

# Regenerative Coffee Scorecard

A Best Practices Guide

The Rainforest Alliance is creating a more sustainable world by using social and market forces to protect nature and improve the lives of farmers and forest communities.



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# INTRODUCTION

A change in the way we do agriculture is no longer a choice but a necessity. Conventional agriculture accounts for nearly 24 percent of greenhouse gas emissions and threatens over 80 percent of species at risk of extinction.<sup>12</sup> The heavy use of agrochemical inputs, intense land conversion, and lack of biodiversity typical of conventional farming drives these environmental crises. Sustainable agriculture has been proven to reduce harm caused by conventional agriculture; and regenerative agriculture goes even further by aiming to restore the ecosystem.

Part of that change is recognizing how we protect and restore the web of complex and mutually beneficial relationships that underpin healthy farms. On a coffee farm, for example, this relationship can be seen between shade trees and soil. Shade trees provide leaf litter that gives vital nutrients to the soil. They also provide a habitat for species that will defend the coffee trees against common pests, and will help to conserve soil humidity, reducing the coffee stress during the dry season.<sup>3,4</sup>

In other words, investing in the naturally occurring relationships on farms improves the overall health of ecosystem services (e.g., carbon sequestration, pollination, and drought tolerance) and helps build resilient, productive farms. This is the very core of regenerative agriculture.

Regenerative agriculture has a long-rooted history in Indigenous practices, but its ability to go beyond the harm reduction of sustainable farming and improve farmer resilience has put it at the forefront of climate discussions. Coffee, a perennial crop cultivated by roughly 100 million smallholder farmers,<sup>5</sup> presents an interesting opportunity as it is both a major trigger of biodiversity loss<sup>6</sup> and a cause of conservation.<sup>7,8</sup>


The challenge for coffee farmers and roasters alike seeking to take the next step beyond sustainable farming is the lack of a model, or even standard definition, for regenerative agriculture. The Rainforest Alliance designed a tool to meet this sectoral need: a regenerative coffee scorecard.

The regenerative coffee scorecard is a voluntary tool that builds on Rainforest Alliance certification. It offers both certified and non-certified supply chain actors a tool to assist their regenerative transition by identifying the current performance of farmers, highlighting where targeted support is needed, and tracking improvement towards regenerative goals.

The scorecard is underpinned by the Rainforest Alliance's definition for regenerative agriculture, which takes a conservation and rehabilitation approach to farming where agroecology and integrated system management strategies are combined. Simply put, a regenerative farm demonstrates measures to promote soil health, on-farm biodiversity conservation, ecosystem restoration, and adequate crop productivity to improve livelihoods.<sup>9</sup>

We developed the Rainforest Alliance Regenerative Coffee Scorecard with our long-time partner Nespresso, which has long-standing experience in agroforestry and coffee production. As our first milestone, we have collaborated and designed the scorecard to help move the entire coffee sector one step forward. The scorecard builds on our joint knowledge of coffee and regenerative agriculture.

The scorecard was initially tested in 2020 in two coffee production regions of Costa Rica. The insights gathered from the test, along with input from coffee experts from around the world, allowed us to further adjust the scorecard to ensure applicability and flexibility for other coffee farms.

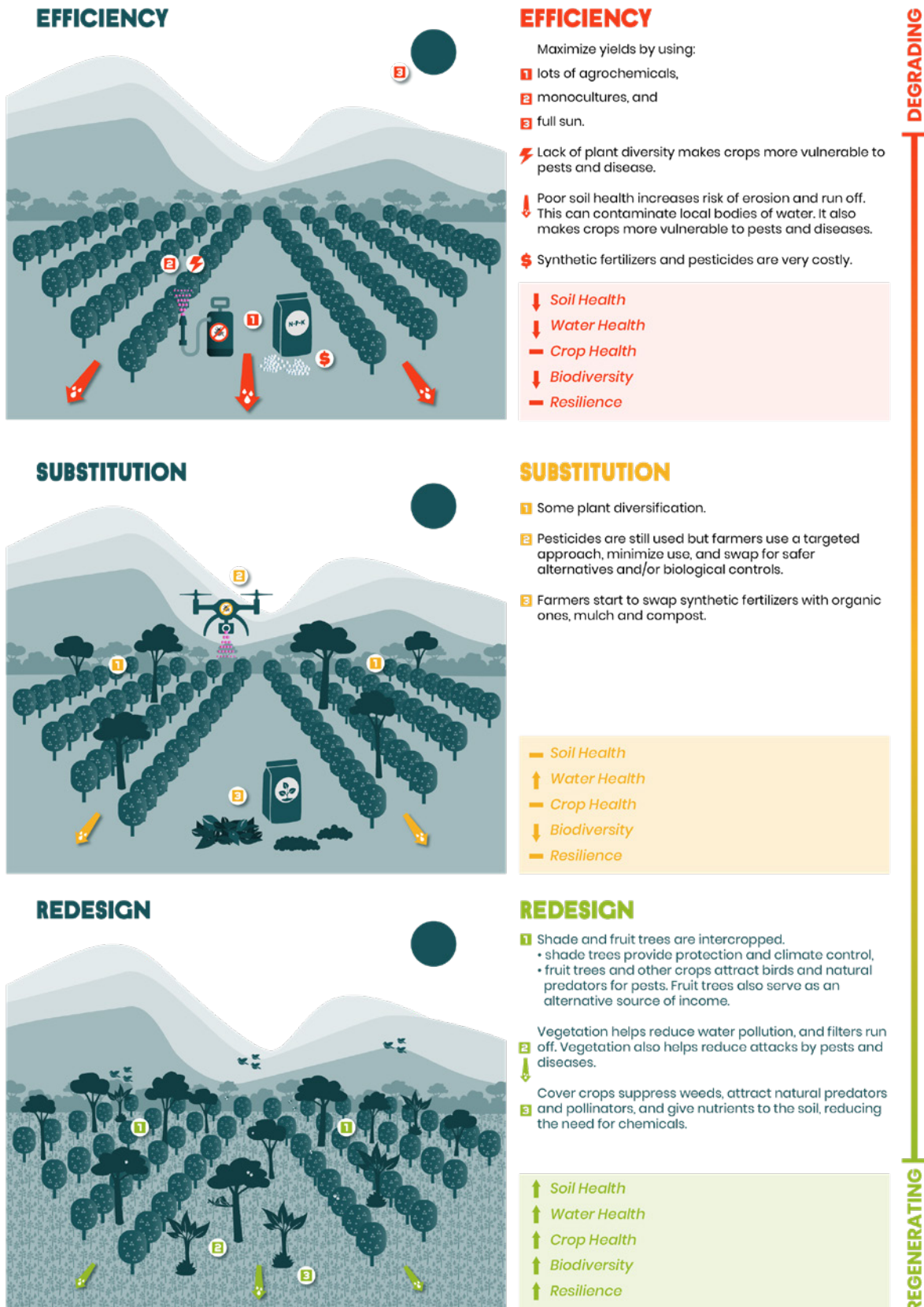




**“The Rainforest Alliance and Nespresso have promoted climate smart, sustainable agriculture practices for several decades. Nespresso is committed to conserving natural landscapes and improving biodiversity within our supply chain. We recognize that the next step towards our goals will be a regenerative one.”**




– GUILLAUME LE CUNFF, CEO, NESPRESSO

**FIGURE 1**

The regenerative transition involves moving away from a model of farming where efficiency is prioritized over ecological health, towards a system where investing in the ecosystem rewards both people and nature.



