Carbonsafe

Carbonsafe carbon farming project – North Bulgaria

PROJECT DESIGN DOCUMENT

FOR REPORTING OF REMOVED GREENHOUSE GAS EMISSIONS CARBON DIOXIDE (CO_2)

PROJECT TITLE	CARBONSAFE CARBON FARMING PROJECT – NORTH BULGARIA
PROJECT DEVELOPER	CARBONSAFE
PROJECT ID	CSBG-BG-N
COUNTRY	BULGARIA
SECTORAL SCOPE	AGRICULTURE
PROJECT TYPE	CARBON REMOVAL – SOIL ORGANIC CARBON (SOC) SEQUESTRATION
PROJECT START DATE	17/01/2023
CREDITING PERIOD	2023 - 2063
VERSION	2.1
DATE (DD/MM/YYYY)	08/05/2026

CONTENT:

1. PROJECT OVERVIEW

1.1 Project Summary

The Carbonsafe carbon farming project in the North region is developed and managed by Carbonsafe JSC, a company dedicated to advancing sustainable agriculture and climate solutions. Implemented in the Republic of Bulgaria, the project operates within the agriculture sector and is designed as a carbon removal initiative focused on the long-term sequestration of Soil Organic Carbon (SOC).

The project officially commenced on 17 January 2023 and is structured under a 40-year crediting period (2023–2063), during which its activities will generate verified climate benefits and carbon credits linked to measurable increases in soil carbon stocks.

The core climate outcome of the project is the generation of verified carbon dioxide (CO_2) removal credits through measurable and monitored increases in Soil Organic Carbon (SOC) stocks in agricultural soils. These removals are quantified ex post, based on direct soil sampling and laboratory analysis, converted into CO_2 equivalents, independently verified, and issued as carbon removal credits in accordance with the Balkan Carbon Credit Standard (BCCS). The project therefore delivers durable, measurable, and conservatively credited CO_2 removals aligned with BCCS outcome terminology for soil carbon sequestration.

1.2 Project Stakeholders:

- Carbonsafe JSC – project aggregator and manager - Responsible for overall project design and implementation, farmer onboarding, coordination of monitoring, reporting and verification (MRV) activities, data management, engagement with validation and verification bodies, and registration and issuance of carbon credits in the registry.
- Participating Bulgarian farmers - Implement eligible agricultural practices on enrolled land parcels, provide access to fields for soil sampling and monitoring, maintain records of land management activities, and comply with project participation and permanence requirements.
- Accredited Soil Sampling and Analysis Partners - Conduct field soil sampling in accordance with the approved methodology and analyze soil samples in accredited laboratories to determine SOC content, bulk density, and related parameters required for carbon quantification.
- Independent Validation and Verification Bodies (VVBs) - Independently assess the project design, baseline, monitoring data, and quantification results to confirm compliance with the applied standard and methodology prior to validation, verification, and credit issuance.
- Methodology Developer - Responsible for developing, maintaining, and updating the approved soil carbon methodology applied by the project, including definitions of eligibility criteria, baseline establishment, quantification approaches, uncertainty management, additionality tests, and MRV requirements. The methodology developer ensures that methodological rules are scientifically robust, conservative, and aligned with the Balkan Carbon Credit Standard (BCCS), and supports consistent application of the methodology across all project activities and verifications.
- Balkan Carbon Credits Standard (BCCS) - Maintains the official registry infrastructure for project registration, serialization, issuance, transfer, and retirement of verified CO_2 removal credits, ensuring transparency, traceability, and avoidance of double counting.

1.3 Project Structure:

The project is structured as a regional grouped project in which each farm represents a sub-project. Farms can be added progressively over time, provided they meet predefined eligibility criteria (land use, management practices, and ownership verification). This allows national scalability, cost efficiency, and standardized monitoring.

1.4 Project Developer Information:

CARBONSAFE JSC is a company registered in the Commercial Register at the Registration Agency on 17.11.2022 with UIC 207162188 and was transformed into a joint-stock company on 19.03.2025 with UIC 208222962

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2. PROJECT OBJECTIVES AND DESCRIPTION

2.1. Project Description & Activities

Synopsis.

Carbonsafe is a national carbon farming project that quantifies and issues high-integrity SOC removal credits based solely on direct, geo-referenced soil measurements taken annually on every enrolled plot. The project accelerates adoption of regenerative practices (reduced tillage, diversified rotations, cover crops, optimized nutrient management, and organic amendments) across northern Bulgarian croplands to remove atmospheric CO_2 and store it as stable organic carbon in soils. Credits are issued ex-post only after measured SOC gains are independently verified by an accredited VVB and registered on BCCR with full plot-level traceability.

The project is implemented through a structured and sequential implementation model that guides participating farms from enrolment through to verified carbon credit issuance. The key stages of the project lifecycle are as follows:

Farmer onboarding begins with outreach and engagement by the project developer, followed by preliminary eligibility screening to confirm land-use type, geographic eligibility, legal control over land, and exclusivity with respect to other carbon schemes. Eligible farms enter into participation agreements defining roles, data access, and long-term commitments.

Baseline establishment is conducted for each enrolled farm or sub-project through initial soil sampling and documentation of historical land management practices. This baseline defines the reference Soil Organic Carbon (SOC) stock against which future changes are measured.

Following baseline establishment, participating farmers implement or improve eligible agricultural practices consistent with the project requirements. Practice adoption is supported through technical guidance and ongoing engagement but remains under the operational control of the farmer.

Farms with partial baseline adoption of eligible practices are considered eligible when the project participant commits to a measurable increase in the intensity, frequency, or quality of management practices already in place, leading to an increased potential for soil organic carbon sequestration above the levels specified in the baseline management conditions.

Examples of eligible increases include:

- switching from minimum tillage to no-till farming,
- reducing the frequency and depth of tillage operations,
- increasing the proportion of land under cover crops,
- extending the period of soil cover,
- including additional species in the crop rotation
- increasing the amount and frequency of organic inputs, such as compost, manure, crop residues, plant biomass mulch, etc.

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Форматирано: Списък на абзаци, С водещи символи + Ниво: 1 + Подравнено на: 0,63 см + Отстъп на: 1,27 см

Коментирал [DK1]: Text added in this section for further clarification.

Форматирано: английски (Съединени американски щати)

Monitoring activities are carried out on a recurring basis through repeat soil sampling, data collection, and documentation of land management practices. Monitoring results are compiled and processed within the project's data management system.

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Verified monitoring data are submitted for independent verification, after which verified net CO_2 removals are registered and issued as carbon removal credits in the registry.

Responsibilities for key project activities within the implementation model are allocated as follows:

- The project developer (Carbonsafe) is responsible for farmer engagement and onboarding, eligibility screening, coordination of baseline and monitoring activities, data aggregation and management, quality control of project data, and coordination with validation and verification bodies (VVBs) and the registry.
- Participating farmers are responsible for implementing agricultural practices on enrolled land parcels, maintaining records of land management activities, and providing access to land and relevant information for soil sampling and monitoring.
- Soil sampling contractors and accredited laboratories are responsible for field sampling and laboratory analysis of soil parameters in accordance with the approved methodology.
- Independent validation and verification bodies (VVBs) are responsible for validating the project design and verifying monitoring results prior to credit issuance

Measurement activities are integrated as a core component of the project implementation cycle. Initial soil sampling defines the baseline SOC stock for each farm or sub-project prior to crediting. Subsequent monitoring cycles are conducted to quantify changes in SOC over time. Measurement results inform both carbon accounting and ongoing project management, enabling conservative issuance of credits based solely on verified SOC stock increases and supporting continuous oversight of project performance throughout the crediting period.

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Project main activity

Proper sequencing of agricultural practices is essential for effective carbon sequestration and the maintenance of soil health. It ensures that each agronomic measure builds upon the previous one rather than neutralizing its effect. Farmers must follow the correct order of operations precisely, avoid unnecessary soil disturbance, and prevent excessive use of plant protection products and fertilizers in order to preserve soil health and maintain the effectiveness of the applied technology.

Chronology of Implementation of Agronomic Measures:

- Soil management practices – shallow soil cultivation at a depth of 5–15 cm, without inversion of the soil layer, and with reduced machinery passes across the field (use of disc harrows, cultivators, stubble cultivators, combined implements, minimum tillage seeders, direct seeders, etc.);

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- Sowing and crop selection – inclusion of as many different crops as possible, including cereals, legumes, and brassicas (crop rotation), which minimizes disease and pest pressure, reduces the need for chemical plant protection, and restores soil health;

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- Cover crops and green manure crops – restoration of soil health, enhancement of biodiversity, reduction of dependence on synthetic fertilizers and pesticides, and weed control (e.g., rye, oats, mustard, clover, vetch, peas);

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- Plant protection and fertilization – limitation of fungicide and insecticide use, applying them only when necessary and based on established economic thresholds, avoiding preventive spraying, and adhering to recommended fertilizer application rates, with a maximum nitrogen dose per single application of 3–3.5 kg/da of active substance;

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- Harvesting and crop residue management – crop residues protect soil from erosion, desiccation, and temperature fluctuations; their decomposition supports soil microbiota and increases humus content. Roots and residues create soil porosity, improving water infiltration and aeration. It is recommended that residues be chopped and evenly distributed after harvest, left as mulch, or treated with biostimulants.

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Alignment of Practices With:

- Climatic conditions;
- The biological cycles of the cultivated crops

Carbonsafe includes the following practices in the project activities:

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- Zero till;
- Cover crops/intercrops and residue management;
- Organic fertilization (manure, compost and others) and pesticides;

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- annual, geo-referenced SOC measure–remeasure (0–30 cm, 30–60 cm, 60–90 cm) in accredited labs and ex-post issuance.

Required practices

Farm operators are required to have at least one practice improved or implemented plus annual, geo-referenced SOC measure–remeasure (0–30 cm, 30–60 cm, 60–90 cm) in accredited labs and ex-post issuance.

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Legend of Practices	
I. Zero-till	1. Conservation without processing
II. Cover crops/intercrops and residue management	2. Treatment of beds 3. Minimal processing 4. Biological agriculture 7. Diversification of crops 10. Cultivation of nitrogen-fixing crops 11. Mulching treatment 13. Processing of stripes 14. Pasture and/or crop rotation and crop rotation management 15. Weeding of the rows in perennial crops and vineyards 16. Joint cultivation of more than one agricultural crop 17. Implementation of strip farming 18. Improvement measures in permanently grassed areas
III. Organic fertilization (manure, compost and others) and pesticides	5. Integrated production 6. Precision agriculture 8. Fertilization with microbial fertilizers 9. Green fertilization (Sideration) 12. Use of organic/natural pesticides

2.1.1. Grouped project architecture.

The PDD covers North region in Bulgaria and operates as a grouped project. Each participating farm is a sub-project with its own geo-boundaries, baselines, monitoring records, and issuance

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ledger. New farms may join over time if they meet predefined eligibility and additionality criteria. This architecture enables scale while preserving per-farm accountability, transparency, and serial-number traceability.

Within the grouped project architecture, each participating farm is treated as a sub-project for MRV and accounting purposes. A sub-project consists of one or more eligible land parcels (plots) under the operational control of the participating farmer and enrolled under a single participation agreement.

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Individual plots within a farm are geo-referenced and mapped as discrete spatial units. These plots are aggregated at sub-project level for baseline establishment, monitoring, quantification, and issuance calculations. Monitoring data are collected at plot level and consolidated at farm (sub-project) level for statistical assessment and reporting.

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While issuance occurs at sub-project level, all plot-level data remain traceable within the internal data management system to ensure transparency, consistency, and auditability

New farms may be incorporated into the grouped project provided they meet predefined eligibility and additionality requirements. At minimum, inclusion criteria require that:

- Land use type falls within eligible agricultural categories defined under the approved methodology;
- The land is located within the defined geographic scope of the project;
- Baseline conditions can be established in accordance with methodological requirements;
- The farmer demonstrates legal control or use rights over the enrolled land;
- The land is not registered under another carbon crediting scheme;
- Participation agreements are executed prior to formal inclusion.

The grouped architecture enables scalable expansion through periodic inclusion of new sub-projects. Expansion is not automatic; each new farm undergoes eligibility screening, baseline establishment, contractual onboarding, and internal review prior to formal incorporation under the registered project framework.

New sub-projects are incorporated only if they remain fully consistent with the registered PDD, approved methodology, monitoring plan, and boundary conditions. Material changes to the project design, geographic scope, or methodological application require formal amendment.

The current PDD defines the North region of Bulgaria as the registered geographic boundary for project implementation. This region constitutes the fixed operational boundary for all currently enrolled and future sub-projects under this registration.

2.1.2. Measurement and MRV Approach.

Carbonsafe applies a standardized sampling design implemented by a specialized field team. Each farm is divided into smaller plots (cells) from 4 ha to 25 ha. Within each cell, 25 drills are performed in a diagonal/zig-zag pattern, at three depth layers (0–30, 30–60, 60–90 cm). We take 25 cores at three depths, which form 3 samples - one for each depth.. These are then composited into one representative soil sample for each depth. Samples are taken every year on the same geo-referenced cell using an automatic GPS-enabled probe. Sampling tracks (ATV traces) are logged digitally. Samples are analyzed by ISO/IEC 17025-accredited laboratories with a QA/QC protocol. SOC stocks are computed using bulk density and depth-explicit compositing. All field, lab, and issuance data are managed in a secure ERP/digital MRV system with audit trails and role-based access.

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2.1.3. Baseline and additionality Overview.

The baseline reflects prevailing conventional practices absent carbon-farming incentives (e.g., conventional tillage, limited cover cropping). Adoption of the project's regenerative measures is not business-as-usual in the regional and national context and faces financial and behavioral barriers. Additionality is demonstrated through practice change documentation, management history, and farmer contracts committing to new or strengthened regenerative measures beyond baseline norms.

Additionality is demonstrated in accordance with the specific tests and criteria defined in the applied methodology. This includes confirmation of regulatory surplus (i.e., that implemented practices are not legally mandated), assessment of non-common practice conditions within the regional context, and evaluation of financial and operational barriers that would prevent implementation in the absence of carbon finance.

Practice change documentation, historical management records, and participation agreements serve as evidentiary elements supporting these methodology-defined additionality tests. These documents substantiate the transition from baseline practices to project practices and demonstrate that the resulting SOC removals would not occur under business-as-usual conditions

The baseline scenario for each sub-project is defined with reference to historical land management practices prior to formal enrolment in the project. The baseline reference period corresponds to documented management conditions in the years immediately preceding project participation, as specified in detail in Section 4.2 (Baseline Scenario) and Section 5 (Eligibility and Additionality). This temporal anchoring ensures that business-as-usual conditions are clearly distinguished from post-enrolment practice changes

BASELINE STATE

The baseline state reflects the prevailing conventional agricultural practices currently applied to 53% of open-field arable land. The soil cover distribution is characterized as follows[1]:

- Bare Soil: 42%
- Plant Residue: 8%
- Cover/Intermediate Crops: 2%

2.1.4. Quantification boundary and gases.

The GHG accounting boundary includes net CO_2 removals via SOC stock change in agricultural soils to 90 cm.

2.1.5. Issuance, Reserves and Buffers

Credits are issued ex-post after verification. To prudently manage year-to-year variability and potential reversals, Carbonsafe applies a conservative issuance policy: by default, 25% of verified net removals are issued, while 75% are retained in a sub-project reserve. Subject to positive farm balance in next monitoring period, reserve is released; conversely, reserves are used to cover negative results in the sub-project's balance in the final year of its crediting period. Reversal liability, response actions, and make-good provisions are defined contractually and operationalized through the reserve and monitoring system. Additionally, a 5% buffer pool on all credits is collected to cover for climate and force majeure incidents.

