
Global Coffee Data Standard Documentation

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This project displays the initial basic common indicators for farm-level coffee sustainability. The common indicators are a result of a collective multi-stakeholder approach on defining key metrics for sustainability performance, based on the Sustainability Progress Framework elaborated under the joint facilitation of the Sustainable Coffee Challenge (SCC) and the Global Coffee Platform (GCP). COSA – with feedback from the members of a carefully selected global expert committee – have developed and synthesized practical metrics to operationalize the indicators so they can be functional across origins and comparable over time. The approach builds on extensive global experience with sustainability metrics and the expertise of the committee members.

CHAPTER 1

Partners of this project





The project has been supported by the ISEAL Innovations Fund, administered by the ISEAL Alliance



The ISEAL Innovations Fund is supported by the following partners:



1.1 Common Indicators for Coffee Sustainability

1.1.1 Guidelines & Key Information

This project displays the initial basic common indicators for farm-level coffee sustainability. The common indicators are a result of a collective multi-stakeholder approach on defining key metrics for sustainability performance, based on the Sustainability Progress Framework elaborated under the joint facilitation of the Sustainable Coffee Challenge (SCC) and the Global Coffee Platform (GCP). The objective of this project was to define common denominators of indicators that are considered most important by a range of experts and practitioners. An additional criterion was the feasibility and complexity of the indicators. COSA—with feedback from the members of a carefully selected global expert committee – have developed and synthesized practical metrics to operationalize the indicators so they can be functional across origins and comparable over time. The approach builds on extensive global experience with sustainability metrics and the expertise of the committee members.

Data Privacy

In the framework for this project, no data will be shared. However, it lays the ground for the potential to exchange data and making it easier to do so if needed, be it between business partners, or for sending information to a sustainability standard, etc. The project's underlying philosophy is that every party has sovereignty over their own data and is not obligated to share it.

Impact vs. Monitoring Data

The following indicator approaches are built on a Monitoring methodology and not a Full Impact approach. The Monitoring approach generally relies on farmer recall of the most recent production year and reasonable local estimates that can provide good enough information in a simple way. This can facilitate wide adoption and use without the burden of full accounting which can be onerous for some organisations and farmers. Full Impact approaches can be used where desired and are in many cases compatible as it provides more accurate information but requires more investment and time in detailed record keeping, accounting, and data gathering skills.

Sustainability Monitoring (through farmer surveys) usually relies on a single farmer's response per household—usually the head of household. The head of the household can be any one person in the household but is generally the farm owner or main decision maker. To track activities or other engagements provided to farmers through programs or initiatives, an organisation may wish to capture additional information on multiple individuals in a household where relevant (e.g., all training or service recipients). COSA has a separate protocol for this type of producer and household identification and tracking and can provide that to interested organisations.

Producer Sampling Guidelines

1. Representativeness: While sampling all farmers in a target group (census) is ideal, sampling a portion of farmers can be appropriate if the farmers selected for the survey are representative of the target population as a whole. Being aware of the homogeneity of the farmer population is important as well as individual farmer locations. The ideal approach would be a simple random sample where the appropriate number of farmers are randomly selected from a list and surveyors go to that list of farms to conduct the surveys. COSA has a Sample Size calculator built for Monitoring applications specifically.
2. The accuracy of farmer recall (memory) diminishes significantly beyond one year, so try only to ask about the last production cycle. It is also optimal to visit farmers soon after the main harvest period (and ideally at approximately the same time each year). It is important to ask questions as close to the end of the last production year as possible to ensure that the full production and harvest cycle is included in the response. The production year refers to the end of the last harvest to the end of the corresponding harvest before that (12 month period).
3. Try to talk to the head of the household for each farm (different people may give you different perspectives but typically the decision-makers will yield the most accurate results).
4. Quality checks in the first week of a surveyor's work can also make a big difference; make sure surveyors stick to the specific questions as written.

Certification & Audit Data

Some of the indicator data below may be covered in audits or through other compliance inquiries. If an entity wishes to use that data to report on the indicator framework, please be aware of the following:

1. Compliance and audit data are usually collected on a much smaller sample of farmers than typical monitoring approaches (audit sampling typically relies on square root sampling instead of a large enough population to ensure statistically sound results). This means that audit data may not be representative of the whole population.
2. Compliance data typically gives the user a binary result on a single topic, i.e., whether a certain condition was met or not. It does not usually convey the degree to which a certain condition was met, nor can it be used to see incremental change over time. Therefore, to achieve more control over the supply chain and improve the ability to remedy significant issues, it is strongly recommended to use the SMART indicator approaches detailed below (in fact, the approaches below could be built into an organisation's compliance assessment tools).

Guidance on Green Bean Equivalent calculation

For Green Bean Equivalent (GBE) calculations, one may follow the conversion rates as recommended by the International Coffee Organisation (ICO) and quoted in the Coffee Exporters Guide (<http://www.thecoffeeguide.org/coffee-guide/world-coffee-trade/conversions-and-statistics/>). However, for some locations, other conversion rates might be recommended. Please make sure these local differences are taken into account in the relevant cases.

The reference framework for first mile farm data

For its development, the Global Coffee Data Standard has taken the reference framework for first-mile-farm data as a starting point (<https://farm-level-data-standard.readthedocs.io/en/latest/>). In particular, the conceptual model has been embraced.

The first-mile reference framework has organised key data entities in the data structure, such as farmer groups, farmers, farms and plots in such a way that, many different concepts of agriculture can be incorporated, including family farms, sharecroppers, communal farms, industrial farms. In addition, the data structure is designed in such a way that it closely matches the way end-users think and talk about concepts in the real world.

It is therefore assumed that multiple organisations can easily develop a mapping from their own internal data structures onto such conceptual model because of the internal logic of the end-user community. The data model can therefore function as a neutral and organisation independent interface for the data from one database to another database. In analogy of the first-mile reference framework, each data element in the Global Coffee Data Standard is linked to the appropriate farmer, farm, plot level.

Also, the concept of a Global ID has been incorporated, allowing to trace each dataset back to its organisation of origin.

