



# Delta Sustainability Framework Indicators \_Version 0

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## Introduction

The Delta Sustainability Framework aims to align sustainability monitoring and reporting within and across the cotton and coffee sectors. It provides a **common set of 15 impact and outcome indicators** to measure and report on sustainability improvements as well as **guiding principles** to gather and communicate sustainability information.

The framework builds on the work already undertaken by several commodity platforms and initiatives to define and harmonize sector-wide sustainability goals, and in particular on the **Coffee Data Standard** developed by Global Coffee Platform (GCP) and on **the Guidance Framework on Measuring Sustainability in Cotton Farming Systems** published by the Expert Panel on the Social, Environmental and Economic Performance of Cotton (SEEP)<sup>1</sup>.

The guiding principles draw inspiration from the **ISEAL's Sustainability Claims Good Practice Guide** to communicate relevant sustainability information generated through the common set of indicators, building on the principles of reliability, relevance, clarity, transparency, and accessibility.

The framework has a strong alignment to the **Sustainable Development Goals (SDGs)** to promote the adoption of a common language and approach to the goal of achieving global sustainable agriculture.

## Scope of the framework

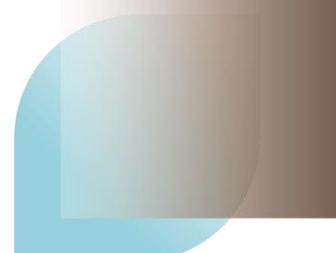
The Delta Sustainability Framework is intended to apply worldwide to any cotton and coffee farming system, with the potential to be expanded to other agricultural commodities over time. The scope is the farm, with the single exception of the indicator on greenhouse gas emission estimation which includes cotton ginning. Results however can, and often would need, to be aggregated at higher levels to be more informative.

Most of the environmental and social impacts of agriculture are felt at a larger scale than the farm. As landscape monitoring systems using remote sensing become more accessible, the Delta Project team aims to upgrade the framework indicators and methodologies to a landscape approach (e.g. living income, deforestation risk maps, social risk maps).

The Delta Project team also fully recognises the relevance of expanding the scope of the framework to cover other segments of the value chain in future.

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<sup>1</sup> SEEP is an expert panel of the International Cotton Advisory Committee (ICAC) established in 2006:  
<https://www.icac.org/CommitteesandNetworks/CommitteesandNetworks?CommitteeTypeId=4&MenuId=61>



## Intended uses

The **intended uses** of the Delta Sustainability Framework include:

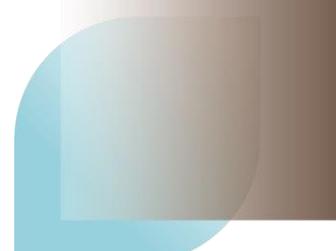
- National reporting on the commitments set by the SDGs and the ratification of relevant international conventions on chemicals, climate change, biodiversity and labour rights;
- Evidence-based recommendations to streamline sustainability in agricultural policies;
- Upgrading of extension services to support continuous improvement at farm level;
- Transparency and communication with consumers on the actual value of sustainably produced goods;
- Identification of business opportunities leveraging sustainable value chains.

## Consultations with the sector stakeholders

The common set of indicators is the result of an intensive consultation process that began in June 2019 and engaged sustainability standards, retailers, donors, research institutes, national committees and international organisations from the agricultural sector. In addition to the project partners, the members of the Cotton 2040 Impacts Alignment Working Group Members, comprising major cotton sustainability standards, programmes and codes<sup>2</sup>, the SEEP members representing the Government of 10 countries and the European Union, the Australian Sustainability Working Group, the ISEAL Secretariat and some ISEAL members such as Bonsucro and Rainforest Alliance, have provided substantial input to the development of the indicator set through workshops, webinars, on-line surveys and one-to-one calls. Technical expert group such the Global Soil Partnership have been consulted on methodological guidance on specific indicators.

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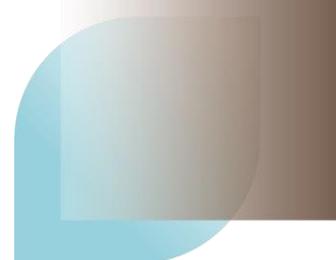
<sup>2</sup> <https://www.forumforthefuture.org/cotton-2040>



## Sustainability areas and goals

Key sustainability priority areas and sub-areas for coffee and cotton production were identified at the start of the project and validated in the initial consultations held with the stakeholders. The sustainability issues covered directly link to several SDGs targets and in particular to those under SDGs 1, 2, 3, 5, 6, 8, 10, 12, 13, 14 and 15.

SDGs	Pillar	Impact area	Impact sub-area
12, 3, 6, 13, 15	Environment	Pest and Pesticide Management Water Management Soil Management Biodiversity and Land Use Climate Change and energy use	Pesticide management Pest Management Water quality Water use Soil conservation Soil erosion Fertilizer use Land conversion Biodiversity conservation Energy use/ Greenhouse Gas Emissions Farmers' adaptation to climate change
1, 10	Economic	Economic Viability Economic resilience Poverty line Living conditions	Income Profit/returns Productivity Price Debts Asset Yield volatility Price volatility Payments Credits Poverty reduction Access to drinking water, electricity, sanitation
2, 8, 10	Social	Decent work Child labour Worker Health and Safety Equity and Gender Labour rights Food security	Wages Pensions Social protection Child labour/forced labour Children at school Fatalities and non -fatal accidents Health care facilities Water/sanitation Women empowerment Indigenous people No discrimination Democratic organisations Freedom of association Access to food



Drawing from the priority areas, cotton stakeholders have formulated nine shared sustainability goals to guide the selection of the impact and outcome indicators.

	Environmentally sustainable agricultural practices (SDGs 3,6,12,13,14, 15)	Decent livelihoods/ poverty reduction (SDGs 1, 8, 10)	Promote social equality & empowerment (SDGs 2, 3, 6, 8, 10, 16)
<b>Nine common goals</b>	Sustainable cotton farming minimise contamination of natural resources	Cotton farmers and workers earn a 'decent' income	Human rights are respected on cotton farms, with no forced and child labour
	Sustainable cotton farming protects and regenerates ecosystem services	Sustainable cotton farming is economically viable and farmers are economically resilient	Healthy & safe working conditions are present for all farmers and workers
	Sustainable cotton farming reduces greenhouse gas emissions and builds resilience to climate change	Sustainable cotton farming alleviates poverty	Sustainable cotton farming delivers equality and empowerment, including gender equality, for cotton farmers and workers

These goals have yet to be validated with the coffee stakeholders.