2.1.6. Leakage, non-permanence, and risk.

The project manages leakage by ensuring that regenerative practices do not lead to a displacement of emissions or production. Leakage is directly measured through the continuous monitoring of yield changes across all enrolled farms, further supported by satellite data to verify land-use consistency and detect any off-site impacts. Overview of main risks and mitigation approaches are discussed in section *2.1.13. Summary of Project Risks and Mitigation Strategies.*

[1] Ministry of Agriculture and Food of the Republic of Bulgaria. (August 2025). *Интегрирана статистика за земеделските стопанства в България през 2023 г. (IFS2023): Основни показатели* [Integrated Farm Statistics in Bulgaria 2023 (IFS2023): Main indicators]. Sofia, Bulgaria: Ministry of Agriculture and Food. Available at: https://www.mzh.government.bg/media/filer_public/2025/09/05/ifs2023publicationaugust2025.pdf

2.1.7. Stakeholders, safeguards, and justice.

Upon initiation, the project strives to avoid or mitigate any impacts on marginalized or proximate communities or culturally/ecologically significant lands. This is ensured through the application of eligibility criteria (including land tenure verification), a Do-No-Harm framework, and a structured risk assessment process to identify and mitigate potential environmental and social risks. A grievance mechanism is in place to allow stakeholders to raise concerns. Benefit-sharing is transparent; farmers receive carbon credits revenue, complemented by annual agronomic recommendations derived from the full soil panel (macro/micro-nutrients, pH, etc.), improving yields, input efficiency, and resilience.

2.1.8. Data integrity, transparency, and registry.

All credits are traceable to the exact farm, and vintage on BCCR, with public-facing serials and issuance logs. The digital MRV stack supports information security best practices, and comprehensive auditability (field tracks, GPS points, chain-of-custody, lab Certificate of Analysis (COAs), QC records, calculation workbooks, and VVB findings).

2.1.9. Project management capacity

Management capacity

The management capacity in the Carbonsafe project is presented in two aspects: the management capacity of the developer (the organization that manages and coordinates the project) and the management capacity of the individual farms participating in the project.

- ✓ Developer Management Capacity: Project developer Carbonsafe has strong leadership and an effective organizational structure to support the implementation of the program. This includes specialized experts in agriculture, climate and sustainable development to provide the necessary scientific expertise and advice to project participants. The developer is currently developing a data and information management system (ERP) in place to support the collection, analysis and reporting of carbon sequestration data and other relevant parameters.
- ✓ Farm/sub-project management capacity: To successfully participate in the program, farms must have management skills and the ability to implement/improve new farming practices. They are able to extract and analyze their soil and plant data and apply the project's proposed methods and technologies to increase carbon sequestration. Developer support, including training, consultancy and financial incentives, is essential to strengthen farm management capacity.

The successful management of the Carbonsafe project requires cooperation and synergy between the developer and the participating farms, and both stakeholders must have the necessary capacity and resources to achieve the overall objectives of the project.

Project developer ISO certification

Quality Management Systems

Certificate No: GIBP-0157-QC

Services for sampling, measuring, improving and reporting the level of carbon sequestered in soil, in the agricultural sector. Preparation of agronomic recommendations and individual strategies to improve agricultural practices. Maintenance of documentation for the implementation of projects under the carbon farming program, for the issuance of carbon credits.

ISO 14001:2015

Environmental Management Systems

Certificate No: GIBP-0157-EC

Services for sampling, measuring, improving and reporting the level of carbon sequestered in soil, in the agricultural sector. Preparation of agronomic recommendations and individual strategies to improve agricultural practices. Maintenance of documentation for the implementation of projects under the carbon farming program, for the issuance of carbon credits.

2.1.10. Operating costs

Project developer

A team of qualified specialists, specialized software and technical equipment are used for the implementation of the activities.

- ✓ Personnel costs: Includes salaries for developer staff, including managers, agricultural and climate specialists, administrative staff, etc.
- ✓ Administrative costs: Reflect the costs of administrative services, office rent, utilities, office equipment, etc.
- ✓ Transportation costs: Includes the costs of transporting personnel, materials and equipment, as well as organizing meetings and events.
- ✓ Marketing and Public Relations: Covers the cost of marketing and PR activities that help promote the project and attract new farm participants.

Sub-projects/farms

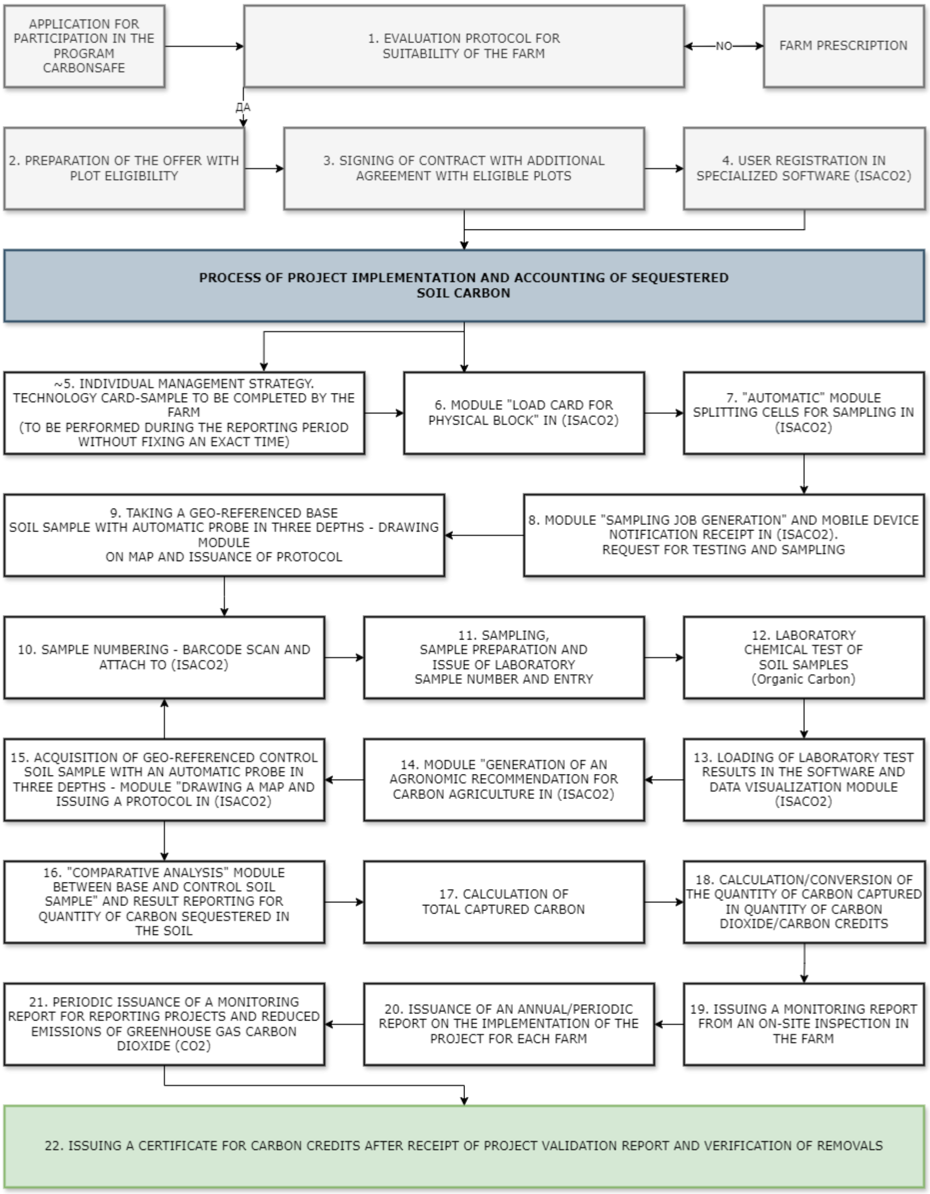
For the implementation of the activities, farms' equipment and labor need to be considered.

- ✓ Materials and equipment: Includes the cost of purchasing materials such as seeds, fertilizers, soil additives and specialized equipment to implement/improve the new sustainable farming practices.
- ✓ Labor costs: Cover labor costs associated with the implementation/improvement of new agricultural methods and technologies, including wages for workers and farm owners.

2.1.11. Expected outcomes.

The project is expected to deliver verifiable net CO_2 removals and measurable co-benefits: improved soil health and biodiversity, increased water retention and drought tolerance, reduced fertilizer and pesticide use, and enhanced farmer livelihoods.

2.1.12. Figure 1: Process Flowchart



2.1.13. Summary of Project Risks and Mitigation Strategies

Risk Category	Risk Description	Potential Impact	Mitigation Strategy
1. Climate & Environmental Risk	Droughts, floods, or erosion may reduce SOC gains or cause reversals.	Loss of sequestered carbon and lower credit issuance.	Annual SOC measurement and remeasurement; 75% performance reserve; 5% project-wide buffer pool; adaptive agronomic guidance; erosion control via reduced tillage and cover crops.
2. Agronomic Risk	Transition from conventional to regenerative farming may cause yield fluctuations or management failures.	Temporary income loss or project withdrawal.	Tailored agronomic support; annual soil diagnostics; flexibility policy for temporary tillage or rotation changes; carbon revenues as financial buffer.
3. Market and Price Risk	Volatility in voluntary carbon market prices or demand.	Revenue uncertainty for farmers and project.	Conservative issuance (25% ex-post); potential offtake contracts; alignment with international standards; transparency to buyers.
4. Data & MRV Risk	Sampling errors, lab inconsistencies, or data corruption in digital MRV system.	Over/underestimation of removals; loss of credibility.	Accredited ISO/IEC 17025 labs; uncertainty deduction; QA/QC at field, lab, and data levels; secure ERP with audit trails; third-party verification.
5. Permanence & Reversal Risk	SOC losses due to land-use change, poor management, or force majeure.	Carbon re-emission; reversal liabilities.	Sub-project performance reserves; reversal coverage; annual monitoring; contractual penalties for dropout; empirical detection via MRV.

Risk Category	Risk Description	Potential Impact	Mitigation Strategy
6. Leakage Risk	Activity shifting (new land cultivation elsewhere) due to yield drop.	Net emissions increase beyond project boundary.	Yield-protective agronomy (nutrient optimization, residue cover); monitoring of yield and land-use data; compliance with land-use regulations.
7. Financial & Behavioral Risk	Lack of capital, short leases, or farmer reluctance to change practices.	Low adoption or discontinuation of regenerative practices.	Aggregation model reduces costs; revenue-sharing; tenure verification; behavioral incentives through direct income; targeted training.
8. Operational & Organizational Risk	Land tenure disputes, farm ownership changes, or poor coordination.	Contractual breaches; loss of traceability.	Land-rights due diligence; legally binding 5-year renewable contracts; sub-project register with unique identifiers; due diligence on ownership changes.
9. Social & Community Risk	Community conflicts, access restrictions, or nuisance from field operations.	Reputational damage; stakeholder opposition.	FPIC and voluntary participation; grievance mechanism (5-day response, 30-day resolution); annual engagement meetings; route planning to reduce nuisance.
10. Health, Safety & Labor Risk	Accidents during soil sampling or unsafe agrochemical use.	Worker injury or legal non-compliance.	OHS plan with PPE, ATV training (contractors), IPM adoption recommendations; adherence to ILO Core Standards; confirmation of adherence to H&S and Labor laws by farmers

Risk Category	Risk Description	Potential Impact	Mitigation Strategy
11. Legal & Regulatory Risk	Non-compliance with land, CAP, or Natura 2000 regulations.	Project suspension or loss of eligibility.	Compliance screening at enrolment; internal compliance audits; alignment with national law.
12. Data Privacy & Integrity Risk	Unauthorized access or misuse of personal/farm data.	GDPR violations; loss of trust.	Role-based access in ERP; defined retention limits; GDPR-compliant data processing; registry transparency balanced with privacy.
13. Corruption or Conflict of Interest Risk	Potential collusion between project entities or misuse of funds.	Reputational and financial loss.	KYC controls; disclosure of conflicts (developer, verifier, registry); grievance mechanism; contractual duties.

2.2. Climate Objective.

The overarching climate objective of the Carbonsafe project is to contribute to the global effort of mitigating climate change by delivering measurable, durable, and verifiable carbon dioxide removals from the atmosphere. The project achieves this by increasing the stock of Soil Organic Carbon (SOC) in agricultural soils through the implementation of regenerative agricultural practices in northern Bulgaria. By systematically replacing conventional, input-intensive farming practices with regenerative approaches such as reduced tillage, cover cropping, diversified crop rotations, and the use of organic amendments, the project enhances the natural capacity of soils to capture and store atmospheric carbon in a long-term and stable form.

The project is designed as a large-scale, regionally distributed initiative, structured as a grouped project under a single Project Design Document (PDD). Carbonsafe, acting as the project developer and aggregator, coordinates the participation of multiple farms across North region, Bulgaria. Each farm is treated as a sub-project with its own boundaries, monitoring, and issuance records. This structure ensures that removals are quantified and attributed with precision at the farm level while maintaining the efficiency of a unified monitoring and reporting framework.

The climate benefits of the project are quantified through a measure–remeasure approach based entirely on physical soil sampling. Carbonsafe applies a 100% sampling protocol, under which every farm is divided into plots of no more than 25 hectares. Within each and every plot, geo-referenced soil samples are collected annually, following a zigzag or diagonal pattern, and composited into representative samples for three distinct depth layers. Laboratory analyses are carried out in accredited facilities, producing results that measure SOC content and other relevant soil parameters with full scientific reliability. The annual repetition of this process on the same geo-referenced plots ensures methodological rigor and comparability over time.

The project issues only ex-post credits, meaning that credits are generated solely for removals that have already been achieved, monitored, verified, and certified by an independent third-party Validation and Verification Body (VVB). This principle guarantees that buyers receive only high-integrity credits backed by actual removals, thereby avoiding risks associated with forward-looking or model-based crediting. In addition, the project applies a conservative issuance policy. In this way, the project not only safeguards permanence against the risk of reversal but also builds additional credibility in line with best practices and high-quality carbon credit criteria.

In addition, the project contributes to multiple Sustainable Development Goals (SDGs), including SDG 13 (Climate Action), SDG 15 (Life on Land), SDG 12 (Sustainable Consumption) and SDG 2 (Zero Hunger). Co-benefits include improved soil fertility and water retention, enhanced biodiversity through diversified cropping systems, reduced reliance on synthetic inputs, and strengthened resilience of rural communities. Farmers receive direct financial rewards from the sale of carbon credits, creating sustainable livelihoods and incentivizing long-term adoption of regenerative practices.

The minimum projected removals are estimated at an average of 3–10 tonnes of CO_2 per hectare per year, depending on baseline soil conditions, crop types, and management practices. The permanence of stored carbon is expected to last decades under continuous regenerative management, supported by the contractual obligations of participating farmers and Carbonsafe's agronomic advisory services. Monitoring is carried out annually throughout the renewable crediting period of five years, which may be extended upon re-validation.

The climate objective of Carbonsafe is to deliver scientifically robust, transparent, and socially inclusive carbon removals from agriculture in the Region of North, Bulgaria. Through its rigorous design, reliance on 100% direct measurement, conservative issuance practices, and integration with regional and international standards, the project ensures that every issued credit represents genuine, additional, and durable climate impact.