1.2 Use cases

The data standard for coffee sustainability indicators allows all actors along the coffee supply chain to compare, aggregate and exchange coffee sustainability data without having to clean and reorganize data manually. This enables the sector stakeholders to:

- align and streamline sustainability measurement
- reduce (data) production & transaction efforts and cost
- prepare for SDG and sustainability reporting requirements (e.g. EU legislation)
- publish comparable sustainability data

The data standard can be applied independent of any specific technology solution or reporting engine. Anyone working with data and sustainability measurement will be able to implement the results into any technology solution.

In terms of data exchange between commercial supply chain actors (farmers, cooperatives, traders, agents, roasters, retailers), there are two major use cases, vertical and horizontal exchange.

On the one hand, the standard might be used to facilitate data flow within one vertical and private supply chain between two or more actors, e.g. from the cooperative to a trader or from the trader to a roaster. I.e. a cooperative might pass on sustainability information attributed to the produce to a trader, who in turn might pass it on to its customer.

On the other hand, the standard might be used to facilitate horizontal exchange and aggregation between peers, e.g. to support joint sustainability reporting for a specific region or country. This might be especially relevant for the implementation of a sustainable region or a jurisdictional approach to sustainability, also known as verified sourcing area.

More specific use cases of the data standard include:

1.2.1 Narrative 1: Demonstrating impact

Standards & companies are better enabled to demonstrate impact in a comparable manner and their contribution to collective impact with minimal additional effort. The Global Coffee Data Standard creates a baseline of data elements which can be used for the purposes of international reporting. When these indicators are implemented by mapping internal data to the Global Coffee Data Standard, reports and even comparisons between organisations are easily made. The indicators in the Global Coffee Data Standard are aligned with the Sustainable Development Goals, the ISEAL Common Core Indicators as well as other relevant publicly referenced indicator sets.

1.2.2 Narrative 2: Improving data quality

When the Global Coffee Data standard is widely implemented, datasets can easily be exchanged between organisations. This enables certification standards, companies and public institutions to cross-validate data, leading to a significant data quality improvement.

1.2.3 Narrative 3: The development of farmer services

Standardized data make it easier to develop targeted farmer services. E.g. if farm-level data are available in a standardized format, a bank can develop protocols to use this data to determine his or her bankability. Equally, other service providers, such as extension services, logistics or an input provider, will be enabled to operate more efficiently with better information available. Better comparable data can as well lead to better targeted agricultural policies by local and national governments.

1.2.4 Narrative 3: Reducing the effort of data collection

Data collection in the field is a demanding task, both for the farmer as well as for the data collector. Availability and exchange of farm data may reduce the need for additional data collection, for at least for the standard indicators. The existing data (of another organisation) may even be used for data analytics, for example to determine which area these problems are most likely to occur.

1.2.5 Narrative 4: Supporting traceability

Consumers more and more want to know where the product they buy comes from and how sustainably it is produced. When coffee data is globally standardized, this information can be provided to consumers about all coffee producing areas in the world in a standardized way, tapping into a global data resource.

1.2.6 Narrative 5: Supporting the development of sector-specific information technology

Currently every company, standard, public institute is developing its own technical infrastructure to manage or monitor the coffee sector. If these actors are more aligned in which data is collected, how data is collected and how data is stored, it will become easier to develop the specific digital tools. This applies to data collection tools, management information systems, data analytics, visualization and data exchange via an API.

1.2.7 Narrative 6: Facilitating certification audits

The role of a control body is to inspect if all practices at a farm or farmers group are being performed conform certification requirements and to inform the voluntary standards system about the results of the inspection. If the auditor, the person who actually performs the inspection, could receive farm data in advance, he could make a pre

analysis which farms he likes to visit and can use this information as a guidance in the field to focus on specific farmers or topics. The data can also be helpful to validate some audit points in advance before the field visit or to pre fill some of the data points that need to be collected in the field, for example it is less work to check a field boundary then to measure it, saving time and money. The reuses of existing data will be facilitated if all organisation use more or less the same data formats, can map their data on an exchange format and use the same data collection methods.

1.3 Governance

As the Global Coffee Data Standard develops over time, with updated versions and new publishers, it is important that a diverse group of stakeholders are engaged in the process. This document outlines the governance and revision processes for the Global Coffee Data Standard.

1.3.1 Version 1.0 and Beyond

The Global Coffee Data Standard was initially developed through an iterative process in 2017 & 2018, resulting in an initial draft version in November 2018.

During 2019, we have been working towards a first version of the standard, version 1.0. Our work has focused on addressing some issues identified through wider adoption of the Standard during 2019 and 2020.

This document outlines a process for managing changes to the Global Coffee Data Standard during the move from a draft version to an officially agreed version, which will be numbered 1.0.

Currently the following new projects from the ISEAL Innovation Fund are upcoming:

1. The Delta Project with BCI, GCP, partnering with the International Coffee Organisation (ICO) and the International Cotton Advisory Committee (ICAC) to develop common cross-commodity sustainability indicators.

It is expected that the further development, adoption and elaboration of the data standard becomes an integral part of these projects.

1.3.2 Stewardship and Governance

Global Coffee Platform (GCP) acts as the lead steward of the Global Coffee Data Standard. The organisation is led by an Executive Director. The organisation's activities are overseen by a Board of Directors.

In the pursuit of openness and community-driven process, subscribers to the Global Coffee Data Standard and those engaging with the Global Coffee Data Standard GitHub repository will be kept informed at all stages about planned revisions to the Global Coffee Data Standard, and will be offered clear and timely opportunities to input and comment.

To ensure the relevance, quality and effective implementation of proposed updates to the Standard, new version releases will be subjected to a process of peer review with invited reviewers from publisher and user communities, and an open review process.

A Standard Stewardship Committee, responsible for giving final approval to formal upgrades of the Standard and ensuring the processes in this document have been properly carried out will be set up in due course.

Intellectual property

The Global Coffee Data Standard is the joint intellectual property of GCP and ISEAL.

Contributors to the Global Coffee Data Standard agree to transfer any copyright in their contributions to GCP and COSA, in order that it is held in trust as part of the Standard. No content infringing upon third-party Intellectual Property Rights will be included in the Standard.