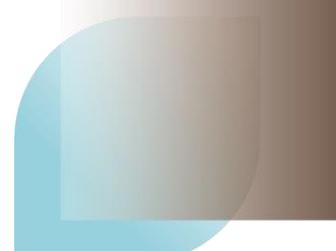
## The Delta Sustainability Indicator Set

Over 200 indicators currently in use by cotton and coffee specific initiatives as well as more generic sustainability frameworks were assessed during the consultation process for their fitness to monitor progress towards the nine goals. The list of initiatives reviewed is provided in Annex 1.

As a result, the Delta Sustainability Framework comprises a core set of **15 farm-level, outcome/impact indicators across the social, economic and environmental dimensions of sustainability**. Considering the interdependences between the social, economic and environmental sustainability pillars, the set of common indicators needs to be seen as a whole.

The indicators were selected for their relevance, usefulness and feasibility in monitoring progress towards sustainable agricultural commodities.

- **Relevance:** progress towards goals and credibility
- **Usefulness:** global commitments, comparability and aggregation, stakeholders' needs
- **Feasibility:** easy of data collection and costs.



1. **USE OF HIGHLY HAZARDOUS PESTICIDES**
2. **PESTICIDE COMPOSITE RISK INDICATOR**
3. **WATER MANAGEMENT (IN IRRIGATED FARMS)**
  - **QUANTITY OF WATER USED FOR IRRIGATION**
  - **WATER USE EFFICIENCY**
  - **WATER CROP PRODUCTIVITY**
4. **TOP SOIL CARBON CONTENT**
5. **FERTILIZER USE BY TYPE (IN FUTURE: NITROGEN USE EFFICIENCY)**
6. **FOREST, WETLAND AND GRASSLAND CONVERTED FOR COTTON OR COFFEE PRODUCTION**
7. **GREENHOUSE GAS EMISSIONS**
8. **AVERAGE YIELD**
9. **NET AVERAGE RETURNS FROM COTTON AND COFFEE PRODUCTION (IN FUTURE: LIVING INCOME)**
10. **PRICE AT FARMGATE**
11. **PROPORTION OF WORKERS EARNING A LEGAL MINIMUM WAGE**
12. **INCIDENCE OF THE WORST FORMS OF CHILD LABOUR**
13. **INCIDENCE OF FORCED LABOUR**
14. **GENDER: WOMEN IN MANAGERIAL/LEADERSHIP ROLES AND OTHER RELEVANT DECISION-MAKING INFLUENCE**
15. **NUMBER OF FATALITIES AND NON-FATALITIES ON THE FARM**

Some indicators include the monitoring of practices to better interpret changes at the outcome level, e.g. good soil management practices to explain changes in organic soil content. In general, the SDG 4.2.1 guidance indicates that *measuring sustainability performances through farm practices presents several challenges. The impact of a given practice often varies from one place to another, and from one farm type to another, and what can be considered sustainable in one setting may not be suitable in another.*

## General definitions

**FARM:** all types of agricultural holdings to be taken into consideration, with the exception of hobby farms<sup>3</sup>

**FAMILY AND SMALL-SCALE FARMING** is a means of organizing agricultural production which is managed and operated by a family and predominantly reliant on family labour (adapted from Fairtrade).

**SMALL-SCALE PRODUCERS** are farmers who are not structurally dependent on permanent hired labour and who manage their production activity mainly with family workforce.

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<sup>3</sup> The characteristics of “hobby farms” are highly context-specific. For instance, in some countries the lower bound for considering an activity as “professional” is a revenue of 1000 USD per year. In other poorer countries, the application of such lower bound would actually exclude from the set of small-scale food producers poor farmers, fisherman and forester who would deserve much attention under SDG 2.3. The only possible solution to this problem seems to be a country-specific lower bound.

Source: Sustainable Development Goal Indicators 2.3.1 and 2.3.2: <http://www.fao.org/3/I8809EN/i8809en.pdf>



## Description of the Indicators

### 1. USE OF HIGHLY HAZARDOUS PESTICIDES (HHPs)

This indicator measures the use of highly hazardous pesticides (e.g. aldicarb, benomyl, carbendazim, carbofuran, dicofol, endosulfan, etoprophos, lindane, methamidophos, monocrotophos, paraquat parathion-methyl and phorate) in cotton and coffee production. Highly hazardous pesticides are of particular concern due to the severe adverse effects they can cause to human health and the environment, especially in developing countries where protective personal equipment is mostly unavailable, costly and uncomfortable, where pesticides and other farming equipment and materials are stored in homes, and where accidental or intentional exposure to pesticides is unacceptably common.

<b>Dimension</b>	Environmental and social
<b>Area(s)</b>	Pest and pesticide management
<b>Unit</b>	kg active ingredient (a.i.) of highly hazardous pesticide per ha of harvested land
<b>Relevance</b>	All except from farms under organic management Exclusion criterion for sustainability standards
<b>Target</b>	0% - A clear, time-bound plan needs to be in place to phase out the use of HHPs
<b>Data points</b>	Actual quantity in kg of pesticides applied to the crop Ha of harvested land
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	Farm records, farmer interviews. Farm level data can be crosschecked with import and pesticide industry records, cotton companies, extension officers
<b>SDG reference</b>	2.4.2. – 7.2 data item: Use of highly or extremely hazardous or illegal pesticides by the agricultural holding (Y/N)

#### DEFINITIONS

**Highly Hazardous Pesticides:** Highly hazardous pesticides are pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as the World Health Organization (WHO) or the Globally Harmonised System of Classification and Labelling of Chemicals (GHS ) or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous (FAO/WHO International Code of Conduct on Pesticide Management 2014).

The definition explicitly includes WHO Class Ia and Ib pesticides, GHS Class 1A and 1B carcinogens, mutagens and reproductive toxicity listed pesticides, pesticides listed in the Rotterdam and Stockholm Conventions and in the Montreal Protocol and pesticide active ingredients and formulations that have shown a high incidence of severe or irreversible adverse effects on human health or the environment.



