



NOURISHING A BETTER WORLD

Global Regenerative Agriculture Framework



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Message to Suppliers

At Grupo Bimbo, we exist to nourish a better world. That means nourishing the wellbeing of people and nature, because we can only truly achieve better if we do both. This is a bold ambition, and it won't be a simple journey, but we have a plan to get there. It's a plan to bring better nutrition to millions. By providing more diverse nutrients in simpler recipes. To fight the degradation of nature. By becoming a zero-carbon champion of regenerative agriculture. To help our communities thrive. By empowering those that help us sow, source and sell. We're nourishing people and nature so that we can all be stronger together.

As the world faces enormous challenges due to climate change, biodiversity loss and degradation of soils, we want to make sure we are doing our part to promote solutions. That's why we have set an ambitious goal to have **100% of our key ingredients be sourced from land being farmed using regenerative agriculture practices by 2050**. At the core of regenerative agriculture is ecologically sound farming practices to address the long-term health of our agricultural soils and farm families. However, regenerative agriculture can also result in reduced agricultural emissions and soil carbon sequestration that together can have a positive impact on climate change. To further demonstrate our commitment, we have set an ambitious goal to achieve net zero carbon emissions by 2050. This commitment goes beyond just Grupo Bimbo's own operations to include all the work done by our suppliers to produce the ingredients that we use in our products. Achieving this goal will require working closely with the farms that provide the strategic ingredients that we rely on.





We know that these are ambitious goals, and the path to achieve them will require hard work, creativity, and close partnerships with farmers, producers, suppliers, scientists, governments and peers.

*The Regenerative Agriculture Framework presented here is intended to help our supply chain partners understand the major principles we will be promoting and measuring as part of our commitments. **These principles are soil health, biodiversity and ecosystem health, and enhancing producer communities.** In addition, with this exercise, we add to the discussion that the food industry is having at a global level and in which Grupo Bimbo participates through various international and local alliances. We are excited for the opportunity to grow our brand and begin to engage the agricultural sector in new and exciting ways.*

David Hernández

Global Procurement - Grupo Bimbo

Introduction

This document aims to provide the Regenerative Agriculture Framework that Grupo Bimbo will use to promote regenerative practices and measure impacts across all the regions that we source from around the world. In accordance with the work that Grupo Bimbo has already committed to, including Grupo Bimbo's Global Agriculture Policy, this framework will focus on definitions, goals, primary principals, impacts, and opportunities to consider while supporting the transition to regenerative agriculture practices.

We are building from a strong foundation of work, that began when Grupo Bimbo first formalized a Global Agriculture Policy in 2017. Since then, Grupo Bimbo has worked to consistently update our goals and stay informed of the most pressing environmental and social issues facing our supply chains. With the help of Earthworm Foundation, we are committed to formulating a response that is equal to the task at hand.

Grupo Bimbo supports regenerative agricultural practices that promote environmental, economic and social recovery, long-term health, resilience and adaptation. We recognize that, in the long term, the livelihoods of farmers will depend on the availability and quality of natural resources and, in the same way, the health and well-being of the entire population is related to the health of agricultural production systems on which we all rely.

This document is based on current industry best practices in regenerative agriculture, from the most relevant global agricultural research as well as our internal findings through sustainable agricultural pilots, primarily with CIMMYT in Mexico. We are committed to updating this framework as new and relevant information comes to the forefront.



Regenerative Agriculture for Grupo Bimbo



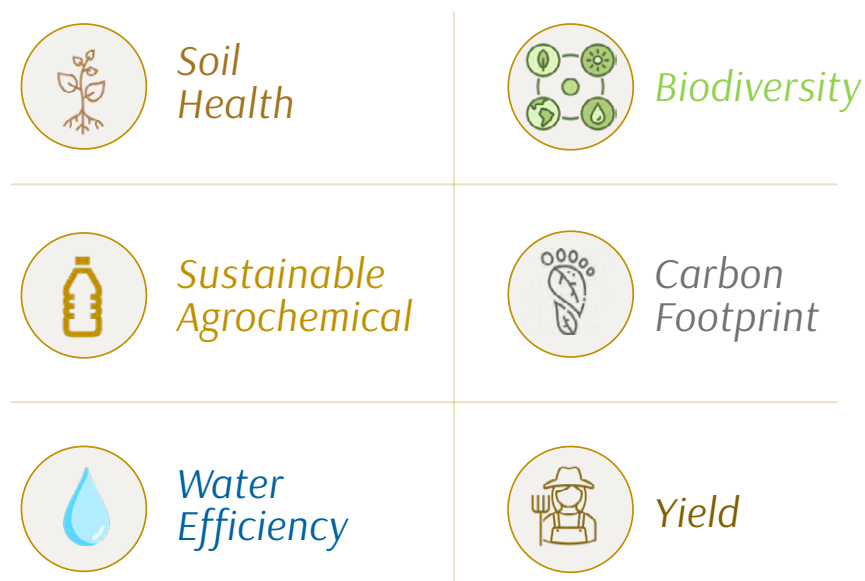
Grupo Bimbo is the world's largest baking company, producing more than 13,000 products across more than 33 brands in 35 countries. We rely on key ingredients such as wheat, corn, potatoes, and sugar, which are grown on millions of hectares of land around the world and we recognize that the conventional agricultural practices that are widely used today are degrading the soil, reducing biodiversity, and contributing to greenhouse gas emissions. We believe that regenerative agriculture is a key pillar to achieve our sustainability strategy, while also ensuring the quality and availability of key ingredients for generations to come.

Regenerative agriculture is the implementation of farming practices that aim to improve the health and fertility of the soil, enhance biodiversity, sequester carbon from the atmosphere, increase water quality, and enhance producer communities. In the following sections, we outline the generally accepted practices that contribute to these outcomes. These practices include no-till, living roots year-round (cover crops and rotational crops) and leave the stubble on the ground.

These practices are based on the principles of mimicking nature, minimizing disturbance, maximizing diversity, and integrating animals and crops. Grupo Bimbo is adopting a holistic approach that is flexible based on the region, soil type, ingredient, and local context.

To be considered part of our regenerative agriculture program, hectares must have a minimum of two regenerative agriculture practices implemented with the ambition to increase the practices on the land, depending on the local context. In addition, each program will have a component of technical assistance and education as well as practice and outcome data collection to demonstrate change and continuous improvement.

We are monitoring and measuring the impact of regenerative through the following KPIs:



Our goal

Our goal is to have 100% of our key ingredients (wheat, corn, potatoes, and sugar) produced with regenerative agricultural practices by 2050. We work with farmers, suppliers, NGOs, academic institutions, and other stakeholders to design and implement regenerative agriculture programs that are tailored to the specific needs and challenges of each location.

We believe that through collaborating with others in the industry and sharing best practices, we will be able to scale regenerative agriculture across the food industry and see positive change.