	ACTIVITY	BRONZE LEVEL	SILVER LEVEL	GOLD LEVEL	MONITORING & EVALUATION	
 <b>SOIL</b>	<b>Farms implement integrated weed management by:</b>	<input type="checkbox"/> Limiting herbicide <u>spot applications</u> to aggressive / <u>invasive</u> weeds only, and not using pesticides following the lists in Rainforest Alliance Annex 7	<input type="checkbox"/> No use of herbicides from the Exceptional Use Policy. Use of <b>2</b> or less active ingredients from the list of risk mitigation pesticides in Annex S07 of the Rainforest Alliance Standard	<input type="checkbox"/> Use of at most one herbicide active ingredient from the the list of risk mitigation pesticides in Annex S07 of the Rainforest Alliance Standard	Indicators to monitor: <ul style="list-style-type: none"> <li>• Organic / synthetic fertilizer</li> <li>• Herbicide usage for Bronze and Silver only</li> </ul>	
	<b>Farms promote soil health by:</b>	<input type="checkbox"/> Conducting a soil assessment and analysis including, if relevant: <ul style="list-style-type: none"> <li>• Erosion prone areas and slope</li> <li>• Soil structure</li> <li>• Soil depth and soil horizons</li> <li>• Densification of compaction areas</li> <li>• Soil moisture and water level in the soil</li> <li>• Drainage conditions</li> <li>• Identification of areas with visula symptoms of nutrient deficiencies</li> <li>• <u>Soil organic matter</u></li> </ul>				
		<input type="checkbox"/> Applying some <u>organic fertilizer</u> , or <u>composted</u> organic matter when needed to increase the level of <u>soil organic carbon</u>	<input type="checkbox"/> Applying organic fertilizer, or composted organic matter, on at least half of the farm	<input type="checkbox"/> Applying organic fertilizer, or composted organic matter, on at least <b>75%</b> of the farm, when possible using organic material coming from the own farm		
		<input type="checkbox"/> Using minimal amount of <u>cover crops</u> and <u>mulch</u>	<input type="checkbox"/> Maintaining at least <b>40%</b> bare ground covered with mulch or cover crops (preferably flowering)	<input type="checkbox"/> Maintaining at least <b>80%</b> bare ground covered with mulch or cover crops (preferably flowering)		
	<input type="checkbox"/> Monitoring soil cover and loss, implementing basic <u>soil conservation practices</u> according to the slope of the farm, and adjusting conservation practices as needed					
 <b>BIODIVERSITY</b>	<b>Farms contribute to landscape biodiversity also through agroforestry (according to local climatic conditions) by:</b>	<input type="checkbox"/> Maintaining <u>agroforestry</u> cover, including a diversity of trees on the overall farm, with at least <b>4</b> species (ideally native).  If agroforestry cover is not suitable per the local environmental conditions, trees may also be planted around infrastructure, borders, etc; maintaining an area equivalent to <b>5%</b> of farm area in <u>natural vegetation</u> (at least 20% in Brazil).  To be validated with GIS polygons in Brazil only. <i>Please see definition of 'natural vegetation' in the definitions document.</i>	<input type="checkbox"/> Maintaining agroforestry cover, including a diversity of trees on the overall farm, with at least <b>6</b> species (ideally native), and includes species with potential for income diversification, nitrogen fixing, pollination, pest control, or other ecosystem services.  If agroforestry cover is not suitable per the local environmental conditions, trees may also be planted around infrastructure, borders etc, maintaining an area equivalent to <b>10%</b> of farm area in natural vegetation (at least 20% in Brazil with increased vegetation diversity).  To be validated with GIS polygons in all countries. <i>Please see definition of 'natural vegetation' in the definitions document.</i>	<input type="checkbox"/> Maintaining agroforestry cover, including a diversity of trees on the overall farm (coffee plots and / or surroundings), with at least <b>8</b> species (ideally native), manages species diversity as described in Silver level, and provides two <u>strata</u> of tree levels.  If agroforestry cover is not suitable per the local environmental conditions, trees may also be planted around infrastructure, borders etc; maintaining an area equivalent to <b>15%</b> of farm area in natural vegetation (at least 20% in Brazil with natural vegetation).  To be validated with GIS polygons in all countries. <i>Please see definition of 'natural vegetation' in the definitions document.</i>	Indicators to monitor: <ul style="list-style-type: none"> <li>• Tree species diversity and density</li> <li>• Natural vegetation (including riparian) area</li> </ul>	

