
The ‘Digital Economy’: Cementing the Expansion of Extraction and Pollution

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The idea that the economy is increasingly turning ‘digital’ usually follows the assumption that information technologies (from computers and drones to blockchains (1) and recognition machines) would be the focus of future economic activity. The ‘digital economy’ is usually referred to as one that has a relatively low impact on the environment, one in which material resources are largely unnecessary. But what (and who) is being hidden by such images of an almost ethereal and cleaner economy?

Apart from the alarming level of corporate concentration that accompanies the digitalisation of the economy, the various environmental and social impacts of information technology are becoming more evident. These include not only the toxic by-products associated with its production, but also the pollution caused by the massive amounts of energy and water required by data centres such as those of Google and Facebook. When one looks at the immense web of wires, cables, towers, generators and other physical equipment that underpins the apparently virtual realm of this so-called ‘cyberspace’, the ‘digital’ realm does not seem to be far removed from the more traditional forms of industrial manufacturing. (2)

The huge additional quantities of electricity required to run enormous libraries of ‘big data’ through super-fast computers in giant data centres places even more pressure on forest lands that contain sources of hydropower or fossil fuels. These new massive demands on energy also put yet more stress on climate stability. These data centres are often referred to as data warehouses, data farms, server farms, or more recently, ‘the cloud,’ a more convenient name which camouflages these massive operations behind the immaterial image of a ‘cloud.’ The combined power usage of giant tech firms such as Amazon, Google, Microsoft, Facebook and Apple is more than 45 terawatt-hours a year, which is about as much energy as is annually used by the entire country of New Zealand. That amount is projected to grow, as the rise of artificial intelligence and machine learning requires more computing power. (3) If the ‘cloud’ were a country, it would be the sixth largest consumer of electricity on the planet. And of course, where energy is used, heat is generated. Cooling even a medium-sized server farm can require as much as 360,000 gallons (1.36 million litres) of clean, chilled water a day; a single semiconductor fabrication facility requires millions of litres. Dwindling water availability represent one of the many unanticipated consequences the implications of which are only just beginning to be realised. (4)

Digitalisation impacts all aspects of society. The manufacture of digital devices requires the extraction of massive amounts of mineral resources. Every computer depends on hundreds of energy-intensive, toxic waste-emitting, international supply chains, and frequently hazardous conditions for the workers involved. Meanwhile the ‘online’ retailer Amazon, owns and operates one of the largest warehouse, transportation, and logistics operations in the world.

When considering the various layers in the production, operation and consumption chains of the ‘digital economy’, it becomes evident that it is far from being ‘clean’ and its impacts on the environment and climate, and thus on the populations that depend upon those life spaces, are immense. It is a global phenomenon characterised by stories of extraction, the destruction of life spaces, precarious working conditions, pollution, environmental degradation, the displacement of communities, racism and oppression.

Digitalising land and agriculture

Sophisticated attempts to digitise agriculture tend to expand the range and scope of corporate resource extraction and state efforts to survey and harass forest-dependent peoples and peasant farmers. Big finance and technology companies want farming to go ‘online.’ A combination of drones, 5G technology, remote sensing and satellites are being established as the backbone of this ‘digital agriculture,’ which aims to turn the genetic materials of seeds, soil and water resources, as well as farming, transport, storage and sales operations, into data circuits. Computer-enabled transport and extraction corridors are meanwhile menacing the livelihoods and territories of forest-dependent peoples and peasant farmers. And who actually owns this data is a crucial issue of power over food production chains and peasant territories. (5)

Giant retail companies such as Amazon, Walmart, Alibaba and Flipkart are also profiting from an exploding food delivery market. They are partnering with other giant tech firms in order to benefit from information technologies to access data on what people buy, eat and wear. This helps them to better influence and shape consumption choices in ever more sophisticated ways.

Moreover, there is an increasing trend to digitalise land governance and the use of the land and resources linked to it. This digitalisation involves the use of localisation technology and the measurement of property boundaries. And although in theory these technologies could assist in the processes of land titling, their use within existing power imbalances that marginalize collective titling and the rights of forest-dependent communities results in these technologies ending up validating the historic processes of land grabs.

A recent report from GRAIN analysing five regions of agribusiness expansion in South America, including Brazil, Colombia, Paraguay, Bolivia and Argentina, exposed the widespread individual titling in favour of those who first access digital precision systems (GPS) on public lands or on lands customarily occupied by communities. This trend, the report warns, basically constitutes digital land grabbing, (6) which is being reinforced by none other than the World Bank. The Bank has allocated US45.5 million dollars for the registration of Brazil’s savannah (known as *Cerrado*) in the rural environmental cadastre, and US100 million dollars for a multi-purpose cadastre in Colombia. Cadastres are being used as a new form of validation of property rights, legalising wrongfully obtained property titles derived from historical injustices, violence and land grabs. Once the historic violence has been ‘erased’ by the digital cadastres, the origin of the products in the value chain –such as soya, meat or oil palm– are re-issued and validated as ‘sustainable’. This is carried out through the verification and traceability systems of the new technological infrastructure of these long production chains, mainly through Blockchain technology. Moreover, the same digital systems are used for the surveillance and criminalisation of those living in the territories, people who were ‘erased’ by the digital cadastres.