Governance principles

We are committed to the [Open Standard principles](#) for standards development. The Global Coffee Data Standard has been developed with:

- **Due process:** Decisions will be made with equity and fairness among participants. Through an open process for submitting issues, extensions and requests for updates, no one party will dominate or guide standard development. All processes will be transparent and opportunities will exist to appeal decisions. Processes for periodic standards review and updating are well defined in this document.
- **Broad consensus:** The process will allow for all views to be considered and addressed, such that agreement can be found across a range of interests.
- **Transparency:** We will provide advance public notice of proposed standards development activities, the scope of work to be undertaken and conditions for participation. Easily accessible records of decisions and the materials used in reaching those decisions will be provided. Public comment periods will be provided before final standards approval and adoption.
- **Balance:** Standard activities will not be exclusively dominated by any particular person, company or interest group.
- **Openness:** The Global Coffee Data Standard processes are open to all interested and informed parties.

1.3.3 Versioning and Upgrade Process

Over time, changes will be needed to the Standard, including addition of new codes and fields, and occasionally involving changes to existing fields and structures.

The revision process will ensure:

- The consequences of any change for different stakeholders are identified and considered; It is clear why changes are needed, and that there is broad support for any proposed changes;
- Changes are easy to identify and are transparent, and publishers, users and intermediaries have clear documentation to allow them to update their data and tools;
- Changes to the Global Coffee Data Standard should be made periodically, with the version number of the standard incremented to indicate that changes have been made, and a change-log maintained.
- That backwards compatibility will be maintained wherever possible.

Versions

Distinct branches of the Standard will be maintained within Github for each version. Branches can be in one of two states:

- **Development.** Both schema and documentation on a development branch can be updated and should only be implemented on an experimental basis.
- **Master.** Only documentation updates are permitted on a master branch. All documentation changes must be reviewed to ensure they do not make any changes to the meaning of the Standard.

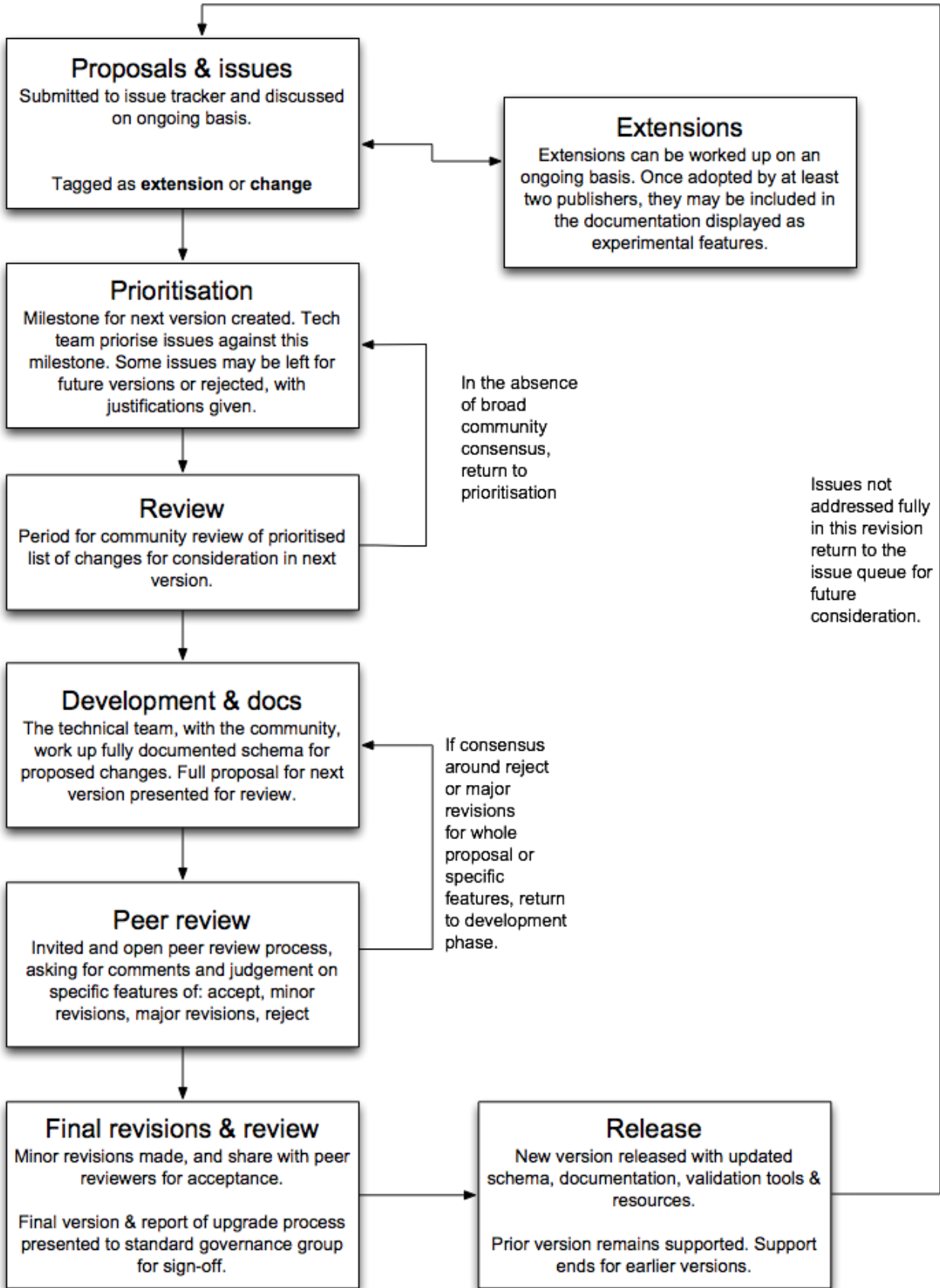
Semantic Versioning practices will be used to distinguish between:

- Major versions which make backwards-incompatible API changes; and
- Minor versions which add functionality in a backwards-compatible manner.

These are captured by a version number in the format MAJOR.MINOR

Revision process

To release a new minor or major version upgrade will involve a number of stages outlined in the flowchart below, and described in more depth in the following sections.



