BACKGROUND BRIEF

AGROECOLOGY & SYSTEMS THINKING

Green Avengers

THE CANOPY LAB

This briefing note provides a short overview of agricultural terms. It assumes that the reader is familiar with MSD. It was prepared by Clara García Parra, Principal Consultant at the Canopy Lab, for the Green Avengers Community of Practice. If you would like to join the Green Avengers, please complete this survey.

Agroecology & Systems Thinking

We do not all need to be agronomists, but there are some basics we should know.

Conventional agriculture, while effective in increasing short-term yields, relies heavily on agrochemicals that harm the environment, degrade soil health, and jeopardize the sustainability of the agricultural systems we aim to strengthen. Regenerative agriculture offers an alternative that not only maintains but aims to enhance the resilience and productivity of agricultural systems.

Between conventional and regenerative agriculture, there is a full spectrum of sustainable agricultural practices that rely on practices such as crop rotation, agroforestry, reduced tillage, or organic farming, all of which improve soil health, increase biodiversity, and reduce dependency on synthetic inputs.

In this brief, agriculture encompasses activities geared towards growing, harvesting, processing and marketing products intended for food, textiles, energy or construction (amongst other uses). For most MSD projects, agriculture encompasses farming, fisheries or agropastoral activities, as well as foraging and other activities such as apiculture.

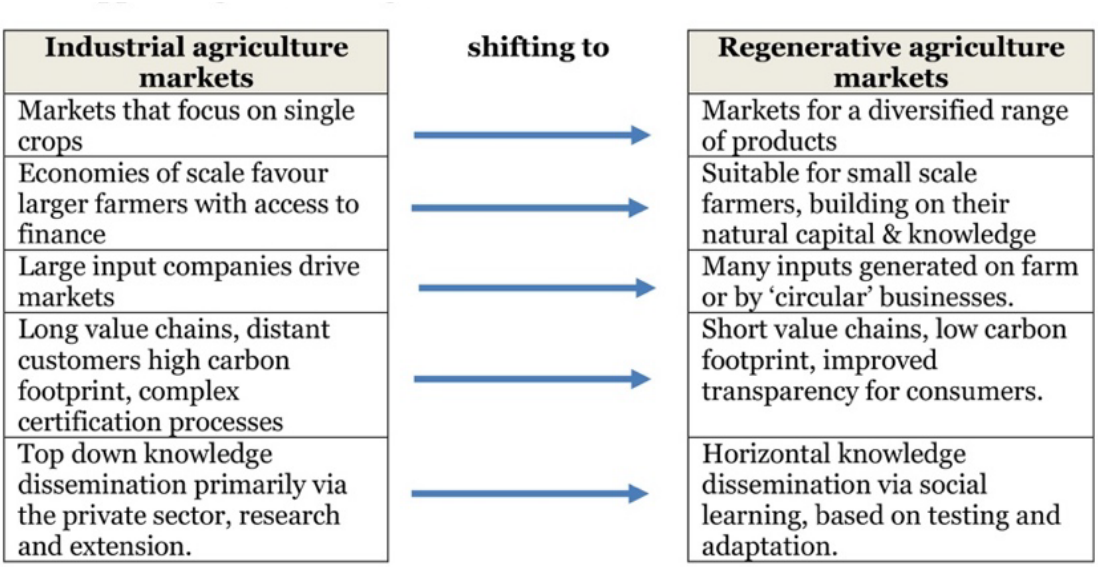
Getting the basics straight: useful terms and some examples

Most of this content is adapted from the Greening the MSD approach for agricultural programs glossary. Note that most of these concepts are linked (for example, conservation agriculture is usually associated with carbon storage).

Sustainable agricultural practices

- ***Agroecology / regenerative agriculture***: approaches that integrate ecological principles[1] into farming systems to promote sustainable and resilient food production while restoring or enhancing the health of ecosystems. See the presentation prepared by IFAD for the Green Avengers. Practical Action developed a useful guide to support MSD projects aiming to transition from conventional to regenerative practices. Here is a table included in their blog where they summarize 5 key strategies that MSD projects can use:

[1] Key ecological principles for land use and management deal with time, species, place, disturbance, and the landscape. https://cfpub.epa.gov/watertrain/pdf/modules/landuseb.pdf



Industrial agriculture markets	shifting to	Regenerative agriculture markets
Markets that focus on single crops	→	Markets for a diversified range of products
Economies of scale favour larger farmers with access to finance	→	Suitable for small scale farmers, building on their natural capital & knowledge
Large input companies drive markets	→	Many inputs generated on farm or by 'circular' businesses.
Long value chains, distant customers high carbon footprint, complex certification processes	→	Short value chains, low carbon footprint, improved transparency for consumers.
Top down knowledge dissemination primarily via the private sector, research and extension.	→	Horizontal knowledge dissemination via social learning, based on testing and adaptation.