	ACTIVITY	BRONZE LEVEL	SILVER LEVEL	GOLD LEVEL	MONITORING & EVALUATION
<b>WATER</b> 	<b>Farms conserve watersheds by:</b>	<input type="checkbox"/> Maintaining existing <u>riparian buffer zone</u> as required in the Rainforest Alliance Standard	<input type="checkbox"/> Ensuring that <u>aquatic ecosystems</u> are surrounded by riparian buffers following the Rainforest Alliance Standard width parameters	<input type="checkbox"/> Ensuring that aquatic ecosystems are surrounded by riparian buffers of natural vegetation following the RA standard width parameters	Indicators to monitor: <ul style="list-style-type: none"> <li>• Water use</li> </ul>
		<input type="checkbox"/> (As applicable) Treating wastewater from coffee processing and monitoring total water usage (processing and irrigation)	<input type="checkbox"/> (As applicable) Treating wastewater from coffee processing so that it meets Rainforest Alliance <u>water quality parameters</u> and reducing total water usage during irrigation	<input type="checkbox"/> Reducing total water usage during processing (per unit of product) and significantly reducing irrigation from off-farm water sources	
<b>CROP RESILIENCY</b> 	<b>Farms implement good agronomic practices including:</b>	<input type="checkbox"/> Frequent <u>pruning</u> to maintain coffee tree health and productivity			Indicators to monitor: <ul style="list-style-type: none"> <li>• <u>Agrochemical</u> usage (pesticides)</li> <li>• Yield</li> </ul>
		<input type="checkbox"/> Replanting or <u>renovation</u> , implemented to ensure young or middle age ( $\leq 8$ years) trees in plot	<input type="checkbox"/> Replanting or renovation, implemented to ensure at least <b>40%</b> of plot in young or middle age ( $\leq 8$ years) trees	<input type="checkbox"/> Replanting or renovation, implemented to ensure at least <b>50%</b> of plot in young or middle age ( $\leq 8$ years) trees	
	<input type="checkbox"/> Coffee variety is selected based on quality, productivity, and <u>rust resistance</u> . Some use of rust resistant varieties	<input type="checkbox"/> Coffee variety is selected based on quality, productivity, and rust resistance. Use of rust resistant varieties on <b>&gt;35%</b> of plot	<input type="checkbox"/> Coffee variety is selected based on quality, productivity, and rust resistance. Use of rust resistant varieties on <b>&gt;50%</b> of plot		
	<b>Farms follow an <u>integrated pest management (IPM)</u> plan and reduce chemical inputs by:</b>	<input type="checkbox"/> Complying with lists of permitted pesticides in Rainforest Alliance Annex 7, and only using nematicides under specific circumstances (demonstrated need in IPM plan)	<input type="checkbox"/> No use of pesticides from the Exceptional Use Policy, reducing the use of pesticides ( <b>4</b> or less ingredients from the risk mitigation list), and reducing the use of fungicides and insecticides	<input type="checkbox"/> Reducing the use of pesticides ( <b>2</b> or less ingredients from the risk mitigation list), and eliminating the use of synthetic chemical nematicides in farm	
<b>LIVELIHOODS</b> 	<b>Farms manage their coffee farm as a business, and are compensated accordingly, by:</b>	<input type="checkbox"/> Monitoring <u>costs of production</u> and calculating revenue from sale of coffee	<input type="checkbox"/> Creating farm management or <u>business plans</u>	<input type="checkbox"/> When appropriate, diversifying income streams, and adjusting business practices as necessary	Indicators to monitor: <ul style="list-style-type: none"> <li>• Coffee net income</li> <li>• Household revenue sources</li> <li>• GHG footprint</li> </ul>

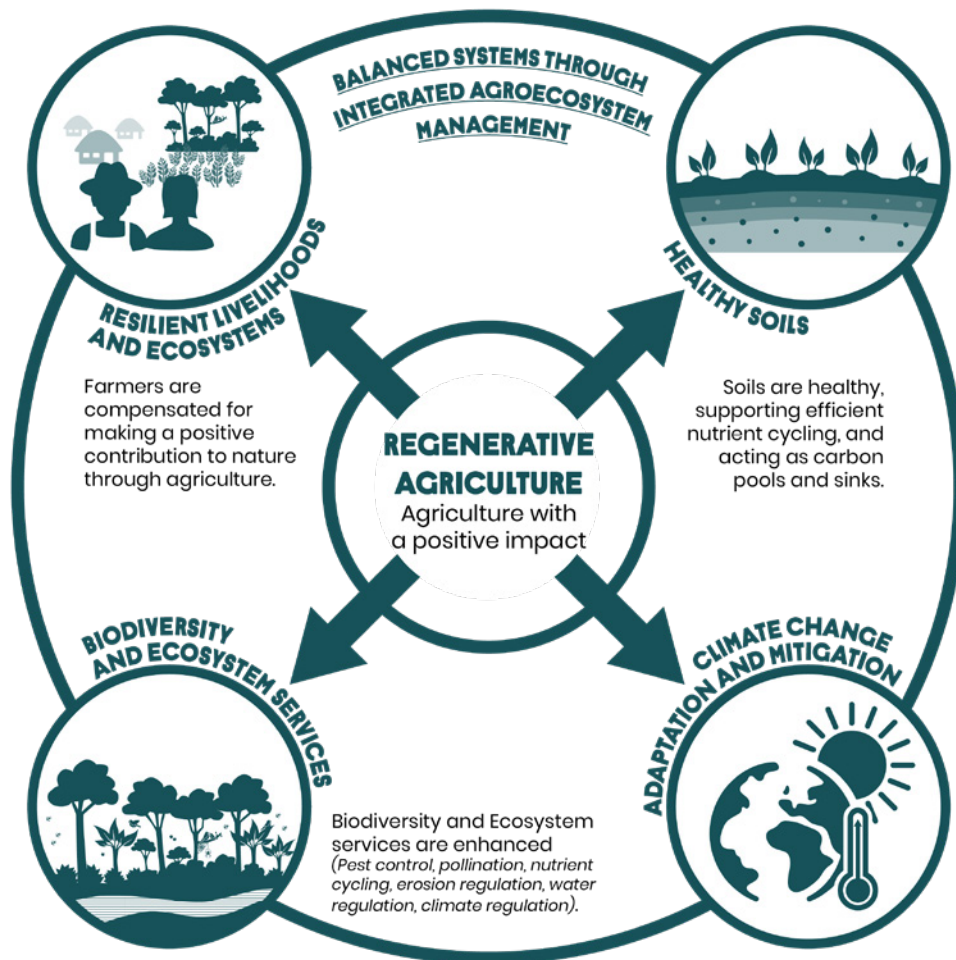
# THE SCIENCE BEHIND THE SCORECARD

Of the 103 coffee species that exist, only two account for almost 100 percent of the coffee trade: Arabica (*Coffea arabica*) and Robusta (*C. canephora*).<sup>10</sup> In their natural area of distribution, Arabica and Robusta coffee grows alongside forests. These naturally occurring agroforestry systems are commonly referred to as “coffee forests.” In coffee forests, functional biodiversity and the health of ecosystems and ecosystem services are at their prime, ensuring healthy and productive plants. However, coffee forests have been replaced by systems of intense monocropping and heavy agrochemical use. While these systems may have high yields, they are detrimental to biodiversity and vulnerable to climactic stress, eventually leading to diminishing yields.<sup>11, 12, 13</sup>

Regenerative agriculture aims to restore the agroecosystem found in coffee forests by enhancing natural capital and increasing the function of ecosystem services (fig. 2). Nearly all ecosystem services start from the ground up with healthy soil.

**FIGURE 2**

Healthy soil, flourishing biodiversity, climate change mitigation, and resilient livelihoods are all outcomes of regenerative agriculture.