The revision process will follow these general principles:

- **Publicity:** All stages of the revision process will be announced via the GCP website. This is the formal channel for notification during the process.
- **Consensus:** The process should act in the interest of the data standard, with particular consideration given to what the changes will mean for current publishers. All processes should aim towards gaining community consensus for changes. In cases where consensus cannot be reached, the process will be put to a final majority vote by the Stewardship Committee. The GCP technical team are responsible for generating key documentation during the process, but should always be guided by community consensus, submitting all decisions for public discussion.
- **Appeal:** Any party may appeal against decisions made during the process by writing to the Standard Stewardship Committee via the GCP discussion forum. The Stewardship Committee has the authority to reject proposed revisions on the Standard in response to appeals

Proposals

Changes to the Standard can be proposed by anyone at any point via the GCP discussion forum either as issues for discussion, or [pull requests](#) with a clear description of the proposed change. Contributors are encouraged to raise discussions in order to seek consensus on proposed changes. Changes may be proposed as updated field definitions or code list entries, or as new features to the Standard.

1.3.4 Prioritisation

The technical team, with reference to community views, identify change proposals and extensions which should be considered for adoption in the next version of the Standard, assigning these to milestones in the issue tracker on GitHub where they are open for discussion.

Periodically, at the start of a revision process a cut-off date for proposals will be announced with at least two weeks' notice. After that date, a prioritised list of updates is produced. Any new proposed changes received after this period may not be considered until the next prioritisation phase.

Prioritisation review

The list is shared on the GCP website, with at least a two-week window for discussion.

Based on discussions, a final list is then proposed by the technical team with all the issues that will be taken forward into the rest of the process. A proposal that has made it this far may or may not make it into the final upgrade. As the proposal is worked into final concrete examples and schema changes, further issues may arise that mean the original proposal cannot be implemented.

All reviews and the judgement made will be published. Community members may also submit their own reviews of the whole revision, or specific elements. The minimum period for Committee review is one month.

Revisions

The GCP technical team, with reference to the Standard Stewardship Committee as appropriate, should evaluate reviews and decide whether the whole upgrade, or specific features of it, need to be revised, rejected or postponed to future processes.

If only minor changes are suggested, then the revised Standard can be submitted back to reviewers for a brief review period of at least two weeks. If major changes are required, then a longer follow up review process of at least one month should be allowed for.

Release

Once all reviewer comments have been addressed to the satisfaction of the reviewer in question, then the updated version of the Standard should be submitted to the Standard Stewardship Committee for final approval, along with a short report of the process.

Following Stewardship Committee approval, the revision branch can be set to live.

1.3.5 Deprecation Policy

If a term (an indicator or property) is scheduled to be renamed or removed from the specification as a result of the revision process, the next release of the specification must deprecate the term within the schema, and the following major release must rename or remove the term from the schema, making the term obsolete. Implementations may use deprecated terms, but will receive warnings from the GCP Data Quality tool described below. Implementations may not use obsolete terms, and will receive errors from the Data Quality tool.

1.3.6 Support Policy

Support will be offered for one prior version of the Standard. Support for any earlier versions than this will be ended when a new version is released. For example, when 1.1 is the latest release, 1.0 will be supported in the Data Quality tool and other relevant tools and platforms managed by GCP. When 1.2 is released, support for 1.0 will no longer be guaranteed.

Publishers are encouraged to review each new version when released, and to consider how they might adopt new features. Publishers should aim to move to a new major version within 18 months of its release.

1.4 Global Coffee Data Standard

This project displays the initial basic common indicators for farm-level coffee sustainability. The common indicators are a result of a collective multi-stakeholder approach on defining key metrics for sustainability performance, based on the Sustainability Progress Framework elaborated under the joint facilitation of the Sustainable Coffee Challenge (SCC) and the Global Coffee Platform (GCP). COSA – with feedback from the members of a carefully selected global expert committee – have developed and synthesized practical metrics to operationalize the indicators so they can be functional across origins and comparable over time. The approach builds on extensive global experience with sustainability metrics and the expertise of the committee members.

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1.4.1 1 Metadata

Details:

Property name: metadata

Type: *object*

```

1 "metadata": {
2   "globalCoffeeDatasetId": {
3     "identifier": "634748-hfgf-ydhgd",
4     "organisation": "COSA",
5     "timestamp": "2019-01-02"
6   },
7   "schemaVersion": "0.0.5",
8   "productionYear": {
9     "start": 201802,
10    "end": 201811
11  }
12 }
```

1.1 Coffee Dataset Id

Details:

Property name: globalCoffeeDatasetId

Reference: *global-unique-id.json*

The unique identifier for this dataset. The organisation is responsible for the best-practice values.

1.2 Schema version

Details:

Property name: schemaVersion

Type: *string*

Allowed values: '0.0.5'

Optional

The version number of the schema. When not provided the latest version of the schema will be used to validate the dataset.

1.3 Production year

Details:

Property name: productionYear

Type: *object*

The production year is defined as the end of the last harvest to the end of the corresponding harvest before that (12 month period).

1.3.1 The start of the projection year in YYYYMM

Details:

Property name: start

Type: *integer*

Minimum: 199000

Maximum: 210000

1.3.2 The end of the projection year in YYYYMM

Details:

Property name: end

Type: *integer*

Minimum: 199000

Maximum: 210000

1.4.2 2 Farmer

Details:

Property name: farmer

Type: *object*

The farmer characteristics

2.1 General farmer characteristics

Details:

Property name: general

Type: *object*

The general farmer characteristics

```

1  "general": {
2    "farmerId": {
3      "organisation": "Chamber of Commerce, Burundi",
4      "identifier": "1035413151",
5      "timestamp": "2010-05-21"
6    },
7    "name": {
8      "firstName": "Carlos",
9      "lastName": "de la Huerta"
10   },
11   "address": {
12     "streetAddress": "1600 Amphitheatre Pkwy",
13     "countryName": "Burundi"
14   },
15   "dateOfBirth": "1974-12-31",
16   "gender": "M",
17   "thirdPartyIds": [
18     {
19       "identifier": "N2786-Q5572-H8123-S9007",
20       "organisation": "UN Blue number",
21       "timestamp": "2018-12-08"
22     },
23     {
24       "identifier": "514356411",
25       "organisation": "COSA",
26       "timestamp": "2017-12-30"
27     }
28   ],
29   "farmIds": [
30     {
31       "identifier": "2345",
32       "organisation": "Land register of Burundi",
33       "timestamp": "1998-12-28"

