EARTHWATCH® INSTITUTE

SOIL HEALTH, BIODIVERSITY AND THE BUSINESS CASE FOR SUSTAINABLE AGRICULTURE

CONTENTS

1. EXECUTIVE SUMMARY

Soils and biodiversity are essential to agricultural production and underpin the supply chain. Globally, 99.7% of our food calories come directly from the soil, and 75% of food crop types rely on animal pollination. It is therefore clear that investing in long-term soil health and biodiversity is essential rather than elective.

Understanding how best to engage with soil health and biodiversity, and selecting the most effective ways to improve their protection within supply chains, can be a challenge for businesses. This discussion paper provides a broad overview of the impact that agriculture can have on soil health and biodiversity, and identifies key actions that businesses can take within their supply chains to support farmers to improve soil health and biodiversity outcomes.

We challenge conventional thinking and highlight multiple business opportunities for investing in soil health and biodiversity, including long-term viability of business models; cost savings; increases in operational efficiency; increased market shares; access to new markets, products and services; predictable and stable supply chains; and better relationships with both stakeholders and customers.

1.1 EVIDENCE-BASED DECISION-MAKING

Businesses can enable farmers to make evidence-based decisions by providing resources that facilitate farmer-led monitoring. This in turn enables identification of the most effective measurements for soil health and biodiversity and supports environmentally sound and evidence-based management decisions. Businesses should also embed scientific approaches that integrate soil health and biodiversity into reporting, accounting and supply chain assurance, and demonstrate how such land management systems deliver environmental benefits. Taking a landscape approach to agricultural management can increase the positive impacts and benefits to the environment, while giving farmers autonomy can result in significant financial benefits to both farmer and business.

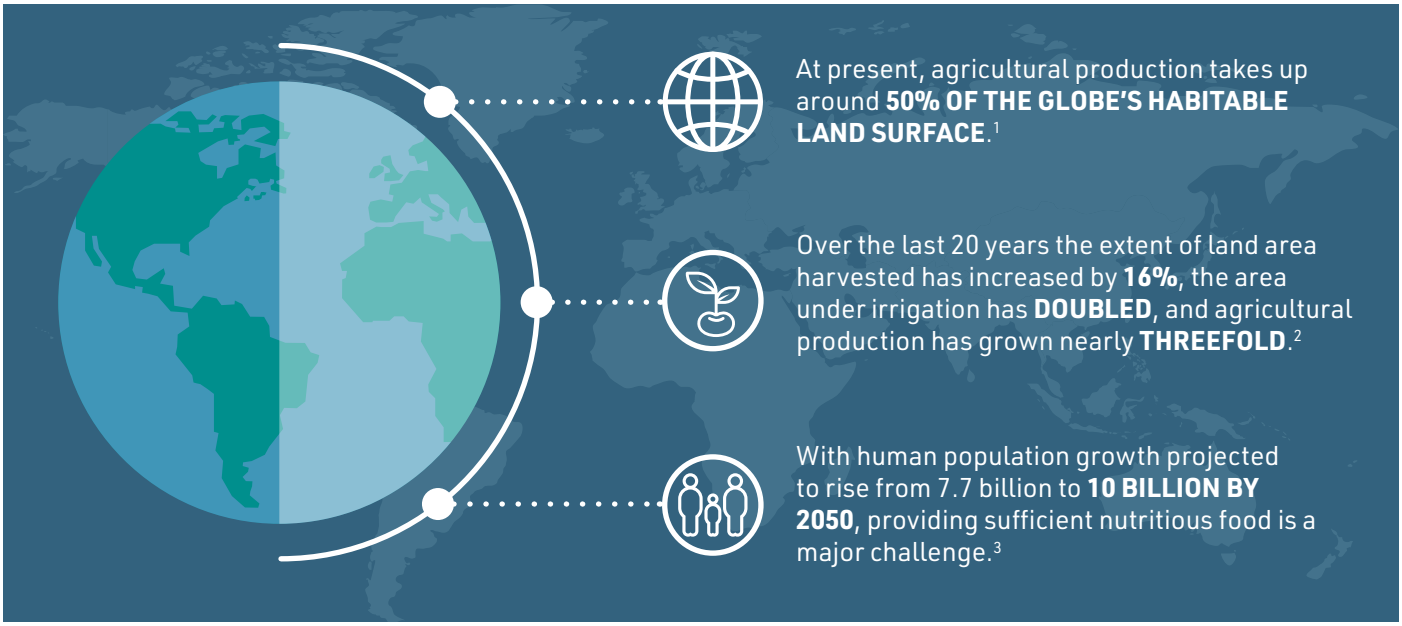
1.2 ENABLING LONG-TERM DECISION-MAKING & LOCAL ADAPTATION

Businesses can also enable long-term thinking among farmers by supporting them to increase their understanding of how their actions impact more broadly on ecological processes, climate change and environmental services. Businesses can work to reduce short-term pressures and demands on food producers that restrict their capacity to implement long-term decision-making. In addition, businesses can work with farmers to enable adaptation of farm practices and mitigation strategies that are appropriate to their local environment, in order to improve the sustainability of their operations.