#### JMPM FAO/WHO criteria for highly hazardous pesticides:

1. Pesticide formulations that meet the criteria of classes Ia or Ib of the WHO Recommended Classification of Pesticides by Hazard; or
2. Pesticide active ingredients and their formulations that meet the criteria of carcinogenicity Categories 1A and 1B of the Globally Harmonized System on Classification and Labelling of Chemicals (GHS); or
3. Pesticide active ingredients and their formulations that meet the criteria of mutagenicity Categories 1A and 1B of the Globally Harmonized System on Classification and Labelling of Chemicals (GHS); or
4. Pesticide active ingredients and their formulations that meet the criteria of reproductive toxicity Categories 1A and 1B of the Globally Harmonized System on Classification and Labelling of Chemicals (GHS); or
5. Pesticide active ingredients listed by the Stockholm Convention in its Annexes A and B, and those meeting all the criteria in paragraph 1 of annex D of the Convention; or
6. Pesticide active ingredients and formulations listed by the Rotterdam Convention in its Annex III; or
7. Pesticides listed under the Montreal Protocol; or
8. Pesticide active ingredients and formulations that have shown a high incidence of severe or irreversible adverse effects on human health or the environment.

#### METHODOLOGICAL NOTES

**List of highly hazardous pesticides.** A list of HHPs not recommended for use on cotton and coffee production is being developed based on the eight FAO/WHO criteria developed by the Joint Meeting on Pesticide Management (JMPM)<sup>4</sup> and it will be annexed to the framework. The list will be updated on a regular basis.

**Reporting.** During the phase out period, results can be reported in reduction of kgs of each listed active ingredient used per ha of harvested land. As the target is being reached, results can also be reported by area with no use of HHPs and/or number and percent of smallholder farmers reporting phasing out of listed HHPs.

#### REFERENCES

- FAO/ WHO International Code of Conduct on Pesticide Management:  
<http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/>

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<sup>4</sup> <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/panelcode/en/>



## 2. PESTICIDE COMPOSITE RISK INDICATOR

Risk assessment model/approach under consideration

*This indicator is based on information on the use of pesticides on the farms, the type of pesticides used and the type of measure(s) taken to mitigate the associated risk.*

*The best pesticide risk assessment approach to analyse pesticide use and exposure data for the purpose of this framework is under consideration.*



### 3. IRRIGATION WATER MANAGEMENT (IN IRRIGATED FARMS)

This suite of indicators provides an indication of how effectively irrigation water is used on the farm. It includes the total irrigation water used, the efficiency in supplying the water used (water withdrawn or diverted from its sources versus water used) and the amount of marketable biomass produced in relation to the irrigation water used. These indicators do not directly address the critical issue of freshwater sources' depletion. However, increasing water use efficiency is a key aspect of ensuring sustainable withdrawals and supply of freshwater. Sustainable agriculture requires that the level of use of freshwater for irrigation does not affect water reserves. Irrigation systems in cotton and coffee differ from drip irrigation to surface irrigation methods. In most of the cases, there are opportunities to improve efficiency by reducing water losses.

Notwithstanding the relevance of these water metrics to all irrigated farms, concerns remain on their feasibility in small-scale farming for both cotton and coffee. Additional research and consultations will be held during the project pilots to verify the feasibility and costs associated with the application of these indicators and alternative, simplified options

- **3.1 QUANTITY OF WATER USED FOR IRRIGATION**
- **3.2 IRRIGATION WATER USE EFFICIENCY**
- **3.3 WATER CROP PRODUCTIVITY (WCP)**

<b>Dimension</b>	Environmental
<b>Area(s)</b>	Water management
<b>Sub/ indicators</b>	3.1 Quantity of water used for irrigation in mega litres (blue water)/ha of harvested land
<b>Unit</b>	3.2 Irrigation Water Use Efficiency in percentage (%)
	3.3 Water Crop Productivity in mega litres per tonne of cotton lint or Green Bean Equivalent (GBE)
<b>Relevance</b>	Irrigated farms
<b>Target</b>	Locally specific - Increase efficiency over time
<b>SDG reference</b>	SDG 6.4.1 Change in water-use efficiency over time. The SDG indicator measures the value added per water withdrawn, expressed in USD/m3 over time of a given major sector (showing the trend in water use efficiency).

#### DEFINITIONS AND CALCULATION FORMULA

**Water used for irrigation:** Water used for irrigation provides a measure of the total amount of water used to grow the crop in the field. This indicator however does not take into account the use efficiency: either in terms of the actual production of marketable produce associated with that water use, or in terms of water losses between the point of extraction and delivery to the crop.

**Irrigation water use efficiency (WUE) (%).** Water use efficiency (%) is the ratio between the amount of water actually used (evapotranspiration - ET) and the amount of water withdrawn or diverted from its



source (rivers, lakes, bores etc). It is sometimes also referred to as “water supply efficiency” or “irrigation efficiency” (FAO, 2008). Water use efficiency is therefore a measure of water losses occurring from the storage points to and onto the field.

*Crop water use* is calculated as the actual evapotranspiration (ET) from the field (FAO, 2012). Evapotranspiration is a combination of two separate processes whereby water is lost from the soil surface through evaporation and used by the crop through transpiration.

Formula: 
$$\frac{\text{Crop water use (ET)} - \text{Rainfall} - \text{Soil moisture change}}{\text{Water used for irrigation}} \times 100$$

**WATER CROP PRODUCTIVITY (WCP).** Water Crop Productivity the quantity of output (kg cotton lint /ha) in relation to the volume of water used to produce this output (FAO, 2008).

This indicator is a measure of the marketable biomass produced in relation to the water used. Water consumption accounts for irrigation, rainfall and water stored in the soil and it is measured as the actual evapotranspiration.

Formula: 
$$\frac{\text{Cotton yield}^5 \text{ (tonnes cotton lint/ha harvested land) OR GBE}}{\text{Water used for irrigation} + \text{rainfall} + \text{soil moisture change}}$$

This formula does not account for the biomass produced in marketable by-products, as a result the water crop productivity overestimates the amount of water used to produce the commodity. For cotton, a separate WCP measure for cotton seed should be included.

Notwithstanding that the above two formula are the most accurate, the measurement of soil moisture changes in countries with limited field research capacity has been raised as a concern and deserves further feasibility investigations.

#### METHODOLOGICAL NOTES

**Mixed systems.** Cotton and coffee are often grown in spatial combination with other crops. In mixed farming systems (e.g. intercropped fields), crop water use and water crop productivity for cotton and coffee can be calculated based on the estimated land area under each crop grown in the field.

**Rainfed cotton.** Inclusion of indicators on water availability and water scarcity in combination with geo-referenced risk maps is being explored for the next version of the Delta Sustainability Framework.