The project's climate objective is designed to meet the durability and permanence requirements of the Balkan Carbon Credit Standard (BCCS). The project's duration is 40 years. Permanence is ensured through long-term contractual commitments with participating farmers, requiring continued land use and management practices consistent with soil carbon retention objectives. The project applies a 5 year monitoring after the 5 year renewable crediting period of each sub-project, in line with BCCS requirements for ongoing verification of storage stability. Reversal and non-permanence risks are addressed through a project-specific risk assessment and the application of a buffer reserve mechanism, whereby a defined share of verified credits is allocated to a buffer pool managed by the registry to compensate for potential reversals. Together, these contractual, monitoring, and risk mitigation measures ensure that credited CO_2 removals represent durable and conservative climate outcomes consistent with BCCS permanence principles

The climate objective applies to the project area as defined within the approved project boundary. Under the current Project Design Document, the objective is implemented for participating agricultural lands located in the North region of Bulgaria. The project is structured as a grouped framework, allowing for the inclusion of additional eligible sub-projects within North Bulgaria in accordance with the same methodology, eligibility criteria, and BCCS requirements, subject to validation and registration.

2.3. Agronomic Objective.

The agronomic objective of the Carbonsafe project is to fundamentally improve the long-term productivity, fertility, and resilience of agricultural soils in Bulgaria through the systematic adoption of regenerative farming practices. By prioritizing the restoration of soil health, the project aims to achieve measurable climate benefits through carbon sequestration and to deliver immediate and sustained agronomic co-benefits to farmers. These benefits could directly support food security, optimize resource use, and improve the economic viability of farms engaged in the project.

At its core, the project seeks to reverse the trend of soil degradation that has resulted from decades of intensive, conventional agricultural practices characterized by frequent plowing, monocropping, and heavy reliance on synthetic fertilizers and pesticides. Such practices have depleted soil organic matter, reduced biodiversity, disrupted soil structure, and diminished water retention capacity, leaving farms vulnerable to droughts, floods, and yield variability. Carbonsafe aims to address these challenges through regenerative approaches that rebuild soil organic matter, restore microbial activity, and enhance nutrient cycling, thereby transforming soils into living, resilient systems.

Introduction of Efficient and Sustainable Fertilization Management

The introduction of efficient and sustainable fertilization management aims to reduce greenhouse gas emissions while improving soil fertility. This includes:

- Development of individual fertilization plans based on soil analysis;
- Optimization of fertilizer rates, timing, and application methods;
- Combination of mineral and organic nutrient sources;
- Implementation of precision fertilization where technically feasible.

Soil pH Level

Correction of soil acidity ensures maximum nutrient availability, stimulates root growth, and maintains optimal microbiological activity.

Positive Effects of Proper pH Regulation:

- Maximum nutrient availability: At near-neutral pH (6.0–7.0), essential macronutrients (nitrogen, phosphorus, potassium, calcium, magnesium) are available in forms accessible to plants.

- Reduction of toxicity: Proper pH prevents excessive solubility of aluminum, iron, and manganese, which become toxic to plants in highly acidic soils.

- Improved fertilizer efficiency: Fertilizers are utilized more effectively when pH is within the optimal range, reducing losses from leaching or fixation into insoluble compounds.
- Stimulation of beneficial microorganisms: A favorable environment enhances soil bacterial activity, supporting organic matter decomposition and nutrient release.
- Improved soil structure: Optimal pH contributes to better aeration and water regulation, facilitating root system development.
- Economic efficiency: Neutral pH expands the range of suitable fertilizers, allowing farmers to select economically optimal options.

Liebig's Law of the Minimum

Plant growth is determined not by the total quantity of available resources, but by the element in shortest supply (the limiting factor). Even if all other nutrients are abundant, growth is constrained by the most deficient element.

Laboratory testing of macro- and micronutrients reduces the risk of nutrient imbalance and prevents deficiencies that limit plant development.

C/N Ratio

The optimal carbon-to-nitrogen ratio (C:N) in soil (10:1–12:1) ensures balanced organic matter decomposition and prevents nitrogen deficiency.

It stimulates beneficial microbial activity, improves soil structure, and ensures gradual nutrient release, supporting healthy plant growth.

Key Benefits:

- Regulation of decomposition: Balanced C:N ratios determine the rate at which organic residues are converted into humus; optimal values directly influence mineralization.
- Immobilization and mineralization balance: At proper ratios, microorganisms decompose organic matter without depriving plants of nitrogen. Higher ratios help prevent rapid nitrogen leaching by promoting immobilization in microbial biomass.
- Soil health: C:N balance is essential for soil biological stability, supporting aggregation and nutrient retention.
- Balanced nitrogen input: Small, controlled nitrogen applications help maintain appropriate C:N ratios and support humification processes.

Organic Matter

Organic matter is essential for soil fertility and achieving high agricultural yields. It originates from plant and animal residues and serves as a primary source of nutrients for crops.

- The presence of organic matter improves soil structure by enhancing aeration and creating a looser soil profile. This facilitates root development and improves water and nutrient uptake. It also increases soil water-holding capacity, which is particularly important under drought conditions.
- Organic matter stimulates beneficial soil microorganisms that participate in nutrient cycling and enhance nutrient availability. It also reduces erosion and protects soil from degradation.
- Soil analyses provide essential information on organic matter content. Based on these data, farmers can manage organic inputs more effectively.

Integrated Soil Management Approach

Optimal soil management is based on the interrelationship between soil pH, nutrient balance (Liebig's Law), C:N ratio, and organic matter content. These factors collectively determine soil fertility and agroecosystem resilience.

Through proper management based on soil analysis, optimal conditions are created for:

- Microbiological activity,
- Efficient nutrient uptake,
- Stabilization of soil organic carbon.

This integrated approach simultaneously contributes to increased yields, preservation of soil health, and long-term soil carbon sequestration.

The agronomic objectives are operationalized through the following project activities:

1. Soil Health Restoration and Fertility Enhancement.

The project increases soil organic matter and improves soil nutrient availability through practices such as reduced or no tillage, use of cover crops, diversified crop rotations, and organic amendments (e.g., compost, manure, and crop residues). These practices enhance the natural capacity of soils to retain and cycle macro- and micronutrients, reducing the dependency on synthetic fertilizers while improving crop yields. Carbonsafe's unique feature of annual soil sampling provides a full nutrient profile (N, P, K, S, Ca, Mg, and trace elements), enabling the delivery of precise, site-specific agronomic recommendations for each 4-25ha plot to each participating farm.

These activities are qualitatively monitored with organic matter (OM)

2. Water Management and Drought Resilience

By improving soil structure and organic matter content, the project enhances water infiltration and retention. Soils under regenerative management exhibit higher porosity and moisture-holding capacity, reducing the risks of erosion and runoff while strengthening resilience to climate extremes. This directly improves farm stability and reduces risks associated with water scarcity, a growing challenge under the impacts of climate change.

These activities are qualitatively monitored.

3. Yield Optimization and Input Efficiency.-

Participating farmers benefit from optimized fertilizer and input use, as annual soil analyses allow precise nutrient management. Global best practices point to a positive trend in both productivity and input efficiency under regenerative practices. Carbonsafe Project assumes that this could translate into yield improvements of 5–15% over the medium term and reductions in fertilizer costs of 10–50%, associated with improved nutrient-use efficiency. (FAO, 2011; Rodale Institute, 2020; World Bank, 2017; Nitrogen opportunities for agriculture, food & environment - UNECE guidance document on integrated sustainable nitrogen management, 2022; European Commission, 2020). [2] This dual benefit of increased productivity and reduced input costs could significantly improve farm economics.

These activities are reported in Carbonsafe Technological maps and supported with N2O calculations.

4. Soil Biodiversity and Ecosystem Services.

[2]https://www.fao.org/4/i2215e/i2215e00.pdf;
https://rodaleinstitute.org/wp-content/uploads/FST_40YearReport_RodaleInstitute-1.pdf
https://openknowledge.fao.org/server/api/core/bitstreams/b21f2087-f398-4718-8461-b92afc82e617/content
https://nora.nerc.ac.uk/id/eprint/534033/1/N534033CR.pdf
https://food.ec.europa.eu/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf

The project fosters soil biodiversity by promoting microbial diversity, earthworm populations, and root-soil interactions. These biological processes are essential for long-term soil fertility, organic matter stabilization, and pest and disease suppression. By integrating biodiversity into soil management, Carbonsafe enhances ecosystem services beyond the carbon metric, contributing to the overall sustainability of agriculture in Bulgaria.

5. These activities are qualitatively monitored.Farmer Capacity-Building and Knowledge Transfer.

Carbonsafe provides farmers with science-based agronomic recommendations derived from laboratory results and project monitoring. These recommendations are communicated annually and are tailored to each 4-25 ha plot, ensuring actionable guidance for improving soil fertility, reducing inputs, and optimizing crop rotations. Farmers also receive training in regenerative practices, which enhances their agronomic knowledge and empowers them to become active stewards of soil health.

The agronomic objectives of the project are fully aligned with broader European agricultural and environmental strategies, such as the EU's Common Agricultural Policy (CAP). By combining carbon sequestration with direct agronomic benefits, the project delivers a synergistic model in which climate goals and farm productivity reinforce one another.

Furthermore, the project ensures that the agronomic benefits are equitably distributed among farmers, strengthening local food systems and promoting sustainable livelihoods. Farmers retain ownership of their carbon results and receive financial rewards through the sale of credits, while simultaneously benefiting from improved soil health and lower production risks. This dual reward system — agronomic and financial — incentivizes long-term adoption of regenerative practices well beyond the crediting period.

The agronomic objective of Carbonsafe is to establish a self-reinforcing cycle of soil regeneration, improved yields, reduced input dependency, and enhanced climate resilience. These outcomes not only secure the long-term productivity of Bulgarian agriculture but also create a replicable model for integrating carbon markets with sustainable agronomic development at scale.[3][4]

All agronomic performance outcomes referenced in this Project Design Document, including improvements in soil health, productivity, yield stability, input efficiency, and resilience, are indicative and context-dependent. Actual outcomes may vary between farms, fields, crop types, soil conditions, climatic factors, and baseline management practices. Such outcomes are not guaranteed and are influenced by site-specific conditions and farmer implementation decisions. The project does not make ex-ante performance guarantees beyond the verified measurement and reporting of soil organic carbon stock changes in accordance with the applied methodology.

2.4. Community Objective.

The Carbonsafe project is designed not only as a climate mitigation initiative but also as a project for strengthening rural communities and improving the socio-economic resilience of farmers in Bulgaria. Beyond carbon removals, the project seeks to ensure that farmers and their communities are the primary beneficiaries of the transition to regenerative agriculture, in line with international expectations for environmental justice and equitable benefit-sharing.

Carbonsafe's community objective is a commitment to fairness and transparency. Each participating farmer retains individual ownership of the carbon credits generated on their land, and revenues from credit sales are shared directly with themwith 50–60% of the credits allocated to farmers, or as specified in individual agreements between the farmer and the buyer/investor. This ensures that those who manage the land and implement regenerative practices are the ones who receive the primary financial benefits. By acting as an aggregator, Carbonsafe lowers the

[3] Wang, Y., Liu, X., Smith, P., Li, J., Wang, X., Chen, Y., ... & Zhang, W. (2024). Global cropland soil carbon sequestration potential and its sustainability. *Nature Communications, 15*, Article 54536. https://doi.org/10.1038/s41467-024-54536-z
[4] Paustian, K., Lehmann, J., Ogle, S., Reay, D., Robertson, G. P., & Smith, P. (2024). Climate change mitigation through soil carbon management: Prospects, barriers and policy frameworks. *Ecological Economics, 214*, 107030. https://www.sciencedirect.com/science/article/abs/pii/S0378429024000960

entry barriers for smallholder and family farms, who would otherwise lack access to global carbon markets due to high transaction costs and complex compliance requirements.

The percentage distribution of carbon credits may vary between Carbonsafe and each individual farm. The transaction is pre-arranged through a contract/agreement, and the participant is aware of the percentage they will receive from the carbon credits. The establishment of different distribution percentages between Carbonsafe and each farm is based on various agreements and activities, for example: Payment for soil samples at the expense of Carbonsafe and/or a client wishing to purchase credits and/or a client who uses/trades agricultural raw materials and other types of barter or barter-financial transactions. For all transactions, contracts/agreements are drawn up between all interested parties. In this sense, the distribution percentages of carbon credits may vary depending on the commitments of all participating parties. To determine the distribution of carbon credit shares among the parties, the actual weighted average value based on project activities and current accounting records is used.

The above is discussed in the Carbonsafe Benefit-sharing Mechanism.In addition to direct revenues, the project delivers annual agronomic benefits to farmers. Through 100% physical soil sampling and comprehensive laboratory analysis, Carbonsafe provides detailed insights not only into changes in soil organic carbon but also into key agronomic indicators such as nitrogen, phosphorus, potassium, pH, and micronutrients. This data is translated into individualized recommendations, enabling farmers to optimize fertilizer use, improve crop yields, and reduce input costs. In this way, carbon farming becomes not only a source of additional income but also a driver of improved farm efficiency and long-term soil health.

The project also strengthens community resilience against climate change and economic volatility. By improving soil moisture retention, enhancing soil organic matter, and diversifying agricultural practices, farmers are better able to withstand droughts, floods, and market shocks. These improvements reduce dependency on external inputs and build stronger, more sustainable rural livelihoods.

Beyond the individual farm level, Carbonsafe strives to create broader community co-benefits. Health and safety risks may be minimized as regenerative practices reduce reliance on synthetic agrochemicals. Food security could be strengthened through improved soil fertility and sustainable production, while biodiversity and water systems may benefit from reduced tillage, cover cropping, and organic amendments. The project has an ongoing conversation with farmers and stakeholders from the early stages to ensure transparency and procedural fairness.

Carbonsafe adheres to a strict “Do-No-Harm” framework. Only landowners or legal land users with verified rights are eligible to participate, preventing land tenure conflicts or displacement. Environmental justice is central to the project design, ensuring that communities who are most vulnerable to climate risks and economic instability are the ones who experience direct improvements in their livelihoods.

In the long term, Carbonsafe’s community objective is to create systemic benefits that extend beyond the lifetime of the project. By embedding knowledge, technical skills, and regenerative practices at the farm level, the project ensures that improvements in soil health and community well-being persist even after crediting periods conclude.

For details about Carbonsafe grievence mechanism refer to Section *3.4.6. Safeguards Against Displacement and Conflicts.*

Through this comprehensive approach, Carbonsafe demonstrates that carbon farming can serve not only as a climate solution but also as a pathway for rural empowerment and sustainable development. The Community Objective therefore reinforces Carbonsafe’s position as a project that integrates environmental, social, and economic benefits, setting a benchmark for transparency and community inclusion in soil carbon projects.

2.4.1 Stakeholder Identification and Engagement

Stakeholders include:

- participating farmers;
- local communities in project regions;
- national public authorities;
- soil sampling contractors and laboratories;
- validation and verification bodies.

Stakeholder communication status

To date, the project has implemented the following engagement actions:

- All settlements in which project activities are implemented have been informed;
- The Ministry of Environment and Water has been officially notified;
- A grievance mechanism is in place and publicly communicated;
- No complaints or objections have been submitted to date.

Project participation

Since the projects start up to 15.05.2025:

- Total participating farmers: 36
- Total enrolled area: 21032 ha
- Monitoring period coverage: 8 farms
- Monitoring area: 1,983,76 ha

These data demonstrate strong stakeholder acceptance and the absence of identified negative social impacts.

2.4.2 Grievance Redress Mechanism

The project maintains a grievance mechanism accessible to farmers, local communities and other stakeholders.

The mechanism includes:

- public communication of contact channels;
- registration of incoming complaints;
- documentation of investigation and resolution;
- annual review of grievance records.

Current status: No grievances or objections have been received since project start.

2.4.3 Distinction Between Monitored and Indicative Social Benefits

To ensure auditability, the project distinguishes between:

A. Social outcomes actively monitored

The following aspects are measured and documented:

- stakeholder engagement;
- farmer participation and project reach;
- knowledge transfer and advisory support;
- grievance management;
- proxy indicators of farm resilience and economic sustainability.