1.3 COLLABORATION

Businesses should promote collaboration between farmers, within supply chains and amongst relevant landscape stakeholders. Fostering dialogue between different stakeholders can increase sustainable practices that address biodiversity and promote soil health more broadly. Connecting agricultural businesses with their growers in skill-sharing and collaborative partnerships can allow farmers to manage their operations more effectively, while providing agricultural businesses with greater insight to operational realities to allow them to improve the effectiveness of relationship management and decision-making.

2. INTRODUCTION TO AGRICULTURAL IMPACTS



Preserving soils, protecting biodiversity and ensuring healthy water systems is vital for long-term food security. Yet current practices around agricultural expansion (conversion of natural habitat for growing food) and intensification (an increase in agricultural production per unit of inputs) pose a threat to these systems, causing soil degradation, pollution, climate change, deforestation, groundwater contamination, biodiversity loss, irrigation problems and waste[4,5,6].

In terms of the economic threats from degraded soils and biodiversity loss, farmers will feel immediate impacts as crop failure affects their livelihoods, while businesses will face price volatility and business risk. Furthermore, food security will be increasingly threatened, while ecosystems and the services they provide to societies and economies will be subject to irreparable damage.

The environmental impacts of agriculture vary significantly depending on chosen production practices, and therefore the choices businesses make and the ways they support their producers can not only reduce but also in some cases reverse the adverse impacts of current practices. Furthermore, achieving high yields alongside approaches that protect soils and biodiversity is far from impossible, if under-practiced.

While policy frameworks and farmers' actions have a major influence on agricultural practices, globally, businesses also have significant power over land management decisions, either directly through operations or indirectly through markets and finance[7]. Business commitment to soil health will be crucial to achieving agricultural sustainability, and there is an urgent need for businesses to address sustainable agriculture through exploring the socio-ecological impacts across their supply chains, in order to improve farming practices and operations.

2.1. AGRICULTURAL IMPACTS ON SOILS

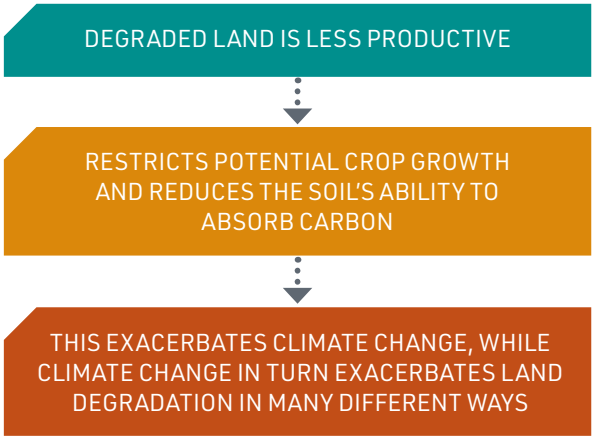
The upper metre of Earth's soils contains around three times as much carbon as the world's vegetation, and nearly twice as much as held in the atmosphere. Primarily composed of carbon, the organic matter in soils plays a role in four important ecosystem services – resistance to soil erosion, water-holding capacity, soil fertility for plants and soil biodiversity[8].

DESPITE THE OBVIOUS VALUE OF SOILS, APPROXIMATELY **24 BILLION TONS OF FERTILE SOIL ARE ANNUALLY LOST** FROM AGRICULTURAL SYSTEMS WORLDWIDE[2].

SIMILARLY, INTENSIVE AGRICULTURE HAS CAUSED ARABLE SOILS TO **LOSE 40 - 60% OF THEIR ORGANIC CARBON**[9]

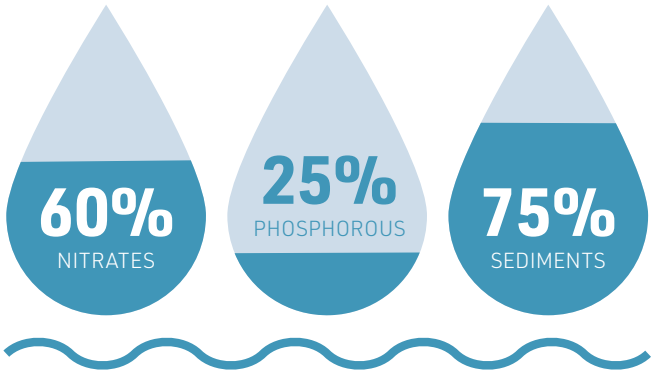
The two factors that have had the greatest impact on loss of carbon from agricultural soils are the frequent disturbance through tillage and harvesting, and a shift from deep-rooted perennial plants to shallow rooted annual plants[10]. Soil degradation will accelerate as pressures on land use increase in line with demands for food, fibres and biofuels, while rising temperatures and frequency of extreme drought and rainfall events under climate change pose a further threat[11].

Globally, a third of soils are already moderately or highly degraded, while 12.5% of all animal and plant species are threatened with extinction[6,12].