#### REFERENCES

- Benchmarking Water Productivity of Australian Cotton, 2019: <https://www.dpi.nsw.gov.au/agriculture/irrigation/irrigation/irrigation-primefacts/benchmarking-water-productivity-of-australian-cotton-primefact>
- Crop yield response to water. FAO Irrigation and Drainage Paper No. 66. Rome: <http://www.fao.org/3/i2800e/i2800e00.htm>

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<sup>5</sup> Yield calculated as indicated under Indicator 8



#### 4. TOP SOIL CARBON CONTENT

This indicator measures the soil organic carbon (SOC), which is the main component of soil organic matter (SOM), in the top layer of the soil (0-10/30 cm) over time. Soil organic matter is increasingly being recognised for its contribution to nutrient cycling, water retention, biological function and optimising crop growth. The last Intergovernmental Panel on Climate Change (IPCC) report on climate change and land considers SOC management as one of the most cost-effective options for climate change adaptation and mitigation. Countries signatories of the United Nations Framework Convention on Climate Change (UNFCCC) are committed to monitor and report SOC stock changes. Sustainable agricultural systems therefore integrate practices aimed at conserving soil resources and enhancing soil carbon content. On the contrary, large-scale monocultures, if not properly managed, can negatively impact soil health as a result of reduced soil biodiversity and increased erosion.

<b>Dimension</b>	Environmental
<b>Area(s)</b>	Soil health and Climate Change
<b>Unit</b>	Grams of organic carbon per tonne soil/ha
<b>Relevance</b>	All farms
<b>Target</b>	Stable or higher SOC over time
<b>Data points</b>	Soil carbon content
<b>Data collection</b>	Yearly visual assessments and laboratory tests every 5/6 years
<b>Reporting</b>	5/6 years
<b>Data sources</b>	Visual assessments, laboratory tests
<b>SDG reference</b>	15.3.1 Proportion of land that is degraded over total land area

#### DEFINITIONS

**Soil organic matter (SOC).** Soil organic matter refers to all decomposed, partly decomposed and undecomposed organic materials of plant and animal origin (FAO,2017).

#### METHODOLOGICAL NOTES

Determination of organic soil concentration with the current methods in use remain complex and expensive. Therefore, the indicator combines yearly **visual assessments** with actual topsoil testing every 5-6 years. In order to explain eventual variations in organic carbon content, it is also recommended to monitor soil management practices to reduce soil erosion and soil fertility losses.

**Visual assessment:** The simplest method for visual assessment and colour determination is the Munsell Notation System (see references). A more accurate but expensive method is the portable spectrophotometer (CieLab color) which avoids the human error associated with the interpretation and/or perception of the colour of the sample.



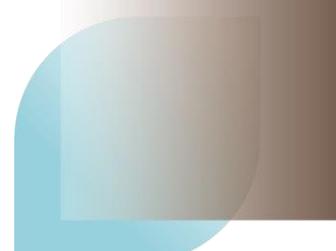
**Laboratory testing protocols:** The Global Soil Laboratory Network (GLOSOLAN) has been recently established to harmonize existing soil laboratory procedures, standards for results' interpretation and provision of recommendations to farmers. The Delta framework will align with the Standard Operating Procedures (SOPs) proposed by GLOSOLAN to harmonize organic and total carbon measure. SOPs offer step-by-step instructions on how to perform laboratory analyses. For SOC the Walkley-Black method (Titration and colorimetric method) is recommended.

**Good soil management practices include:**

- Increase biomass production by increasing water availability for plants with soil water conservation and adequate irrigation management;
- Balanced fertilizer applications with appropriate and judicious fertilizer application methods, types, rates and timing;
- Effective use of organic amendments, such as animal manure, compost, digestates, biochar;
- Managing crop residues: using forage by grazing rather than harvesting, applying mulches or providing the soil to give permanent cover;
- Use of cover crops and/or perennials in crop rotations;
- Reducing tillage events and intensity and/or adopting new residue management techniques, minimum or no-tillage;
- Implementing crop rotations with more crops;
- Landform management modification such as those implemented for erosion control (e.g. terraces), surface water management, and drainage/ flood control.

**REFERENCES**

- Munsell Notation System: <https://munsell.com/about-munsell-color/how-color-notation-works/>
- Soil Organic Carbon, the hidden potential, FAO, Rome 2017. SBN 978-92-5-109681-9 <http://www.fao.org/3/a-i6937e.pdf%20>
- Standard Operating Procedure (SOPs) for Soil Organic Content. Walkley-Black method (Titration and colorimetric method) <http://www.fao.org/3/ca7471en/CA7471EN.pdf>
- Global Soil Partnership: <http://www.fao.org/global-soil-partnership/pillars-action/5-harmonization/glosolan/en/>
- Voluntary Guidelines for Sustainable Soil Management: <http://www.fao.org/3/a-bl813e.pdf>



## 5. FERTILIZER USE BY TYPE (NITROGEN USE EFFICIENCY IN FUTURE)

This indicator provides data on inorganic fertilizers, in terms of nutrient content, for the three crop nutrients: nitrogen, phosphorus and potassium. An accounting of synthetic fertilizer types and quantities represents a proxy for understanding soil management practices and quality. Although it does not *per se* capture the efficiency of the application, it is relevant to pollution prevention strategies. In future, this indicator might also include organic fertilizers, in alignment with the Coffee Global Standard.

<b>Dimension</b>	Environmental
<b>Area</b>	Soil management and Climate Change
<b>Unit</b>	kg a.i. of type of fertilizer (N,P,K) per ha of harvested land
<b>Relevance</b>	All except from farms under organic management
<b>Target</b>	Increased nutrient use efficiency
<b>Data points</b>	Kg of fertilizer products used/ha Fertilizer conversion factors for: Nutrient nitrogen N kg / ha Nutrient phosphate P2O5 kg /ha Nutrient potash K2O kg / ha
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	NPK fertilizer applications/purchases
<b>SDG reference</b>	2.4.2. - management of fertilizer

### METHODOLOGICAL NOTES

**Fertilizer conversion factors.** In the case that specific values to convert tonnes of fertilizer product used into nutrient concentration are not available, a **fertilizer converter tool is provided** in the webpage of the **International Fertilizer Association**.

**Good management measures** to improve fertilizer management and use efficiency include:

- Follow protocols as per extension service or retail outlet recommendations or local regulations, not exceeding recommended doses;
- Use soil sampling to perform nutrient budget calculations;
- Perform site-specific nutrient management or precision farming (where possible);
- Use an organic source of nutrients (including manure or composting residues) alone, or in combination with synthetic or mineral fertilizers;
- Use legumes as a cover crop or intercrop to reduce fertilizer inputs; and
- Consider soil type and climate in deciding fertilizer application doses and frequencies.