Without healthy soil, the productivity and resilience of both the coffee plant and wider ecosystem are compromised. This is because the soil's condition—defined by its structure, texture, and physical and chemical composition—can determine its ability to retain water, minimize the impact of erosion, and house microbial communities that are necessary for nutrient cycling and carbon sequestration.<sup>14</sup> Evidence shows that coffee roots and microbial communities will respond to stress, like disease and pests, by working together to conserve, exchange, and distribute nutrients. This dynamic relationship helps maintain plant health and reliable yields. It is further enhanced by adding organic material to the soil.<sup>15</sup>

How farmers treat the soil has a direct impact on the farm's health. Practices that improve soil health include planting cover crops, utilizing organic fertilizers and alternatives to toxic agrochemicals (particularly herbicides).

At the surface level, cover crops, such as dwarf mucuna (*Mucuna deeringiana*) and pinto peanut (*Arachis pintoi*), reduce soil erosion by minimizing exposure to harsh winds, flooding, and intense heat.<sup>16</sup> Other crops, such as buckwheat and sunn hemp, play a role in pest and weed management by suppressing weeds and attracting the natural predators of common coffee pests.<sup>17, 18, 19</sup> In turn, cover crops reduce the need for pesticides and herbicides that pose a risk to the soil biota (such as fungi, bacteria, and arthropods)—that are vital for nutrient cycling and carbon sequestration.

Cover crops improve soil health below the surface, as well. What would otherwise need to be provided with costly synthetic fertilizers can be achieved with nitrogen fixing cover crops (such as pinto peanut, *crotalaria spectabilis*, and pigeon pea).<sup>20</sup> As the roots and leaves of cover crops decompose, they also serve as a source of organic matter that bolsters the soil's ability to retain water and cycle nutrients.

But cover cropping is just one of the many activities that farmers can pursue to enhance the quality of their soil. Mulching and the application of organic fertilizers also have demonstrated benefits. Mulching with organic material, like cover cropping, provides the nutrients needed for plants to photosynthesize and minimizes exposure to harsh environmental conditions. In the case of coffee, organic mulching is linked to higher yields<sup>21, 22</sup> and greater resistance to drought and erosion.<sup>23</sup>

Indeed, when testing the scorecard in Costa Rica, Rainforest Alliance staff observed that in addition to using cover crops, farmers applied organic fertilizers made with nitrogen-fixing bacteria and nutrient-rich coffee residue (a byproduct of the coffee production process) to improve soil quality. Farmers can also utilize tree clippings and pulled weeds to create locally sourced "green mulch."







## BIODIVERSITY

Just as important as what we apply to the soil is what we grow from it. Promoting and maintaining biodiversity is a key component to building a regenerative coffee farm.

Coffee farms with a variety of trees and crops are linked to increased biodiversity both above and below the soil.<sup>24, 25</sup> By providing micro-climate control and nutrient-rich leaf litter, shade trees on coffee farms help create the necessary conditions for soil biota to flourish.<sup>26, 27, 28</sup>

As mentioned in the previous section, soil biota is necessary for maintaining soil structure, nutrient cycling, and carbon sequestration. Evidence shows that diverse coffee agroforestry systems sequester and store carbon at a greater rate than conventional monocultures do.<sup>29, 30, 31, 32</sup> Of course, carbon sequestration is just one of the many ecosystem services improved by biodiversity. Other ecosystem services include pest control, soil fertility, and water quality management.<sup>33, 34</sup>

Diverse agroforests attract and shelter species that provide key services like pest control and pollination.<sup>35</sup> For example,

shade trees attract bird, ant, and spider species that are natural predators to coffee borer beetles and coffee leaf miners.<sup>36, 37</sup> The increased presence of pollinators in coffee agroforests is also linked to greater coffee production, in some cases exhibiting upwards of a 20 percent increase in yields.<sup>38</sup>

Intercropped shade and fruit tree species also serve as natural barriers to the spread of fungi and coffee pests.<sup>39</sup> They help keep nutrients in the soil. In fact, one study on Costa Rican coffee farms observed that monocultured farms had nitrogen losses that were three times greater than coffee agroforests planted with *Musa* and *Erythrina* trees.<sup>40</sup> Where nitrogen and other nutrients can be lost in runoff or leaching, vegetatively rich riparian buffers help prevent the nutrients and sediment from entering bodies of water, thereby further retaining nutrients in the soil and reducing the risk of water pollution.<sup>41</sup>

Ultimately, increased diversity in coffee agroforests contributes to improved coffee production, less pests, more pollination, and improved soil health and quality.<sup>42, 43</sup>



Photo: Radim Schreiber

The entire coffee production process is water intense. At the growing stage, many coffee farmers use a rain-fed approach to irrigation.<sup>44</sup> Other farmers source from groundwater reserves. Both approaches are vulnerable to droughts and climate change-linked water scarcity.<sup>45</sup> While coffee agroforests with healthy soils are less likely than coffee monocultures to experience water loss from runoff and evaporation, helping farmers conserve water through efficient irrigation and processing systems is key.<sup>46</sup>

However, regenerative farms not only look at water conservation, but protection as well. In addition to runoff, waste generated during the coffee fermentation process threatens local bodies of water if not managed properly.<sup>47</sup> Farmers can reduce the risk of contamination by maintaining riparian buffers and efficient wastewater treatment systems.

A riparian buffer is a vegetative area located near a body of water. Generally, the larger and more vegetatively rich the riparian buffer is, the more effective it is at protecting aquatic ecosystems and supporting biodiversity.<sup>48</sup> Research shows that streams located near coffee farms with higher levels of shade cover show lower levels of turbidity and conductivity—two indicators of agricultural contamination.<sup>49</sup> Evidence also shows that riparian buffers effectively promote both aquatic and terrestrial biodiversity.<sup>50</sup>

Of course, riparian buffers alone are not enough. Efforts to reduce agrochemical inputs and install wastewater treatment systems are also needed. Reliable and efficient irrigation techniques are not just beneficial for local bodies of water, they are also important to crop health and resilience.





## CROP RESILIENCY

At this point, the natural connections start to become clearer, and we can see the benefits of regenerative agriculture through improved crop resilience. A diversity of cover crops and shade trees increase nutrient availability in the soil, provide micro-climate control, and foster pest management, thereby making crops less susceptible to pests and diseases.<sup>51</sup> Being anchored in rich, moisture-retaining soil and shielded by lush vegetation also helps crops better withstand winds, droughts, and floods.

In addition to leveraging these naturally occurring relationships, farmers can pursue an array of good agronomic practices to improve their crop's resilience. For coffee, this includes frequent pruning, renovating, selecting fungi-resistant or -tolerant varieties (e.g., for leaf rust), and implementing an integrated pest management plan (IPM).