Agricultural intensification also affects water quality through the release of nutrients (as a result of soil management and fertiliser application) and other chemicals into the water environment, through biological contamination (e.g. from microbiological organisms in manure) and via soil being eroded and washed off farmland. Thirty eight percent of water bodies in the EU are under pressure from agricultural pollution, while in the US, agriculture is the main source of pollution in rivers and streams[5].

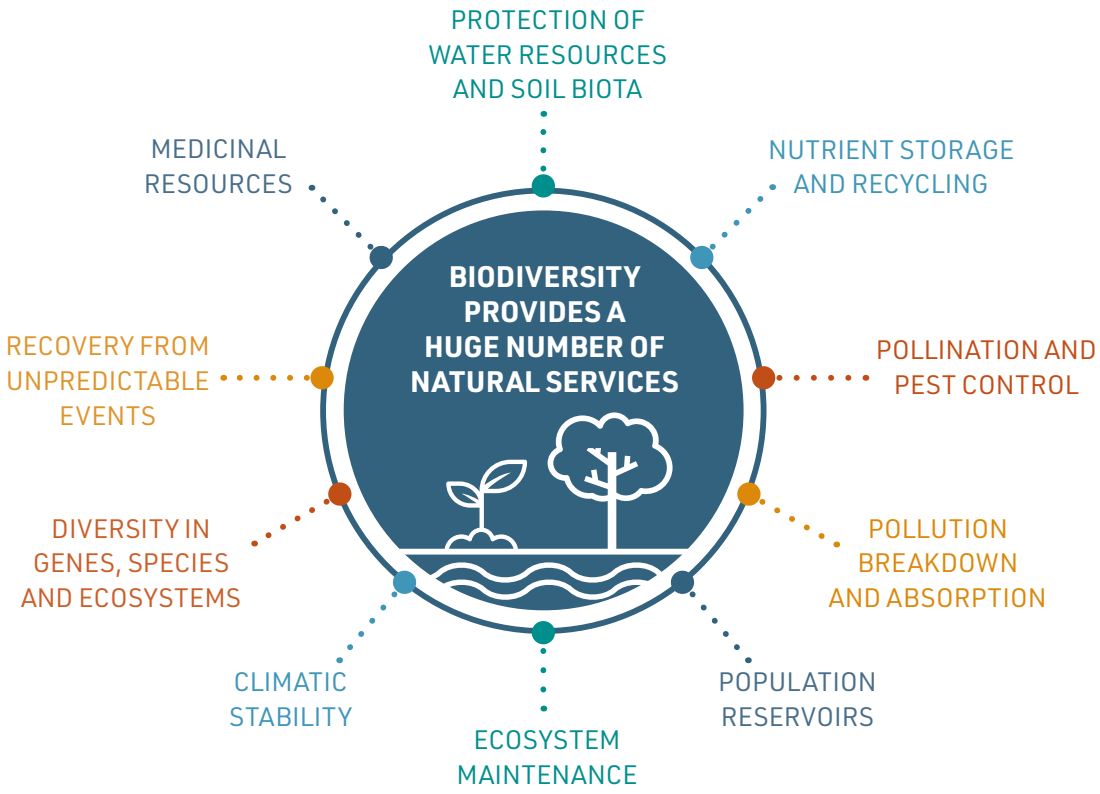
Improving and maintaining soil health is therefore a pressing global issue, and currently sits at the heart of three UN conventions on climate change (UNFCCC-United Nations Framework Convention on Climate Change), biodiversity (CBD- Convention on Biological Diversity) and desertification (UNCCD United Nations Convention to Combat Desertification). The ability of soils to sequester and store carbon means they are key to reducing carbon emissions and addressing climate change. For example, the international initiative "4 per 1000" (launched by France at the CoP 21) was borne out of the idea that if we could bring about an annual growth rate of 0.4% in global soil carbon stocks, we would stabilise the amount of CO2 held in the atmosphere related to human activities[14].