### REFERENCE

International Fertilizer Association: <https://www.ifastat.org/>



## 6. FOREST, WETLAND AND GRASSLAND CONVERTED FOR COTTON OR COFFEE PRODUCTION

This indicator measures the conversion of any natural land (e.g., forest, wetland, grassland) to land used for cotton or coffee production. The term forests refers to both primary and naturally regenerating forests. Most of the forest loss takes place in tropical forests which host at least two thirds of the terrestrial species. Stopping deforestation contributes to reducing impacts of climate change as forests absorb carbon dioxide from the atmosphere and store it as biomass.

<b>Dimension</b>	Environmental
<b>Area</b>	Biodiversity and Climate Change
<b>Unit</b>	Ha of forest, wetland or grassland converted to cotton or coffee production
<b>Relevance</b>	All farms
<b>Target</b>	0% Exclusion criterion for sustainability standards
<b>Data points</b>	Land area (in ha) and proportion of the farm that was converted from natural land (e.g., forest, wetland, grassland and savanna) to land used for coffee production in the last 5 years.
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	Farmers' interviews, secondary data and GPS maps
<b>SDG reference</b>	15.1 Forest area as a proportion of total land area

### DEFINITIONS

**Forest.** forest is a land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.

**Naturally regenerating forest:** forest predominantly composed of trees established through natural regeneration.

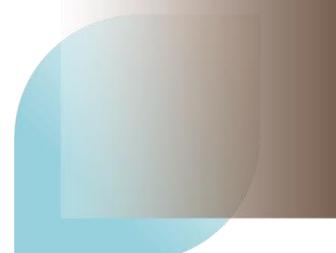
**Primary forest:** Naturally regenerated forest of native tree species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.

*Source: FAO, 2020*

### METHODOLOGICAL NOTES

**Geo-referenced risk maps.** The Global Coffee Data Standard suggests overlaying GPS coordinates of farms with regional deforestation maps to understand areas at risk. Note though that usually only a single GPS point will exist for many smallholder farms, meaning that there often isn't sufficient information to track the contribution of individual farms to deforestation in most cases. However, even with single GPS points, general farming areas prone to deforestation will still be visible.

**REFERENCE:** FAO's Forest Resource Assessment (FRA) 2020 Terms and Definitions Document  
<http://www.fao.org/3/I8661EN/i8661en.pdf>

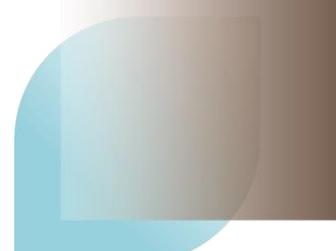


## 7. GREENHOUSE GAS EMISSIONS

Unit: kg CO<sub>2</sub>e / kg cotton lint or GBE

*This indicator is defined as the ratio between CO<sub>2</sub> equivalent emissions from agricultural activities and the marketable biomass produced: cotton lint or Green Coffee Beans (GBE). Activities includes, among others, the use and manufacturing of fertilizers and pesticides.*

*Available commodity-specific tools to estimate emissions will be reviewed by the project partners with the aim to recommend a common methodological approach in the coming months.*



## 8. YIELD (AVERAGE)

High land productivity (yield) is likely to lead to better economic returns and to reduce pressure on increasingly scarce land resources, commonly linked to deforestation and associated losses of ecosystem services and biodiversity.

<b>Dimension</b>	Economic
<b>Area</b>	Economic profitability
<b>Unit</b>	Kg cotton lint or GBE/ha of harvested land
<b>Relevance</b>	All farms
<b>Target</b>	Increased yield over time
<b>Data points</b>	Coffee productive land/ Cotton harvested area Kg seed cotton or cotton lint / kg harvested coffee Conversion factors to lint and GBE
<b>Data collection</b>	Yearly
<b>Reporting</b>	3- year average
<b>Data sources</b>	Farm cash records, farmer interviews
<b>SDG reference</b>	SDG 2.4.1. percentage of agricultural area under productive and sustainable agriculture,

### METHODOLOGICAL NOTES

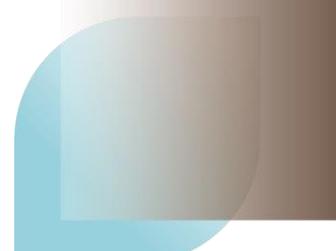
#### Conversion factors

*Coffee amount harvested.* Coffee amount harvested requires local unit conversion to kgs. The main coffee forms considered are Dried Cherry, Parchment and FAQ (cleaned/re-processed). Amount sold can be a suitable proxy where harvested amounts are unknown (i.e., many smallholders will only know production volumes when their product is weighed at the mill).

*Seed cotton conversion to cotton lint.* This indicator requires conversion from seed cotton to cotton lint in countries where yield is measured in kg of seed cotton, which includes the weights of both the seeds and the lint. ICAC publishes ginning percentages for 37 cotton producing countries which can be used to convert seed cotton production to lint. In case of multiple pickings, the average yield is calculated.

### REFERENCES

- ICAC Cotton Data Book, 2020
- ICO conversion factors <http://www.ico.org/documents/cy2016-17/conversion-factors-e.pdf>



## 9. NET AVERAGE RETURNS FROM COTTON AND COFFEE PRODUCTION (LIVING INCOME IN FUTURE)

This indicator tracks crop profitability as an important dimension of its economic sustainability. The indicator calculates the average gross income from coffee or seed cotton minus the cost of production. The indicator therefore measures the net operating income generated by cotton or coffee, as distinct from the total income of the farming household, which also includes remittances and off-farm income.

<b>Dimension</b>	Economic
<b>Area</b>	Economic viability
<b>Unit</b>	USD/ ha seed cotton or GBE
<b>Relevance</b>	All farms
<b>Target</b>	Increasing returns over time
<b>Data points</b>	Cost of cultivation (inputs and operational costs)/ha Gross income (from the selling of the crops and by-products marketed) on seed cotton and GBE/ha Currency conversions rates to USD
<b>Data collection</b>	Yearly
<b>Reporting</b>	3-year average
<b>Data sources</b>	Farm cash records, farmer interviews
<b>SDG reference</b>	

### DEFINITIONS

**Cost of cultivation:** Cost of cultivation includes all input costs and manpower/operational costs associated with the inputs. It however does not include ginning cost, land rent, taxes etc.

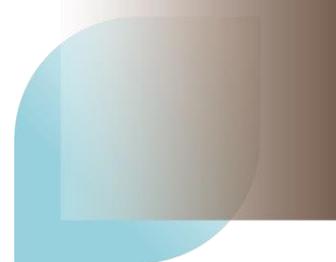
**Gross income:** Gross Income is the income generated through the selling of seed cotton (includes lint and seeds) or GBE.