Our Goals and Commitments

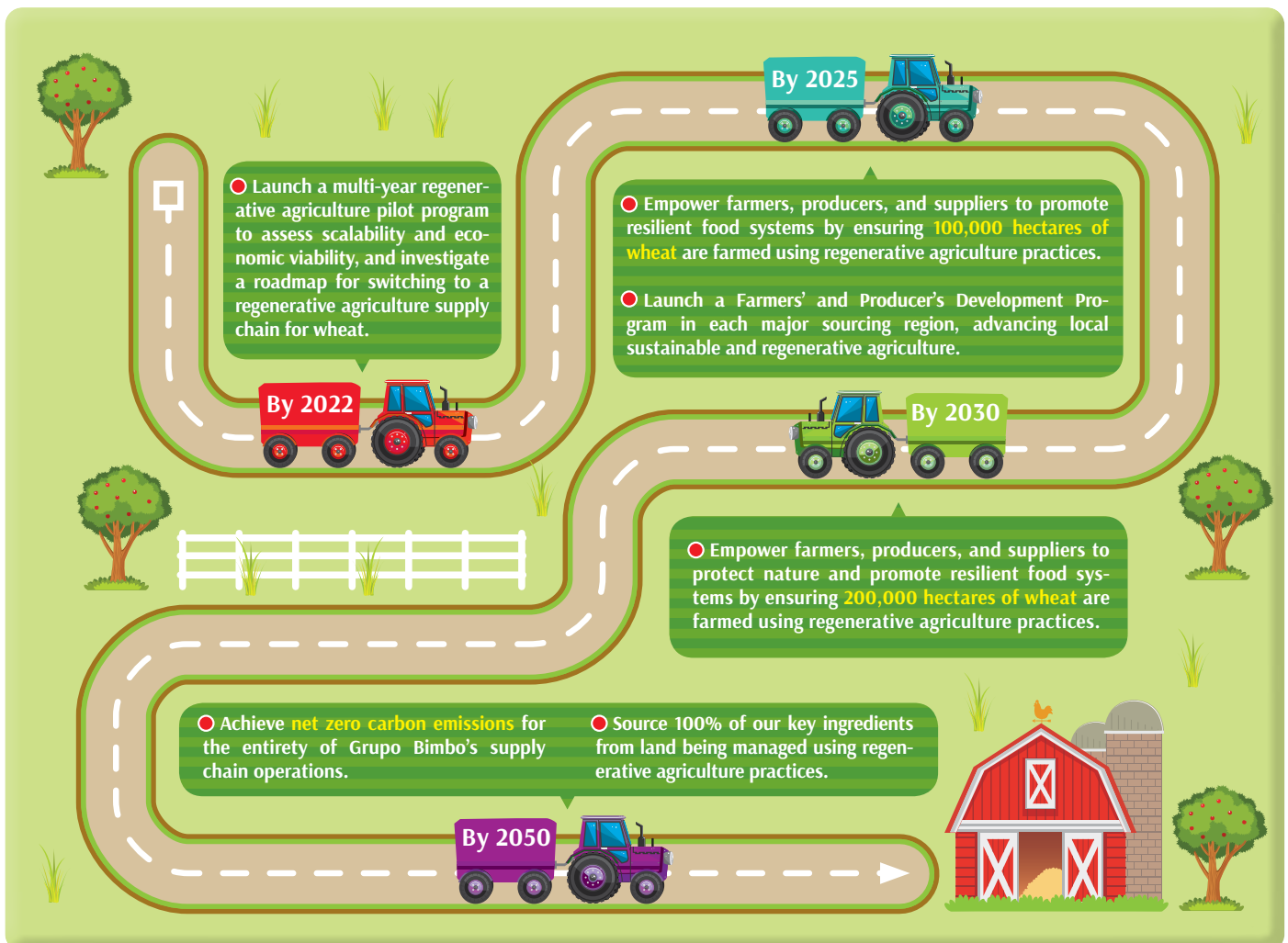
“Grupo Bimbo is committed to the promotion of systems of regenerative agriculture that improve soil health, strengthen biodiversity and ecosystem health, and enhance producer communities. Focusing on regionally specific practices that prioritize minimizing soil disturbance, improving the water cycle, and increasing biodiversity may help lower our carbon footprint while creating greater resiliency in agriculture communities”.



Grupo Bimbo is **committed** to transitioning to regenerative agriculture practices that capture carbon, enrich soils and enhance farmers' and producers' livelihoods where all Grupo Bimbo's key ingredients are sourced. We will achieve this by:

1. **Working** with farmers and producers to understand the benefits and needs of regenerative agriculture practices in their specific context.
2. **Supporting** farmers and producers in their transition to regenerative agricultural practices.
3. **Collaborating** in research and development with regards to regenerative agriculture along with other key players in the industry and value chain.
4. **Sourcing** from farms and producers practicing regenerative agriculture for all of Grupo Bimbo's key ingredients, while prioritizing wheat, our largest volume commodity, in the beginning.

To achieve this commitment, we have set the following intermediate goals:





Contribution to UN Sustainable Development Goals

Grupo Bimbo supports the **UN Sustainable Development Goals** and seeks to align this work with specific goals set internationally in this framework. The **Sustainable Development Goals (SDGs)** were created as a universal call to end poverty, protect the planet and work towards peace and prosperity for all people by 2030.



Contribution to UN Sustainable Development Goals

There are 17 different SDGs, but they are all interrelated, since interventions in one area will affect the results of others, and because development must balance environmental, economic and social sustainability¹ (UNDP).



Food and agriculture play a major role in meeting the SDGs, since the sustainable provision of food is necessary to human life and plays a major role in issues such as poverty and malnutrition. Additionally, rural communities around the world are engaged in the production of food, and the farming practices that they utilize impact natural ecosystems, including the health of forests, soils and water, as well as impacting farm-based livelihoods. Rural development and investment in regenerative and sustainable agriculture are central to helping the global community achieve sustainable development over time.

The SDGs central to our agriculture commitments at Grupo Bimbo include:



2 ZERO HUNGER

► Recognizing that in most regions hunger is a food access challenge, not a productivity issue, Grupo Bimbo is committed to implementing climate resilient agricultural practices that will help to improve agricultural productivity, and simultaneously improve farmer and producer resilience.



13 CLIMATE ACTION

► Grupo Bimbo is promoting on-farm practices that will sequester carbon and minimize greenhouse gas emissions within our supply chains, with the goal of developing net-zero greenhouse gas emission value chains.



15 LIFE ON LAND

► Grupo Bimbo will support the restoration of degraded land and ecosystems through regenerative agriculture practices, regenerating the soils that we rely on to grow food.

¹ (Nations, n.d.)

Core Principles

Grupo Bimbo has identified the following three main principals of regenerative agriculture:

1. Soil health



2. Biodiversity & Ecosystem Health



3. Enhancing Producer Communities



Each principle is broken down into a series of associated desired outcomes with descriptions. Recommended practices to accomplish these outcomes will be specific to each region, commodity, and agricultural systems that Grupo Bimbo sources from. Metrics to track progress toward soil health, biodiversity and ecosystems health, and enhancing producer communities will be developed to reflect the practices established in each agricultural system.



The core principles for Grupo Bimbo's Regenerative Agriculture Framework and the priority outcomes have been determined through reviews of verified practices. These are summarized in this document and illustrated in **Figure 1**. We recognize that the ingredients we use are grown and produced all over the world, and no single set of practices will work everywhere. Local and regional research, as well as farm-by-farm experimentation will be needed to design the set of practices and measurements for each region that will work best in that specific place.