B. Indicative social benefits (not quantitatively verified)

The following outcomes are supported by scientific literature and project logic but are not guaranteed and not quantitatively monitored:

- long-term income improvements;
- food security impacts;

- public health impacts.

These outcomes are considered context-dependent and indicative only.

2.4.4 Indicators for Monitoring Social Co-Benefits

2.4.4.1 Stakeholder Engagement Indicators

Indicator	Monitoring method	Frequency
Number of informed settlements	Communication records	At project expansion
Notified public authorities	Official correspondence	One-time / updates
Number of grievances received	Grievance registry	Annual
Number of grievances resolved	Grievance registry	Annual

Current result: 0 grievances submitted.

2.4.4.2 Participation and Project Reach

Indicator	Monitoring method	Frequency
Number of participating farmers	Project registry	Annual
Total project area (ha)	GIS and contracts	Annual
Number of farms in monitoring cycle	Monitoring reports	Annual

Current values:
36 farmers; 21032 ha total;

8 farms and 1,983,76 ha in monitoring period.

2.4.4.3 Capacity Building and Knowledge Transfer

Indicator	Monitoring method	Frequency
Farmers receiving agronomic recommendations	Advisory records	Annual
Advisory and training interactions	Internal documentation	Annual
Share of farmers receiving recommendations (%)	Participant database	Annual

Participating farmers receive annual science-based agronomic recommendations derived from laboratory soil analyses.

2.4.4.4 Proxy Indicators of Farm Economic Resilience

Direct income monitoring is outside project scope. Instead, the project tracks proxy indicators:

Indicator	Monitoring method	Frequency
Individual fertilization plans developed	Soil analysis documentation	Annual
Technological maps prepared	Project documentation	Annual
Farms implementing regenerative practices	Practice monitoring	Annual

These indicators demonstrate adoption of practices linked to improved input efficiency and reduced production risks.

2.4.4.5 Social Acceptance Indicators

Indicator	Monitoring method	Frequency
Number of grievances from communities	Grievance registry	Annual
Number of farmers leaving the project	Participant registry	Annual
Number of new farmers joining	Participant registry	Annual

These indicators provide evidence of the project's social acceptance and continued voluntary participation.

3. PROJECT BOUNDARY AND GEOGRAPHIC SCOPE.

3.1. Geographic Boundary.

The operational geographic boundary of the project is strictly limited to agricultural land parcels formally enrolled under participation agreements and located within the administrative provinces defined in the North region of Bulgaria. Project activities, including baseline establishment, monitoring, quantification, verification, and credit issuance, are conducted exclusively on these enrolled agricultural parcels.

Areas located outside the listed administrative regions are not eligible for inclusion under this Project Design Document and are explicitly excluded from the project boundary.

The North region defined in this PDD constitutes the fixed geographic boundary for the registered project. All current and future sub-projects incorporated under this grouped project structure must be located entirely within the listed administrative regions.

All enrolled land parcels within the project are geo-referenced using spatial coordinates and cadastral identification data. Each plot is mapped and recorded within the project's data management system and must fall entirely within the defined geographic boundary to be eligible for inclusion.

Plot-level spatial boundaries are aggregated at sub-project (farm) level for monitoring and issuance purposes, while maintaining full traceability from individual plot to sub-project and project-level reporting. This ensures consistency between the high-level geographic boundary and the operational monitoring units.

The following Acts are taken into consideration:

- Ordinance No. 3 of 29 January 1999 on the Establishment and Maintenance of a Register of Agricultural Farmers
- Cadastre and Property Register Act
- Agricultural Land Protection Act
- Agricultural Land Ownership and Use Act
- Act on Support of Agricultural Producers
- Climate Change Mitigation Act

Project documentation was developed for the implementation of projects in accordance with the “Methodology for improving and reporting the level of sequestered carbon in the soil in the agricultural sector”, Version 3.1/22.08.25”. The methodology has been approved by the Balkan Carbon Credit Standard (BCCS) on 24.10.2025. .

GENERAL TERRITORIAL SCOPE OF THE PROJECT

REPUBLIC OF BULGARIA

The Republic of Bulgaria is a country in Southeastern Europe. It borders Romania to the north; Serbia and North Macedonia to the west; Greece to the south; Turkey to the southeast; and the Black Sea to the east. With an area of nearly 111,000 km² and a population of approximately 6,520,000 people (2021), it ranks 11th and 16th respectively within the European Union. Sofia is the capital and largest city, followed by Plovdiv, Varna, and Burgas.

Bulgaria is located in Southeastern Europe and occupies the eastern part of the Balkan Peninsula, along the coast of the Black Sea. It shares a total of 1,808 kilometers of land borders with Greece and Turkey to the south, North Macedonia and Serbia to the west, and Romania to the north. To the east lies a 354-kilometer Black Sea coastline. Bulgaria has a total area of 110,994 km², making it the 105th largest country in the world

Administrative division:

Map of the districts in Bulgaria

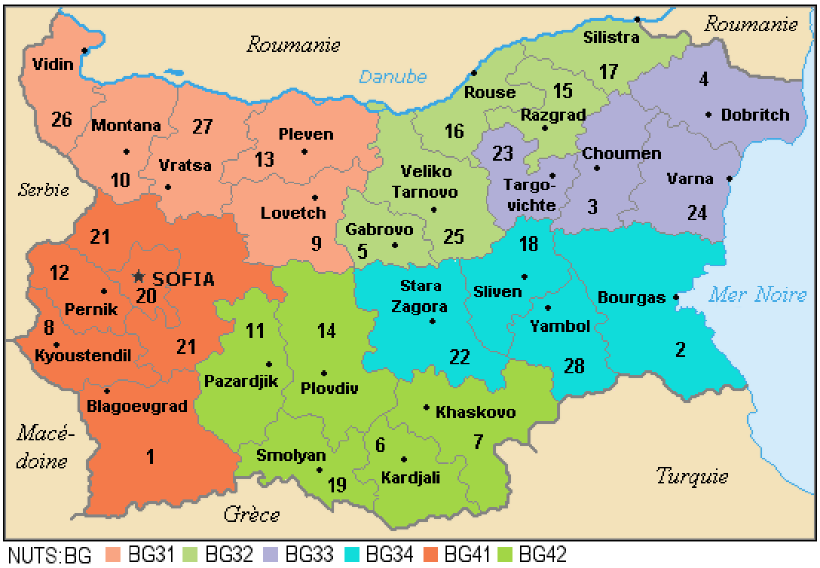
Since 1999, the Republic of Bulgaria has been administratively divided into 28 districts: Blagoevgrad, Burgas, Varna, Veliko Tarnovo, Vidin, Vratsa, Gabrovo, Dobrich, Kardzhali, Kyustendil, Lovech, Montana, Pazardzhik, Pernik, Pleven, Plovdiv, Razgrad, Ruse, Silistra, Sliven, Smolyan, Sofia-Capital District, Sofia District, Stara Zagora, Targovishte, Haskovo, Shumen, and Yambol.

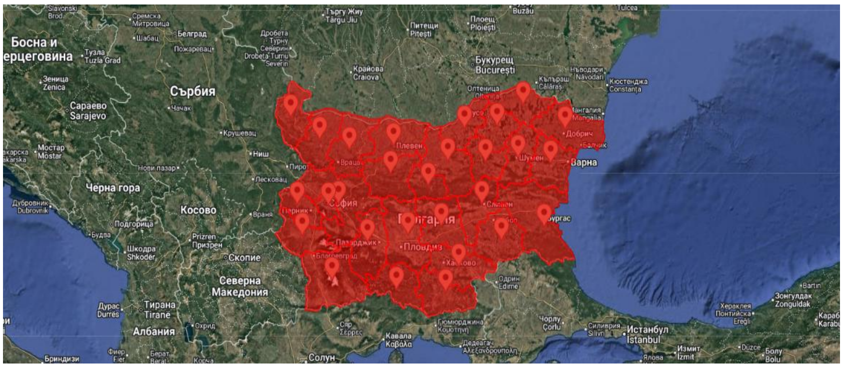
All districts are named after their respective administrative centers, with the capital city forming a separate district.

Prior to this structure, until 1987 the country was divided into 28 regions, and between 1987 and 1999 into 9 larger regions.

The districts are subdivided into municipalities, and municipalities are further subdivided into mayoralties. As of 25 July 2014, the 28 districts comprise a total of 265 municipalities.

The territory of the Republic of Bulgaria (BG) is divided into 6 planning regions covering the 28 districts, based on the territorial planning principle under the NUTS II and NUTS III classification, in accordance with the Nomenclature of Territorial Units for Statistics (NUTS), established by Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistical purposes (NUTS).





PROJECT – NORTHERN BULGARIA

The present project covers the geographical boundaries of the districts located in Northern Bulgaria, based on the utilization of agricultural land, as follows:

BG3 – Northern and Southeastern Bulgaria

BG31 – Northwest Planning Region (BG31NW)

- BG311 – Vidin District
- BG312 – Montana District
- BG313 – Vratsa District
- BG314 – Pleven District
- BG315 – Lovech District

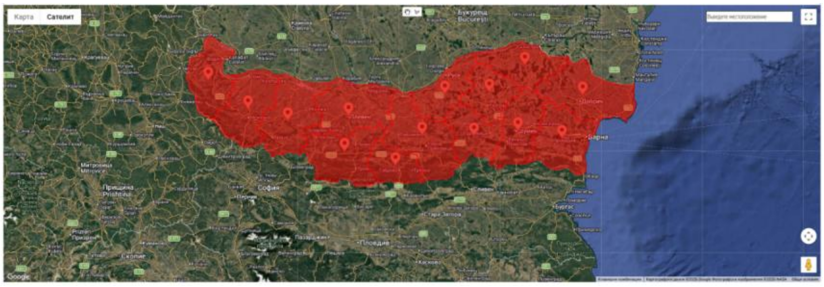
BG32 – North Central Planning Region (BG32NC)

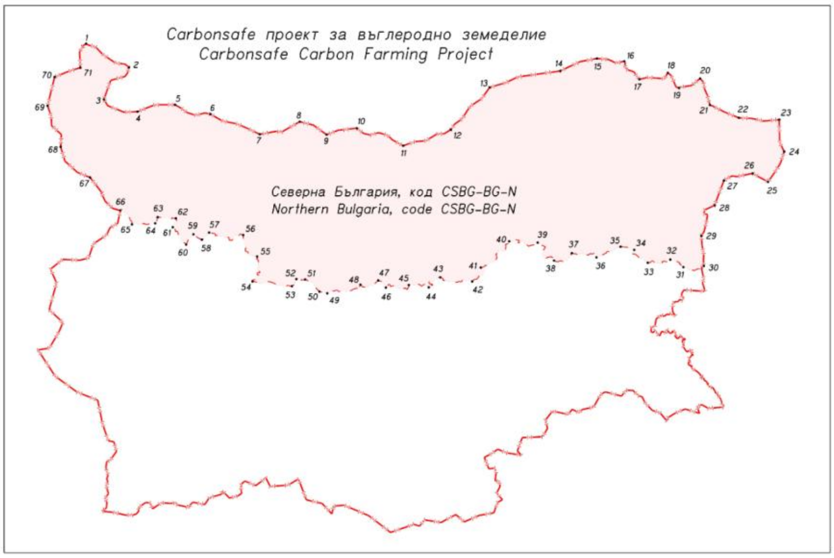
- BG321 – Veliko Tarnovo District
- BG322 – Gabrovo District
- BG323 – Ruse District

- BG324 – Razgrad District
- BG325 – Silistra District

BG33 – Northeast Planning Region (BG33NE)

- BG331 – Varna District
- BG332 – Dobrich District
- BG333 – Shumen District
- BG334 – Targovishte District





EXTERNAL SPATIAL GEOGRAPHICAL BOUNDARIES OF THE PROJECT – NORTHERN BULGARIA

GEOGRAPHICAL COORDINATES OF THE NORTHERN BULGARIA PROJECT ARE STATED IN SECTION ANNEX 16.2.

PROJECT

The present project groups Participants/Operators on a territorial basis, based on the legal grounds for the use of agricultural land within the land-use system.

Each Participant/Operator represents a single agricultural holding or a group of agricultural holdings and participates in the project for a minimum period of five (5) years with the same land areas.

It is permissible for one Participant/Operator to participate in multiple project regions with different land areas.

The identification of each individual Participant/Operator within the project is generated according to the following algorithm:

<CSBG-42SC-421PVD-23/28-AGRI-0001>

Where:

- **CS** – Methodology code
- **BG** – Country of implementation of the project activity
- **42SC** – Abbreviation of the planning region
- **421PVD** – Abbreviation of the district
- **23/28** – Five-year participation contract period
- **AGRI** – Sector of project activity implementation
- **0001** – Sequential number of the Participant/Operator within the respective contract period related to carbon farming activities

PARTICIPANTS / OPERATORS AND GROUPS OF PARTICIPANTS / OPERATORS

Participant/Operator means a legal entity or natural person carrying out carbon sequestration activities within their own agricultural holding(s) on agricultural land within the land-use system in the territory of Northern Bulgaria.

Group of Participants/Operators means legal entities or natural persons carrying out carbon sequestration activities within their own agricultural holdings on agricultural land within the land-use system in the territory of Northern Bulgaria.

The project allows participation of legal entities and/or natural persons registered as agricultural holdings from the sectors:

- Crop production
- Combined crop and livestock production

Agricultural holdings must conduct their activities within the territory of the Republic of Bulgaria.

The project is not applicable to livestock-only agricultural holdings that do not cultivate agricultural land within the land-use system.

LAND PARCEL IDENTIFICATION[5]

The identification of land parcels is under the authority of the State Agency for Geodesy, Cartography and Cadastre (AGCC).

In accordance with the Cadastre and Property Register Act, the main functions of the Agency include:

- Creation and maintenance of the cadastral map and cadastral registers for the entire territory of the country;

[5] Agency for Geodesy, Cartography and Cadastre (AGCC). (n.d.). *Official website of the Agency for Geodesy, Cartography and Cadastre*. Sofia, Bulgaria: Ministry of Regional Development and Public Works of the Republic of Bulgaria. Available at: https://www.cadastre.bg/

- Coordination of cadastral activities with the Property Register, EKATTE (Unified Classifier of Administrative-Territorial and Territorial Units), BULSTAT, ESGRAON (National Population Register), and the registers of state and municipal properties;

- Administrative and technical services to citizens, institutions, municipalities, and other users of cadastral information;

- Maintenance of the state geodetic, cartographic, and cadastral fund;

- Maintenance of registers of licensed professionals authorized to perform cadastral, geodetic, and cartographic activities.

For each land parcel, an official document ("sketch") is issued, containing:

- Unique parcel identification number
- Ownership
- Area
- Location
- Boundaries
- Adjacent properties

The unique identifier is generated through specialized software and consists of:

- Permanent EKATTE code of the land area
- Permanent block number
- Automatically generated variable parcel number

Example: **<24241-0065-0013>**

A document for this shall be required and/or verified through the electronic registry when necessary in connection with the implementation of a carbon farming project. It serves as proof of ownership or legal use of the land.

CROPS GROWED IN BULGARIA AND SOIL SAMPLING PERIODS - Stated in Annex 16.3.

The Northern Region represents the core of Bulgaria's grain production zone, situated primarily within the fertile Danubian Plain and the adjacent plateaus and valleys that descend toward the Black Sea. The region's geography combines extensive plains suitable for mechanized farming with foothill and loess landscapes that are vulnerable to erosion and degradation. The northern boundary is defined by the Danube River, providing both fertile alluvial soils and important hydrological connectivity, while the southern boundary follows the foothills of the Balkan Mountains (Stara Planina).