The average coffee plant can live up to 60 years, but their yields begin to decline after 20 years. As they age, they also become more vulnerable to diseases and pest attacks. By routinely renovating their farms and removing older and more vulnerable trees, coffee farmers can decrease the risk of losing their crops to blight while maintaining steady production.<sup>52, 53</sup> Frequent pruning also helps minimize the risk of disease.<sup>54</sup>

Left unpruned, the coffee tree's thick branches will trap moisture, creating ideal conditions for pests and fungi. Unpruned coffee trees also direct energy towards growing their many branches instead of coffee fruit, resulting in lower yields. When compared to unpruned coffee trees, pruned trees exhibit higher yields and lower levels of pest infestation.<sup>55, 56</sup>

One particularly devastating coffee fungus is coffee rust (*Hemileia vastatrix*). An outbreak of coffee rust between 2008 and 2013 was responsible for plummeting production across Latin America. In Colombia, production declined 31 percent while in Central America it dropped by 16 percent.<sup>57</sup> Selecting rust resistant varieties, like Lempira and Catimor<sup>i</sup>, is a recommended practice throughout the sector.<sup>58</sup> Regenerative coffee farmers implement IPM systems to deal with other pests like coffee leaf miners and coffee borers without also harming beneficial insects and wildlife.

Under an IPM system, the use of toxic herbicides and pesticides are avoided or minimized and replaced with manual and biological strategies. Frequent pruning, weeding, and removing fallen coffee berries to maintain sanitary fields fall under manual IPM strategies. Effective biological IPM strategies include border cropping, planting crops that attract and provide sustenance for predators and parasites that target coffee pests, as well as intercropping with vegetation that maintains microclimates inhospitable for coffee pests.<sup>59</sup>

Understandably, some farmers may express concerns about tradeoffs between yields and following regenerative practices. While this is a valid concern, little evidence exists to support it.<sup>60</sup> Instead, studies show that farmers who pursue regenerative practices maintain stable yields and even outperform conventional farmers in overall farm level productivity, profitability, and food security.<sup>61, 62, 63</sup>

<sup>i</sup> These are just two examples of regionally specific rust resistant varieties ideal for Latin America. Scorecard users should consult with the Rainforest Alliance and/or local agronomists to identify locally appropriate rust resistant varieties.



Regenerative practices not only deliver environmental benefits but can provide economic ones, as well. These benefits include diversified incomes, reduced dependence on costly agrochemical inputs, and growing opportunities to participate in carbon markets and payments for ecosystem services.

By planting a variety of fruit trees and engaging in practices like beekeeping, coffee farmers are not only diversifying the local flora and fauna but can also diversify their incomes. In fact, several studies show that farmers often choose to diversify as a means of improving their income and enhancing their food security.<sup>64, 65</sup>

Often one of the largest expenses that farmers face is the cost of fertilizers and other agrochemicals. But, as exhibited in the above sections, cover crops and a diversity of trees can suppress weeds, contribute to pest management,<sup>66</sup> and

fixate nitrogen in the soil,<sup>67</sup> thereby replacing or offsetting the need for costly and toxic agrochemical inputs.

Finally, many regenerative coffee farmers are better positioned to benefit from carbon credit and payment for ecosystem services (PES) programs, providing another stream of revenue.<sup>68</sup> Of course, companies have a considerable role to play in providing both financial assistance and incentive for farmers to make the regenerative transition. Here, companies can explore options like premiums and subsidies to support the farmers they source from in making the regenerative transition. And while regenerative agriculture can create financial opportunities for farmers, it is important that farmers maintain financial records to assess costs of production and track which practices are positively contributing to their incomes.



## QUESTIONS? CONTACT US!

The Rainforest Alliance is proud to share this tool with the wider coffee community. In our commitment to continuous improvement, we value your feedback and are happy to answer questions about the scorecard.

Please direct your questions to:

**Matthew Bare**, Senior Manager Market Innovation, [mbare@ra.org](mailto:mbare@ra.org),

**Dr. Juliana Jaramillo**, Lead, Regenerative Agriculture [jjaramillo@ra.org](mailto:jjaramillo@ra.org)

TERM	DEFINITION	REFERENCE	ADDITIONAL GUIDANCE	FOOTNOTE
<b>Agrochemicals</b>	Commercially produced, usually synthetic, chemical compounds used in agricultural production, such as fertilizers, pesticides, growth regulators, nematicides, or soil conditioners. Annex 7 presents the lists of prohibited, obsolete and risk mitigation pesticides.	<a href="#">Rainforest Alliance Guidance H: Integrated Pest Management IPM</a>	<a href="#">Rainforest Alliance Annex S7: Pesticide Management</a>	pg. 4 (Guidance H)
<b>Agroforestry</b>	The combination of trees alongside, agricultural crops, and potentially including other vegetation and livestock, in integrated systems that produce food, support biodiversity, create healthy soils, and secure water availability and sequester carbon from the atmosphere.  Protecting and enhancing natural vegetation boosts soil quality, conserves biodiversity, protects water sources, mitigates climate change through carbon sequestration, and maintains ecological processes. As a result, it is important to maintain a minimum amount of natural vegetation coverage (> 10%)	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>	<a href="#">Rainforest Alliance Guidance M: Natural Ecosystems and Vegetation</a>	pg. 3 (Glossary) pg. 24-25 (Guidance M)
<b>Aquatic ecosystem</b>	Flowing and still water bodies and other wetlands. This includes:  1. Flowing and still water bodies: all naturally occurring streams, rivers, pools, ponds, lakes, and lagoons, as well as seasonal streams that flow continuously for at least two months in most years, or flow intermittently and are at least 1 meter wide.  2. Other wetlands: all naturally occurring wetlands, where the natural hydrological conditions result in either or both of the following conditions: a) Soils are waterlogged for the majority of the year; b) the land is periodically or permanently inundated by shallow water	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>		pg. 3
<b>Climate-smart agriculture</b>	A combination of various sustainable methods to tackle the specific challenges from climate change of a specific farming community. It is composed of three main pillars:  1. Sustainably increasing agricultural productivity and incomes 2. Adapting and building resilience to climate change 3. Reducing and/or removing greenhouse gas emissions, where possible	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>		pg. 6
<b>Compost</b>	Biological decomposition of organic matter under controlled conditions (temperature, humidity, oxygen) into a humus-like stable product that can be used as a natural fertilizer	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>		pg. 7
<b>Conservation</b>	Protection of a natural ecosystem against direct or indirect human conversion or degradation. Natural ecosystems may be conserved through any combination of strict preservation, restoration, or sustainable management.	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>		pg. 7
<b>Cost of production</b>	The total cost of production is the sum of labor costs, input costs, as well as any additional cost that may occur. Labor costs generally include hired labor, but can also include the costs associated with family labor. Whereas input costs typically include the costs of fertilizer, agrochemicals, water used in irrigation, energy used in processing, and transportation. Other expenses that can contribute to the total cost of production may include tools, machinery, land leases, and taxes.	<a href="#">"Handbook on Agricultural cost of Production Statistics: Guidelines for Data Collection, Compilation, and Dissemination"- FAO</a>		pg. 14
<b>Cover crops</b>	According to the FAO "...cover crops are mainly grown for their effect on soil fertility or as livestock fodder... Cover crops are grown during fallow periods, between harvest and planting of commercial crops, utilizing the residual soil moisture...There are various crop alternatives to be used as vegetative cover, such as grains, legumes, root crops and oil crops. All of them are of great benefit to the soil; however some cover crops have certain attributes, which need to be kept in mind when planning a rotation scheme..."	<a href="#">"Cover crop species, with a special focus on legumes" FAO</a>		pg. 1

