

## The business case for soil

### Arguments for soil sustainability must move beyond the farm into the boardroom, urges Jess Davies.

Nobody likes dirty business, but the business world must get to grips with dirt. Soil provides food, fibres and fuels and regulates water resources and climate. Yet most businesses are unaware that their bottom lines depend on soil, let alone of the risks they face from its degradation. More must recognize that improving soil quality is a smart investment.

A third of all soils and over half of agricultural soils are moderately or highly degraded due to soil erosion, loss of organic carbon, sealing, compaction, and salinization, resulting in a severe reduction in their ability to provide vital ecosystem services such as food provision and climate and water<sup>1</sup>. Each year, through deforestation, overgrazing, extractive farming, urbanization and pollution we damage another 12 million hectares – an area the size of Bulgaria<sup>2</sup>. Global needs for food and resources are rising as populations grow, lifestyles shift and the world transitions to a low carbon economy. Climate change and biodiversity loss exacerbate soil problems.

While many businesses in agriculture, forestry and some in the food sector describe measures taken to reduce soil impacts in their sustainability reports, most others do not. Soil is vital to all industries that use plant or animal products like cotton, rubber, leather or wood in their supply chains, from fashion to pharmaceuticals and increasingly energy. Insurers and investors have a stake – they lose money when crops fail, commodity prices rise and operations are disrupted.

Extreme weather, water scarcity, natural disasters and climate change were listed in the top 5 risks in terms of impact in the 2017 World Economic Forum's Risk Perception Survey. Whilst, the recent political climate meant that climate change was knocked off the top spot for weapons of mass destruction in this year's poll, current politics, however, has also mobilised business response to climate, with over 600 companies petitioned President Trump for the US to stay in the 2015 Paris climate Agreement (<http://www.lowcarbonusa.org/>). Soil is not mentioned in WEF's risk analysis and yet cuts across all these environmental concerns.

If the private sector is serious about sustainability and commitments to climate change, it must take action on soil. In collaboration with researchers, businesses should advocate for international legislation, assess their soil risks and impacts and invest in maintaining and enhancing this resource.

### Buried treasure

Soil's invisibility in the boardroom is due more to unawareness than apathy. For instance, in October 2016 I ran a session on soil business risks and opportunities at the annual meeting of the World Business Council for Sustainable Development, a CEO-led forum of over 200 multinational companies. Participants from across the accounting, agriculture, chemicals, engineering and food sectors said they were surprised to learn of soils' roles beyond agriculture.

Water regulation is one soil function where business has an important stake. Soil moisture is crucial for rain-fed agriculture, which accounts for three quarters of human freshwater usage<sup>3</sup>. Soils that are compacted, eroded or lacking organic material hold less water. This increases the likelihood of floods, the impact of droughts and intensifies competition for water resources. Water scarcity is

widely acknowledged as a major risk to the global economy<sup>4</sup>: in 2016 droughts and water scarcity cost businesses \$14bn<sup>5</sup>. The contribution of soil degradation to these costs, and the potential for mitigating risks through soil remediation are key areas of uncertainty.

Water intensive industries such as beverages, mining and energy are taking action in the catchments where they operate. These usually involve hydro-engineering. For example, the drinks company SABMiller is maintaining irrigation channels, improving aquifer recharge and removing invasive tree species around its plants in Peru and South Africa<sup>6</sup>. Water intensive industries should also look at safeguarding and improving local soils by reducing soil disturbance, promoting adoption of conservation agriculture and rehabilitating degraded lands.

Climate risk and mitigation is another area where soil's potential is underappreciated in business. As soil is the largest global reservoir of organic carbon, changes to soil carbon are important for climate. It is estimated that land use change and soil management has resulted in a net loss of ~40- 80 GT of carbon from soils over the past century<sup>7</sup>, the majority of which is likely to be emitted as CO<sub>2</sub>. Comparing this to a total cumulative human emissions in the region of 450-600 GTC since the industrial revolution shows that this is not an insignificant total. But there is a potential to reverse this trend and increase carbon storage in soils through sustainable land management. Scientific and political visibility for soil as a climate solution is rising: for example, on the 21<sup>st</sup> of March the UN's FAO will hold the first Global Symposium on Soil Organic Carbon with the aim of reviewing the role of soils in climate change and integrating its assessment into the regular IPCC Assessment Reports. This is a scientific meeting, but the global business community need to be engaged and contributing to such events if scalable solutions are to be achieved. For instance, soil sequestration could easily be amongst the solutions highlighted to businesses through the Low Carbon Technology Platform, developed by the International Energy Agency, United Nations and World Business Council for Sustainable Development at the Paris climate meeting.

### **Muddy profile**

Lack of regulation perpetuates the problem: awareness is raised through the need to comply. Soil is a global resource and degradation has global consequences – for society and business alike. Yet there is no international legislation governing soils directly<sup>8</sup>. The EU's Soil Framework Directive, proposed in 2014, failed to be adopted. Only a handful of countries such as the US, Switzerland and Australia have national soil policies<sup>8</sup>.

