensors to monitor forests in real time and at scale. This can provide early warnings of illegal deforestation, potentially saving millions of hectares of forest globally.

- AI can provide accurate, localised warnings of poor air quality which can reduce healthcare costs and offer economic benefits.

- AI can provide enhanced weather and disaster prediction and response. **IBM uses AI** to forecast the weather with predictions that are now 30% more accurate than previously. This helps energy companies better manage operations, and maximise use of renewable energy, whilst reducing carbon emissions.

- AI powered agricultural monitoring and management can lead to better crop yields with reduced reliance on fertilizers and water for irrigation. **Blue River Technology** is using AI to detect the presence of invasive species and other factors affecting biodiversity.

- Accurate traffic management, real-time journey planning and autonomous vehicles help people move more sustainably. Google uses AI in **GoogleMaps** whereby machine learning algorithms are used to optimise navigation.

- Water resource prediction and management can ameliorate the global water crisis and eliminate waste, as well as lower costs and environmental impacts.

Environmental AI's trade offs and challenges

There will be trade-offs, challenges and opportunities when it comes to AI.

Challenges include:

- Lack of awareness about sustainable AI
- Lack of funding
- Talent shortages
- Inadequate governance and policy
- Cost of AI solutions
- Risk of AI increasing the use of non-renewable resources to run it
- Insufficient focus on “sustainable” AI
- Accountability and trust around scaling AI
- Lack of data, limited accessibility of data, and data quality issues
- Over-exploitation of resources due to automation, if not carefully managed
- Rogue AI, cybersecurity and privacy risks

How to prepare for the challenges ahead

Firms and companies will need to invest seriously in their digital transformation, and champion responsible practices.

Policy and market reforms will be needed, to ensure new AI solutions can scale multiple systems, governments and regulators.

Action needs to be taken around improving data assets and AI tools. Companies need to embrace the upskilling and reskilling of their workers so they can start developing AI strategies that build in - and optimise for - sustainability. They need to onboard best practices in data science, digital skills and machine learning basics.

“Training for new skills will be fundamental”

AI and environmental sustainability needs to be addressed on a global scale. All stakeholders, from governments and tech developers, to companies, need to invest in R&D, digital infrastructure and skills development.

While there are challenges ahead, there's much to be optimistic about, with AI predicted to be able to deliver substantial economic and environmental benefits. Job losses in certain areas (e.g. in agricultural automation) can be compensated for by job gains in other sectors, however governments need to step in to retrain displaced workers and enable them to start new careers.

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