```

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```
34     }  
35   ]  
36 }
```

2.1.1 Unique ID of the farmer

Details:**Property name:** farmerId**Reference:** *global-unique-id.json*

Globally Unique ID of the recording of the farmer at a specific time and by a specific organisation.

Each producer should have a unique ID. Optimally this can be a national ID, but in its absence a buyer ID, project ID or other unique number can serve. It is important to keep in mind that various entities may have access to reported data, so confidential information should not be included in the shared record (e.g. Social Security number).

2.1.2 Name of the farmer

Details:**Property name:** name**Reference:** *name.json*

First and last name(s) of the farmer surveyed should be collected in separate fields/columns to ensure consistency (avoiding confusion between Carlos de la Huerta and De la Huerta, Carlos). Initials should be avoided when possible. In places where farmers use only one name (a family name), that name should be entered as the Last Name and an appropriate prefix or “Farmer” could be entered as the First Name.

2.1.3 The address of the farm

Details:**Property name:** address**Reference:** *address.json*

Generally, data should include Country and then State/Department and Municipality/District, unless the address is collected for the sake of auditing. This should be the location of the farm itself (main plot), not the home of the farmer, if different.

2.1.4 Date of birth

Details:**Property name:** dateOfBirth**Type:** *string***Examples:** '2000-08-17', '1973-05-30'**Pattern:** `^[12][0-9]{3}-[01][0-9]-[0-3][0-9]$`

Best practice is to use 'Year of Birth' as opposed to age. Age has to be updated annually, but year of birth is the same indefinitely, and can be used to calculate age at any point.

Data point used to understand the relative presence of youth and calculate youth engagement: % of producers in the sustainability program or supply chain 35 years old and under.

2.1.5 Gender**Details:****Property name:** gender**Type:** *string***Allowed values:** 'M', 'F', 'O', 'NA'

Data point used to understand the relative presence of women and to calculate women's engagement and the outcomes they experience as diverse from men: % of women in the sustainability program or supply chain.

2.1.6 Farm Ids**Details:****Property name:** farmIds**Type:** *array***Unique items:** *True***Minimum items:** *1***Array items:** *global-unique-id.json*

Which farms belong to this farmer. At least one is required.

2.1.7 Third-party identifier**Details:****Property name:** thirdPartyIds

Type: *array*

Unique items: *True*

Array items: *global-unique-id.json*

When this dataset is reused by another organisation who needs to use their own Global Unique Identifier, the original identifier can be saved here, to track history and origin.

2.2 Social farmer characteristics

Details:

Property name: *social*

Type: *object*

The social farmer characteristics

```
1 "social": {
2   "povertyLevel": {
3     "householdMembers": 3,
4     "totalHouseholdIncome": 20.58
5   },
6   "childLabor": {
7     "schoolAgeHouseholdMembers": 33.3,
8     "hazardousProhibition": "No"
9   },
10  "hunger": 0
11 }
```

2.2.1 Poverty level

Details:

Property name: *povertyLevel*

Reference: *poverty-level.json*

Comparison of total household revenue to World Bank International Extreme Poverty Line (total divided by # adult individuals in household).

The Monitoring approach is to ask producers the proportion of total household income coming from the sale of coffee (since the coffee revenue amount from the Net Income indicator (Profit) is already known, an estimate of the full household income amount can be derived with that proportion). This allows a good sense of the economic picture on the farm without adding substantial detail to the approach in terms of all household income streams (e.g., sales of other crops or services, income from other businesses, gifts and remittances, etc.) and any associated costs.

The World Bank International Extreme Poverty Line is \$1.90 USD per day as of 2015 (<https://datahelpdesk.worldbank.org/knowledgebase/articles/906519>). Comparison to national poverty lines may be useful for discussion related to one country or domestic policy but that can be calculated separately as needed.

An organisation may choose to use the PPI score evaluation of the propensity of a farmer or community to be poor as another option that can be more relevant in some rural areas and can be calculated separately as needed. Organisations may also choose to participate on this topic in the Living Income Community of Practice.

2.2.2 Child labor

Details:

Property name: childLabor

Reference: *child-labor.json*

The issue of Child Labor is often addressed as a compliance audit question, but it is rarely answered because of the moral hazard (nobody wants to answer that they have child labor). Instead, “children in school at the appropriate grade level” serves to provide a valuable proxy that directly reflects an outcome of child labor and results in a better understanding of the plight of children in a community. Note that in many countries the compulsory school age may be lower than 18, and organisations are welcome to include other age limits in their own analysis of the data, but children in the appropriate grade for their age through 18 serves as an aspirational target. This data can be segmented by gender to get additional insights into the differences in education levels for both boys and girls in a community.

As an additional option, it may be desirable to ask whether young workers (those under age 18) are working in hazardous conditions (applying chemical pesticides, using hazardous machinery, moving excessive weights/loads, etc.)

These concepts are common to many sustainability standards and the approach is built on the ILO standards and the SDGs.

We recognize that child labor can also occur outside the family setting. At this initial stage of common metrics, it is necessary to note that capturing that requires either a labor assessment targeting workers (risky for them, often requires an independent surveyor, and timing is critical) or a risk assessment or data from the wider community (consider costs and comparability). This is an important topic and it is necessary to adequately understand which communities are more prone to this situation, therefore, we propose that it be addressed with different tools than these basic performance indicators developed with the GCP.

2.2.3 Hunger days

Details:

Property name: hunger

Type: *integer*

Minimum: 0

Whether the household was food secure during the last production year (report 0 days of food insecurity—i.e., not skipping meals or significantly reducing food intake because food was not available).

The simple approach depends on asking the producer the number of days during the last production year that any member of household cut food consumption due to lack of food. It is good practice to ask this question in ranges of days to help with farmer recall: 0 days; 1-9 days, 10-19 days; 20-29 days; 30 or more days in the past year. Producers that answer ‘0 days’ are considered to be food secure. Optimally, the approach would also include the months when food insecurity occurred in order to understand the times of year when producers experience more or less food security.

More comprehensive nutritional indicators can be expensive and require significant technical ability, time and resources to carry out effectively, so instead the focus is on days of food insecurity as a proxy. Note that while this survey question is often asked to the head of household, this indicator is best expressed when it includes multiple perspectives in the household. This indicator is an important human development issue and a core indicator for social justice.

1.4.3 3 Farm

Details:

Property name: farm

Type: *object*

The farm characteristics

3.1 General farm characteristics

Details:

Property name: general

Type: *object*

The general farm characteristics