Business awareness could be elevated through non-legally-binding initiatives such as the UN's Sustainable Development Goals (SDGs). But soil is not one of the main goals. It gets a mention in 4 targets, including for sustainable food production (2.4) and zero land-degradation (15.3). Soil's roles in water security and climate change are missing. Yet when the SDGs were launched in 2015, 71% of businesses surveyed planned to engage with them and 41% said they would embed them into their strategies within 5 years.

Since then, the UN has released Voluntary Guidelines for Sustainable Soil Management, endorsed by the FAO in December 2016. These are an important step. But, being only focused on agriculture, they have much less reach than the SDGs.

Soils are buried in the scientific frameworks, such as 'planetary boundaries'<sup>9</sup>, that businesses turn to when they develop their sustainability strategies. Scientists know soils are central to nitrogen and phosphorus flows, the integrity of the biosphere, land-system and climate changes. But without naming soil loss or degradation as a limit that humanity must live within, it is easily overlooked.

Soil is missing from corporate environmental reporting standards, such as those of the Global Reporting Initiative (<https://www.globalreporting.org/Pages/default.aspx>). Some companies are moving in the right direction by publishing soil-related numbers in their sustainability, but these remain entangled in other statistics. For example, in 2015 Kering (the parent group of fashion brands Gucci and Puma) reported that 50% of their environmental impacts are associated with producing raw materials such as wool, cotton and leather. The biggest contributor, land use change, totalled €200 million in damages per year, and some of the effects of soil degradation will be hidden in this cost

### **Three paths**

The business community should follow three paths: advocacy, assessment and investment. Science strategy and partnerships should underpin them.

First, businesses should join the science community in lobbying for better soil policies and practices. International legislation should be a priority. Making the case will require compelling narratives, equivalent to for example the 2 °C global warming goals that describe the benefits of action over inaction. For instance, what would a 2% soil carbon loss mean in terms of lost production and water storage, carbon emissions and socioeconomic costs? Or what does a 40% degraded soil resource world mean in these terms? How does this compare with a scenario where we achieve a 0.4% increase in agricultural SOC as proposed by the 0.4% initiative that came out of the Paris talks?

The business momentum of the Paris climate agreement should be harnessed. Hundreds of companies signed up in Paris to coalitions such as the UN's Non-State Actor Zone for Climate Action and coalitions like We Mean Business. These should extend their mandate to protect soils. The Global Soil Partnership and the Intergovernmental Technical Panel on Soil could support this and broaden their remit beyond soil's agricultural functions. The message that soils are not only for agriculture needs to be heard.

Second, companies need to assess the extents to which their operations and value chains depend on services provided by soils. Metrics and tools should be developed and integrated into reporting frameworks such as the GRI as well as into 'natural capital' approaches for assessing environmental business risks (such as the Natural Capital Protocol, launched in 2016 by a coalition of over 200 leading organizations).

Third, soils need to be seen in business as an investment opportunity to mitigate climate, water, energy and supply chain disruption risks. Global soil investment funds, similar to those for climate approved by the World Bank, should be put in place to support soil remediation where it is needed most. These could be funded through voluntary payments or regulations and levies on soil users (with care that taxation policies incentivise good practice). Funds could also come from existing climate mitigation pots.

Projects to promote natural rather than built infrastructure in business should champion soils. For example, the World Business Council for Sustainable Development's work program, chaired by Shell and Dow, is already constructing wetlands, enhancing biodiversity schemes to provide pollination and catchment afforestation to increase aquifer recharge. Soil measures could easily be added.

All 3 paths can only be successful if they are supported by robust science. Scientists need to listen and learn the language, priorities and procedures of the business world to enable change.

A scientific strategy to help build business cases for action on soil should include: international and long-term monitoring of soil resources; creating metrics that matter to business and measuring the socio-economic impacts of degradation; illuminating the risks and consequences of inaction or intervention; and tools that support decision making and soil investment.

Soil is a common good and essential resource. Governments, civil society and businesses with the support of science must ensure it is not treated like dirt.

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#### REFERENCES

- 1 FAO, I. Status of the World's Soil Resources (SWSR)—Main Report. *Food and Agriculture Organization of the United Nations and Intergovernmental Technical Panel on Soils, Rome, Italy*, 650 (2015).
- 2 Initiative, E. The value of land: Prosperous lands and positive rewards through sustainable land management. *available at: www.eld-initiative.org* (2015).
- 3 Hoekstra, A. Y. & Mekonnen, M. M. The water footprint of humanity. *Proceedings of the national academy of sciences* **109**, 3232-3237 (2012).
- 4 Mekonnen, M. M. & Hoekstra, A. Y. Four billion people facing severe water scarcity. *Science advances* **2**, e1500323 (2016).
- 5 Worldwide, C. Thirsty Business: Why water is vital to climate action. (2016).
- 6 Miller, S. (2011).
- 7 Lal, R. Soil carbon sequestration impacts on global climate change and food security. *science* **304**, 1623-1627 (2004).
- 8 Montanarella, L. Agricultural policy: Govern our soils. *Nature* **528**, 32-33 (2015).
- 9 Steffen, W. *et al.* Planetary boundaries: Guiding human development on a changing planet. *Science* **347**, 1259855 (2015).