Technology Applications for the SDGs

Excerpt from: Tincq, B., Cunha Brito, M., & Sinet, L. (2019). *The Frontiers of Impact Tech: moonshots worth taking in the 21st century*. Paris: Good Tech Lab.

- **Innovative logistics for sustainable development**, including clean container ships, cargo airships, and drone deliveries of medical supplies
- **Internet access technologies** to bring the second half of humanity online in remote areas, such as airborne backhaul infrastructure and innovations for last-mile access
- **Advanced technologies for sustainable industry:** additive manufacturing, biofabrication, AI for new materials discovery, short-loop recycling, circular and flexible factories
- **Data-based SME financing** for developing markets

- **Sustainable transportation systems** that emerge at the convergence between electrification, autonomy, ride-hailing, new vehicles, mobility-as-a-service and public transit
- **Air pollution control and mitigation technologies**, such as sensor networks that allow hyperlocal monitoring, as well as large-scale air purifiers
- **Various solutions that improve urban metabolism** through organic resources looping, local food production, energy and water efficiency, advanced recycling, and other circular economy mechanisms
- **Digital tools for urban planning**, like citizen participation, urban data management, and advanced simulations
- **Infrastructure and basic services for fast-growing urban areas**, as well as their informal settlements

- **Digital solutions to reduce food waste** at the retail, catering and consumer levels: optimized procurement, dynamic pricing, and redistribution platforms for unsold food
- **Product reuse, repair, and upgrade** relying on digital technologies, circular business models and modular designs
- **Sustainable materials and chemicals**, either using feedstock derived from biological sources, captured greenhouse gases, or recycled waste, as well as advanced materials with superior longevity and robustness
- **Responsible retail technologies** like online farmers markets, product sustainability ratings, and blockchain records to certify ethical supply chains
- **Fintech for sustainable consumption**, such as digital ethical banks, retail impact investing platforms, digitized local currencies, and civic crowdfunding

Emissions reduction (see also SDG2, 7, 9, 11, 12)

- **Decarbonized energy:** substituting fossil fuels with clean energy, adding storage and flexibility into the grid, and reducing the emissions from existing fossil fuel plants
- **Decarbonized agriculture:** reducing food waste and the share of animal food products, and adopting regenerative farming methods
- **Decarbonized industry:** scaling the circular economy, replacing fossil-based feedstock with sustainable alternatives, increasing production efficiency, and safely phasing out HFC refrigerants
- **Decarbonized transportation:** scaling electric vehicles, low-emission fuels, and mobility-as-a-service, increasing logistics efficiency, and reducing air travel emissions
- **Decarbonized buildings:** scaling energy efficiency, improving the competitiveness of low-carbon construction materials, and reducing demand for new buildings

Negative emissions (carbon removal)

- **Carbon removal *via* engineered solutions** like enhanced weathering, direct air capture, carbon capture and use (e.g. construction materials, fuels, chemicals, plastics, protein, carbon fiber, and nanomaterials)
- **Carbon removal *via* natural and hybrid solutions** like carbon farming, biochar, and the restoration of carbon-dense natural ecosystems—other potential solutions, such as phytoplankton stimulation and bioenergy with carbon capture and storage, still need to demonstrate system sustainability

Cross-cutting strategies

- **Digital enablers of mitigation**, including data-driven climate strategies and blockchain-based carbon credit systems
- **Climate adaptation technologies**, especially for the resilience in agriculture, urban areas, and low-lying islands

- **Marine cleanup technologies** to remove plastic pollution from oceans, lakes, and streams
- **Ocean plastic prevention** through marine biodegradable materials, digitized recycling, and other circular models
- **Marine biodiversity protection**, using satellites and AI to monitor fisheries, or aquatic drones and robots to detect threats to marine life (e.g. invasive species, pollution, ocean acidification)
- **Coastal ecosystem restoration**, including genetic engineering to strengthen coral reefs, and drones to restore mangroves
- **Sustainable seafood solutions** like traceability blockchains, improved aquaculture systems, plant-based and cell-based fish

- **Terrestrial ecosystems and wildlife monitoring** using satellite imagery, drones, remote sensing, machine learning, DNA analysis devices, and citizen science apps
- **Computational conservation science**, including soil modeling and analysis, geospatial data platforms, and biodiversity genomics databases
- **Reforestation and desert greening technologies**, ranging from low-tech innovations in agroecology to drones and algorithms used for industrial-scale reforestation
- **Fintech for ecosystem restoration** like impact investing platforms, crypto-tokens, and more

Discussion Questions:

Choose one or two of the SDGsx- that most closely matches your chosen challenge (or a problem you're passionate about):

- Have you seen any examples of these technology applications?
- What technology application stands out to you?
- Do you perceive any obvious pitfalls with any of these ideas?
- How can your chosen project and challenge fit into the landscape represented here?
- What's missing from the list for this SDG? Can you think of any innovative solutions that aren't covered, or challenges that are not addressed in this list?