```
1 "general": {
2   "farmId": {
3     "identifier": "2345",
4     "organisation": "Land register of Burundi",
5     "timestamp": "1998-12-28"
6   },
7   "farmerId": {
8     "organisation": "Chamber of Commerce, Burundi",
9     "identifier": "1035413151",
10    "timestamp": "2010-05-21"
11  },
12  "address": {
13    "countryName": "Mali",
14    "postalCode": "5987 BL"
15  },
16  "totalFarmSize": 150.25,
17  "totalAreaCoffee": 160.48,
18  "location": {
19    "geoLocation": {
20      "coordinates": [
21        125.25,
22        135.255
23      ],
24      "type": "Point"
25    },
26    "positionTakenAt": "Location of the front door of the head office"
```

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27 }
28 }

3.1.1 Farm Id

Details:**Property name:** farmId**Reference:** *global-unique-id.json*

Globally Unique ID of the recording of the farm at a specific time and by a specific organisation.

3.1.2 Farmer Id

Details:**Property name:** farmerId**Reference:** *global-unique-id.json*

Globally Unique ID of the farmer of this farm

3.1.3 Location of the farm

Details:**Property name:** location**Reference:** *farm-location.json*

GPS should be captured for each farm plot if possible. GPS readings should be taken outside of buildings and away from significant tree coverage to avoid interference in the signal. GPS should be captured in the middle of the plot, and/or near the entrance to any main building (if there is one). Where the main residence or other buildings are not located on the farm plot, GPS should be taken in the middle of the plot.

3.1.4 Farm address

Details:**Property name:** address**Reference:** *address.json*

This should be the location of the farm itself (main plot), not the home of the farmer, if different.

3.1.5 Total farm size (ha)

Details:

Property name: totalFarmSize

Type: *number*

Exclusive minimum: 0

Total Farm size refers to total property size, including land used to grow crops, pasture, wooded areas, land covered by buildings, and any other area included in the property.

Best practice is to collect response in any given unit, and then perform conversion to a standard international unit (ha). Data validation should ensure that the total area planted in coffee should be less than the total farm size. It is ok to rely on farmer recall although more rigorous estimates will include GPS or polygonal mapping data. Consider that farms may contain multiple plots (plots are farm land areas that are not connected, or farm areas that are managed differently, or both). Make sure to add all relevant plots managed by members of a household together (that is, the farm area should coincide with the land used to account for the farm cost and revenue data being reported).

3.1.6 Total Area planted in Coffee (ha)

Details:

Property name: totalAreaCoffee

Type: *number*

Exclusive minimum: 0

Sum of coffee farm areas from producers in the sustainability program or supply chain (ha)

Area under coffee production can also be triangulated with other pieces of data collected (e.g., trees planted per unit land (density rate) and/or total number of trees planted).

3.1.7 Third-party identifier

Details:

Property name: thirdPartyIds

Type: *array*

Unique items: *True*

Array items: *global-unique-id.json*

When this dataset is reused by another organisation that needs to use their own Global Unique Identifier, the original identifier can be saved here, to track history and origin.

3.2 Social farm characteristics

Details:

Property name: social

Type: *object*

The social farm characteristics

```

1 "social": {
2   "laborPractices": {
3     "prohibitingDiscrimination": "Yes",
4     "clearContracting": "No",
5     "hazardousWorkingCondition": "Yes",
6     "rightToOrganise": "Yes"
7   },
8   "wages": {
9     "wagesProcessing": 4,
10    "wagesHarvesting": 14,
11    "wagesCoffee": 16,
12    "nationalMinimumWage": 12.5
13  }
14 }
```

3.2.1 Labor Practices

Details:

Property name: laborPractices

Reference: *labor-practices.json*

% of good labor practices adopted (of those listed). This indicator is applicable where farms rely on hired labor (not labor of household members).

The percent refers to the number of good labor practices from the list that are adopted (meaning that each practice should have a binary response) and change over time is noted by the type and number of practices.

These concepts are common to many sustainability standards and the approach is built on the ILO standards and the SDGs. While there may be moral hazard in asking these questions outright, asking the questions themselves serves to educate the respondent about the norms and aspirations that are part of general good labor practices.

3.2.2 Wages

Details:

Property name: wages

Reference: *wages.json*

Daily average earnings for farm labor compared to (rural) minimum wage. Wage is listed and also expressed as a percentage of the rural minimum wage (where that exists), alternately to the national minimum wage.

The approach involves asking for the average daily wage rate paid. If applicable, include wages for coffee production, harvesting, and processing and take an average across all three categories.

Wage is listed and also expressed as a percentage of the rural minimum wage (where that exists), alternately to the national minimum wage.

This approach gives a good sense of worker earnings coming from the most prominent types of labor without needing to detail individual jobs, rates, benefits, etc.

Organisations may wish to participate in working groups to define and measure living wage. There is still no widely used methodology, but the ability to understand whether a worker could survive on the wage earned would be useful for any industry.

3.3 Economic farm characteristics

Details:

Property name: economic

Type: *object*

The economic farm characteristics

```
1 "economic": {
2   "coffeeProfit": 4.5,
3   "productivity": {
4     "coffeeProductiveArea": 1500,
5     "amountHarvested": 2500,
6     "formOfCoffee": "Dry cherry"
7   },
8   "productionCosts": {
9     "fertilizers": {
10      "amount": 2500,
11      "percentage": 100
12    },
13    "pesticides": {
14      "amount": 2500,
15      "percentage": 90
16    },
17    "hiredLabor": {
18      "amount": 2544,
19      "percentage": 98
20    },
21    "plantingMaterial": {
22      "amount": 1258,
23      "percentage": 100
24    },
25    "renovation": {
26      "amount": 0,
27      "percentage": 0
28    },
29    "other": {
30      "amount": 1851,
```

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```

31     "percentage": 50
32   }
33 },
34 "price": {
35   "totalCoffeeRevenue": 25800,
36   "kgSold": 2510
37 },
38 "sustainablePurchases": {
39   "volumeOfSustainablePurchases": 1500,
40   "proportionOfTotal": 25
41 }
42 }

```

3.3.1 Coffee Profit

Details:

Property name: coffeeProfit

Type: *number*

Exclusive minimum: 0

Total revenue from coffee sales minus total costs for coffee production (Reported in USD/ha of coffee productive area.)