Another key question is who controls the physical infrastructure for making this digitalisation possible. In December 2020, the Indonesian government offered the Papuan island of Biak, home to some 100,000 inhabitants, to US-billionaire Elon Musk as a potential launch site for SpaceX. The plan is to

launch and maintain as many as 42,000 satellites in orbit around the Earth, in order to provide high-speed wireless Internet everywhere on the planet, as well as support for explorations to and the possible future colonisation of Mars. This would require almost daily rocket launches. Russia's space agency, Roscosmos, also aims to develop a large rocket launch site on Biak island by 2024. The island also sits within a region rich in copper and nickel. These metals are essential for the production of rockets, as well as batteries for long-range electric vehicles, such as those produced by Tesla, a company also owned by Elon Musk. (7)

A Digital Economy = A Paperless Economy?

It was already clear for some time that the supposedly forest-friendly 'paperless economy' heralded by 20th-century enthusiasts of the 'digital economy' was never going to happen. Proponents have long claimed that 'going paperless' can save money, boost productivity, save space, make documentation and information sharing easier, keep personal information more secure, and help the environment. They also claimed that paper use would fall and that expansion of the pulp and paper industry would be slowed down by this 'digital' trend. But that is not what has happened.

The shift of the pulp and paper industry was largely towards packaging materials due to the tremendous demands associated with shipping products purchased 'online', along with other steady and growing demands such as tissue papers and food packaging.

'Online' shopping has required packaging to optimise the display of products on shelves for more efficient storage. This growth encompasses a higher demand for carton boxes. 'Online' sales of pulp and paper products are growing in the United States and China, which are the biggest markets. Moreover, the global demand for various types of packaging products seems to be increasing as well. (8)

This continuous demand is felt first and foremost on the territories of communities confronting the devastating impacts of monoculture tree plantations. Indonesia's Ministry of Industry confirmed in February 2021 that at least six new pulp mills had recently started operating in the country, which points to an increase in demand for pulpwood and thus for new plantations to feed them. Two of the mills are already running at full capacity, three are supposed to do so by the end of this year, and the sixth will ramp up to 85% capacity this year. Their combined output at full capacity will be one million tons of pulp per year. There's also a plan by China's largest pulp company, Nine Dragons Paper, to expand into Indonesia with a view to producing six million tons of pulp a year. (9) The hundreds of thousands of hectares of forests, peatlands and communities' life spaces turned into monoculture tree plantations in Indonesia have already had devastating impacts, as well as increasing the outbreaks and intensity of uncontrolled fires. The construction of new pulp mills will only exacerbate these impacts, in particular for the vulnerable region of Papua.

The 'green' face of the 'digital era'

Aware of the enormous trail of pollution that big technology companies are leaving behind, and trying to avoid that the supposed 'cleaner' 'digital' economy loses any legitimacy, these companies have jumped onto the bandwagon of 'green' PR campaigns.

Microsoft, for example, has vowed to be 'carbon negative' by 2030, which means that it will claim to be removing more carbon dioxide from the atmosphere than it emits each year. By 2050, Microsoft says it will "remove from the environment all the carbon the company has emitted either directly or by electrical consumption since it was founded in 1975." This will be done mainly by capturing carbon

dioxide underground and by the use of carbon-offset projects.

Apple has committed to being 100 per cent ‘carbon neutral’ with respect to its supply chain and products by 2030. Amazon says its shipments will be ‘net zero’ and is targeting this objective for 50 per cent of all shipments by 2030. Google has pledged to run all of its data centres on carbon-free electricity (such as hydropower, wind and solar) 24 hours a day, by 2030.

This list of pledges only reinforces the reality that the demand for large-scale carbon offset projects will increase, and this, in turn, will increase even further the pressure on forests, communities’ territories and fertile land.

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(1) Blockchain technology allows property values such as money to be transferred “peer to peer” – directly from one party to another without a third party, such as a bank or trustee. Transaction data are stored in blocks that are time stamped and tied to one another in forms of codes and cipher systems, forming a chain. Copies of this chain are stored across multiple devices and updated with each new transaction, which makes it virtually impossible to alter transactions retroactively.

Blockchain systems frequently make use of so-called “smart contracts” in order to facilitate negotiations of contracts as well as the fully automated commercialisation of the assets through a web portal. For further information see the following [article from WRM Bulletin 247, January 2020](#)

(2) Ensmenger Nathan, The Environmental History of Computing, Technology and Culture, Volume 59, Number 4 Supplement, October 2018, pp. S7-S33

(3) Financial Times, 2021, [How tech went big on green energy](#)

(4) Idem (2)

(5) ETC Group, 2021, [Big Brother is Coming to the Farm: the Digital Takeover of Food](#)

(6) GRAIN, 2020, [Digital fences: the financial enclosure of farmlands in South America](#)

(7) Spaceport Genocide, [International Appeal](#)

(8) International Energy Agency (IEA), [Tracking Industry 2020. Pulp and Paper](#)

(9) Mongabay, March 2021, [In Indonesia, pulp and paper firms stoke demand that may drive deforestation](#)