**Net average returns:** Net average returns on seed-cotton per hectare are calculated as gross income on seed cotton minus the total cost of cultivation.

### METHODOLOGICAL NOTES

The computation of net returns requires basic financial transactions which are usually maintained in large commercial farms, but not often in small scale farming. If farm records are not available, returns can be estimated based on farmer declaration of outputs and inputs quantity and value.

**Currency conversation into USD:** the International Monetary Fund (ITM) provides official exchange rates on a monthly basis.: [https://www.imf.org/external/np/fin/data/param\\_rms\\_mth.aspx](https://www.imf.org/external/np/fin/data/param_rms_mth.aspx)



## 10. PRICE (AT FARMGATE)

This indicator refers to the average price received per tonne of seed cotton or coffee (GBE).

<b>Dimension</b>	Economic
<b>Area</b>	Economic viability
<b>Unit</b>	Local currency / tonne of seed cotton or coffee (GBE)
<b>Relevance</b>	All farms. Relevant to premium-based standards only.
<b>Target</b>	
<b>Data points</b>	Prices for each sale
<b>Data collection</b>	Yearly
<b>Reporting</b>	3- year average
<b>Data sources</b>	Farm cash records, farmer interviews
<b>SDG reference</b>	

### METHODOLOGICAL NOTES

**Multiple sales.** For multiple sales, calculate the price average of sales. The average price can then be compared to the global reference price (e.g., ICO, ICAC). This approach avoids the additional time and resources necessary for detailed accounting and asking about each sale (and the associated premiums, deductions or bonuses) while still providing good results.

For countries like USA, BRAZIL, AUSTRALIA values will be provided for lint and cotton seed and converted into seed cotton.



## 11. WAGES - PROPORTION OF WORKERS EARNING A LEGAL MINIMUM WAGE BY GENDER

This indicator allows identifying holdings or businesses that do not pay a fair remuneration to all employees. The wages paid are an indication of the economic risk faced by unskilled workers in terms of remuneration received, the later benchmarked against the minimum wage set at national level in the agricultural sector. All living wages or wages of all workers and employees should be equal or above existing official national minimum wages or sector agreements, whichever is higher.

<b>Dimension</b>	Social
<b>Area</b>	Labour rights
<b>Unit</b>	Daily average earnings for farm labour compared to (rural) minimum wage in local currency and also expressed as a percentage of the rural minimum wage (where that exists), alternately to the national minimum wage.
<b>Relevance</b>	Farms that employ hired labour; not applicable to farms that employ only family labour
<b>Target</b>	100%. Entry criterion for sustainability standards
<b>Data points</b>	Average daily wage rate paid National minimum wages Currency conversion rates
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	Work contracts, farmer interviews
<b>SDG reference</b>	8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

### DEFINITIONS

**Agricultural skilled workers.** Skilled agricultural workers grow and harvest field or tree and shrub crops; in order to provide food, shelter and income for themselves and their households. A full description of tasks performed by agricultural skilled workers is provided in the Sub-major Group 61 Market-oriented Skilled Agricultural Workers of the International Standard Classification of Occupation (ISCO) classification.

**Wages.** Compensation includes both monetary and in-kind payment.

*Definitions adapted from Fairtrade Standard for Small-scale Producer Organizations:*

**Workers.** In the context of the Delta framework, workers are all workers including migrant, temporary, seasonal, sub-contracted and permanent workers. Workers are waged employees hired to work in the field.

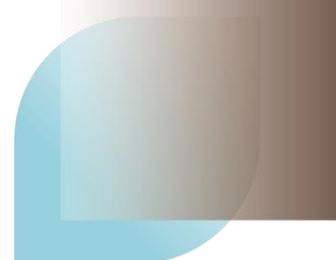
**Migrant worker.** A migrant worker is a person who moves from one area within her or his own country or across the borders to another country for employment. A migrant worker works for a limited period of time in the region that he/she has migrated to. Workers are not considered migrant after living one year or more in the region where they work, and if either a permanent position has been granted by the employer or legal permanent resident status has been granted.

**Seasonal worker.** Seasonal worker refers to a worker whose work by its character is dependent on seasonal conditions and is performed only during part of the year.

**Temporary worker.** A temporary worker is a person who works at the company on a non-regular, short term basis. A temporary worker may be a seasonal worker.

#### REFERENCES

- International Standard Classification of Occupation (ISCO-08 - code 92)  
<https://www.ilo.org/public/english/bureau/stat/isco/docs/groupdefn08.pdf>
- ILO Minimum Wage Fixing Convention, 1970 (No. 131)  
[https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100\\_INSTRUMENT\\_ID:312276](https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312276)



## 12. INCIDENCE OF THE WORST FORMS OF CHILD LABOUR

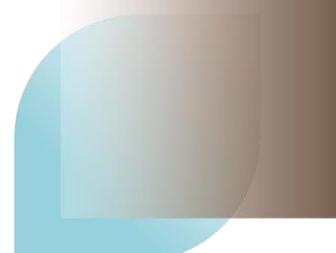
This indicator tracks the employment of children below the age of 15 or under the age defined by local law, whichever is higher. Child labour is “work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development”. Not all work carried out by children is considered child labour. Some agricultural tasks may help children acquire important livelihood skills and contribute to their survival and food security. However, many child labourers in agriculture are trapped in hazardous work. Child labour in cotton and coffee production has been reported/ in several countries, primarily as a consequence of the low farm income.

Assessing child labour in the field remains complex and sensitive. Opportunities for collaboration with UN dedicated agencies such as FAO and ILO are a real opportunity in many countries which should be explored .

<b>Dimension</b>	Social
<b>Area</b>	Child Labour
<b>Unit</b>	Number of children aged 5–17 years engaged in child labour, by sex and age .
<b>Relevance</b>	All farms
<b>Target</b>	0%. Exclusion criterion for sustainability standards.
<b>Data points</b>	Age of the child Working tasks of the child (to be contextualised to the farming conditions) Working hours per day/week (or average hours ) Hazards associated with the agricultural tasks Additional relevant data: impacts of the child’s work on their health impacts of the child’s work on their education (regular access to school, age and education level)
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	Secondary data on child labour (if existing) Interview with beneficiaries; interview with children; household survey; school attendance monitoring.
<b>SDG reference</b>	8.7.1 Proportion and number of children aged 5–17 years engaged in child labour,

### DEFINITIONS

**Child labour.** Child labour is defined by ILO as work that impairs children’s well-being or hinders their education, development and future livelihoods. The Convention on the Rights of the Child (UN, 1989) recognizes and emphasizes the child’s right to education and the right of the child to be protected from economic exploitation and from performing any work that is likely to be hazardous, interfere with the child’s education, or be harmful to the child’s health or physical, mental, spiritual, moral or social development.