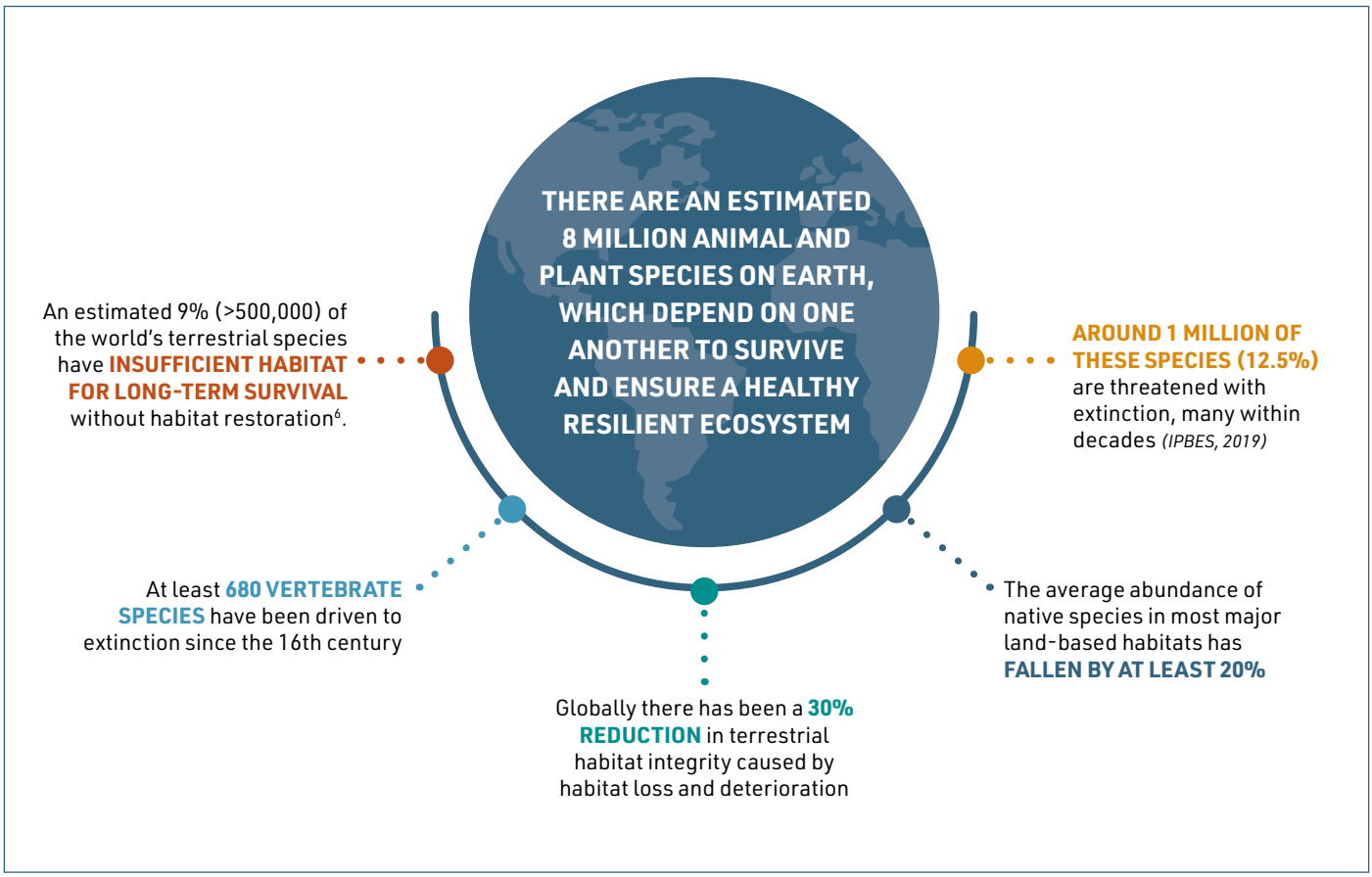


IN UK WATER BODIES ARE ESTIMATED TO HAVE DERIVED FROM FARMING[13]

2.2. AGRICULTURAL IMPACTS ON BIODIVERSITY

Biodiversity refers to the variety of life on earth in the form of plants, animals, microorganisms and ecosystems.





Current biodiversity status assessments

The role of agriculture in this decline is significant. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Biodiversity Assessment states that land use change is the top direct driver of nature decline amongst five influential drivers (the other four are direct exploitation of organisms; climate change; pollution and invasive alien species). Since 1970 there has been a 300% increase in food crop production, in response to population growth, rising demand and technological development. Concurrently, many key indicators of nature's contributions to people (such as soil organic carbon and pollinator diversity), have declined, indicating that gains in material contributions are often not sustainable.

The IPBES report points to the need for promoting good agricultural and agro-ecological practices; multifunctional landscape planning and cross-sectoral integrated management, and highlights the importance of deeper engagement of all actors throughout the food system and more integrated landscape and watershed management.

It also emphasises the economic value of approaches that empower consumers and producers through market transparency, improved distribution and localisation (that revitalizes local economies), reformed supply chains and reduced food waste.

While agricultural subsidies are increasingly shifting towards positive incentives for conserving biodiversity, the evidence on whether these incentives will achieve their aims is inconclusive. The majority of global SDGs for conserving biodiversity by 2020 are expected to be missed, and goals for 2030 and beyond will only be achieved through transformative changes across economic, social, political and technological factors. Furthermore, current negative trends in biodiversity and ecosystems will undermine progress towards 80% of the assessed SDG targets related to poverty, hunger, health, water, cities, climate, oceans and land, highlighting that loss of biodiversity is not only an environmental issue, but also a developmental, economic, security, social and moral issue as well[6].

3. TRANSITIONING BUSINESSES TO A SUSTAINABLE FUTURE

The urgency and scale of action required to reduce soil degradation, improve soils and promote biodiversity conservation requires multi-stakeholder action across landscapes and supply-chains.

3.1. THE BUSINESS CASE FOR INVESTING IN SOIL HEALTH

Soil underpins the supply chain.