TERM	DEFINITION	REFERENCE	ADDITIONAL GUIDANCE	FOOTNOTE
<b>Crop Productivity</b>	<p>As defined by the OECD, productivity is "... a ratio of a volume measure of output to a volume measure of input." Productivity measures how efficiently inputs—such as land, labor, fertilizers, pesticides, machinery and water—are used, compared to the value of production. Productivity takes into account the costs of these inputs. It is important to differentiate between yield and productivity, as increasing yields does not automatically lead to an increase in the farmer’s income if the costs for the inputs increase more than the additional income</p>	<p><a href="#">"Cover crop species, with a special focus on legumes" FAO</a></p>		<p>pg.1</p>
<b>Farm Business Plan</b>	<p>A roadmap that helps farmers or farm owners to find, describe and refine the competitive advantage of the farm business to help it to achieve its short-and long-term goals and objectives. The plan considers markets, supply and demand, everything that pertains to the farm operation, management structure, financial analysis, products, and prices, and it should include a detailed list of resources that are available and needed for the operation.</p>	<p><a href="#">"First Steps"- USDA &amp; "How to Start a Small Farm Business"- Treehugger</a></p>		
<b>Fertilizer</b>	<p>Any organic or inorganic material of natural or synthetic origin (other than liming materials) that is added to a soil to supply one or more plant nutrients aiding the growth of plants.</p> <ul style="list-style-type: none"> <li>• Inorganic Fertilizer: A fertilizer material in which carbon is not an essential component of its basic chemical structure. Fertilizer in which the declared nutrients are in the form of inorganic salts obtained by extraction and/or by physical and/or chemical industrial processes. Examples are ammonium nitrate, ammonium sulfate, and potassium chloride.</li> <li>• Organic Fertilizer: By-product from the processing of animal or vegetable substances that contain sufficient plant nutrients to be of value as fertilizers. Examples include compost, manure, peat, and slurry.</li> </ul>	<p><a href="#">Rainforest Alliance Glossary (Annex 1)</a></p>	<p><a href="#">Rainforest Alliance Annex S7: Pesticide Management</a></p>	<p>pg. 9</p>
<b>Integrated Pest Management (IPM)</b>	<p>The careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations, as well as keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of healthy crops and cattle with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms. The application of pesticides is based on the monitoring of disease or pest infestations</p> <p>For pest prevention and control, it is important to use biological, physical, and other non-chemical control methods first, and document the use and the effectiveness of these methods. When threshold levels of pests are reached, agrochemical applications may be carried out, as advised by a competent technician and/or upon the advice or instruction by an official national organization. When agrochemicals are used:</p> <ul style="list-style-type: none"> <li>• Agrochemicals with the lowest possible toxicity and highest selectiveness are used</li> <li>• Applications are made only on the impacted plants and areas</li> <li>• Active ingredients are rotated to avoid and reduce resistance</li> <li>• Calendar spraying is avoided, and only allowed when recommended by a competent technician or official national organization</li> </ul>	<p><a href="#">Rainforest Alliance Guidance H: Integrated Pest Management IPM</a></p>		<p>pg. 4 &amp; 13</p>

TERM	DEFINITION	REFERENCE	ADDITIONAL GUIDANCE	FOOTNOTE
<b>Integrated Weed Management (IWM)</b>	<p>According to the FAO "An integrated weed management approach to land management combines the use of complementary weed control methods such as grazing, herbicide application, land fallowing, and biological control. The resulting combinations provide the best possible solutions to weed problems for land managers."</p> <p>A good plan for weed management includes:</p> <ol style="list-style-type: none"> <li>1. Prevent the establishment of weeds using the following interventions when applicable: <ul style="list-style-type: none"> <li>• Know your major weeds. The time of their flowering and seeding</li> <li>• Field margin management</li> <li>• Clean seeds</li> <li>• Use of cover crops</li> <li>• Mulching (dead or living)</li> <li>• Allelopathic compounds</li> <li>• Timing and depth of cultivation</li> </ul> </li> <li>2. Reduce the impact of weeds on the crops through: <ul style="list-style-type: none"> <li>• Plant variety choice</li> <li>• Spatial arrangement of crop</li> <li>• Mechanical or manual weeding</li> <li>• Intercropping</li> <li>• Biological control(pests that attack the weed)</li> </ul> </li> <li>3. Reduce seed return by: <ul style="list-style-type: none"> <li>• Clean machinery</li> <li>• Water and fertilizer management</li> <li>• Weed seed collection and destruction</li> <li>• Last resort: post emergence and spot application of post-emergence herbicides</li> </ul> </li> </ol>	<p><a href="#">"What is Integrated Weed Management". - Food and Agriculture Organization of the United Nations (FAO)</a></p>	<p><a href="#">Rainforest Alliance Guidance H: Integrated Pest Management IPM</a></p>	<p>webpage (FAO)</p> <p>pg. 23 (Guidance H)</p>
<b>Invasive species</b>	<p>A plant or animal species or subspecies that is not native to a given place, and whose presence or introduction in that place causes or is likely to cause economic harm, environmental harm, or harm to human health. For the Rainforest Alliance standard, invasive species are the ones referenced by IUCN/SSC Invasive Species Specialist Group (ISSG) as 100 of the World's Worst Invasive Alien Species. Crop or livestock species are not considered invasive species.</p>	<p><a href="#">Rainforest Alliance Glossary (Annex 1)</a></p>		<p>pg. 16</p>
<b>Management plan</b>	<p>A detailed overview, set up by the management, of the goals that are set to be compliant with the requirements (for both management, workers, and/or group members) and the respective services necessary to meet these goals. The actions can include mitigation actions, remediation actions, and services, such as training, technical assistance, access to inputs (e.g. seedlings), and awareness-raising activities. The Management Plan indicates details on the actions such as the timeline, frequency, responsible person, target group, and status.</p>	<p><a href="#">Rainforest Alliance Glossary (Annex 1)</a></p>		<p>pg. 17</p>
<b>Mulch</b>	<p>The practice of applying a layer of material to the surface of an area of soil. Mulches can be either made of materials like plastic or nets (for weed control or to exclude pests and to heat cold soils), or they can be living mulches, like flowering herbs, which help improve soil condition and increase biodiversity. Mulching can help improve soil structure, water infiltration and retention, and soil fertility.</p>		<p><a href="#">"What is Climate-Smart Agriculture?" - Rainforest Alliance</a></p>	<p>pg. 15 (Guidance H)</p> <p>webpage (Rainforest Alliance)</p>
<b>Native species</b>	<p>Native species are those occurring within their natural range and are adapted to the environmental conditions where they naturally grow. As a result, native species are likely to thrive in a given environment and play an important role in supporting native wildlife, including birds, mammals, and pollinators that rely on native plant species for food and habitat.</p>	<p><a href="#">Rainforest Alliance Guidance M: Natural Ecosystems and Vegetation</a></p>		<p>pg. 21</p>