- ***Agroforestry***: sustainable land use system that combines the cultivation of trees or shrubs with crops or livestock in a mutually beneficial manner.
- ***Climate-smart agriculture:*** approach that aims to address the challenges posed by climate change while promoting sustainable food production, increased adaptation to climate change, and climate change mitigation through for example the reduction of GHG and the protection of carbon sinks.
- ***Conservation agriculture***: farming approach that supports minimal soil disturbance, permanent soil cover, crop rotation and diversification as elements that support the conservation of natural resources.
- ***Organic agriculture***: Agricultural production system that places a strong emphasis on sustainability, environmental protection, and the avoidance of agrochemicals and genetically modified organisms.
- ***Sustainable agriculture***: approach that seeks a balance between human needs for agricultural products while minimizing negative impacts on the environment.

Traditional approaches

- ***Conventional agriculture***: also known as industrial agriculture, this is the most dominant and widely practiced approach to farming that relies on modern technologies, standardized methods, and the use of synthetic inputs such as chemical pesticides and fertilizers.
- ***Intensive / extensive agriculture***: Intensive agriculture refers to practices that have high input intensity and aim to achieve high productivity in reduced areas (such as greenhouse horticulture or commercial dairy). Extensive agriculture refers to less inputs per unit or land in larger land extensions – for example pastoralism in open rangeland. Many traditional MSD projects have favored this approach to agricultural development, seeking economies of scale and consolidation while also ensuring food safety through the introduction of standards and good agronomic practices.

Technological solutions

- ***Carbon capture and storage (CCS)***: practices aiming to capture and store CO2 emissions underground relates to methane capture or carbon sequestration in soils through for example no-till agriculture, increasing soil coverage or agroforestry. See carbon finance note in the resource library.
- ***Precision agriculture***: Also referred to as precision farming, it constitutes an advanced approach to farming that uses technology and data-driven methods to optimize various aspects of agricultural production through improved resource use to increase farming productivity.

Ecosystem and nature-based concepts and approaches

- ***Natural capital***: the stock of natural resources and ecosystems on our planet including air, water, soil, minerals, forests, oceans, and biodiversity. This stock delivers ecosystems services upon which humankind depends. In food systems, these include pollination or pest management by multiple species.
- ***Nature-based solutions***: strategies that leverage the power of natural functions and processes to address environmental, societal, and economic challenges. In agriculture, these include agroforestry, cover cropping, crop rotation, integrated pest management, polyculture, or sustainable livestock grazing.
- ***Payment for ecosystem services (PES)***: mechanisms that provide financial incentives to agricultural market actors to sustainably manage the ecosystems in which they operate and on which they rely. Examples of PES in agriculture include carbon sequestration, water quality improvement, soil or biodiversity conservation.
- ***Resilience***: ability of agricultural market systems to allocate resources, draw on system-level resources (such as social safety nets, social capital, the financial system, or government assistance), and innovate in order to solve problems in the face of climate-related shocks and stresses (adapted from Market Systems Resilience- a framework for measurement).
- ***Soil erosion***: process by which the top layer of soil (topsoil) is removed due to natural factors such as water, or human activities, such as fertilizer abuse. This erosion of topsoil has detrimental effects on agricultural productivity and the environment and is likely to generate dependency on ever-increasing amounts of agrochemical use. We are constantly updating our understanding of the importance of healthy soils – not only do they act as carbon sinks, but they are also key for biodiversity and ecosystem health.
- ***Vulnerability***: The degree to which ecosystems and agricultural socioeconomic systems are susceptible to climate change, assessed in terms of the exposure to climate-related impacts.

Additional reading and resources: some of our top picks

For those of you looking to get back to basics in terms of how to incorporate greening practices into your programs (whatever stage they're at), check out the "Greening the MSD approach for agricultural programs" on the BEAM Exchange.

If you' would like to read a (refreshingly) strong-worded view on how our current food systems are built on and reinforce oppression, read "Feminist Climate Justice: A Framework for Action (Chapter 2)" by UNWOMEN. It is a good resource for those of us interested in the Women's Economic Empowerment angle.

Looking for an introduction to regenerative agriculture and how it fits with environmental and social objectives? Look no further than the "Aligning regenerative agricultural practices with outcomes to deliver for people, nature and climate" Report by the Food and Land Use Coalition (2023). If you're more interested in agroecology and its potential to scale, ActionAid has you covered through the "Agroecology: scaling-up, scaling-out" resource which is full of practical ideas.

For those of us interested in the circular potential of food systems, the Ellen Macarthur Foundation has a whole section dedicated to the topic, including reports and importantly ongoing pilot initiatives with large market players.