GLOBALLY, **99.7% OF OUR FOOD** CALORIES COME DIRECTLY FROM THE SOIL

AND **LESS THAN 0.3%** FROM OCEANS AND OTHER AQUATIC ECOSYSTEMS[15]

THE ESTIMATED ECONOMIC COST OF LAND DEGRADATION IS **MORE THAN 10%** OF ANNUAL GLOBAL GROSS PRODUCT, AND BY 2050, LAND DEGRADATION AND CLIMATE CHANGE ARE PREDICTED TO REDUCE CROP YIELD BY **10% GLOBALLY** AND **UP TO 50%** IN CERTAIN REGIONS[6]

If soil natural capital is degrading, then businesses are at risk, as are ecosystems and the services they provide to societies and economies.

Many businesses are already responding to this threat and investing in soil health. For example, in 2013 Syngenta committed to improving the fertility of 10 million hectares of degraded farmland by 2020. Four years into the soil commitment, they had implemented 157 projects in 41 countries, benefiting a total of 7.5 million hectares. Similarly, Olam has invested in training over 26,500 sugarcane farmers in India on practices to improve soil health, such as the use of organic inputs, novel row spacing, companion cropping technologies and improved irrigation and water conservation techniques (e.g. crop mulching). Through the program, use of organic inputs among farmers more than doubled and crop yields increased by more than a third[9].

THE EU POLICY CONTEXT

Agricultural land accounts for 40 % of total EU land. Agriculture and food related industries and services provide over 44 million jobs in the EU, and 22 million people are directly employed in the sector itself. In 2018, the European Commission presented legislative proposals on its agricultural subsidies system - the Common Agricultural Policy (CAP) - that aim to make it more responsive to current and future challenges such as climate change and generational renewal, while continuing to support European farmers for a sustainable and competitive agricultural sector. Specifically, this includes higher ambition on environmental and climate action through mandatory requirements on preserving carbon-rich soils through protection of wetlands and peatlands; and obligatory nutrient management tools to improve water quality, reduce ammonia and nitrous oxide levels. There is also discussion of financial support for actions that promote carbon sequestration such as crop rotation, reduced tillage, direct sowing and agroforestry.

Under the proposed new legislation farmers will have the possibility to contribute further and be rewarded for going beyond mandatory requirements, and EU countries will develop voluntary eco-schemes to support farmers to observe agricultural practices beneficial for climate and environment. Research and innovation forms a key part of this and the European Commission has proposed to set aside €10 billion euros from the Horizon Europe programme for research and innovation in food, agriculture, rural development and the bio-economy. Based on the results of the reporting under the Monitoring Mechanism Regulation, all EU Member States explicitly identify the agriculture sector as one of their priority sectors, and there are opportunities for implementing a wide variety of measures at farm level that aim to improve the management of soils and water, resulting in benefits for climate change adaptation and mitigation, the environment and the economy. Businesses have an important role to play in enabling adaptation at the farm level, where adaptation measures are currently poor due to lack of resources for investment, institutional capacity and access to adaptation knowledge[16].

The business case for investing in soil health is therefore strong, and offers a win-win from both economic and environmental standpoints.

Benefits will be delivered across the business - from maintaining or enhancing revenues and reputation, reducing costs, increasing resilience, or opening up new finance and investment opportunities[9].

Reducing and reversing soil degradation, at scales from individual farms to entire watersheds, can provide cost effective, immediate, and long-term benefits to communities and support several Sustainable Development Goals[17] (SDGs) with co-benefits for adaptation and mitigation. The IPCC's report on climate change and land estimates the total technical mitigation potential from sustainable agriculture activities and agroforestry is 2.3-9.6 gigatonnes of equivalent carbon dioxide (GtCO2e) per year by 2050[13].

3.2. THE BUSINESS CASE FOR INVESTING IN BIODIVERSITY PRESERVATION

The importance of preserving biodiversity goes far beyond its inherent value, and there is a strong business case for its conservation. A large, growing body of research and practice from around the world demonstrates that many components of biodiversity have direct, obvious relationships to agricultural productivity, whilst other components have indirect, less obvious roles in production or generate benefits beyond the farm to wider society. Understanding the benefits of different components of biodiversity is necessary for businesses to manage resources and identify opportunities to maintain yields, livelihoods and supply chains. This understanding must be coupled with an appreciation of risks and opportunities linked to the reputational, financial, legal and regulatory implications, as well as the less quantifiable cultural significance of biodiversity.

Biodiversity is essential to agricultural production. Seventy five percent of global food crop types (primarily fruits, nuts and seeds) rely on animal pollination, and pollination increases the global value of crop production by US$235-577 billion per year[6,18]. Certain species groups also provide pest and disease suppression, nutrient cycling and other services integral to sustainable production. For example, earthworms play an important role in the control of many soil-borne pests such as plant fungi [19,20]. Twenty three percent of land areas have already seen a reduction in productivity due to land degradation, and without sufficient biodiversity, global food production will become increasingly volatile[6]. Maintenance and recovery of biodiversity within and around farms guarantees those ecosystem services which underpin crop production, making farms ecologically and economically sustainable in the long term. Moreover, inclusion of biodiversity and its services as part of good farm management can reduce input costs and increase productivity. In short, incorporation of biodiversity in agricultural landscapes makes them more resilient, more cost effective, more sustainable and more productive.