The simple approach (which avoids the additional time and resources necessary for detailed accounting while still providing good results) is to ask for the **total** revenue from sales of coffee as a whole, and subtract main costs. This indicator is reported on a per hectare basis to allow comparability across projects and regions.

This simplified approach does not cover asking the producer about revenue and prices for each transaction or amount sold, nor any premiums or deductions. It also factors in only the main costs in the coffee production system (see Cost of Production indicator below).

3.3.2 Yield / Productivity

Details:

Property name: productivity

Reference: *productivity.json*

kgs of GBE (harvested)/ha of coffee productive area

For general GBE conversion guidance, please see: <http://www.thecoffeeguide.org/coffee-guide/world-coffee-trade/conversions-and-statistics/>

3.3.3 Cost of Production

Details:**Property name:** productionCosts**Reference:** *production-costs.json*

Costs incurred to produce the coffee during the last production year (calculated per kg of GBE)

The simple approach asks only about the main costs in the production system that typically account for the vast majority of total costs (and the total amount spent on each during the last production year). By focusing on the main costs in a system, this provides a good sense of the economic picture on the farm without adding substantial detail to the approach.

Main costs typically include (at a minimum):

- Fertilizers
- Pesticides
- Hired Labor
- Planting material/ Renovation costs

For those using the Full cost accounting approach the categories are comparable though fewer. The full approach would include: deductions by buyers, rent of land, energy, irrigation, capital assets, cultivation practices, traceability and record keeping, costs of standards or certifications, planting and reforestation costs, training costs, interest on credit, crop insurance, cooperative fees, or the value of unpaid family labor (although any important costs in a system should be captured).

Costs should be associated with the coffee production only (i.e., if labor is hired for multiple crops, only the portion used for coffee production should be included). One way to make sure that costs are correctly associated with the production of the coffee is to ask for the percent of inputs that were used for the coffee.

When calculating costs, include only expenditures coming from the household's own revenue. If inputs are provided as technical assistance for free or at a subsidized cost on a **persistent, substantial**, and **systemic** basis it is recommended to account for the value of the input as a cost in the calculation (at an appropriately determined rate).

This indicator is a Sub-metric for Net Income (or Profit).

3.3.4 Average Price

Details:**Property name:** price**Reference:** *average-price.json*

Average Price received per kg of coffee (GBE). The simple approach involves asking for the total revenue received from coffee during the last production year as well as the amount sold (and the form). The average price per unit can then be calculated. For multiple sales, calculate the price average of sales

The average price can then be compared to the global reference price (e.g., ICO).

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.

3.3.5 Sustainable purchases

Details:

Property name: sustainablePurchases

Reference: *sustainable-purchases.json*

The volume of sustainable purchases by the buyer and as a proportion of the total, and change year to year.

Detailed methodology developed by the SPF Working Group (not a farmer level metric).

3.4 Environmental farm characteristics

Details:

Property name: environmental

Type: *object*

The environmental farm characteristics

```

1  "environmental": {
2    "forestEcosystemProtection": {
3      "areaConvertedLand": {
4        "absoluteArea": 15,
5        "proportiesOfFarm": 100
6      },
7      "ecosystemProtection": 18.58
8    },
9    "fertilizerUse": "Yes",
10   "water": {
11     "waterConservation": {
12       "dripIrrigation": "No",
13       "waterCatchments": "Yes",
14       "waterEfficientProcessing": "No"
15     },
16     "waterContamination": {
17       "preventUntreatedWater": "Yes",
18       "noPesticideCleaningNearWater": "No",
19       "noLivestockNearWater": "Yes",
20       "noDomesticDischarge": "Yes"
21     }
22   },
23   "pestControl": {
24     "ipmPractices": {
25       "conductRegularVisualExaminations": "Yes",
26       "pestRepelSpecies": "No",
27       "useNaturalPesticides": "Yes",
28       "applyAfterIdentifying": "No",
29       "predatorPlaces": "Yes",
30       "recordPestInfestation": "No"
31     },