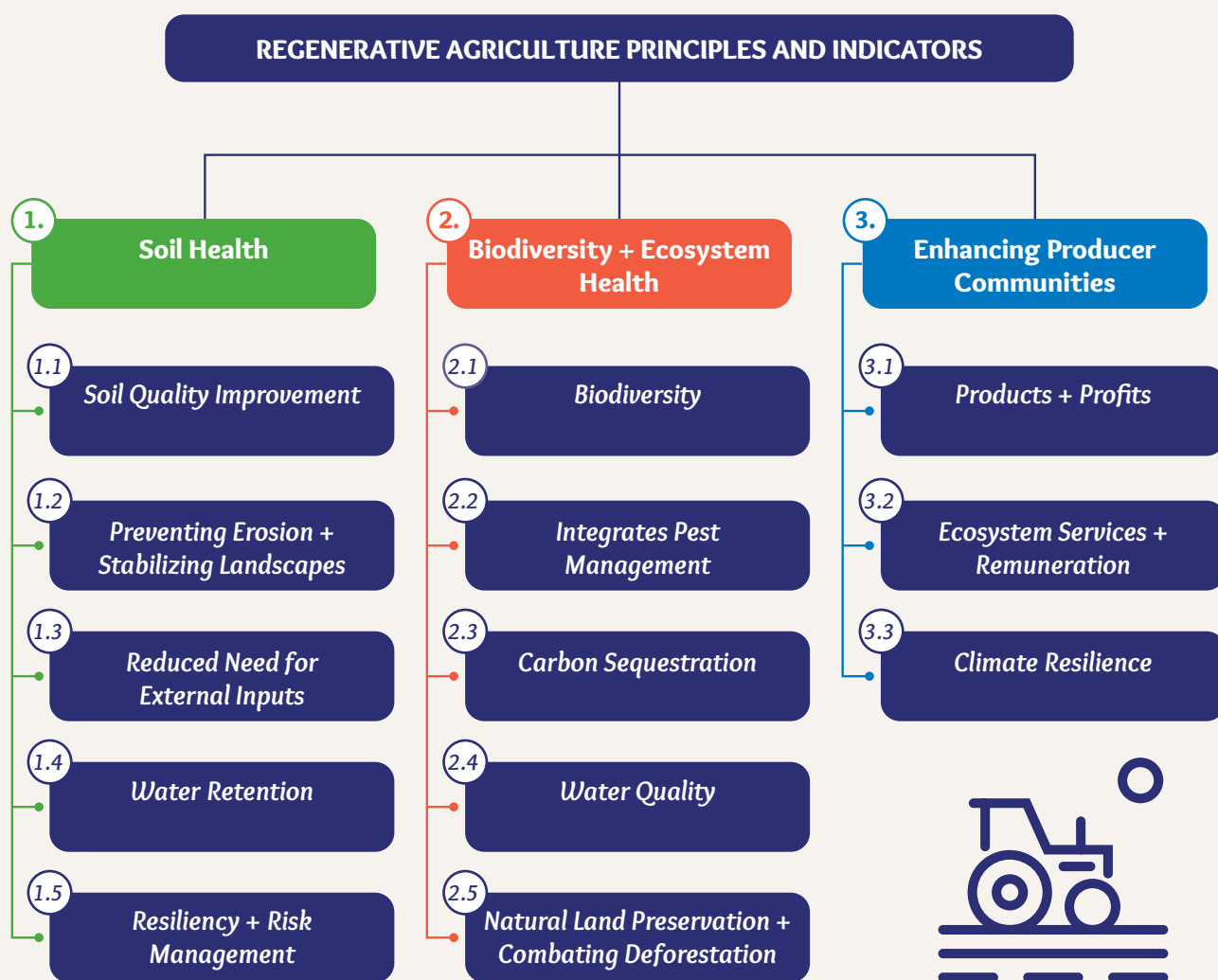


Figure 1: Overview of Regenerative Agriculture Framework, with indicators for key principles of Soil Health, Biodiversity and Ecosystem Health, and Enhancing Producer Communities.



1. Soil Health

“Sustainable land management, including sustainable forest management, can prevent and reduce land degradation, maintain land productivity, and sometimes reverse the adverse impacts of climate change on land degradation (very high confidence). It can also contribute to mitigation and adaptation (high confidence). Reducing and reversing land 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 (SDGs) with co-benefits for adaptation (very high confidence) and mitigation (high confidence). Even with implementation of sustainable land management, limits to adaptation can be exceeded in some situations”.² (FAO)

A thin layer of topsoil is responsible for ~95% of all the food produced for human consumption. Yet an estimated 33% of land³ is moderately to highly degraded. Overall, soil is being lost from agricultural areas 10 to 40 times faster than the rate of soil formation, endangering humanity’s capacity for food production.⁴

By transforming agricultural practices, we can begin to reverse this situation and build healthy and regenerative agricultural soils.

Soil is the cornerstone of any functioning agricultural system’s health. Soil is a complex network of living organisms, minerals, organic matter, liquids and gases. The layer that has seen the most critical damage is the topsoil – which is capable of storing large quantities of water, carbon, and providing a healthy biome for farmers to produce food.

Correct soil management can help us reduce and reverse the effects of erosion and degradation. The care of the soil is essential to meet the objectives set forth by Grupo Bimbo. Partners in the agriculture and food sector must work to stop the loss of healthy soils due to erosion and the deterioration of fertility due to the shortage of organic matter and use of chemical fertilizers.

Land degradation is a “decline in land quality caused by human activity”.⁵ Degraded land has diminished carbon above and belowground, and increased carbon dioxide off-gasses. Unsustainable farming practices such as excessive tillage, poorly managed irrigation, and improper fertilizing techniques can result in soil compaction, erosion, desertification, acidification, fertility depletion, loss of organic matter, salinization, and crusting.⁶

When the soil is already degraded and has lost its functionality to maintain high-yield crops, corrective work must be implemented to help rehabilitate the health of the soil. For healthy soil the structure, operation and dynamics of the natural system must be replicated, using practices such as minimal or zero tillage, use of organic fertilizers, incorporating beneficial microorganisms such as bacteria and fungi, in addition to conservation practices.

² (Intergovernmental Panel on Climate Change, 2020)

³ (Intergovernmental Technical Panel on Soils, 2015)

⁴ (Pimentel, 2013)

⁵ (Nair, An Introduction to Agroforestry, 1993)

⁶ (GRAIN)

1.1 Soil Quality Improvements



Description:

All regenerative agriculture practices lead back to increasing the vitality of soil, through additional organic matter, carbon, structure, etc. This includes improved annual cropping, livestock, and perennial systems. More soil organic matter can result in higher fertility, better drought resistance, less vulnerability to erosion, and less loss of nutrients via leaching.⁷ Regenerative agriculture systems from conservation agriculture to perennial crops also reduce or eliminate tillage of the soil. The elimination of tillage or reduction of tillage reduces erosion and increases the complexity and diversity of life in the soil.

Regenerative practices also improve the structure of the soil, reduce compaction, improve water cycling and capture, and boost plant growth. Deep rooted crops can increase the water storage capacity of soils.