As with soils, businesses are recognising the importance of preserving biodiversity within their operations. For example, building on the success of their soils program, Syngenta started the "Multifunctional Covers" (MFC) campaign. MFCs, which integrate flowers into cover vegetation, provide nectar sources for pollinating insects and support agricultural biodiversity enhancement[9]. Similarly, in Brazil, British American Tobacco has worked in partnership with NGOs to promote cost-effective solutions to improve agricultural sustainability, biodiversity conservation and livelihoods; and to strengthen the business case for biodiversity and ecosystem services management in agriculture and encourage widespread adoption of local good practice[21].

The business case for investing in biodiversity includes maintaining or increasing revenues, reducing costs, enhancing reputation, or opening up finance opportunities. Whilst an investment may be primarily focused on one outcome (e.g. enhancing crop productivity or livelihoods, climate mitigation, improving water resources, or protecting biodiversity), an investment in biodiversity for any one of these outcomes will deliver multiple benefits.

THE UK POLICY CONTEXT

The 25 Year Environment Plan set by the UK government sets out a broad ambition to protect and enhance the environment, including improvements to agricultural landscapes. As a means to deliver on the Environment Plan, the UK Agriculture Bill was developed with a view to replace direct subsidies for farmers and instead transition to a system of payments for public goods. However, questions remain over what exactly will be considered a public good. Within the bill, the Environmental Land Management (ELM) scheme thus far specifies that farmers and land managers will be paid public money (i.e. not subsidies) in return for providing environmental benefits such as clean air, clean water, reductions in environmental hazards and pollution, thriving plants and wildlife, enhanced landscapes, and mitigation and adaptation measures to minimise the impact of climate change. Unfortunately, at the time of writing (November 2019) the Agriculture Bill failed to make it through its second reading in Parliament due to a change in session, and so its future remains uncertain.

4. RECOMMENDED BUSINESS ACTIONS

We have identified four priorities for business action. These actions will enable businesses to have an impact and ensure their supply chains incorporate practices that increase biodiversity, enrich soils, improve watersheds and enhance ecosystem services, whilst providing increased yields, resilience to climate instability, and higher health and vitality for farming communities.

4.1. PROVIDING RESOURCES TO SUPPORT EVIDENCE-BASED DECISIONS

Long-term decision-making should be based on evidence and not assumptions. Farmers have significant expert knowledge of agricultural landscapes that scientists lack, but their extremely busy workloads combined with a regularly changing evidence 'landscape' means it is challenging to stay up to date with newer approaches. As a result, farmers may base decisions on how they have always done things. Similarly, farmers have a lot of knowledge about their own land, but often do not monitor 'invisible' impacts (e.g. groundwater pollution). Businesses should build capacity for farmers to independently assess whether to adopt soil health and biodiversity promoting practices, including profitability and economic risk.

Businesses can support farmers by providing resources that enable farmer-led monitoring that in turn enables identification of the most effective measurements for soil health and biodiversity and supports environmentally sound and evidence-based management decisions. Embedding scientific approaches that integrate soil health and biodiversity into reporting, accounting and supply chain assurance, and demonstrating how such land management systems deliver environmental benefits, should be a priority.

Taking a landscape approach to agricultural management can also increase the positive impacts and benefits to the environment. Such approaches involve engaging relevant stakeholders across large areas where agriculture and other productive land uses may compete with environmental and biodiversity goals, and providing them with the tools and concepts to allocate and manage land to achieve social, economic, and environmental objectives[22]. Another way businesses can enable farmers is by taking advantage of the national context. For example, alignment with national agriculture, soil health and biodiversity policies could open up financial options and technical support for in-country producers.

CASE STUDY 1:
PARTICIPATORY MONITORING WITH FRESHWATER WATCH

The Ciliwung river is a 119 km long river flowing from the volcanic ranges of West Java, through the Indonesian capital Jakarta, and out into Jakarta Bay. Earthwatch have partnered with HSBC employees living in Jakarta and the local Agroclimate and Hydrology Research Institute to monitor water quality along the river. Their measurements show that nitrate and phosphate concentrations in the river are influenced by both agricultural practices and rainwater intensity.

The results of the study have contributed to water improvement projects along the river's course including influencing farming practices in the upstream area of Ciliwung River. The farmers are reducing fertiliser dosages for their agricultural needs to reduce their impacts on the river. This is improving water quality in Jakarta, where thousands of people live in stilted houses directly above the river.

Supporting and encouraging farmer autonomy can also carry significant financial benefits to both farmer and business. For example, outside of information provided by government agencies such as SEPA or charities such as the Soil Association, soil data is typically only available to farmers through a range of soil testing and interpretation techniques that are provided by commercial companies for a significant fee (e.g. sampling and laboratory-based analysis, GPS soil mapping and soil structure scanning). Paying for such services is not considered economically viable on small-scale farms and on certain farm types[23].