The project boundary includes enrolled farms from smaller to large corporate farms. The diversity of farm structures ensures wide applicability of regenerative practices across different scales. Major crops include winter wheat, sunflower, maize, barley, and rapeseed, while secondary crops such as alfalfa, pulses, sugar beet, and vegetables occur in localized systems, and orchards and vineyards persist in foothill areas.

The Northern Region's soils are dominated by Chernozems, Phaeozems, and Alluvial soils, with Luvisols and Cambisols present in higher and more sloped terrain. Chernozems in the Danubian Plain are among the most fertile soils in Europe, with excellent potential for Soil Organic Carbon (SOC) sequestration. However, prolonged conventional practices—deep ploughing, residue removal, and narrow crop rotations—have led to gradual SOC depletion, compaction, and erosion, particularly on loess-derived slopes and lighter-textured soils near the coast.

Climatically, the Northern Region is predominantly temperate-continental, with average annual temperatures between 10°C and 12°C, and annual precipitation of 480–650 mm. Rainfall is irregular, with peaks in May–June and dry spells in July–August, frequently leading to summer droughts and water deficits. Winters are cold with frost periods, but snow cover contributes to spring soil moisture recharge. The eastern provinces, influenced by the Black Sea, experience milder winters and slightly more humidity, while the western Danubian Plain is drier and more exposed to continental extremes.

Hydrologically, the region is traversed by Bulgaria's main river systems: the Danube, Iskar, Lom, Ogosta, Vit, Osam, Yantra, and Kamchiya rivers. Although extensive irrigation infrastructure was developed in the mid-20th century, much of it is now obsolete, leaving most agricultural land rainfed and exposed to drought and runoff erosion. This reinforces the importance of soil practices that improve infiltration, water retention, and structural stability.

Topographically, the Northern Region is mostly flat to gently rolling, with altitudes ranging from 20 meters along the Danube to over 500 meters at the foothills of the Balkan Mountains. The loess plateaus of Pleven, Razgrad, and Shumen and the open plains of Dobrich and Silistra are highly productive yet prone to both wind and water erosion under conventional tillage.

Socio-economically, the region accounts for a major share of Bulgaria's agricultural output but remains economically vulnerable. Rural populations are aging, unemployment rates are above national averages, and income from conventional farming is low due to price volatility, dependency on subsidies, and high input costs. Large-scale agribusinesses dominate cereal and oilseed production, while smaller farms rely on mixed cropping and livestock. Integrating these lands under the Carbonsafe program provides a unique opportunity to stabilize incomes, improve soil health, and align rural development with climate mitigation goals.

The geographic boundary of the Carbonsafe project for Northern Bulgaria therefore encompasses a region that combines exceptional soil fertility with pressing challenges of degradation, drought, and rural vulnerability. Through targeted regenerative practices, the project maximizes carbon sequestration potential and supports both environmental and socio-economic resilience in Bulgaria's agricultural heartland. [6][7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22]

3.1.1. Regional Allocation of Farms with Multiple Plots

In certain cases, an individual farm participating in the project may consist of agricultural plots located in both Project North and Project South. In such instances, each plot is allocated to the respective regional project according to its geographic location and regional classification. The farm as a whole is therefore included in more than one project, with each plot subject to the applicable Monitoring, Reporting, and Verification (MRV) procedures of the project in which it

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[6] Oblastna administratsia Vratsa. (2005). *Oblastna strategiya za razvitie na oblast Vratsa 2005–2015* [Regional Development Strategy of Vratsa Region 2005–2015]. Vratsa Regional Administration. Retrieved from https://vratsa.government.bg/files/Oblastna_strategia_oblast_Vratsa_2005-2015-1.pdf

[7] Regional Inspectorate of Environment and Water – Vratsa (RIEW Vratsa). (2023). *Godishnik na RIOSV–Vratsa 2023* [Annual Environmental Report of the Regional Inspectorate of Environment and Water – Vratsa 2023].
Ministry of Environment and Water of the Republic of Bulgaria. Retrieved from https://riosv.vracakarst.com/pic/2023_%D0%93%D0%9E%D0%94%D0%98%D0%A8%D0%9D%D0%98%D0%9A_%D0%A0%D0%98%D0%9E%D0%A1%D0%92-%D0%92%D0%A0%D0%90%D0%A6%D0%90_compressed.pdf

[8] Regional Development Strategy of Lovech Region (2005–2015) Oblastna administratsia Lovech. (2005). *Oblastna strategiya za razvitie na oblast Lovech 2005–2015* [Regional Development Strategy of Lovech Region 2005–2015]. Lovech Regional Administration. Retrieved from https://www.iris-bg.org/fls/osr-lovech.pdf

[9] Regional Inspectorate of Environment and Water – Pleven (RIEW Pleven). (n.d.). *Uvedomlenie po chlen 10 ot Nar edbata za Otsenka na Vazdeystvieto varhu Okolnata Sreda (OVOS/EO)* [Environmental Impact Notification under Article 10 of the Environmental Impact Assessment Regulation]. Ministry of Environment and Water of the Republic of Bulgaria. Retrieved from https://riew-pleven.eu/doc/OVOSEO/uved_IP/EO/4041-prg.pdf

[10] Regional Profiles – Pleven (2024) Institute for Market Economics (IME). (2024).
Regional Profiles: Indicators of Development – Pleven District 2024. North: Institute for Market Economics. Retrieved from https://www.regionalprofiles.bg/var/docs/2024_EN_RP/12_Pleven.pdf

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falls. Farms participating in both Project North and Project South are governed under a single participation agreement with regional annexes.

This approach ensures that:

- Emission reductions and removals are attributed accurately to the ~~corresponding~~ Project.
- Monitoring and soil sampling are implemented consistently within the boundaries of each project.
- The integrity of credit issuance is maintained by preventing double counting while enabling full participation of farms with diverse landholdings.

The project registry and MRV system are designed to manage such cases in a transparent and traceable manner, ensuring that each plot is individually tracked, verified, and credited under the respective Project (South or North). In cases where a farm includes plot areas assigned to different Projects, these plots are described and reported within the Monitoring Report (MR) of the respective Project to which they correspond.

Regional allocation of plots is determined strictly on the basis of official administrative boundaries. Each land parcel is classified according to its cadastral registration and corresponding EKATTE (Unified Classifier of Administrative-Territorial and Territorial Units) code. The administrative province in which the cadastral parcel is registered defines its regional allocation within the grouped project structure.

Prior to enrolment, a mandatory preliminary geospatial verification is performed using official shapefiles of participating areas. Plot boundaries are digitally mapped and overlaid against the defined regional boundary layers to confirm correct allocation. The assigned region is recorded within the project's ERP system and forms part of the permanent digital record for the plot.

Allocation decisions are documented and retained within the internal data management system to ensure auditability and consistency.

Double counting risks are mitigated through a combination of technical, administrative, and registry-level controls. Each enrolled land parcel is assigned a unique ERP identification number (ERP-ID) within the project's internal management system. This identifier is permanently linked to the cadastral plot reference and its regional classification.

Region-specific issuance ledgers are maintained at sub-project level, ensuring that credits are calculated and issued only once per uniquely identified plot.

Registry submission processes include cross-checks to prevent duplicate serialization of credits derived from overlapping spatial boundaries. These combined controls ensure that no plot can generate credits in more than one regional sub-project or under multiple registrations.

This structure ensures consistency of farmer obligations, permanence commitments, monitoring requirements, and benefit-sharing provisions.

3.2. Technical Boundaries.

The technical boundary of the Carbonsafe project for North region, Bulgaria defines the greenhouse gas (GHG) sources, sinks, and reservoirs (SSRs) included in the accounting system, as well as the physical soil parameters, management practices, and measurement approach applied to quantify carbon sequestration. This boundary ensures that all relevant carbon fluxes are captured, while maintaining scientific integrity, transparency, and consistency with internationally recognized methodologies.

3.2.1. GHG Covered.

The project accounts for carbon dioxide (CO_2) removals associated with the sequestration of atmospheric carbon into Soil Organic Carbon (SOC) pools. SOC is the primary reservoir monitored within the boundary, representing stable, long-term carbon storage in agricultural soils. In addition, the project accounts for N_2O reductions or increases, as the increases are being deducted from the farms' total volume of carbon credits. N_2O emissions related to fertilizer use and soil processes are included within the monitoring and accounting scope to ensure a comprehensive net greenhouse gas balance for the project

The exclusion of other non-CO_2 greenhouse gases (including CH_4) is consistent with the approved soil carbon methodology and the accounting scope permitted under the applicable BCCS provisions. The methodology defines the quantification boundary exclusively as net changes in Soil Organic Carbon (SOC) stocks converted into CO_2 equivalents. Non-CO_2 emissions related to for example livestock activities are outside the approved accounting scope and are therefore neither credited nor claimed.

3.2.2.Spatial Boundary of Measurement.

Within each participating farm in North Region, land is subdivided into plots of 4 to 25 hectares. Each plot is geo-referenced and remains fixed throughout the project crediting period. Within each plot, 25 soil cores (drills) are collected annually, each at three standardized depth layers: 0–30 cm, 30–60 cm, and 60–90 cm. Then 3 representative samples are formed for the 3 depths. These depth-specific samples ensure that changes in both topsoil and subsoil carbon stocks are fully captured within the project boundary.

Plot boundaries are defined through geo-referenced cadastral data and are fixed upon enrolment. Each enrolled parcel is assigned a permanent spatial identifier within the project's ERP system.

In cases of land consolidation, subdivision, or ownership change, boundary modifications are formally documented and verified through updated cadastral records and shapefiles. Any affected plots are either re-mapped under consistent spatial rules or excluded from future monitoring and crediting.

Annual documentation submitted by participating farms to the Municipal Agriculture Service ("OC3") confirms continued agricultural activity on the enrolled parcels. This administrative confirmation, combined with annual monitoring and geospatial checks, ensures long-term spatial integrity across renewable crediting periods.

3.2.3. Soil Reservoirs and Pools Included:

1. Soil Organic Carbon (SOC) within the 0–90 cm depth profile, measured annually.

Root Dynamics and Factors Influencing Root Depth

The plant root system is a critical component for resource uptake and resilience against abiotic stresses, such as drought. While primary nutrients are often concentrated in the upper soil horizon, numerous scientific studies demonstrate that roots frequently penetrate significantly deeper into the soil. This behavior is driven not by the search for nutrients, but by their response to spatially distributed moisture and hydrological conditions.

Hydrotropism—the ability of roots to sense and grow toward zones of higher humidity—plays a fundamental role in this dynamics. Garcia-Maquilon et al. (2022) documented that roots demonstrate phenotypic adaptation to soil moisture gradients, leading to asymmetric growth toward wetter soil zones, regardless of nutrient concentration in their immediate surroundings

In support of this, modeling experiments show that the vertical distribution of soil water is the primary factor governing root growth dynamics. Plants adapt the architecture of their root systems based on water availability at various soil depths.

In other words, roots "seek" moisture deeper when the upper layers dry out; this, in turn, provides better access to dissolved nutrients, as absorption is only effective when they are in the aqueous phase.

Specifically, empirical research on root profiles up to 10 meters shows that plants employ a strategy of downward root elongation rather than increasing surface root mass when they encounter severe water depletion in the upper soil layers. This highlights the importance of the water gradient as a factor for deep root expansion, especially under water-stress conditions

These scientific findings support the concept that for regenerative and carbon farming, improving soil structure and water-holding capacity—by increasing organic matter and biological activity—creates conditions where roots penetrate deeper and mobilize resources more effectively. This improves drought resilience and enhances carbon sequestration potential.

Strategic Advantage of Measuring to 90 cm

Measuring soil carbon and health down to 90 cm encourages farmers to adopt:

- Broader Crop Rotations: Integrating diverse species.
- Perennial Crops: Such as alfalfa and other deep-rooting species.

Balanced Nutrition: By avoiding the over-application of fertilizers in the topsoil, plants develop more sustainably and reach deeper into the soil in search of moisture and nutrients.[23][24][25][26]

3.2.4. Soil Reservoirs and Pools Excluded:

1. Aboveground and belowground biomass (outside of soil pools), since the project focuses exclusively on SOC removals.
2. Dead organic matter (e.g., litter), as these pools are not directly measured under the project design.
3. Non-CO_2 GHGs (, CH_4)

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3.2.5. Baseline and Project Scenarios

Baseline Scenario: Conventional agricultural practices typical of Bulgaria, including deep plowing, monocropping, heavy reliance on synthetic fertilizers, and limited use of cover crops. Under this scenario, SOC levels remain stable or continue to decline.

Project Scenario: Regenerative agriculture practices such as reduced or no tillage, crop diversification, cover cropping, organic amendments, and precision nutrient management. These practices enhance carbon sequestration by increasing biomass inputs, improving soil structure, and reducing oxidation of soil carbon.

3.2.6. Time Boundary (Crediting Period).

The monitoring and accounting boundary is a total of 40 years, which includes a 5-year individual farms renewable crediting periods, with annual measurement cycles. Credits are issued only ex-post, following independent verification of SOC increases. This ensures that only actual, measured removals are included within the technical boundary.

3.2.7. Conservativeness.

The project explicitly includes conservative issuance rules applied (e.g., holding back 75% of verified net removals in a reserve on a sub-project level, released upon positive farm balance results in next monitoring period.). This ensures that uncertainty is actively incorporated into crediting outcomes.

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In addition to issuance-level safeguards, conservativeness is embedded directly within the quantification process. Soil Organic Carbon (SOC) concentration and related parameters are determined exclusively by accredited laboratories operating under recognized quality management and analytical standards. Laboratory result protocols incorporate measurement uncertainty assessment and apply conservative reporting practices consistent with their accreditation requirements.

Uncertainty is assessed and quantified as part of the MRV system, based on measurement data, sampling design, and laboratory analysis, and is incorporated into the calculation of net greenhouse gas removals. This deduction is systematically implemented across all sub-projects before credit issuance, regardless of performance level, to account for residual measurement variability, sampling uncertainty, and parameter dispersion. Only net removals remaining after application of this uncertainty factor and any applicable methodological adjustments are eligible for crediting.

These combined laboratory-level controls and project-level uncertainty deductions ensure that credited CO_2 removals are conservatively quantified and do not result in overestimation.

The 75% reserve allocation is applied uniformly across all sub-projects and monitoring cycles. This conservative withholding mechanism is designed to manage long-term reversal risk, market exposure, and performance variability.

Reserve credits are not immediately tradable and remain under project-level control.

The reserve structure is aligned with BCCS risk management principles and functions in addition to the uncertainty deduction applied at quantification level. Together, these safeguards ensure conservative issuance and long-term durability of credited removals.

Rationale and Governance of the Sub-Project Reserve:

The retention of 75% of verified net removals as a sub-project reserve represents a conservative issuance control mechanism designed to manage performance variability, measurement uncertainty, and potential reversal risk over the monitoring period.

The percentage is applied uniformly across all sub-projects to ensure consistent treatment and avoid selective risk allocation. It functions as an internal risk-buffer at the farm (sub-project) level, separate from the project-level buffer pool.

The reserve mechanism aligns with the conservativeness and risk-management principles defined in the applicable Methodology and the Balkan Carbon Credit Standard (BCCS), which require safeguards against over-crediting and long-term reversal risk.

The reserve is released when sub-projects (farms) show subsequent positive results in SOC increase.

Release decisions are governed under the Issuance Policy and approved through the MRV governance structure, including review by the Head of Integrated Management Systems (IMS) and final authorization by the Executive Director.

3.2.8. Leakage Considerations.

Activity-shifting and market leakage are mitigated by the project's focus on maintaining productivity. To ensure transparency, leakage is directly measured through the monitoring of yield changes in farms and is supported by satellite data analysis to confirm that agricultural production remains stable within the project boundary.