The international regulations and Conventions dealing with child labour refer to the following distinctions/concepts:

- Working children
- Child labour
- Age-appropriate tasks
- Light work
- Worst forms of child labour
- Hazardous work

**Minimum age.** The ILO Minimum Age Convention, 1973 (No. 138) specifies the minimum age for different types of employment:

- 13 years for light work
- 15 years for ordinary work
- 18 years for hazardous work

Developing countries that ratified Convention No. 138 have the option to designate a higher age or, in exceptional cases, an age 1 year lower than the standard (e.g., 14 years for ordinary work).

Age-appropriate tasks become “child labour” when children: •are too young for the work they are undertaking; •work too many hours for their age; •undertake work of a hazardous nature or in hazardous conditions; •work under slave-like conditions; or •are obliged to undertake illicit activities.

**Hazardous work.** Hazardous work in the context of crop production includes **exposure to sharp tools and dangerous machinery**, injuries from animals, **exposure to extreme environmental conditions**, **exposure to agrochemicals**, **long working hours in fields** (especially in extreme weather conditions); and physically strenuous or repetitive activities. Hazardous work is an example of the **worst forms of child labour** (ILO Convention, 1999 (No. 182). For all full description of the definitions refer to the FAO Handbook.

**Family labour:** Children below 15 years of age only work after school or during holidays, the work they do is appropriate for their age and physical condition, they do not work long hours and/or under dangerous or exploitative conditions and their parents or guardians supervise and guide them.

#### METHODOLOGICAL NOTES

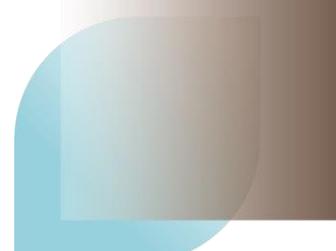
Monitoring child labour is a complex issue. The FAO Handbook for monitoring and evaluation of child labour in agriculture includes a toolkit designed to assess and gather data on child labour in family-based agriculture. It is recommended to use a combination of different tools during data collection, in order to obtain diverse data which can be cross-checked against each other. With a combination of tools, the strengths of one can overcome the potential weaknesses of another, and the data obtained are therefore more reliable.

Standard setting initiatives can monitor the incidence of child labour based on audits and additional qualitative assessments.

#### REPORTING

- Reduction in percentage of children under the legal working age
- Reduction in percentage of children engaged in hazardous work

**REFERENCE:** FAO Handbook for monitoring and evaluation of child labour in agriculture provide a step-wise guidance to monitor child labour: <http://www.fao.org/3/a-i4630e.pdf>.



### 13. INCIDENCE OF FORCED LABOUR

This indicator tracks the systematic or individual use of forced labour in cotton and coffee production.

<b>Dimension</b>	Social
<b>Area</b>	Forced Labour
<b>Unit</b>	Number of people, over 17 years of age, engaged in forced labour, by sex and age.
<b>Relevance</b>	Countries with reported incidence of forced labour
<b>Target</b>	0%. Exclusion criterion for sustainability standards.
<b>Data points</b>	
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	Secondary data (if existing) and <i>ad hoc</i> surveys
<b>SDG reference</b>	8.7 Take immediate and effective measures to eradicate forced labour

#### DEFINITIONS

**Forced labour.** Forced labour as all work or service: - which is not voluntary; and - which is exacted under the menace of a penalty. A person is classified as being in forced labour if engaged during a specified reference period in any work that is both under the threat of menace of a penalty and involuntary.

**Work:** Work is any activity performed by persons of any sex and age to produce goods or to provide services for use by other or for own use.

**Involuntary work:** Involuntary work is any work taking place without the free and informed consent of the worker.

**Threat or menace of any penalty:** Threat or menace of any penalty is any means of coercion used to impose work on a worker against his or her will.

**Reference period.** The reference period can be short such as last week, last month or last season, or long such as past year, past five years or lifetime.

*ILO Forced Labour Convention, 1930 (No. 29)*

#### METHODOLOGY: REFER TO CHILD LABOUR INDICATOR

#### REFERENCES

- ILO Forced Labour Convention, 1930 (No. 29)  
[https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100\\_ILO\\_CODE:C029](https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C029)
- Third-party monitoring of child labour and forced labour during the 2019 cotton harvest in Uzbekistan  
[https://www.ilo.org/wcmsp5/groups/public/---ed\\_norm/---ipec/documents/publication/wcms\\_735873.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipec/documents/publication/wcms_735873.pdf)



#### 14. GENDER: WOMEN IN MANAGERIAL/LEADERSHIP ROLES AND OTHER RELEVANT DECISION-MAKING INFLUENCE

*Index under development* – The Women’s Empowerment in Agriculture Index (WEAI) developed<sup>6</sup> by IFPRI could be adapted to meet the need of the Delta framework.

<b>Dimension</b>	Social
<b>Area</b>	Gender
<b>Unit</b>	Score-based index
<b>Relevance</b>	All farms
<b>Target</b>	Increase empowerment
<b>Data points</b>	<i>Input in productive decisions</i> <i>Access to and decision on credits</i> <i>Control over use of income</i> <i>Work balance</i> <i>Group membership</i> <i>Membership in influential groups</i>
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	Farmers/ household interviews
<b>SDG reference</b>	5.5 Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life

#### DEFINITIONS

The WEAI has 12 sub-indicators mapped to three domains: intrinsic agency (power within), instrumental agency (power to), and collective agency (power with). A gender parity index compares the empowerment scores of men and women in the same household. Out of the 12 dimensions, five or six appear relevant to the Delta framework:

**Input in productive decisions:** What decisions are you a part of? What is your role in making these decisions?

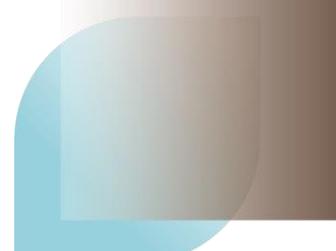
**Income:** Do you have input in decisions on how income and output from all ag activities you participate in is spent or used? Do you have input in decisions on how income from non-agricultural activities is spent?