Similarly, farms with biodiversity friendly production practices require evaluation and monitoring (typically financed by the private sector) in order to be credible. As such, their practical implementation is affected by budget restrictions that limit the number of indicators that can be measured, the number of samples that can be taken, and the frequency of surveys. A recent review of farm biodiversity monitoring found no monitoring program that operates at the farm scale, despite evidence that this would facilitate communication with farmers, and support the interpretation of biodiversity indicator trends. Furthermore, farmland management indicators have been identified as a stakeholder priority, and biodiversity and management records could be linked to farm accountancy monitoring, which is carried out in all North American and European countries[24]. Therefore, putting power back in the hands of farmers through developing appropriate methods for farmer-led monitoring should be a priority.

4.2. SUPPORTING LONG-TERM DECISION-MAKING

The majority of agricultural producers farm the same piece of land for multiple years, decades and even generations, and thus have an invested interest in considering the long-term consequences of decisions they make. However, yield and harvest requirements of food businesses can push farmers to base decisions on short-term production goals, despite potential negative longer-term consequences of such choices on productivity, soil, biodiversity and water.

Businesses can increase capacity and motivation for supporting long-term decision-making at the farm level (and across the business) through externally-led 'immersive' experiences. This refers to experiences that place participants within environments that enable them to connect with the relevant issues and understand the consequences of their actions and impacts more broadly in the context of ecology, climate change and the wider environment. These kinds of approaches both challenge and enable individuals to identify and take positive action within their sphere of influence, whilst also developing professionally relevant skills like business planning, teamwork, project management, resourcing, communication skills, critical thinking, and fact-based decision making.

CASE STUDY 2:
SOCIO-ECOLOGICAL ASSESSMENT OF THE STEVIA SUPPLY CHAIN

Stevia is a low-calorie sweetener that is rapidly growing in demand globally due to its health benefits over sugar. In partnership with a global supplier of food and beverage ingredients, Earthwatch has developed and is conducting research to understand the socio-ecological impact of farming stevia in China (one of the largest global producers of stevia), and support the client in ensuring the market grows using sustainable and ethical practices.

Our analysis of the stevia supply chain will provide new knowledge and insight into the impacts that the client's operations have on the environment and local communities, while our recommendations will enable them to deliver practical guidance on best practice to growers and communities across their stevia supply chain and beyond.

Businesses can also support long-term decision making amongst farmers by lowering the hurdles to practices that promote soil health and protect biodiversity. For example, by exploring value-capture systems that support the grower in offsetting the initial cost of implementing sustainable agricultural practices. However, it's important to note that not all sustainable practices have higher or upfront costs, and while there is a wide perception that sustainable actions are more expensive, in practice this is often not true[25].

4.3. ENABLING LOCAL ADAPTATION

Every farm is different in terms of local environmental variables and the specific challenges and opportunities facing the producer, and circumstances can change over time and with changing weather conditions. Therefore, adapting action to local context is key. Businesses can work with farmers to help them develop relevant mitigation strategies that are appropriate to their local environment, in order to improve the sustainability of their operations, and implement practices that increase soil health and promote biodiversity whilst also improving efficiency (Table 1). Investment in new and innovative sustainable management practices at farm level is also worthwhile and can be of benefit in the longer term. Through collaboration between scientists and farmers, we can develop new practical ways of working and equip farmers with tools to monitor their impact on soil health and biodiversity and adjust their practices accordingly.

CASE STUDY 3:
ABILITY OF COPPICE BUNDLES TO PREVENT SOIL EROSION ON AGRICULTURAL LAND

Earthwatch is engaging farmers in a novel field trial to understand whether installing waste wood products (coppice bundles from rotational cropping) on exposed agricultural soils can prevent environmental damage from soil erosion and reduce nutrient run off into watercourses.

Our research explores the potential of this nature-based solution and determines whether low-impact interventions can enhance the biological potential of waste wood materials, and deliver innovation to support the new circular agricultural bio economy. Furthermore, creating a market for coppice by-product could encourage coppicing as a commercial venture, creating valuable woodland habitat.

SUSTAINABLE PRACTICE	CHALLENGES	POSITIVE OUTCOMES
Cultivate several crops at once (multicropping)	Advance planning of planting, cultivation, fertilisation, spraying & harvesting of more than one crop in the same field is required	Weed, pest & disease reduction, increased soil fertility & efficiency in water & nitrogen use, reduced soil erosion
Practise agroforestry	Lack of financial assistance, training & expertise, developed markets, & potential competition between trees, crops & animals	Increased landscape heterogeneity, habitat for pollinators & pest predators that benefit agricultural production
Plant nitrogen fixing crops	Lack of processing facilities in some regions (UK), reduced resilience to extreme weather, lack of investment in increasing yields	Improved nutrient cycling & soil quality, biodiversity conservation
Reduce tillage	Increased pressure / importance to plant during optimum field moisture conditions	Increased soil moisture & carbon storage
Practise integrated soil fertility management	Lack of policy, financial & institutional support for implementation in low income countries	Healthy mycorrhizal networks, beneficial organisms that suppress soil-borne diseases & pests. Reduced yield losses & pesticide use
Retain crop residues	Release of nutrients (mineralization) in residue back to soil takes 1+ years	Food supplies for insects, birds & small mammals
Use locally-adapted crop varieties & heritage crops	With some (but not all) varieties, yields can be lower, disease resistance reduced, & maintenance during growing session increased	Improved biodiversity & ecosystem services, increased genetic diversity, & resilience to extreme weather & climate conditions
Practise crop rotation	Risk of disease transfer between crops, potential reduced annual yield (especially if expertise is lacking), inability to specialise in one crop type	Improved crop resilience, better nutrient cycling, conservation of biodiversity, improved soil quality
Plant cover crops	Planting & removal of cover crop occurs at busiest time for harvesting & planting of cash crops – farmers are time poor	Reduced soil degradation, nitrate leaching & water pollution, lower requirement for nitrogen fertilisation, improved wildlife habitats & diversity
Switch from annual to perennial crops	May result in increased water use (year round instead of seasonal) & pest populations. Restricts ability to practice crop rotation. Also, there is a lack of public funding for R+D into developing perennial varieties of annual crops (e.g. wheat, rice, legumes, maize, sorghum)	Reduced soil erosion, improved water & nutrient conservation & pest tolerance, increased carbon storage
Practise terrain terracing	Typically reduced ability to use modern technology for planting & harvesting, lack of irrigation	Reduced surface runoff & soil erosion, water harvesting, greater soil depth and potential for precision farming (e.g modify aspect for optimal exposure & draining)