Structured leakage assessment identifying potential leakage pathways and mitigation strategies are elaborated in Carbonsafe Leakage Assessment Framework. Key leakage pathways identified and mitigation strategies are described in Section 9.1.1. Plausible leakage pathways.

3.3. Temporal Boundary.

The temporal boundary of the Carbonsafe project defines the timeframe over which carbon removals are measured, monitored, verified, and credited. This includes the baseline year, the duration of the renewable sub-projects crediting periods, the project lifetime, and the rules applied to ensure that carbon removals are real, permanent, and conservatively accounted for.

3.3.1. Baseline Year.

For farms in North Province, the baseline, corresponds to the first complete cycle of soil sampling, laboratory analysis, and documentation of management practices under conventional agricultural systems.

"Year 0" corresponds to the year in which the first soil sampling is conducted, laboratory results are finalized and farm is assessed against the Project level baseline and additionality.

Baseline conditions are characterized using historical land management practices at project enrolment. Participating farmers provide management history information covering the period preceding Year 0.

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This pre-project management period serves to confirm that baseline conditions reflect conventional agricultural practices and not project-induced practices. Detailed management history requirements and additionality provisions are further described in Section 4.2 (Baseline Scenario) and Section 5 (Eligibility and Additionality).

At the farm level, the baseline includes: initial baseline soil sampling and documentation of management practices covering the five years prior to enrolment.

With regard to management practices, the baseline conditions remain fixed for the defined farm-level five-year crediting period and are not modified during that timeframe. The baseline soil sampling may occur across two different calendar years, depending on the timing of enrolment and field operations.

3.3.2. Project Start and Duration.

The project start date is aligned with the initial soil sampling campaign and the formal enrollment of participating farms into the project. For Carbonsafe, the official start is set in 2023, with the first farm enrolled with signed contract and subsequent annual monitoring.

The initial project duration is defined as 40 years (2023-2063), consistent with prevailing carbon standards. Each participating farm signs a contract for 5 years with encouragement to renew the contract every 5 years. This approach provides both long-term continuity and flexibility to adapt to evolving best practices and scientific knowledge.

3.3.3. Crediting Period.

The crediting period refers specifically to the timeframe during which verified carbon removals can generate carbon credits. For Carbonsafe, the renewable crediting period is 5 years per individual farm (sub-project) and 40 years (2023-2063) for the duration of the whole project, during which soil carbon increases are measured annually and credits are issued ex-post following third-party verification. This ensures that every issued credit corresponds to carbon removals that have already occurred and been confirmed, rather than projected future sequestration.

3.3.4. Monitoring Frequency.

Annual monitoring cycles are central to Carbonsafe's temporal boundary. Each year, all participating farms undergo:

1. Field soil sampling (geo-referenced, repeated on the same plots),
2. Laboratory analysis of SOC and associated soil parameters,
3. Compilation of management practice data

Independent verification is conducted periodically.

This annual cadence allows the project to both capture short-term changes and identify long-term trends in SOC sequestration, while ensuring early detection of potential reversals.

3.3.5. Durability Considerations.

While soil carbon sequestration is subject to potential reversals due to changes in land use or extreme climate events, the temporal boundary incorporates measures to manage permanence risk. These include:

1. A reserve mechanism, whereby 75% of verified carbon removals are initially held back on a sub-project level and released only if positive results are shown in subsequent measurement. A 5% buffer pool on all credits for force majeure incidents.
2. Long-term farmer contracts with renewal encouragement, ensuring sustained implementation of regenerative practices.
3. Annual re-sampling of the same plots, which provides a reliable record of persistence of stored carbon.

The project applies two distinct risk management mechanisms:

(1) Sub-Project Conservativeness Reserve (75%)

A portion of verified net removals (75%) is retained at sub-project level as a structured reserve mechanism. This reserve is designed to manage performance variability, long-term stability assessment, and staged release of credits. Reserve credits are held under project control and may be released progressively following successful monitoring cycles, continued SOC stability.

(2) Buffer Pool (5%) – Force Majeure and Reversal Risk

In addition to the sub-project reserve, a fixed 5% buffer deduction is applied across all verified removals. This buffer is allocated to a dedicated risk pool intended to compensate for force majeure events, unforeseen reversals, or material non-permanence risks. Buffer credits are not attributable to individual farmers and are cancelled or retired if required to compensate for verified reversals.

The two mechanisms serve different purposes: the 75% reserve functions as a structured conservativeness and performance management tool, while the 5% buffer pool serves as a risk mitigation instrument for reversal events in alignment with BCCS permanence and buffer requirements.

The above is implemented in our Issuance Policy.

3.4. Legal & Ownership Boundary.

The legal and ownership boundaries of the Carbonsafe project for North region define the rights and responsibilities of all entities participating in the generation, ownership, and transfer of carbon credits. Establishing these boundaries is critical to ensure transparency, avoid disputes, and guarantee that carbon removals are attributed only to landowners or operators with legitimate rights to implement the required practices.

3.4.1. Land Ownership and Use Rights.

The project includes only agricultural lands within the North Province where land tenure is clear, undisputed, and legally documented. Participation is restricted to farmers who can demonstrate either:

1. Legal ownership of the land (via deeds or official property records), or
2. Long-term usage rights through formal lease or tenancy agreements.

By requiring verifiable tenure documentation, the project ensures that credits are not generated on contested or insecure land and that no third parties can claim overlapping rights to the same carbon benefits.

3.4.2. Participation Agreements.

Each farmer enrolled in the project signs a binding participation contract with Carbonsafe. These agreements set out:

1. The farmer's rights and responsibilities in implementing regenerative practices,
2. Their entitlement to revenues from credit sales
3. Their obligation to maintain practices for the duration of their renewable crediting periods and to allow access for soil sampling and verification, and
4. Provisions for early exit, penalties in the case of non-compliance, and the handling of reversals.

This contractual framework ensures clarity in benefit-sharing and accountability in land management.

While participating farmers may enter into commercial agreements with buyers or investors concerning the economic benefits derived from carbon credits, the Project Proponent (PP) retains the role of aggregator and is responsible for project registration, monitoring coordination, verification interface, and credit issuance within the registry. Credits are registered and issued under the grouped project structure managed by the PP, in accordance with the applicable standard and contractual arrangements.

Individual farmer agreements define the allocation of economic benefits but do not transfer responsibility for registry compliance, reversal risk management, or standard adherence. Legal rights, obligations, and liabilities are clearly defined within participation agreements to ensure that roles regarding credit generation, registration, benefit-sharing, and compliance remain transparent and consistent across the project.

Participating farmers do not enroll their entire agricultural holding into the program. Only clearly defined and contractually agreed land parcels are included as project area. This partial enrollment approach reduces systemic exposure to ownership changes and allows operational flexibility in the event that specific parcels are withdrawn.

Participation agreements between Carbonsafe and participating farmers define the legal, operational, and permanence-related framework for project implementation. Key provisions include:

– Duration: Agreements are concluded for a defined contractual term aligned with the crediting period, including provisions for renewal where applicable.

– Roles and Responsibilities: Farmers are responsible for implementing agreed land management practices, maintaining records, and ensuring continued agricultural use of enrolled parcels. Carbonsafe is responsible for project coordination, MRV management, verification interface, and registry administration.

– MRV Access Rights: Farmers grant access rights for soil sampling, data collection, field inspections, and audit activities necessary for verification and standard compliance.

– Permanence Commitments: Farmers commit to maintaining enrolled parcels under agricultural use and avoiding intentional actions that would reverse credited SOC gains.

– Termination and Withdrawal: Agreements define conditions under which participation may be terminated, including procedures for parcel exclusion, credit adjustment, and treatment of reversals where applicable.

– Renewal and Amendment: Contracts may be renewed or amended subject to continued eligibility and mutual agreement.

3.4.3. Ownership of Carbon Credits.

Carbon credits generated by the project are legally recognized as intangible assets. Within the project structure, ownership is attributed as follows:

1. Farmers are the ultimate owners of the carbon benefits generated on their land.
2. Carbonsafe acts as the project developer and aggregator, responsible for project design, monitoring, reporting, verification (MRV), and registration of credits. Carbonsafe facilitates the issuance of credits but does not claim ownership of them unless explicitly agreed under farmer contracts.
3. Farmers transfer to Carbonsafe the right to register and market credits on their behalf, but retain contractual ownership and revenue entitlement, ensuring equitable benefit-sharing.

Participating farmers retain primary ownership rights over carbon removals generated on their enrolled land, subject to the contractual framework established with Carbonsafe.

Under participation agreements, farmers authorize Carbonsafe to act as project aggregator and issuing agent for the purposes of project registration, verification coordination, credit serialization in the registry, and transaction administration.

Credit registration, issuance, and transfer are conducted under the legal authority granted from farmers to Carbonsafe through participation agreements and in accordance with applicable BCCS rules governing ownership, claims, and registry operations. This structure ensures that beneficial ownership, issuance authority, and transaction management are clearly separated and contractually defined.

3.4.4. Registry and Traceability.

All credits are recorded and tracked on the Balkan Carbon Credits Registry (BCCR). Each issued credit is assigned a unique serial number that links directly to the specific farm, and year of origin. This guarantees full transparency and prevents double counting. Farmers are listed as the official credit owners in the registry, with Carbonsafe identified as the managing project developer.

3.4.5. Compliance with Legal Frameworks.

The project complies with all national and EU laws governing land ownership, agriculture, and environmental management. This includes:

1. Law on Ownership, which governs land ownership rights;
2. Law on Obligations and Contracts, which provides the legal basis for farmer contracts;
3. Relevant EU agricultural regulations under the Common Agricultural Policy (CAP);
4. Law on the Protection of Agricultural Land
5. EU climate policy frameworks, Carbonsafe particularly strives to fullfil the criteria of the Carbon Removal Certification Framework (CRCF).

3.4.6. Safeguards Against Displacement and Conflicts.

The project explicitly prohibits participation of lands where ownership is disputed or where participation could result in physical or economic displacement of local communities. All lands included are subject to documented legal consent, ensuring that the project does not exacerbate land tenure inequalities or create conflicts.

Carbonsafe maintains a formal dispute resolution mechanism and complaints policy (also explained in section *4.3.10. Social safeguards and participation equity)* applicable to participating farmers, stakeholders, and affected parties. Complaints may be submitted through defined communication channels (including written submission to the company), and all complaints are recorded, assessed, and investigated in accordance with established internal procedures.

Grievances may be submitted in writing via email, postal mail, or through designated contact channels provided by Carbonsafe at https://carbonsafe.bg/en/documents/ (e.g.

grievances@carbonsafe.bg) as documented in the grievance mechanism procedure. Upon receipt, grievances are recorded in the grievance register, assigned a unique reference number, and acknowledged in writing within a defined timeframe.

The grievance process includes acknowledgement of receipt, structured assessment, response within defined timeframes, and escalation to senior management where necessary. Where disputes relate to land tenure, benefit allocation, or project participation conditions, resolution is pursued through documented mediation steps and, if required, formal legal channels.

The project applies a Do-No-Harm principle, and risks of displacement or land-use conflict are monitored through participation agreements and annual land-use confirmations. These mechanisms ensure transparency, fairness, and prevention of land-related conflicts throughout the project lifecycle.

Land use in Bulgaria, particularly with respect to agricultural land, is regulated within defined boundaries by the Ministry of Agriculture through the Regional Directorates of Agriculture and the Municipal Agriculture Services.

Each year, agricultural producers submit declarations of legal grounds for land use pursuant to Articles 69 and 70 (contracts), and register in accordance with Ordinance No. 3 of 29 January 1999 on the establishment and maintenance of a register of agricultural producers. Registration is certified through validation of a registration card based on a completed survey card and supporting declaration forms.

Based on these documents, farmers participate in land consolidation agreements for agricultural land use blocks, regulated under the Agricultural Land Ownership and Use Act (“ЗСПЗЗ”). These agreements govern the allocation of agricultural areas among land users within each land parcel territory (cadastral area). The purpose of this procedure is to consolidate fragmented plots into larger blocks cultivated by a single farmer.

Agricultural land use blocks are created through agreements between landowners and/or land users. The conclusion of such agreements is supervised by a commission established for each land parcel territory within the municipality, appointed by order of the Director of the Regional Directorate of Agriculture.

3.4.7. Alignment with High-Integrity Standards.

This legal and ownership boundary framework reflects the international high-integrity standards, which require clear attribution of benefits, legal compliance, and protections against social harms. By ensuring that only lands with clear tenure are eligible, and that farmers remain the primary beneficiaries, Carbonsafe demonstrates its commitment to equity, transparency, and the long-term legitimacy of the credits issued.

4. METHODOLOGY APPLIED

4.1. Methodology Overview

The Carbonsafe project quantifies carbon dioxide removals exclusively through measured increases in Soil Organic Carbon (SOC) using a 100% measure–remeasure approach. The methodology followed is “Methodology for improving and reporting the level of sequestered carbon in the soil in the agricultural sector”, Version 3.1/22.08.25. The methodology has been approved by the Balkan Carbon Credit Standard (BCCS) on 24.10.2025. This version has been applied to the project. Credits are issued ex-post only, after independent verification confirms net SOC stock increases.

4.1.1. Project design and alignment

The methodology is built around four pillars: (i) robust baseline establishment through direct soil measurement and documented management history; (ii) annual, geo-referenced re-measurement on the same spatial units; (iii) conservative quantification with explicit regenerative practices followed and agronomic strategies generated; and (iv) independent validation/verification and transparent credit tracking in a public registry.

The project design has been structured to ensure full alignment with the core requirements and intent of the applied soil carbon methodology. The following summary illustrates how key methodological provisions are operationalized within the project framework:

Baseline Establishment:

The methodology requires establishment of a measurable and documented baseline SOC stock prior to crediting. This is implemented through initial soil sampling, laboratory analysis by accredited laboratories, and documentation of historical management practices prior to enrolment (*see Sections 3.3.1 and 4.2*).

Additionality Demonstration:

The methodology requires demonstration of regulatory surplus, non-common practice, and barrier-based additionality. The project operationalizes this through documented management history, confirmation of non-mandatory practices, participation agreements, and structured eligibility screening (*see Section 5*).

Quantification and Conservativeness:

The methodology requires conservative quantification of SOC stock changes. This is implemented through accredited laboratory measurements and incorporation of uncertainty deduction. (see *Sections 3.2.7 and 7*).

Monitoring and Verification (MRV):

The methodology requires periodic re-measurement and independent verification. The project applies recurring soil sampling cycles, geo-referenced plot tracking, ERP-based data management, and third-party verification prior to credit issuance (*see Section 6 and Section 12*).

Permanence and Reversal Risk Management:

The methodology requires mitigation of reversal risk. This is addressed through a structured 75% sub-project reserve, a 5% buffer pool mechanism, contractual permanence commitments, and annual land-use confirmation procedures (*see Sections 3.3.5 and 8*).

Grouped Project Governance:

The methodology allows grouped project implementation subject to defined eligibility, traceability, and amendment rules. The project applies unique ERP identifiers, shapefile validation, regional allocation procedures, and controlled inclusion of new sub-projects in accordance with *Section 2.1.1 and Section 13*.

4.1.2. Baseline establishment

Each participating farm (sub-project) in North is mapped and divided into fixed sampling plots of 4 to25 ha. During the baseline campaign (Year 0), Carbonsafe conducts:

(a) geo-referenced soil sampling across three depth layers (0–30 cm; 30–60 cm; 60–90 cm) per plot;

(b) a survey of past five-year management where available to document tillage intensity, crop rotations, fertilizer and amendment use, residue management, and any regenerative practices; and

(c) verification of land tenure and eligibility criteria. The baseline SOC stock (t C/ha) is calculated for each depth and plot, forming the reference against which all subsequent changes are assessed.