Even in relatively level soils, tillage can cause erosion and runoff. Regenerative agriculture helps to reduce the loss of soil nutrients due to these conditions.

⁷ (FAO, IPCC, 2013)

Types of Practices



- No-till, low-till
- Cover crops + succession planting
- Living root systems year round
- Perennial agriculture
- Agroforestry systems
- Managed grazing
- 4R Management: nutrients applied from the Right Source, at the Right Rate, in the Right Place, at the Right Time⁸
- Integrated Pest Management

Measurement Example



- Soil organic matter
- Water retention capability
- Physical soil structure
- Soil microbial activity
- Soil pH
- Soil bulk density
- Nitrogen, Phosphorus and Potassium (NPK) levels
- Micronutrient levels

1.2 Preventing Erosion and Stabilizing Landscapes

Description:

Many regenerative agriculture practices help prevent erosion, which is one of the most essential components of ensuring long term soil health, slowing down the movement of water over landscapes, filtering water as it returns to the ground, and rehydrating landscapes.

Soil leveling can reduce the unevenness of the ground in the plot or field, respecting the natural slopes of the area, and on flat land, encouraging the reduction of water erosion, while streamlining the flow of water. It is recommended to respect the natural slopes of the area, and correcting only small slopes using specialized equipment, or through contoured farming techniques.

Leveling also allows for a homogeneous distribution of water within the plot or field covering the entire surface with well-distributed moisture.

Types of Practices



- Contour farming
- Ground leveling
- Cover cropping
- Living root
- No-till, low-till

Measurement Example



- Physical soil structure
- Soil organic matter
- Soil water retention
- Soil erosion (runoff plot, sediment collection)

⁸ (Nutrient Stewardship, n.d.)

1.3 Reduced Need for External Inputs

Description:

Reduced need of external inputs has been found through several regenerative agriculture practices including crop rotation, and use of perennials. The crop diversity of rotational polycultures provides greater pest protection.⁹ The protection increases with greater diversity. Perennial crops require fewer fossil fuel inputs than annual systems, and regenerative agriculture systems include important tools for reducing agricultural fuel emissions.¹⁰

The moment of application of fertilizers defines the productivity of the crop, a fertilizer applied at the right time increases the efficiency of use, prevents damage to the environment due to losses that occur, and this is reflected in higher yields.

When fertilizers are applied outside the optimal time, there can be loss of nutrients, waste of fertilizers and even damage to the crop resulting in added economic costs.

Plants need different amounts of nutrients at different stages of growth, and it is these that determine the optimal time for the application of fertilizers; the schedule for the application of fertilizers must match the demand of the developing plants.



Types of Practices



- 4R nutrient application: Right Source, Right Rate, Right Place, Right Time
- Integrated pest management
- Cover cropping
- Management and preservation of natural habitat
- Soil improvement mechanism

Measurement Example



- On site-biodiversity population (soil, plant, and animal species)
- Amount of chemical application used
- Amount of crop lost due to pest/weed pressure

⁹ 20. IPCC, Land Use, Land-Use Change, and Forestry 21. (Robert Watson, 2000)

¹⁰ Pelletier *et al*, "Energy Intensity of agriculture and food systems", 226 (Pelletier, 2011)



1.4 Water Retention

Description:

Regenerative agriculture systems help to reduce runoff and infiltrate groundwater, making more available for use on-farm. The increased organic matter in soils helps to improve the water holding capacity of agricultural soils.¹¹ Added retention on farms can decrease the need for irrigation systems, as well as improve the long-term health of the soil.

Greater water retention also means greater water filtration, less runoff, and an overall improvement of ecosystem health. Increasing the retentiveness of soils also is a cost saving mechanism, as less water needs to be used in artificial fertilization practices—saving on infrastructure cost as well.

Fortunately, this can mean minimum intervention on site, and low infrastructure requirements. Using furrows and minimizing erosion and runoff will increase water retention. Utilizing on site water resources (pond, stream, dam) can assist in these actions.

¹¹ Oxfam International, *Suffering the Science*, i-ii (Oxfam International, 2009)

Types of Practices



- Contour farming
- No-till, low till
- Cover cropping
- Living root systems
- Alley cropping
- Managed grazing
- Agroforestry

Measurement Example



- Soil organic matter
- Water retention capability
- Soil structure

1.5 Resilience and Risk Management

Description:

Regenerative agriculture is more apt to enable crop production to bounce back to some degree after dramatic weather events, including droughts, storms, pest outbreaks, and other disturbances. Resilience is at the heart of climate change adaptation strategies. Increases in soil organic matter, for example, make soils more drought-resistant.¹²

On-farm resilience begins with soil health. As all products run through soil, the greater vitality within the soil networks, the greater the potential for increased yields and improved ecosystems, which can benefit the farmer in any number of economic or environmental aspects.

Types of Practices



- All regenerative practices can lead towards greater on-farm resiliency and risk management

Measurement Example



- Yield over time, especially during and after extreme weather or pest outbreaks
- Biodiversity indicators
- All soil indicators
- Water retention



¹² Lal, "Abating climate change and feeding the world throw soil carbon sequestration, 450. (Lal)



2. Biodiversity + Ecosystem Health



Biodiversity loss, partly due to intensification of agriculture, has become a global issue. A recent FAO report states that *“Of some 6,000 plant species cultivated for food, fewer than 200 contribute substantially to global food output, and only nine account for 66 percent of total crop production. Additionally, the world’s livestock production is based on about 40 animal species, with only a handful providing the vast majority of meat, milk and eggs.”*¹³ (FAO)

Biodiversity, or the variation of life in an ecosystem, is critical to a healthy agriculture biome, as it serves as nature’s system of checks and balances.¹⁴ Regenerative agriculture systems promote and encourage increased biodiversity; ensuring that microorganisms, plants, and animals on the farm can exist to create healthy soil, and resilient natural systems that aren’t reliant on chemical intervention to manage outbreaks of pest and diseases. Supporting biodiverse environments for plants and animals – cultivated and wild alike, is essential for the wellbeing of international agricultural systems.

¹³ <http://www.fao.org/3/CA3129EN/CA3129EN.pdf> (FAO Commission on Genetic Resources for Food and Agriculture, 2019)

¹⁴ <https://rodaleinstitute.org/why-organic/issues-and-priorities/biodiversity/#:~:text=Regenerative%20organic%20farming%2C%20by%20contrast,to%20manage%20pests%20and%20diseases.> (Rodale Institute, n.d.)

One of the greatest indicators of agricultural health is the health of the ecosystem in which that farm exists. When evaluating ecosystem health, a holistic approach is required. Everything from the life and vitality of the soil, to the number of plant species (agricultural and natural), to the insect, bird, and greater animal populations. A cultivated agricultural system does not need to exist at odds with the environment around it, and regenerative agriculture emphasizes the need to consider the health of the landscape, and the interplay of natural and human-made systems within said landscape.