**Credit:** do you contribute to household decisions on credit (e.g. taking out a loan)? Can you get a loan if you wanted to? Do you have access to a financial account?

**Work balance:** how many hours a day do you work? How much of that time is spent on care giving for children?

**Group membership:** are you a member of a group in your community?

<sup>6</sup> <https://www.ifpri.org/project/weai>



**Membership in influential groups:** are you part of a group that is influential in your community? How influential is your group in the community?

### METHODOLOGY

The WAEI comes with a detailed score-based methodology to compute the index.

Indicator	Definition of adequacy
	<i>Instrumental Agency</i>
Input in productive decisions	Meets <u>at least ONE of the following conditions</u> for <u>ALL of the agricultural activities</u> they participate in 1) Makes related decision solely, 2) Makes the decision jointly and has at least some input into the decisions 3) Feels could make decision if wanted to (to at least a MEDIUM extent)
Access to and decisions on financial services	Meets <u>at least ONE of the following conditions</u> : 1) Belongs to a household that used a source of credit in the past year AND participated in at least ONE sole or joint decision about it 2) Belongs to a household that did not use credit in the past year but could have if wanted to from at least ONE source 3) Has access, solely or jointly, to a financial account
Control over use of income	Has input in decisions related to how to use BOTH income and output from ALL of the <u>agricultural activities</u> they participate in AND has input in decisions related to income from ALL non-agricultural activities they participate in, unless no decision was made
Work balance	Works less than 10.5 hours per day: Workload = time spent in primary activity + (1/2) time spent in childcare as a secondary activity
	<i>Collective Agency</i>
Group membership	Active member of at least ONE group
Membership in influential groups	Active member of at least ONE group that can influence the community to at least a MEDIUM extent

From: Malapit, Hazel J., Agnes R. Quisumbing, Ruth Suseela Meinzen-Dick, Gregory Seymour, Elena M. Martinez, Jessica Heckert, Deborah Rubin, Ana Vaz, and Kathryn M. Yount. Development of the project-level Women’s Empowerment in Agriculture Index (pro-WEAI). IFPRI Discussion Paper No. 1796. Washington, DC: International Food Policy Research Institute



## 15. NUMBER OF FATALITIES AND NON-FATALITIES ON THE FARM BY GENDER

This indicator tracks the number of fatalities and non-fatalities occurring on farm. Worker health and safety refers to the principle that workers should be protected from sickness, disease and injury arising from their employment. In the case of cotton and coffee production, a specific type of non-fatalities that deserve close monitoring are acute and chronic effect of pesticide exposure.

<b>Dimension</b>	Social
<b>Area</b>	Farmers and workers safety
<b>Unit</b>	Number of incidences per million people
<b>Relevance</b>	All farms, aggregation at higher levels
<b>Target</b>	0% fatalities – Decrease in non-fatalities
<b>Data points</b>	
<b>Data collection</b>	Yearly
<b>Reporting</b>	Yearly
<b>Data sources</b>	Administrative records, Hospital records, farmers' interviews
<b>SDG reference</b>	9.3 Mortality rate attributed to unintentional poisoning 8.8.1 Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status

### DEFINITIONS

**Occupational injury** is defined as any personal injury, disease or death resulting from an occupational accident. An occupational injury is different from an occupational disease, which comes as a result of an exposure over a period of time to risk factors linked to the work activity. Diseases are included only in cases where the disease arose as a direct result of an accident.

The ILO's Safety and Health in Agriculture Convention, 2001 regulates specific risks to workers in the agricultural sector, relating for example to machinery safety and ergonomics, handling and transport of materials, sound management of chemicals, animal handling, protection against biological risks, and welfare and accommodation facilities.

*ILO Convention 155 on Occupational Safety and Health*



## METHODOLOGY

The SDG methodology recommends to calculate the two rates separately using the following formula:

Fatal OR non-fatal occupational injury rate =

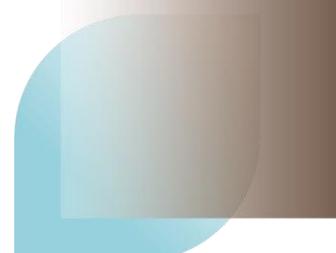
$$\frac{\text{Number of fatal OR non-fatal occupational injuries in the population of reference}}{\text{Number of workers in the reference group}} \times 100\,000$$

Occupational injuries are often underreported, which means that occupational injuries statistics from administrative records or registry systems may be less than comprehensive.

A self-monitoring methodology for acute pesticide poisoning among farmers has been developed by the FAO, which can be adapted to other farming situations.

## REFERENCES

- Official SDG Metadata. <https://unstats.un.org/sdgs/metadata/files/Metadata-08-08-01.pdf>
- Internationally agreed methodology and guidelines. [http://www.ilo.org/wcmsp5/groups/public/-/dgreports/---stat/documents/publication/wcms\\_223121.pdf](http://www.ilo.org/wcmsp5/groups/public/-/dgreports/---stat/documents/publication/wcms_223121.pdf)



## Annex 1

### List of sustainability reviewed to identify sustainability areas & sub-areas

1. **4C Association\***
2. **Better Cotton Initiative (BCI)**
3. Committee on Sustainability Assessment (COSA)
4. **Cotton Connect / REEL code**
5. Cotton LEADS
6. **Cotton Made in Africa (CmiA)**
7. Fairtrade Foundation (Certified Cotton Mark) and Fairtrade Coffee/Fairtrade Cotton Sourcing Program™
8. **Fairtrade Standard for Small scale Producer Organizations**
9. **Global Coffee Platform/ Coffee Data Standard**
10. Global OrganicTextile Standard (GOTS)
11. HERproject™ - empowered women
12. **IFOAM Organic 3.0**
13. **ISEAL Common Core Indicators**
14. Living Income Community of Practice
15. **My Best Management Practices (MyBMP)**
16. Organic Cotton Accelerator
17. Organimark
18. **Rainforest Alliance – UTZ**
19. Responsible Brazilian Cotton (ABR)
20. Responsible Sourcing Network (RSN)'s YESS (Yarn Ethically and Sustainably Sourced) Cotton Lint Standard
21. Sedex and Sustainable Agriculture Initiative (SAI) Collaboration
22. **ICAC SEEP Expert Panel**
23. Sustainable Agriculture Network (SAN) project on forced labour alignment
24. **Sustainable Development Goals (SDGs)**
25. Sustainable Coffee Challenge (SCC)
26. Textile Exchange - Organic Content Standards (OCS)
27. World Fair Trade Organization (Asia)

\*Indicators were drawn from the initiatives in bold characters