TERM	DEFINITION	REFERENCE	ADDITIONAL GUIDANCE	FOOTNOTE								
<b>Natural enemies</b>	Organisms which kill, decrease the reproductive potential of, or otherwise reduce the numbers of another organism. Natural enemies in agricultural production are key components of integrated pest management programs. Important natural enemies of insect and mite pests include predators, parasites, and pathogens.	<a href="#">Rainforest Alliance Guidance H: Integrated Pest Management IPM</a>		pg. 4								
<b>Natural vegetation</b>	<p>Vegetation made up predominantly of native or locally adapted species, resembling in species composition and structure the vegetation that occurs or would occur in the absence of human interference. Natural vegetation may be managed (or, in the case of restoration, established) to incorporate a minority component of exotic species if these are beneficial for regenerating the land, adapting the ecosystem to current or future climates, and/or enhancing biodiversity. If invasive species are present, natural vegetation is managed to reduce their presence.</p> <p>Natural vegetation can include one or more of the following (not exclusive):</p> <ul style="list-style-type: none"> <li>• Riparian buffers</li> <li>• Conservation areas within the farm</li> <li>• Natural vegetation in agroforestry systems</li> <li>• Border plantings, live fences and barriers around housing and infrastructure, or in other ways</li> <li>• Conservation and restoration areas outside the certified farm that effectively provide for long-term protection of the subject areas (for at least 25 years) and yield additional conservation value and protection status relative to the status quo</li> </ul>	<a href="#">Rainforest Alliance Guidance M: Natural Ecosystems and Vegetation</a>		pg. 24								
<b>Non-application zone</b>	<p>An area where no pesticides are applied. The distance in meters indicates the width of the non-application zone depends on the method by which the pesticide is applied, as follows:</p> <ol style="list-style-type: none"> <li>1. 5 meters, if applied by mechanical, hand-assisted and targeted application methods, such as knapsack sprayers, banding, baiting, specific granule placement, soil or plant injection, seed treatments, and weed wiping.</li> <li>2. 10 meters, if applied by broadcast or pressurized spray application methods, such as motorized sprayers or spray booms, air blast sprayers, or foggers (Ultra Low Volume fogging machines) depending on the equipment's technical specifications.</li> </ol>	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>		pg. 20								
<b>Prohibited / Highly Hazardous Pesticides</b>	<p>The Rainforest Alliance list of Prohibited Pesticides (found in Annex 7) is based on the FAO/WHO Guidelines for Highly Hazardous Pesticides. These guidelines include the definition of Highly Hazardous Pesticides (HHPs) following eight criteria. The Rainforest Alliance List of Prohibited Pesticides has eight columns that refer to each of these criteria:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">• Main use</td> <td>• Reproductive toxicity</td> </tr> <tr> <td>• Acute toxicity</td> <td>• International conventions</td> </tr> <tr> <td>• Carcinogenic toxicity</td> <td>• Severe effects</td> </tr> <tr> <td>• Mutagenic toxicity</td> <td></td> </tr> </table>	• Main use	• Reproductive toxicity	• Acute toxicity	• International conventions	• Carcinogenic toxicity	• Severe effects	• Mutagenic toxicity		<a href="#">International Code of Conduct on Pesticide Management, Guidelines on Highly Hazardous Pesticides FAO/WHO, 2016</a>	<a href="#">Rainforest Alliance Annex S7: Pesticide Management</a>	pgs. 7-12
• Main use	• Reproductive toxicity											
• Acute toxicity	• International conventions											
• Carcinogenic toxicity	• Severe effects											
• Mutagenic toxicity												
<b>Pruning</b>	Pruning refers to the selective seasonal or annual activity to remove dead, diseased, or non productive branches, to manage pests and diseases and/or to give shape and redirect growth (formation) with the aim of influencing harvest, productivity and quality, and to ease harvesting itself. Pruning can also be done for crop reproduction/renovation (cuttings, grafting) and for rejuvenation/revitalization of the crop.	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>	<a href="#">Rainforest Alliance Guidance I: Pruning</a>	pg. 4								