2.1 Biodiversity

Description:

Most agricultural systems, regenerative included, are less diverse than their forested or wild undisturbed counterparts, but they nevertheless can provide an important anchor for biodiversity. Regenerative agriculture systems can directly provide habitat for many beneficial organisms, from plants and animals to fungi and bacteria. These plantings can provide critical corridors to create connection between intact natural habitat fragments. They also reduce the clearing of nearby habitats for firewood and fresh farmland. By maintaining good soil and water quality they ensure that habitats downstream remain in good health.¹⁵ Converting conventional cropland to regenerative agriculture can result in a marked increase in habitat for wildlife.¹⁶

Biodiversity benefits are not limited to agriculture. Many practices that sequester carbon in pastures also increase biodiversity.¹⁷ Biodiversity is not just useful for its own sake. Habitat can bring pollinators (essential for production of most crops) and beneficial insects and other organisms that control pests.

Types of Practices



- Integrated pest management
- Cover cropping
- 4R nutrient application: Right Source, Right Rate, Right Place, Right Time
- Intercropping
- Preservation of natural habitat
- Protective systems (windbreaks, shelterbelts, greenways)

Measurement Example



- Number of diverse species (above ground, flora + fauna)
- Number of crop rotations
- Diversity of cultivated crops
- Soil microbial activity
- Decreased chemical inputs

¹⁵ FAO, Review of Evidence on Drylands Pastoral Systems and Climate Change, 14 (FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, 2009)

¹⁶ (Nair, An Introduction to Agroforestry, 1993) 270

¹⁷ FAO, Climate-Smart Agriculture Sourcebook IPCC, Climate Change 2013: The Physical Science Basis, Summary for Policymakers (Food and Agriculture Organization of the United Nations, 2012)

2.2 Integrated Pest Management

Description:

Integrated Pest Management (IPM) systems refer to the use of all available techniques to help combat pest and disease issues on farm. IPM generally includes all techniques that are related to non-pesticidal practices; including but not limited to improving biodiversity to foster additional predator habitats.

IPM has full-farm regeneration benefits, including economic (reducing input costs, lower energy consumption, reduction in application labor); and environmental (lower pesticide application rate, increase of biodiversity, reduction of leaching offsite, elimination of pesticide-resistant species).

When IPM is practiced on a large scale, benefits precipitate throughout the health of the farm, and the ecosystem at large. The methods in which IPM are practiced are many, and can vary from farm to farm, even within the same region.

Types of Practices



- Natural habitat preservation
- Diversified cropping + cover crops
- Windbreaks
- 4R nutrient management: Right Source, Right Rate, Right Place, Right Time

Measurement Example



- Amount of crop lost to pest pressure
- Pesticide input required
- Plant health and nutrient uptake
- Number of on-farm species

2.3 Carbon Sequestration



Description:

Annual crops are grown on roughly 1.2B hectares globally, accounting for 89% of all cropland.¹⁸ To help combat and mitigate the effects of climate change, it is important that we transition these systems from a net emitter of carbon, to a net carbon sink. There are an array of ways in which farmers and producers can sequester carbon into their soil, many of which have already been discussed in this document. Though there is disagreement within the agricultural and scientific communities about the rates of sequestration or longevity of carbon stored, building soil carbon stocks is an essential component to healthy soils and healthy farms, and has a multitude of benefits beyond quantifying the level of carbon removed from the atmosphere.

Many of the sequestering practices allow for continued growth of the same annual crops that Grupo Bimbo relies on while sequestering significant carbon. When integrated with practices such as agroforestry, managed grazing, perennial agricultural systems and other more intensive land change strategies, the level of sequestration increases.

Types of Practices



- Successional Intercropping
- Swidden
- No-till, low till, or strip till
- Cover and rotational cropping
- Biomass integration
- Agroforestry practices use of compost + green manure
- Managed grazing operations

Measurement Example



- Above and below ground organic matter quantified through:
 - a. Physical sampling
 - b. Spectroscopic monitoring
 - c. Modelling software

2.4 Water Quality

Description:

Regenerative agriculture can help to reduce flooding by increasing rainwater infiltration. This process also recharges groundwater.¹⁹ Water quality is fundamentally an issue of soil health, and improvement of soil conditions. Nearly all water that enters our terrestrial waterways must first transfer through soil. The loss of topsoil, compaction of rural areas, neglect of slope or natural waterways all lead to increased amounts of agricultural runoff. Agricultural water pollution can impact community drinking water quality. From a water availability standpoint, for regions that will experience drier and warmer weather globally, these landscapes need to maintain every drop of water that they can.

¹⁸ Toensmeier, "The Carbon Farming Solution" 72-73 (Toensmeier, 2016)

¹⁹ Nair, "Climate Change Mitigation," 47 (Nair, Climate Change Mitigation: A Low Hanging Fruit of Agroforestry, 2012)

One of the most notable impacts of conventional agriculture is its impact on downstream water quality. This is often the result of soil erosion and nutrient leaching from annual cropping systems and poor livestock management. Regenerative agriculture systems result in less nutrient leaching.²⁰

Types of Practices



- All improvement made to soil health can improve water quality
- All land moving mechanisms to improve water retention, can lead to water quality improvements
- IPM
- 4R nutrient management: Right Source, Right Rate, Right Place, Right Time
- Decrease runoff and erosion techniques all increase water quality

Measurement Example



- Note that water quality should be tracked at a watershed level. Quantification examples:
 - a. Eutrophication levels in waterways
 - b. Soil health and organic makeup
 - c. Nutrient levels present in waterways
 - d. Desertification rates
 - e. Soil runoff rates

2.5 Preservation of Natural Forest / Combating Desertification



²⁰ (Toensmeier, 2016) 67-69

Description:

Desertification is “the process of loss of soil fertility in the semi-arid and in the dry sub-humid regions of the world.”²¹ Many regenerative agricultural practices are well adapted to arid conditions and can play a role in combating desertification while providing the basis for human livelihood.²²

In certain regions, desertification is one of the principal large-scale effects of conventional agriculture and climate change. There are practices within the frameworks of regenerative agriculture that are well equipped to handle these types of conditions. Rehydrating landscapes, perennial ecosystems, increases in biodiversity, decreased inputs and increased soil health all help to mitigate greater desertification on farms.



Types of Practices



- Earth moving practices to increase water retention / decrease runoff
- Cover cropping
- Living root
- Stubble management
- No till, low till

Measurement Example



- Water retention capability in soils
- Amount of water needed via irrigation
- Number of diverse species, health of natural habitat

²¹ FAO, 2014, <https://link.springer.com/article/10.1186/s13021-017-0072-2>

²² (Toensmeier, 2016)” 53



3. Enhancing Producer Communities



Regenerative agricultural systems also benefit the producers, operators, employees, and communities that interact and live in them. Regenerative agriculture can bring tangible benefits to people. It is critical that as we develop pathways for the transition to regenerative agricultural practices, we consider how these changes impact communities, and take the steps necessary to ensure that these systems not only benefit the environment, but improve the livelihoods of those inhabiting and operating in these landscapes.

In North America, we are facing an aging farm population, increased land cost, and greater barriers for young and new farms to get started in this industry. The combination of costs and unstable wages can make startup inaccessible, especially to marginalized communities.

There are a number of mechanisms through which Grupo Bimbo can engage in this principle. Through the formation of strong regional partnerships, sharing access to pertinent information, ecosystem services remunerations, or in-kind payments from other partnership organizations; we can assist in leveraging our resources to aid the farmers and producers in their journey to regenerative stewardship.