```

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```
32   "useOfBannedPesticides": "No"
33 },
34 "soilConservation": {
35   "checkDams": "Yes",
36   "interplanting": "No",
37   "contourPlanting": "No",
38   "recyclingOrganicMatter": "Yes",
39   "liveFences": "Yes"
40 }
41 }
```

3.4.1 Forest and Ecosystem Protection

Details:**Property name:** forestEcosystemProtection**Reference:** *forest-ecosystem-protection.json*

The approach involves asking producers if they converted any natural land (e.g., forest, savanna) to land used for coffee production and how much [both in absolute terms (ha) and relative terms (proportion of the farm)] during the last 5 years.

In addition, overlaying gps coordinates of farms (See GPS Coordinate instructions above) with regional deforestation maps provides more interesting data at a landscape level to understand areas of 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.

Forest and ecosystem protection practices include:

1. Reforestation with non-productive trees (i.e., those trees that will not be regularly pruned or removed)
2. Laying land aside (fallow) and/or blocking active use (including hunting).

3.4.2 Fertilizer use

Details:**Property name:** fertilizerUse**Type:** *string***Allowed values:** 'Yes', 'No'

Whether a professional assessment or advice was used to determine fertilizer needs on the farm. It does not require in-depth fertilizer information: nutrient amounts, local commercial names, dosage amounts, application rates, etc.

The simple approach depends on asking the producer about fertilizer use best practices instead of all the individual fertilizer types and amounts they use. Asking if the producer based their fertilizer use on professional advice or assessments is easy to ask in a standardized way globally and can be a proxy for proper fertilization on the farm (there

is ample evidence that the correlation between fertilizer use and yields is not as good as prescribed fertilization and yields).

Professional assessments include advice from an extension agent or other sustainability program implementer and NOT input sellers.

This approach does not require in-depth fertilizer information: nutrient amounts, local commercial names, dosage amounts, application rates, etc.

3.4.3 Water Conservation & Contamination Prevention

Details:

Property name: water

Reference: *water.json*

Water conservation practices include (relevance of individual practices will need to be determined by region):

1. Drip irrigation
2. Water catchments
3. Water-efficient processing

For practices that conserve soil moisture balance and control runoff, please reference the “Soil Conservation” indicator below.

Water contamination prevention measures include the following:

1. Pesticide equipment is cleaned away from natural water bodies
2. Ensuring untreated water from processing does not enter natural water bodies
3. Grazing livestock away from natural water bodies
4. Domestic discharge prevented from entering natural water bodies

These concepts are common to many sustainability standards and the approach is built on FAO Good Agricultural Practices.

Asking about best practice adoption is a standardized way to address this indicator globally without the expensive and technical expertise required to measure water use amounts (and evaluating that in the local context) or taking water samples to evaluate contamination levels and the required protocols for that (taking samples at the appropriate locations and time, factoring in elements that may be beyond an individual producers control, etc.).

3.4.4 Pest control - hazards

Details:

Property name: pestControl

Reference: *pest-control.json*

Standard IPM techniques include:

- Conduct regular visual examinations of the coffee to detect pests and/or diseases

- Use traps, repellants, and natural pesticides
- Create or preserve places (including plant species) for beneficial predators of pests to live
- Maintain written record of pest infestation, treatments, and results
- Plant or preserve species that repel pests of the coffee
- Apply pesticide or kill pests only after identifying the pest and only at the best time in the pest's life cycle to permanently reduce its population

Banned or hazardous pesticides will be based of the WHO Ia and Ib lists. COSA suggests that over time it will be useful to understand the types and/ or individual banned pesticides being used so that research bodies can develop varietals or take other actions that help prevent the need for their use in the field. This approach does not address proper disposal of pesticide containers.

Pesticides include insecticides, fungicides, rodenticides, nematicides and herbicides.

Focusing on IPM techniques is a globally standardized way to understand pest management best practices without the more costly and time-consuming process of detailing individual pesticides, active ingredients, amount used in local units, etc.

3.4.5 Soil Conservation

Details:

Property name: soilConservation

Reference: *soil-conservation.json*

% of applicable soil conservation practices used on the farm (of those listed)

Soil conservation measures include:

1. contour planting, terracing, or soil ridges around trees
2. live fences, hedgerows or buffer zones
3. recycling organic matter and crop waste
4. interplanting, nitrogen fixing plants, cover crops, or mulching
5. check dams, drainage channels or diversion ditches

These concepts are common to many sustainability standards and the approach is built on FAO Good Agricultural Practices.

Asking about best practice adoption is a standardized way to address this indicator globally without the expensive and technical expertise required to measure the actual amount of soil conserved or to do individual soil testing on farms.

1.4.4 4 Plot

Details:

Property name: plot

Type: *object*

The plot characteristics. This is an example of what is possible. The plot property is optional.

4.1 General plot characteristics

Details:

Property name: general

Type: *object*

The general plot characteristics

```

1 "general": {
2   "plotId": {
3     "identifier": "pl956304",
4     "organisation": "Land registry Burundi",
5     "timestamp": "1999-02-28"
6   },
7   "farmId": {
8     "identifier": "2345",
9     "organisation": "Land register of Burundi",
10    "timestamp": "1998-12-28"
11  },
12  "boundary": {
13    "type": "Polygon",
14    "coordinates": [
15      [
16        [
17          100.0,
18          0.0
19        ],
20        [
21          101.0,
22          0.0
23        ],
24        [
25          101.0,
26          1.0
27        ],
28        [
29          100.0,
30          1.0
31        ],
32        [
33          100.0,
34          0.0
35        ]
36      ]
37    ]
38  },
39  "area": 145.57,
40  "thirdPartyIds": [
41    {
42      "identifier": "pl956306",
43      "organisation": "Land registry Burundi",

```

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```
44     "timestamp": "2005-01-12"  
45   }  
46 ]  
47 }
```

4.1.1 Unique ID of the plot

Details:

Property name: plotId

Reference: *global-unique-id.json*

Globally Unique ID of the recording of the plot at a specific time and by a specific organisation.

4.1.2 Farm ID

Details:

Property name: farmId

Reference: *global-unique-id.json*

To which farm belongs this plot

4.1.3 Plot boundary

Details:

Property name: boundary

The boundary of the plot

4.1.4 Plot area

Details:

Property name: area

Type: *number*

Minimum: *0*

Area of the plot

4.1.5 Third-party identifier

Details:

Property name: thirdPartyIds

Type: *array*

Unique items: *True*

Array items: *global-unique-id.json*

When this dataset is reused by another organisation who needs to use their own Global Unique Identifier, the original identifier can be saved here, to track history and origin.

4.2 Economic plot characteristics

Details:

Property name: economic

Type: *object*

The economic plot characteristics

```

1 "economic": {
2   "productivity": 7,
3   "yield": 20
4 }
```

4.2.1 Yield

Details:

Property name: yield

Type: *number*

Minimum: *0*

kgs of GBE (harvested)

4.2.2 Productivity

Details:

Property name: productivity

Type: *number*

Minimum: *0*

Total revenue from coffee sales minus total costs for coffee production (Reported in USD/ha of coffee productive area.)

1.5 Overview of JSON schema

The complete data structure is visualized in the table below:

All required data attributes are indicated in bold,

By clicking on the blue table title -> all data attributes become visible,

By clicking on the data entity buttons -> all data attributes become visible of that data entity and,

By clicking on the {} symbols -> the JSON becomes visible

CHAPTER 2

Indices and tables

- `genindex`
- `modindex`
- `search`