4.1.3. Project scenario and Practicest.

The project facilitates adoption of regenerative agricultural practices tailored to the North context: reduced or no-tillage, diversified rotations, cover/intercrops, residue retention, organic amendments/compost, precision nutrient management, and soil-health informed fertilization. Management changes are recorded annually at the plot level to support attribution and auditability.

4.1.4. Sampling design and field execution

Each 4-25 ha plot is sampled with 25 individual soil cores (drills) taken from each of the 3 depth layers in a diagonal/zigzag pattern that avoids atypical microsites. For every plot and monitoring event, three composite samples are created—one per depth layer—by homogenizing the 25 cores from that layer. Sampling is performed using an automatic, geo-referenced probe mounted on an ATV. The ATV's GPS track is recorded in the software, and the same plot geometry is re-sampled each year, ensuring spatial comparability. Chain-of-custody forms, sample IDs, timestamps, and field conditions are captured digitally and archived.

The sampling design applied under this project meets the requirements defined in the approved soil carbon methodology. Sampling density, geo-referencing precision, depth intervals, and laboratory analysis procedures are implemented in accordance with procedure PR03 – Procedure for Automated Georeferenced Soil Sampling v2.1 (22.08.2025).

4.1.5. Laboratory analysis and Soil parameters

Accredited laboratories (ISO/IEC 17025 or equivalent) conduct:

1. SOC determination by dry combustion (ISO 10694 or equivalent);
2. Bulk density (BD) by core method (ISO 11272 or equivalent)
3. Rock fragment/stone content and moisture correction to convert concentrations to stocks.
4. Soil health panel (macro/micro nutrients, pH, texture) to support agronomic co-benefits and contextualize SOC dynamics.

All analytical parameters used for carbon accounting under this project, including Soil Organic Carbon (SOC) concentration, bulk density (where applicable), and related parameters required for SOC stock calculation, are analyzed exclusively by laboratories operating under valid accreditation.

The analytical methods applied for these parameters fall within the formally accredited scope of the selected laboratories, as defined under their certification (e.g., ISO/IEC 17025 or equivalent national accreditation framework). Laboratory result reports explicitly reference the accredited methods used for each parameter.

4.1.6. SOC stock calculation and CO_2 conversion

The methodology uses several parameters to calculate the actual amount of carbon credits generated by the project.

The method quantifies how much soil organic carbon (SOC) increases on farmland over time and converts that into greenhouse gas (GHG) removals, while also accounting for emissions from fuel use.

1. Soil quantity is calculated for each plot (cell) based on its area, sampling depth (0–30 cm, 30–60 cm, 60–90 cm), and bulk density.
2. Change in organic carbon (OC) is determined by comparing laboratory results of organic carbon (mg/kg) in the control year with either the baseline year or the previous control year, depending on whether increases or decreases are observed.
3. Carbon content per depth is obtained by multiplying the change in OC with the soil quantity per depth.
4. The total carbon content per plot is the sum of the three depths.

5. The gross CO_2 removals are calculated by converting soil carbon to CO_2 using the IPCC factor (1 ton C = 3.667 tons CO_2).
6. Fuel emissions from agricultural equipment are estimated using national methodology, fuel consumption data (tons/ha), and a conversion factor (3.42 tCO_2e per ton fuel).
7. The net removals are obtained by subtracting fuel-related emissions from the gross soil CO_2 removals.
8. Uncertainty is assessed and quantified as part of the MRV system, based on measurement data, sampling design, and laboratory analysis, and is incorporated into the calculation of net greenhouse gas removals.

Finally, the farm balance is the net CO_2 removals summed across all plots and depths for the reporting period, giving the verified climate benefit of the farm's practices.

4.1.7. Accounting for Project Emissions

Carbon dioxide (CO_2) emissions associated with field operations arise primarily from the use of diesel-powered machinery. In line with the applied methodology, the Project Proponent (PP) has adopted a conservative and transparent approach to quantify and deduct these emissions when determining the project's net removals.

Emissions from diesel fuel consumption are converted into CO_2 equivalents using the following relationship:

- 100 liters of diesel/ha = 340 kg CO_2/ha.
- Equivalently, 1 liter of diesel corresponds to 36 MJ of energy. Given that 1 MJ = 95.1 g CO_2, the conversion factor becomes: 36x95.1/1000=3.42. Thus, a coefficient of 3.42 is applied to convert total fuel consumption (tonne/hectare) into tonnes of CO_2 equivalent.
- The coefficient 3.42 is derived as kg CO_2/L diesel. Fuel consumption values are obtained from the national benchmark table, which provides equivalent values in litres/ha converted in tonnes/ha using a 1,000 L = 1 t conversion.

At plot (cell) level, the PP calculates total fuel use based on average consumption values established under the official Methodology of the Ministry of Agriculture for determining annual quotas under the "Aid in the form of a discount on the value of the excise duty on gas oil used in primary agricultural production" scheme. This ensures alignment with nationally recognized benchmarks.

The resulting tonnes of CO_2 equivalent from fuel use are subtracted directly from the gross sequestration of soil organic carbon (SOC) achieved under the sub-project. In doing so, the sub-project reports only the net amount of CO_2 removals.

This conservative deduction of diesel-related emissions prior to credit issuance represents a unique and distinguishing feature within the voluntary carbon market, where many methodologies do not require such explicit subtractions. By applying this safeguard, Carbonsafe ensures that credited removals reflect actual net climate benefits.

4.1.8. Buffer and Reserve Application

All CO_2 removals are reduced by 5%, being set aside in a buffer account. The buffer is aimed at guaranteeing the permanence and sustainability of the projects, and also serves as insurance against force majeuree events. It acts as a guarantee fund that covers all risks of possible leaks or unforeseen fluctuations in SOC levels.

In the calculation method described above, the farm balance is offset year by year. At the end of the project (at the end of the renewable crediting period of a sub-projec) an overall farm balance

Форматирано: Не Осветяване

Коментирал [S2]: The derivation provided for the 3.42 coefficient is based on diesel consumption expressed in litres (36 MJ/L × 95.1 g CO2/MJ = 3.42 kg CO2/L). However, the quantification equation applies this coefficient to fuel consumption expressed in tonnes/ha. The PP is requested to clarify the units of fuel consumption and demonstrate that the applied conversion factor is consistent with those units to ensure traceability and unit consistency within the quantification framework.

Коментирал [DK3R2]: The coefficient 3.42 is derived as kg CO_2/L diesel. Fuel consumption values are obtained from the national benchmark table, which provides equivalent values in litres/ha converted in tonnes/ha using a 1,000 L = 1 t conversion. Consequently, the same numerical coefficient can be applied when fuel consumption is expressed in tonnes, with the resulting emissions reported directly in tCO_2. The methodology has been clarified to explicitly state this conversion and ensure unit consistency.

is reported. The overall balance of the farm is equal to the net quantities of greenhouse gas emissions removed carbon dioxide (CO_2) reported at the end of the crediting period

In cases of a negative balance in the first verification period, the farm is not submitted for verification and no credits are issued. The project can be validated.

When the balance of the farm is positive for the specific reporting period, the farm is submitted for verification and credits are issued. When the balance of the farm is negative for the specific reporting period, the farm can be included in the monitoring report, but no credits are issued. In the case of the cell-level calculation method with a return to the base year or the highest result, and reporting the results based on the balance of the farm, compensations from the buffer fund are not necessary in the case of credits issued in a previous reporting period and a negative balance in a subsequent reporting period.

When the overall balance of the farm is negative, the losses should be covered by a Buffer.

4.1.9. Additionality and Eligibility Controls

Additionality is demonstrated through (i) farm-level management histories confirming that the credited practices were not common on the enrolled fields in the five years pre-enrollment, and (ii) regional practice assessments showing that advanced regenerative practices are not business-as-usual in North region. Carbonsafe excludes lands with recent conversion from high-carbon ecosystems (e.g., forests) and requires proof of legal land tenure or long-term operating rights. Fields under other carbon schemes are ineligible to prevent double-claiming.

4.1.10. Leakage and yield safeguards

The project does not aim to reduce production; instead, it promotes productivity-neutral or positive practice changes. If credible leakage risks is identified, a conservative deduction will be applied.

Leakage is directly measured through the systematic monitoring of yield changes in participating farms. In addition, satellite data provides a supportive assessment of potential production displacement or activity-shifting leakage.

Key leakage pathways identified and mitigation strategies are described in Section 9.1.1. Plausible leakage pathways.

4.1.11. QA/QC and data integrity

1. Soil sampling and analyses conducted by accredited laboratories
2. Data recorded in ERP; geo-trace verification; anomaly flags (e.g., improbable year-over-year swings); full audit trails and version control. All records (field logs, chain of custody, lab certificates, calculations) are retained and made available to VVBs.

4.1.12. MRV cadence and verification.

Annual re-measurement and reporting are mandatory for all plots, in accordance with the monitoring plan and the measurement cycles defined in the applicable Methodology.

Verification shall be conducted periodically by an independent third-party VVB, in accordance with the requirements of the applicable Standard.

Verification shall be initiated upon completion of at least one full monitoring cycle, defined as the availability of two consecutive measurements enabling the calculation of net greenhouse gas removals.

The timing of verification may be determined by the Project Proponent based on the accumulation of verifiable results, provided that:

- all reported quantities are fully documented and traceable to plot, farm, and vintage level;

- monitoring periods are clearly defined and non-overlapping;
- no double counting occurs;
- the approach is transparently described in the monitoring plan.

For the purposes of economic efficiency and project sustainability, verification may be conducted on aggregated results from multiple monitoring periods or groups of project participants (issuance batches), provided that such aggregation does not compromise accuracy, transparency, or the integrity of the MRV system.

Verification includes desk review and risk-based on-site audits.

Only verified removals are eligible for issuance of carbon credits. Issuance shall be performed in batches corresponding to the verified monitoring results, ensuring full traceability to the farm and vintage.

4.1.13. Change management.

The MRV plan is periodically updated to reflect updated lab methods and methodology updates. Material changes that affect crediting integrity are documented and, where required, re-validated; non-material improvements are versioned and disclosed in monitoring reports.

4.1.14. Scope boundaries and exclusions.

Credit issuance includes Soil Organic Carbon (SOC) stock increases within 0–90 cm measured under the project protocol, combined with the accounting of relevant greenhouse gas emissions associated with agricultural activities. Above- and belowground biomass and litter are excluded from issuance (but may be reported).

The released amount of CO_2 from equipment used for agricultural production is calculated for every plot (cell). Emissions of CO_2 from on-farm fuel use are quantified and deducted from the gross CO_2 removals generated by each sub-project to determine the net CO_2 removal.

Emissions of nitrous oxide (N_2O) associated with nitrogen inputs and fertilizer application are included in the greenhouse gas accounting boundary of the project. These emissions are quantified for both the baseline and project scenarios ensuring consistency, transparency, and conservativeness. N_2O emissions are accounted for as part of the overall project emissions balance and are incorporated into the calculation of net climate impact expressed in CO_2 equivalents (CO_2e).

The accounting framework therefore reflects net greenhouse gas performance, whereby SOC removals are adjusted for relevant emission sources, including fuel-related CO_2 emissions and soil-related N_2O emissions. This ensures that credited removals represent a conservative estimate of net climate benefit.

The description of baseline greenhouse gas sources and practices defines the formal accounting boundary of the project. Within this boundary, both carbon removals (SOC) and selected emission sources are quantified and compared between baseline and project scenarios to determine the net greenhouse gas benefit. Other non-material sources remain excluded.

4.1.15. Transparency and registry integrity

All issued credits are publicly listed with unique serials that encode the project, country, sub-project/farm ID, vintage, and serial range. Transfers and retirements are transparently recorded to prevent double issuance/use and to support downstream assurance (buyers, auditors, rating agencies).

4.2. Baseline Scenario.

4.2.1. Narrative baseline (business-as-usual, without the project).

In the absence of the Carbonsafe intervention, agricultural management across Northern Bulgaria—covering the provinces of Vidin, Montana, Vratsa, Pleven, Lovech, Veliko Tarnovo, Ruse, Razgrad, Silistra, Shumen, Targovishte, Dobrich, and Varna—remains defined by conventional, input-intensive practices oriented toward yield stability under a temperate-continental climate. The region spans the Danubian Plain and the Ludogorie Plateau, bounded by the Balkan Mountains to the south and the Danube River and Black Sea to the north and east.

Average annual precipitation ranges between 470–650 mm, with uneven seasonal distribution. Summer droughts are recurrent, while spring and early summer storms often trigger erosion and runoff, particularly on loess soils. The majority of arable land is rainfed, as most irrigation infrastructure built in the socialist period has deteriorated. Consequently, water stress, erosion, and organic matter loss are persistent constraints under baseline conditions.

Under this business-as-usual (BAU) trajectory, conventional tillage dominates; deep moldboard ploughing (20–30 cm) is widely applied, often annually, followed by several secondary passes. Residue removal for fodder, bedding, and biofuel use remains standard, leaving soils largely bare between crops. National data indicate that although "conservation tillage" covers up to 40% of reported arable area, true zero-till systems and consistent cover cropping remain negligible.

Thus, across Northern Bulgaria, the BAU baseline is characterized by:

- Full inversion tillage, minimal winter soil cover, and high erosion vulnerability;
- Fertility management centered on mineral fertilizers (~130 kg nutrients/ha), with rare manure or compost use;
- Widespread residue removal and low SOC replenishment capacity;
- Declining infiltration and increasing compaction from heavy mechanization;
- SOC stagnation or decline in most soil types.

This pattern reflects the long-term continuation of intensive production focused on short-term yields rather than soil carbon restoration.

4.2.2. Cropping systems and rotations.

Dominant crop rotations throughout Northern Bulgaria include winter wheat, sunflower, maize, barley, and rapeseed. These rotations are highly simplified and lack consistent integration of legumes or cover crops. In smaller pockets near the Balkan foothills and river valleys, orchards, vineyards, and vegetables are cultivated, while forage crops (alfalfa, clover) occur sporadically in livestock-adjacent areas.

Large corporate farms dominate in the Danubian Plain, practicing extensive monocultures, while smaller and mixed farms persist in foothill zones. The narrow cereal–oilseed cycles provide limited biodiversity and nutrient recycling, reinforcing SOC decline and erosion risk.

AGRICULTURAL LAND USE AND CROP ROTATION (2022 DATA)[27]

In 2022, total arable land—which includes areas under crop rotation, temporary meadows with grasses and legumes, fallow land, and others—amounted to 3,455,143 hectares (ha). The primary crops were distributed as follows:

- Wheat: 1,207,969 ha
- Sunflower: 985,591 ha
- Corn (Maize): 572,048 ha
- Barley: 127,270 ha

Regional Distribution

In 2022, the share of cereal crops was divided between the two main regions of Bulgaria:

- Northern Bulgaria: 69.5%

[27] Ministry of Agriculture of the Republic of Bulgaria, Department "Agro-statistics". (October 2022). *БАНСИК 2022: Окончателни резултати за заетостта и използването на територията на България през 2022 година* (Резултати и анализи № 419). Sofia, Bulgaria: Ministry of Agriculture. Available at: https://www.mzh.government.bg/media/filer_public/2022/12/14/publication_bancik_2022.pdf

- Southern Bulgaria: 30.5%

CROP ROTATION AND PRECEDING CROPS (PREDECESSORS)

The data shows a high reliance on specific rotation cycles, particularly following row crops:

- Wheat: 76.4% of wheat areas were sown after row crops:
    - 57.3% following sunflower
    - 19.1% following corn
    - 0.9% following barley
    - 0.5% following wheat (monoculture)
- Barley: 56.4% of barley areas followed row crops, with 39.5% specifically following sunflower.
- Corn: The primary predecessor for corn was wheat at 55.6%, followed by sunflower (8.2%) and barley (4.5%).
- Sunflower: Most sunflower crops were planted after wheat (65.5%), followed by corn (20.4%) and barley (7%).