As the environmental and other beneficial on-ground conditions of these farms continue to improve, so too will the strength of their businesses. Through higher quality products, more favorable working conditions, improved health of their farms, and ultimately the reduction of input costs; we can envision a long-term pathway for the financial and environmental success of our farming community.

3.1 Products + Profit

Description:

Regenerative agriculture allows for a greater crop diversity for producers, allowing growers to create a business that relies on more than one primary monocultural output. This can lead to increased profit over time by both bringing in additional income streams for farmers, as well as lowering input costs. The same crops can be fed to livestock to supplement pasture and perennial fodder species. Livestock in turn can provide food, fiber, and in certain regions, transportation, and traction, as well as performing useful functions in integrated farming systems.

Regenerative agriculture can provide much more than food. Pairing products with pulp, paper, fiber and fuel crops can increase viability across different regions, and improve on-farm profitability.

These agricultural systems do more than just grow these products: they help improve the long-term productivity of farms by building soil, making the production of annual crops more sustainable, and also include practices that can lessen reliance on fertilizers and pesticides and reduce carbon emissions.²³

The benefits of regenerative agriculture for producer communities will be largely regionally specific. Regional analysis will need to be done to ensure that interventions add up to improved income and livelihoods for producers, whether through additional sales and marketing opportunities, reduced input costs, or increased self-sufficiency in regions where food security is a key issue.

Types of Practices



- Ensuring access to markets for diversification of crops
- Premium pricing models for producers
- Reduction of on-farm inputs

Measurement Example



- Diversity of products grown
- New markets engaged, including ecosystems service payments and/or subsidies
- Price per yield, and profit per hectare
- Reduction of inputs and money saved due to reduction of inputs

3.2 Ecosystem Services / Remuneration Opportunities

Description:

Emerging markets in carbon, water, and other ecosystem service stocks can play a growing role in helping with the financing of farms as they transition. There is an increasing demand for the sequestration

²³ (Nair, Climate Change Mitigation: A Low Hanging Fruit of Agroforestry, 2012)

of carbon and reductions of greenhouse gas emissions, and pilot operations in biodiversity and water quality and quantity are currently underway. These alternative markets provide the opportunity for a farmer to be compensated for regenerative practices.

Ecosystem services refers to the concept of assigning a value to the many benefits ecosystems provide to human “well-being, health, livelihoods, and survival.”²⁴ These benefits include such things as the oxygen that plants produce, the soil that plants and ecosystems require to produce food in, the biodiversity of our ecosystems that lead to stronger, healthier landscapes, etc. A 2016 study estimated the value of global ecosystem services as \$142 Trillion USD, twice the global GDP at that time of \$71 Trillion. Environmental damage tracked from 1997 to 2016 shows, in comparison, losses of \$23 Trillion in ecosystem services.

We are currently in the early phases of the carbon and environmental credit movement, and Grupo Bimbo will explore opportunities to partner with research and technology groups, local governments, and environmental agencies to ensure that our farmers are well equipped to receive these remunerations.

Types of Practices



- Provide access to the most competitive ecosystem services credits
- Ability to accurately track and trace requisite ecosystem market qualifiers and data
- Ally with organizations willing to purchase credits or offer price premiums to producers for environmental services

Measurement Example



- Carbon credits available
- Emerging markets in water and biodiversity credits
- Use of government subsidies or preferential credit or insurance rates
- Additional remuneration opportunities available through government resources and payouts due to best practices
- Impact on farmer income

3.3 Climate Resilience

Description:

Temperatures and precipitation rates are changing in all agricultural production areas and extreme weather events are becoming more common. The unpredictability of weather patterns seriously threatens the agricultural economies, rural communities, and landscapes in Grupo Bimbo’s sourcing regions.

²⁴ Nair, “Carbon Sequestration in Agroforestry Systems” (B. Mohan Kumar, 2011)

Agricultural practices can help mitigate the negative impacts of climate change. Regenerative agriculture practices that help to stabilize soils, reduce erosion, and sequester carbon can help mitigate climate change, while providing landowners with improved yields and potentially carbon credits for increased resilience in their business models, particularly in areas that are the most affected.

The impacts of climate change are highly variable across regions and will disproportionately impact smallholder producers, women, and minorities, particularly in developing countries and impoverished regions. Agriculture as an industry, requires systemic change in order to assure basic rights and dignity to people throughout the supply chain – whether they are laborers, owners, or consumers. Grupo Bimbo's Framework for Regenerative Agriculture will prioritize practices that help improve the lives of farmers and producers in the regions that we source from.