TERM	DEFINITION	REFERENCE	ADDITIONAL GUIDANCE	FOOTNOTE
<b>Regenerative agriculture</b>	For the Rainforest Alliance, “regenerative agriculture” comprises a broad set of principles and practices under the umbrella of climate-smart agriculture. Taking an agroecology and integrated system management approach, regenerative agriculture aims to increase biodiversity, enhance ecosystem services, and increase agroecosystem resilience thus leading to resilient livelihoods.	<a href="#">Raising the Bar— Regenerative Agriculture for More Resilient Agro-Ecosystems Position Paper</a>		pg. 21
<b>Renovation</b>	Renovation of coffee describes the complete uprooting of old unproductive trees and replanting with new high-yielding, disease and or climate tolerant varieties. Complete renovation might be necessary where pests or diseases have irreversibly affected trees, better-adapted varieties are available, and yields warrant the renovation. Plantations that comprise of trees older than 40-50 years should perform a staggered renovation by replacing a percentage of the oldest and least productive trees every season.	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>	<a href="#">Rainforest Alliance Guidance I: Pruning</a>	pg. 23
<b>Revenue</b>	Revenue is calculated as the production volume multiplied by the average price received for the crop.	<a href="#">“Handbook on Agricultural cost of Production Statistics: Guidelines for Data Collection, Compilation, and Dissemination”- FAO</a>		pg. 48
<b>Riparian buffer</b>	<p>An area of permanent vegetation adjacent to an aquatic ecosystem where crops and livestock are not present. Aquatic ecosystems are surrounded by riparian buffers with the following riparian buffer width parameters:</p> <ul style="list-style-type: none"> <li>• 5 meters horizontal width along both sides of water courses between 1-5 meters wide. For farms &lt; 2 ha, the width of the buffer may be reduced to 2 meters at both sides;</li> <li>• 8 meters horizontal width along both sides of water courses between 5-10 meters wide, and around springs, wetlands, and other water bodies; 15 meters horizontal width along both sides of rivers wider than 10 meters wide</li> </ul>	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>	<a href="#">Rainforest Alliance Guidance M: Natural Ecosystems and Vegetation</a>	<p>pg. 22 (Glossary)</p> <p>pg. 35 (Guidance M)</p>
<b>Rust resistant varieties</b>	Coffee leaf rust CLR ( <i>Hemileia vastatrix</i> ) is a fungal disease that attacks older coffee leaves. Farmers can prevent coffee leaf rust by planting resistant varieties (please consult your local agronomic extension officer or research institute to choose the correct one). The resistance may be naturally occurring, or it may be the result of breeding programs designed to enhance the plant’s ability to resist the specific disease(s). It is important to consider that rust-resistant varieties may exhibit some disease symptoms or damage under heavy pest or pathogen pressure.”	<a href="#">Rainforest Alliance Guidance H: Integrated Pest Management</a>	<a href="#">“Resistance terminology”- Enza Zaden, &amp; “Disease Resistance”- International Seed Federation</a>	pg. 37
<b>Shade coverage</b>	<p>Maintenance of shade coverage through the planting of shade trees and/or native vegetation serves to protect soil against erosion, fluctuations in rainfall and water availability, contribute to soil nutrients through foliage decomposition, as well as serve as a source of biodiversity. Shade coverage can be calculated through a variety of methods from photographing the canopy to more advanced technologies like satellite imagery.</p> <p>Because shade cover is difficult to estimate, we recommend using the following categorization system to assess shade cover: (Contextualization to local conditions needed)</p> <ol style="list-style-type: none"> <li>1. 0-10% shade: sparse shade; needs improvements to increase shade cover</li> <li>2. 10-25% shade: low-intermediate shade level; need to increase shade (for example, for coffee and cocoa, the minimum shade threshold is 40%)</li> <li>3. 25-35% shade: intermediate-high shade level</li> <li>4. 35-45% shade: high shade level</li> <li>5. &gt;45% shade: excessive shade level; suggest to selectively thin by harvesting commercial trees</li> </ol>	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>	<p><a href="#">Rainforest Alliance Guidance J: Soil Fertility and Conservation</a></p> <p><a href="#">Rainforest Alliance Guidance M: Natural Ecosystems and Vegetation</a></p>	<p>pgs. 24, 26-31 (Guidance M)</p> <p>pg. 21 &amp; 26 (Guidance J)</p>

TERM	DEFINITION	REFERENCE	ADDITIONAL GUIDANCE	FOOTNOTE
<b>Soil conservation practices</b>	<p>Soil conservation practices are intended to reduce erosion, maintain fertility and crop support (i.e. nutrient cycling), and support water hydrology (i.e. drainage and drought resistance). Common practices such as non-tillage and cover cropping all aim to maintain a “good” soil profile. A good soil profile is dependent on the following qualities that can be determined via soil assessments:</p> <ul style="list-style-type: none"> <li>• Texture: different mineral/rock particles that make up the soil (clay, silt and sand)</li> <li>• Structure: the way the soil particles are organized. Organic matter and calcium particles help bind the different soil components together into bigger structural units called aggregates. A well-structured soil has air-filled spaces between and within the aggregates.</li> <li>• Richness: rich soil is determined by the presence of useful chemical reserves in the soil for the crop. The presence of soil nutrients is largely dependent on soil type (mineral composition) and organic matter content.</li> </ul>	<a href="#">Rainforest Alliance Guidance J: Soil Fertility and Conservation</a>		pgs. 5-6
<b>Soil Organic Carbon (SOC)</b>	<p>According to the FAO “Soil organic carbon (the carbon stored in soil organic matter) is crucial to soil health, fertility and ecosystem services, including food production – making its preservation and restoration essential for sustainable development. Soils with high carbon content are likely to be more productive and better able to filter and purify water. Soil organic carbon plays a big role in climate change, presenting both a threat and an opportunity to help meet the targets of the Paris Agreement.”</p>	<a href="#">“Soil Organic Carbon”- FAO</a>		webpage
<b>Soil Organic Matter (SOM)</b>	<p>The amount of recycled biomass, by which nutrients are returned to the soil.</p>	<a href="#">Rainforest Alliance Guidance J: Soil Fertility and Conservation</a>		pg. 20
<b>Spot application</b>	<p>When agrochemicals are used applications are made only on the impacted plants and areas</p>	<a href="#">Rainforest Alliance Guidance H: Integrated Pest Management</a>		pg. 13
<b>Strata</b>	<p>Healthy natural forests contain multiple vertical layers, or strata, that reflect the structural integrity of the forest and contribute to ecosystem functioning.</p> <p>The main strata include:</p> <ul style="list-style-type: none"> <li>• the forest floor (consisting of soil, leaf litter, woody debris etc.),</li> <li>• the understory (composed of herbaceous plants, shrubs, saplings and young trees),</li> <li>• the mid-story or canopy (above the understory, approximately 15-30m above the forest floor, often dense with vegetation; vines and lianas are common), and</li> <li>• the overstory or emergent canopy (reaching heights of 30 or more meters, scattered tall trees with canopies that stretch above the mid-level canopy).</li> </ul>	<a href="#">Rainforest Alliance Guidance M: Natural Ecosystems and Vegetation</a>		pg. 15
<b>Water Quality (Wastewater) Parameters</b>	<p>The Rainforest Alliance parameters for wastewater discharge into aquatic ecosystems are:</p> <ul style="list-style-type: none"> <li>• Biochemical Oxygen Demand (BOD5) &lt; 750 mg/l</li> <li>• Total suspended solids &lt; 50 mg/l</li> <li>• Grease and oils &lt; 50 mg/l</li> <li>• pH Between 5.5 and 9.0</li> </ul> <p>The Rainforest Alliance wastewater parameters for irrigation are:</p> <ul style="list-style-type: none"> <li>• Intestinal nematodes (arithmetic mean No. of eggs per liter) &lt;1</li> <li>• Faecal coliforms (geometric mean No. per 100 ml) ≤ 1000”</li> </ul>	<a href="#">Rainforest Alliance Glossary (Annex 1)</a>		pg. 27

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