Table 1: Potential positive environmental outcomes and implementation challenges of different agricultural practices

4.4. SUPPLY CHAIN COLLABORATION

Investing in soil health and biodiversity protection delivers both public and private benefits, and fostering dialogue between different stakeholders can increase sustainable practices that address biodiversity issues and promote soil health more broadly. Adapting action to local context is key, and businesses should focus on building partnerships with NGO's, public-private partnerships, civil society, government agencies and landscape alliances. One approach to this is through co-ordinating workshops that enable knowledge exchange and peer support between land-managers, businesses and other local stakeholders to inform decision making. This kind of approach can promote innovation, spread costs and risks, and ensure locally-appropriate solutions.

The greatest impacts can be achieved by working together, whether that be farmer to farmer, or across supply chains. For example, the actions of one farmer affect neighbouring farms, and facilitating collaboration between individual farmers at the landscape level not only improves environmental outcomes, but also increases efficiency and reduces costs. For example, farmer collaboration could support access to expensive GPS technology and associated soil data by providing economies of scale across multiple smaller farms.

The same logic applies to supply chains – changing practices across only one component is inefficient, and systems level thinking is required for the greatest impact. Engagement across the business can also help to mainstream environmentally sound practices. For example, communication across teams about the business case for soils and biodiversity helps to embed practices and decision making at all levels of the business, supporting employee engagement and promoting business leadership. Finally, connecting agricultural businesses with their supply chain (i.e. growers / smallholders) in skill-sharing / collaborative partnerships can allow farmers to manage their operations more effectively, while providing agricultural businesses with greater insight to operational realities to allow them to manage these relationships more effectively and improve decision making.

CASE STUDY 4:
NURTURING POLLINATING INSECTS IN INDIA

India's Kullu Valley is an important area for agriculture. However, as a result of climate change and pesticide use, the populations of pollinating insects are declining. This in turn has led to a reduced apple crop, threatening the livelihoods of local people who depend on farming for income. Earthwatch is partnering with a local research institute to study the biodiversity in the Kullu Valley, and explore how agriculture is affected by the decline of plants known as 'bee flora', which attract pollinating insects. We are also investigating how agriculture benefits local communities, and how encouraging natural pollination by insects could make farming sustainable once more.

So far, the project has trained and equipped more than 50 local farmers and youths to become beekeepers, while 350 people have been trained about the importance of bee flora, leading to the planting of 2,000 varieties of these important plants. The data collected has also contributed to the Global Pollination Project, a worldwide initiative for the conservation of pollinating insects.

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CREDITS

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ABOUT EARTHWATCH EUROPE

Earthwatch is a global NGO that brings people, science and nature together to build a world in which we live within our means and in balance with nature. We focus on the environmental challenges where we can have greatest impact: reducing pollution of our water bodies; enabling sustainable agricultural land management and creating thriving places to live and work. We believe people can tackle the threats facing the natural world but only through collective action. We therefore take a collaborative approach, working with the public, government, business, educators and scientists to create knowledge, inspire action and drive change. Our approach is grounded in evidence and delivered through a combination of engaging and immersive experiences, citizen science and research.

WORKING TOGETHER

Our work in agricultural land management focuses on understanding and addressing the environmental impacts of agricultural practices at a landscape scale and also within supply chains. This sees us working with businesses, farmers, and communities across three key areas:

1. Supporting innovators and land managers to test and embed evidence-based environmentally sustainable practices in mainstream agriculture, including through stakeholder-driven and Earthwatch-led research.
2. Investigating opportunities for increased sustainability in agriculture-based supply chains, opening up science-based solutions for business to improve environmental outcomes.
3. Engaging both land managers and the public with evidence on best practice in sustainable agriculture to encourage informed and environmentally responsible decision-making.

If you are interested in exploring opportunities to collaborate, please contact us at
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