Types of Practices

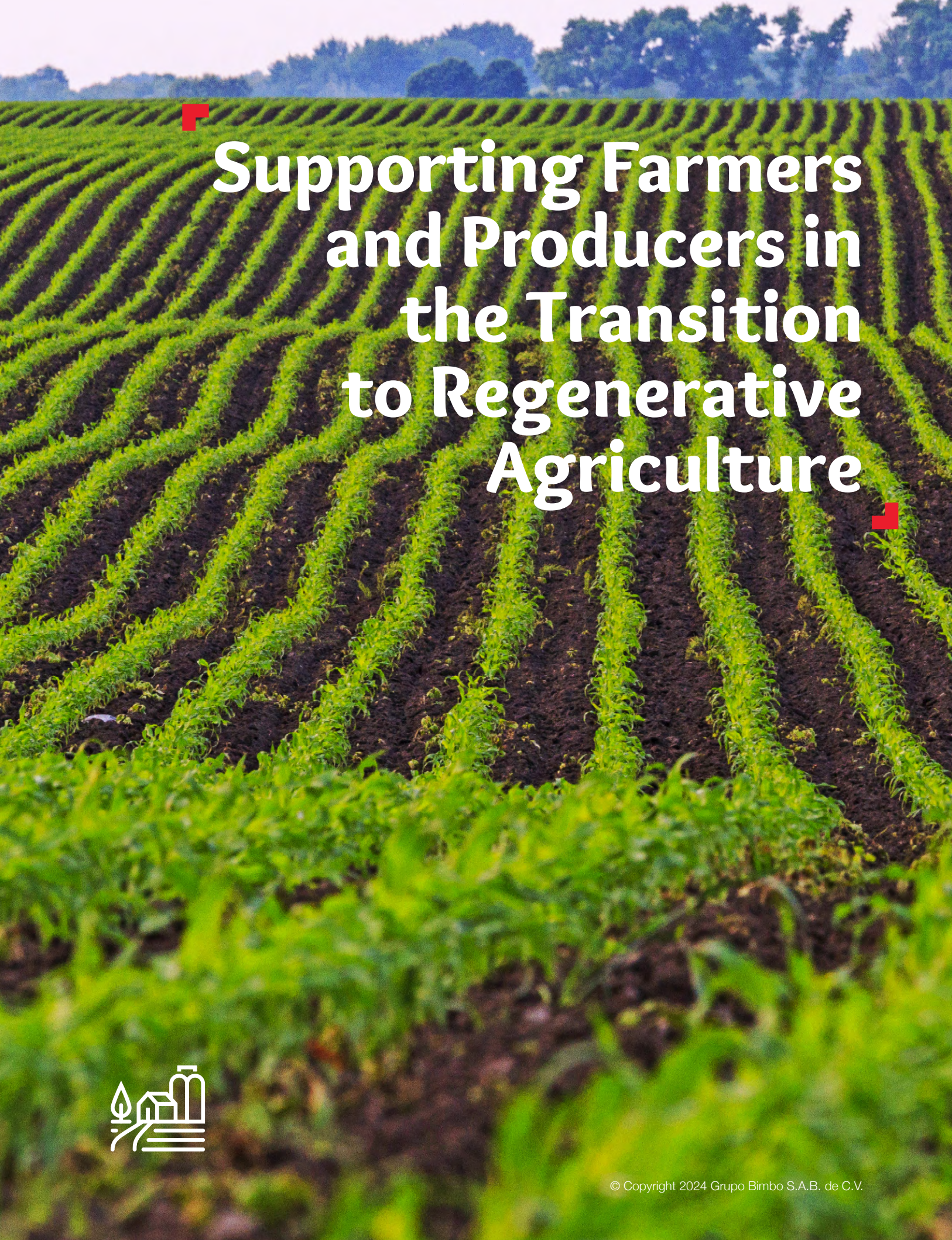


- Prioritize projects in regions that are experiencing high risks due to climate change
- Maintain strong relationships with all farmers and producers in our network, work to develop long term relationships and build trust
- Provide resources including education opportunities, access to markets and payment opportunities to farmers & producers in our networks; ensuring equitable access to programming and resources for women and historically marginalized communities

Measurement Example



- Supply chain stability – minimal turnover of farmers and producers, volume and quality needs stable in a region
- Increased engagement from marginalized communities, women farmers and producers, and smallholders
- Diversified on-farm revenue streams
- Reduction in supply chain emissions & increases in supply chain sequestration



Supporting Farmers and Producers in the Transition to Regenerative Agriculture



Supporting Farmers and Producers in the Transition to Regenerative Agriculture

Agricultural climate mitigation relies on millions of farmers and producers to make changes to the way they farm. Most of the world's farmers, whether they are producers, farmers, commodity growers, or subsistence farmers, work extremely hard and are frequently close to the edge financially. Even though most regenerative agriculture practices have the ability to add resilience and increase productivity on farms, these impacts are often not felt right away. It can take several years to fully implement and reap the benefits of these strategies. For these reasons, it is essential that we provide the opportunity for critical partnerships along our supply chains for farmers that lead to increased opportunities for them to successfully transition towards more sustainable agricultural practices.

In a 2011 paper, researchers McCarthy, Lipper, and Branca identified five major challenges facing farmers as they transition towards climate-smart agriculture:

- **Investment Costs**
- **Variable and Maintenance Costs**
- **Opportunity Costs**
- **Transaction Costs**
- **Risk Costs**²⁵

“Farmers are more likely to adopt practices if they receive help to address existing or perceived risks or challenges associated with transitioning.”

Farmers are more likely to adopt practices if they receive help to address existing or perceived risks or challenges associated with transitioning. For example, farmers are more likely to adopt multifunctional practices that provide direct yields than purely conservation (or sequestration) efforts.²⁶

As part of our support strategy, Grupo Bimbo is identifying the best and most impactful ways in which to work with our suppliers and producer communities in order to facilitate this change. As a first step of this process, we are conducting an intensive mapping and best practices survey throughout our international supply chains. With this information, we will be able to assess opportunities and track various initiatives across the globe. This level of analysis will allow for pinpointing opportunities for further engagement and potential partnerships for pilot operations and transitioning to regenerative agricultural practices.

Grupo Bimbo will assist in the development and success of these various pilots, with the intention that our pilot operations will grow, engage with the larger community surrounding these initial pilots, and precipitate more engagement from other farmers.

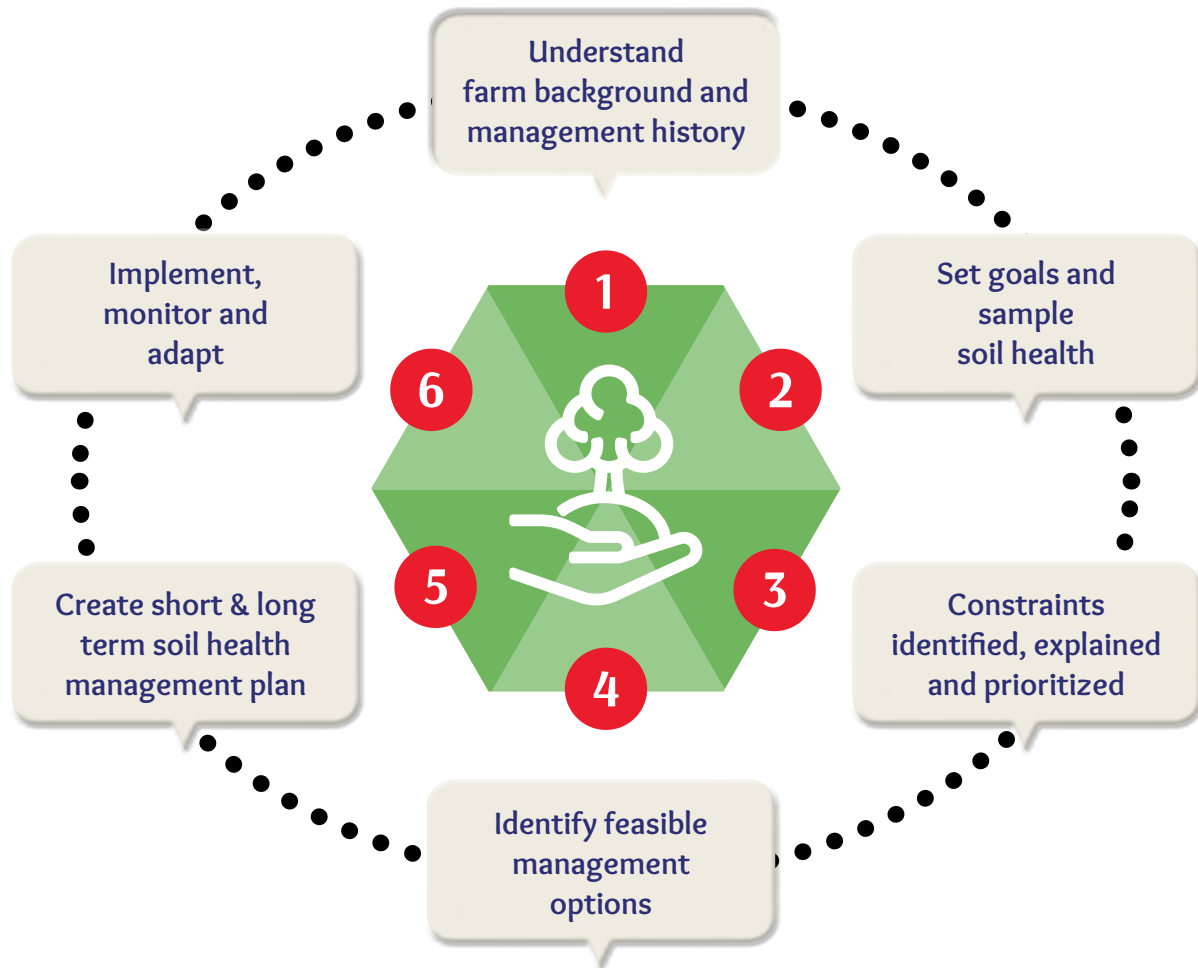
In addition to farmer and producer engagement, we will look to form regional partnerships with research institutions, tech companies, cooperatives, non-profits, universities, and governments in order to identify opportunities for additional funding and resources available to support our projects. Through this linking and leveraging of additional resources, we can assist farmers and producers in their successful transition to regenerative agriculture.

²⁵ (FAO, 2018) <https://link.springer.com/book/10.1007/978-3-319-61194-5>; 599-602

²⁶ (Toensmeier, 2016) 328

Supporting Farmers and Producers in the Transition to Regenerative Agriculture

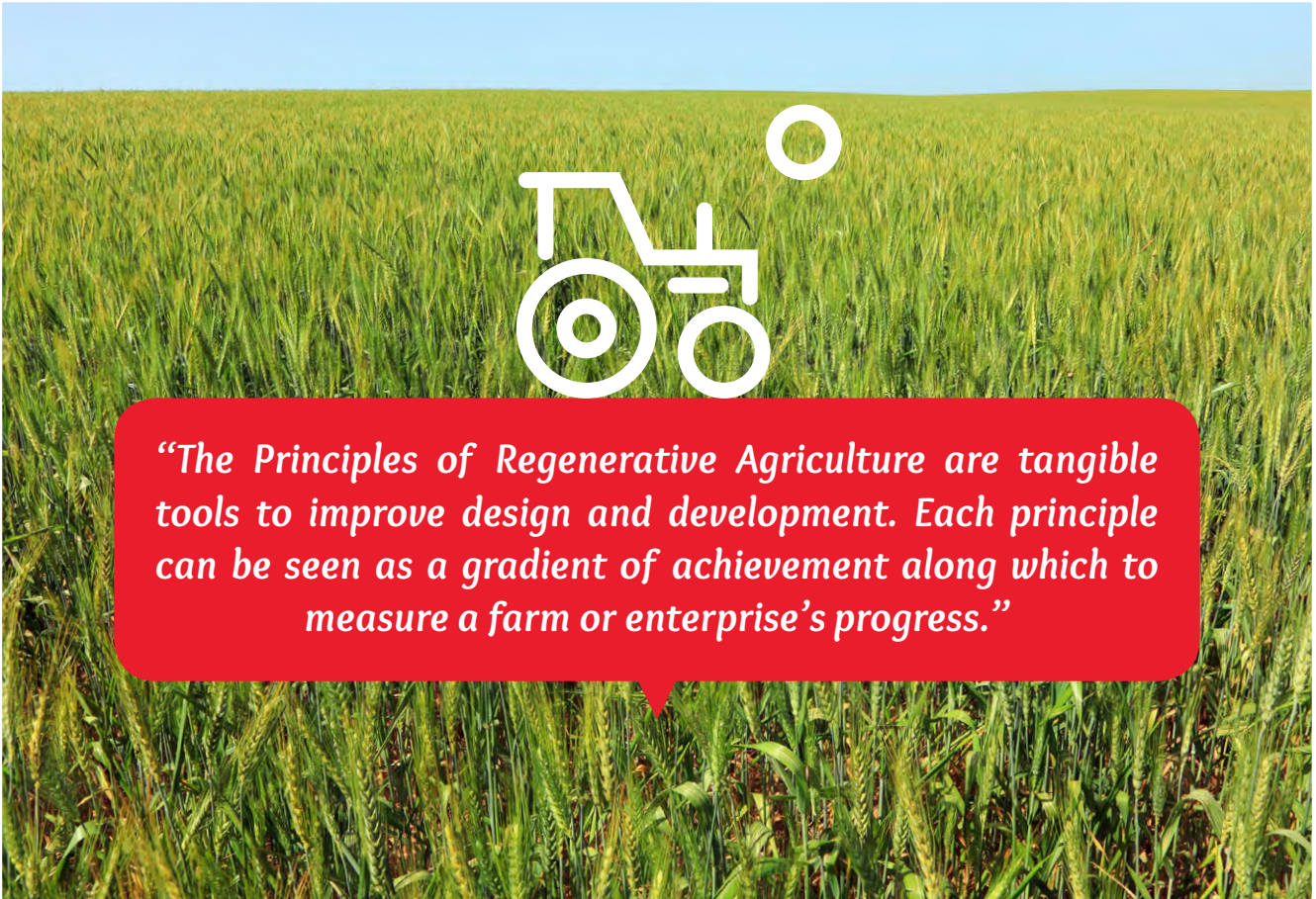
It is critical to emphasize that each farm, pilot, and region must be treated as a unique case that requires individual assessment and planning in order to ensure a successful transition and productive incubator for the expansion of regenerative agriculture. It is for this reason, that we establish a process for engagement with farmers and producers who are interested in participating in these programs. The following describes the process for analysis and farmer engagement.²⁷



As of the initial drafting of this document we envision this framework and this process to be in the beginning phases of a long journey. As we go forward, we will stay open to opportunities and engage in partnerships, embrace science, and work diligently to protect our environments and advance regenerative agriculture.

²⁷ (<http://www.css.cornell.edu/extension/soil-health/manual.pdf> (B.N. Moebius-Clune, 2016))

Conclusion



“The Principles of Regenerative Agriculture are tangible tools to improve design and development. Each principle can be seen as a gradient of achievement along which to measure a farm or enterprise’s progress.”

The framework presented in this paper is an overview for systemic design and decision-making. This can guide our work on integrated whole-living systems. Instead of providing limiting definitions or one-size fits-all solutions, the framework is a lens through which each entity can discern, choose, and develop a path towards regeneration. Regenerative agriculture has the ability to envision a farm or agricultural endeavor in its current context and reveal its larger potential. As these systems progress, the ability to manage complexity and make change increases.

The Principles of Regenerative Agriculture are tangible tools to improve design and development. Each principle can be seen as a gradient of achievement along which to measure a farm or enterprise’s progress. Taken as a whole, this framework offers a clear path for any entity to improve its effectiveness and regenerative potential. We want to sustain a deep dialogue with farmers, businesses, communities, nonprofits, investors, and governments. Now is as critical of a time as any to embrace the transformation from conventional farming into regenerative agriculture.

About this Document



This framework was created in partnership with Earthworm Foundation. Earthworm and Grupo Bimbo align with a diversity of partners to understand and implement best practices. Grupo Bimbo's multi-year and ongoing work with CIMMYT significantly informed the foundation of the Framework presented in this document. Earthworm Foundation is a global non-profit organization that works with individuals from the farm to the boardroom to build supply chains that work for people and nature. Earthworm Foundation starts from bold values-based commitments that drive it and its partners to design and implement solutions that can reach positive impact at scale, from producer to consumers. This document is linked to our Global Agricultural Policy as part of our strategy for sustainable sourcing. If you want to learn more about Grupo Bimbo's Sustainability strategy, visit <https://grupobimbo.com/en/sustainability>

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