REGIONAL CROP DISTRIBUTION BY AREA (HA)

The following table illustrates the distribution of the main crops between Northern and Southern Bulgaria:

Crop	Northern Bulgaria (ha)	Southern Bulgaria (ha)
Wheat	761,143	446,825
Barley	171,295	53,853
Corn	931,182	53,629
Sunflower	1,397,282	339,887

4.2.3. Tillage and residue management.

Under BAU, deep moldboard ploughing remains the universal land preparation method, even on erosion-prone loess and hilly terrains. Multiple secondary passes (disking, harrowing, cultivation) follow, further disturbing soil aggregates and accelerating organic matter mineralization.

Crop residues are routinely removed, reducing organic input to soils. Where residues are incorporated, they are tilled in rather than surface-retained. Reports of “conservation tillage” often reflect shallow non-inversion tillage, not genuine regenerative systems. As a result, bare soils during winter and accelerated runoff and erosion remain widespread features of the Northern Region’s farming landscape.

4.2.4. Fertility management and inputs.

Nutrient management relies overwhelmingly on mineral fertilizers, averaging ~130–140 kg nutrients/ha, aligned with Bulgaria's national profile. Organic inputs such as manure or compost are confined to livestock areas and are not systematically incorporated. Fertility programs are designed for yield maximization, not soil carbon enhancement.

Soil testing practices are mostly limited to pH and macronutrients (NPK). Comprehensive SOC testing to 90 cm depth using accredited laboratories is virtually absent outside projects like Carbonsafe.

4.2.5. Water management.

Despite proximity to major river systems (Danube, Iskar, Osam, Yantra, Kamchiya), irrigation coverage remains extremely low. Deteriorated infrastructure and high pumping costs leave over 90% of farmland rainfed. During May–August, evapotranspiration exceeds precipitation, causing frequent yield losses. In spring, heavy rains trigger surface runoff and gully erosion, especially on loess plateaus and unprotected slopes.

Consequently, baseline conditions in Northern Bulgaria exhibit dual stress: summer drought and spring erosion, which together drive the gradual depletion of SOC and soil structure.

4.2.6. Soil condition and SOC trend under BAU.

Northern Bulgaria's soils—predominantly Chernozems, Phaeozems, Luvisols, Cambisols, and Alluvial soils—are among the country's most fertile yet most exploited. Long-term monitoring confirms declining or stagnant SOC stocks, compaction, and erosion under conventional management.

- In the Danubian Plain, continuous ploughing and residue removal have reduced SOC contents to below 2% in many arable fields.
- In the Ludogorie Plateau (Shumen, Razgrad, Targovishte), sloping loess soils are increasingly eroded and depleted of organic matter.
- In the Dobrich–Varna coastal zone, wind erosion further accelerates carbon loss due to sparse winter cover.

Without intervention, SOC decline and structural degradation are expected to continue under projected warming and irregular rainfall patterns.

4.2.7. GHG profile in the baseline.

Under BAU, net greenhouse gas outcomes include:

1. SOC stock change: expected to be stable to negative, given disturbance from tillage and limited residue/cover inputs.
2. N_2O emissions: ongoing emissions from mineral fertilizer use, unmanaged with respect to SOC outcomes.
3. CO_2 from operations: significant emissions from diesel use in deep ploughing and multiple secondary tillage passes.
4. CH_4: negligible in dryland arable systems, as rice and paddy cultivation are absent.

Emissions of nitrous oxide (N_2O) associated with nitrogen inputs and fertilizer application are included within the greenhouse gas accounting boundary of the baseline and project scenarios. These emissions are quantified and expressed in CO_2 equivalents (CO_2e) as part of the overall greenhouse gas assessment.

In accordance with the applied conservative accounting approach, N_2O emissions are treated as a risk factor rather than a creditable source of emission reductions. Where N_2O emissions increase in the project scenario relative to the baseline, the resulting increase is fully accounted for and deducted from the net greenhouse gas benefit, thereby reducing the volume of carbon credits.

Conversely, where N_2O emissions decrease compared to the baseline scenario, these reductions are not claimed as eligible emission reductions and are not credited. Instead, they are recognized as a positive environmental co-benefit of the project.

The description of baseline greenhouse gas sources and practices defines the formal accounting boundary of the project. Within this boundary, both changes in soil organic carbon (SOC) stocks and relevant emission sources, including N_2O, are quantified and expressed in CO_2 equivalents (CO_2e). This ensures a consistent and conservative comparison between baseline and project scenarios and supports the determination of net greenhouse gas benefits resulting from project implementation.

While the project assesses the greenhouse gas context (including SOC, N_2O, CO_2) to ensure completeness and conservativeness, the formal crediting scope is strictly limited to net increases in soil organic carbon (SOC) stocks, expressed as CO_2 removals, in accordance with the approved methodology. All other emission sources, including N_2O, are quantified and considered only for conservativeness and are not eligible for crediting.

4.2.8. MRV in the baseline.

There is no structured, field-level MRV system for SOC under BAU conditions. Farmers in North typically do not conduct systematic SOC sampling or calculate stock changes; soil tests are performed sporadically for agronomic purposes (pH, NPK) rather than for carbon accounting. No geo-referenced SOC monitoring exists that could generate ex-post credits without external intervention.

This baseline establishes that:

1. Default management in North remains conventional, input-intensive, and not optimized for SOC sequestration;
2. True zero tillage and systematic cover cropping are virtually absent; adoption of residue-retentive practices is limited and inconsistent;
3. No pre-existing MRV systems would enable SOC-based credits absent the project.

These conditions provide the factual foundation to demonstrate regulatory, technological, and behavioral additionality when the Carbonsafe project introduces regenerative practices combined with annual, geo-referenced measure-remeasure SOC accounting.[28][29][30][31][32][33][34]

[28] Nojarov, P. (2024). *Evaporation and the difference between precipitation and evaporation in Bulgaria* [Journal Article]. Journal of the Bulgarian Geographical Society, 51, 131–149. https://doi.org/10.3897/jbgs.e135422

[29] European Commission, Joint Research Centre (JRC). (2009). *Case study: Bulgaria – Sustainable agriculture and soil conservation (SoCo Project).* Retrieved from https://esdac.jrc.ec.europa.eu/projects/SOCO/Case%20Studies/casestudyBG_000.pdf

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[34] Ninov, N. (2015). *Processes of soil degradation in Bulgaria. Scientific Works of the Agricultural University – Plovdiv*, Vol. LIX, Book 5, pp. 29–40. Retrieved from http://nauchnitrudove.au-plovdiv.bg/wp-content/uploads/2019/06/39_05_2015.pdf

4.3. Project Scenario.

4.3.1. Project Scenario (With-Project Case).

Under the Carbonsafe project for the region of North, participating farms in North Province transition from conventional, disturbance-intensive management to a measured, verifiable, and conservatively credited package of regenerative agricultural practices that increase Soil Organic Carbon (SOC) stocks. The project scenario is defined by (i) a clearly specified set of eligible practices tailored to local agro-ecology; (ii) field-level implementation plans and training; (iii) 100% measure–remeasure SOC accounting at fixed geo-referenced sampling units; (iv) conservative issuance; and (v) independent validation, verification, and transparent credit registration.

The transition from business-as-usual (BAU) conditions to the project scenario follows a defined chronological sequence aligned with baseline establishment and monitoring cycles.

Step 1 – Enrolment and Eligibility Confirmation:

A participating farm enters the project following eligibility screening and execution of a participation agreement. At this stage, land remains under BAU management conditions.

Step 2 – Baseline Establishment (Year 0):

A complete soil sampling is conducted to determine baseline SOC stocks. Year 0 corresponds to the year in which baseline sampling and laboratory analysis are finalized. Baseline conditions reflect documented pre-project management practices.

Step 3 – Implementation of Project Practices:

Following baseline establishment, the farmer implements eligible regenerative or SOC-enhancing practices in accordance with project requirements. Practice changes are documented and monitored.

Step 4 – Monitoring Cycle:

Subsequent soil sampling cycles are conducted at defined monitoring intervals to quantify SOC stock changes relative to the baseline.

Step 5 – Verification and Crediting:

Verified net SOC stock increases exceeding conservative thresholds and applicable deductions are eligible for credit issuance. Credits are issued only ex post, following independent verification.

As part of the project implementation, each participating farm submits an annual Registration Update (Annual Re-registration). This document reflects the current state of the farm for the respective reporting year, including:

- Changes in crops and yields;
- Changes in cultivated areas;
- Acquisition or decommissioning of agricultural machinery.

Regarding reported updates in machinery usage, these are officially recorded in the documentation for the 2025 Annual Re-Registration (the next reporting period).

This process ensures a clear distinction between the baseline scenario and the current state of the farm, as the Annual Registration Update provides data that is directly comparable to the initial declarations made upon project entry.

The data included in the Annual Re-Registration is verified through monitoring procedures and on-site inspections conducted by a Carbonsafe agronomist. During these inspections, the existence and compliance of the declared machinery are verified, and its significance for the execution of project activities is assessed.

4.3.2. Practice package and eligibility (field level).

Each enrolled field (organized as a fixed sampling plot ≤ 25 ha) adopts a minimum bundle of practices aimed at reducing soil disturbance, increasing organic inputs, and improving soil structure and nutrient cycling. The package is applied with flexibility to reflect crop or machinery constraints, while maintaining the overall intent to raise SOC:

1. Reduced or no-tillage (primary lever): Eliminate inversion tillage where agronomically feasible; where full no-till cannot be maintained (e.g., wet springs, severe weed pressure), strategic minimal tillage is permitted with a return to reduced/no-till in subsequent windows.
2. Residue retention: Retain and distribute crop residues to maintain protective ground cover and carbon inputs.
3. Cover/intercrops: Introduce winter or shoulder-season covers (or intercrops) to extend photosynthetic capture, protect soil, and augment below-ground carbon inputs. Species mixes are adapted to local conditions (e.g., cereals–legume blends, brassicas for rooting).
4. Diversified rotations: Move away from long wheat–sunflower or wheat–maize cycles towards more diverse rotations that include deep-rooted or leguminous phases (e.g., alfalfa, vetch, pea) to enhance rooting depth and rhizodeposition.
5. Organic amendments/compost: Apply composts or stabilized manures where available and agronomically justified; avoid over-application relative to crop demand and nutrient balance.
6. Precision nutrient & pH management: Use soil test–based prescriptions from annual lab panels (macro/micro nutrients, pH) to meet yield goals with fewer losses; incorporate split applications, placement technology, and liming where needed.
7. Traffic/compaction control and water retention: Minimize traffic on wet soils; use controlled traffic where feasible. Encourage surface cover and root density to improve infiltration and reduce erosive losses.

Eligibility rules: Fields with clear tenure/operating rights, no recent conversion from high-carbon land uses, and not enrolled in other carbon projects. A five-year management history is required at enrollment to demonstrate that credited practices are additional to pre-project management. Projects must introduce or implement one or more new changes to pre-existing practices. Pre-existing practices are considered eligible when the project participant commits to a measurable increase in the intensity, frequency, or quality of management practices already in place, leading to an increased potential for soil organic carbon sequestration above the levels specified in the baseline management conditions. The change in practices must constitute either a single significant change or a combination of practices that, taken together, reduce soil disturbance, increase carbon sequestration in the soil, or improve organic carbon retention.

Коментирал [DK4]: Text added in this section for further clarification.

Required practices (minimum bundle)

Farm operators are required to have at least one practice improved or implemented plus annual, geo-referenced SOC measure–remeasure (0–30 cm, 30–60 cm, 60–90 cm) in accredited labs and ex-post issuance.

Furthermore, project activities are explained in *Section 2.1*. Project activites lead to SOC increase.

4.3.3. Implementation model and farmer support.

For each farm, Carbonsafe develops an individual strategy for managing the areas on the farm that specifies: target rotations, cover crop windows, residue targets, tillage exceptions, and nutrient plans aligned with lab results, use of biological and organic plant protection products. Carbonsafe provides training and technical assistance to address operational bottlenecks. Practice adherence is recorded annually via digital forms and field audits.

The agronomic recommendations include individualized comments for each participating farm. These comments are developed based on the specific analytical results obtained from the respective fields, as well as taking into account the crop cultivated on the given field at the time the recommendation is prepared.

The comments consist of targeted guidance to the agricultural producers, tailored to the parameters identified through the conducted soil analyses. This approach ensures farm-specific treatment, precision, and scientific justification of the recommendations, as well as their practical applicability at the farm level.

Farmer training support is implemented through the established Farmer Training Policy.

4.3.4. Spatial unit, sampling, and lab analytics (MRV backbone).

The project's MRV is built on fixed geo-referenced sampling plots (≤ 25 ha). Annually, each plot is sampled with 25 drills in a zigzag/diagonal pattern, composited into three depth-specific samples (0–30 cm; 30–60 cm; 60–90 cm). Sampling is executed with an automatic GPS-enabled probe; the ATV track is recorded in a mobile app/ERP, creating a reproducible spatial record.

Accredited laboratories (ISO/IEC 17025 or equivalent) analyze:

1. SOC by dry combustion.
2. Bulk density (BD) by core method.
3. Stone fraction and moisture to convert concentrations to stocks.
4. Soil health panel (macro/micro nutrients, pH, texture) to support agronomic optimization and interpret SOC dynamics.

Chain-of-custody, duplicates/controls, and full QA/QC are applied in field and lab (БДС ISO/IEC 17025:2017). All records are versioned in the ERP and made available to the verifier.

4.3.5. Quantification and conservative issuance.

SOC stocks are computed per depth (0-30 cm, 30-60 cm, 60-90 cm). Annual change (ΔSOC) equals the difference between the monitoring period and the previous reporting period.

Issuance is ex-post only and conservative:

1. 25% of verified, conservative removals are issued each reporting period.
2. 75% are placed in a sub-project level reserve and released upon positive performance. Negative results halt releases.

This structure manages over-crediting risk and supports durability under variable climate.

4.3.6. Data integrity, governance, and verification.

Carbonsafe maintains end-to-end data integrity through:

1. Digital field logs (geo-trace, timestamps), chain-of-custody, and QC rules in ERP.
2. Lab QA/QC (certified protocols, CRMs, proficiency testing).
3. Audit trails for any calculation or data correction.

A third-party VVB validates the PDD and verifies monitoring reports on an annual or periodical cadence, including on-site audits. Only verified removals are submitted for issuance.

Data integrity and quality assurance are governed through clearly defined roles and approval layers prior to submission to the Validation and Verification Body (VVB).

Data Entry and Initial Validation:

Laboratory results are entered into the MRV system and linked to geo-referenced parcel identifiers. The Agronomic Team performs technical validation of SOC results and associated field data prior to internal approval.

Correction Authority:

Any identified data inconsistencies, anomalies, or documentation gaps are reviewed by the MRV Review Team, chaired by the Head of Integrated Management Systems (IMS). Data corrections require documented justification and approval by the Head of IMS.

Quality Assurance:

Before data is finalized for issuance calculations, the MRV Review Team confirms completeness of:

– Geospatial validation

– Laboratory accreditation confirmation

– Agronomic review

– Administrative registration

Data and Issuance Authorization:

Following successful QA review, the Head of IMS authorizes the data for the monitoring period. Final issuance documentation and submission to the VVB require approval by the Executive Director.

Submission to VVB:

The VVB Liaison coordinates formal submission of monitoring reports, calculation files, and supporting evidence to the independent Validation and Verification Body.

All validation steps, corrections, approvals, and submission records are minuted and archived.

This process is outlined and supported by the "MRV Protocol – Processes, Governance and Accountability" document.

4.3.7. Registration, traceability, and no double counting.

Issued credits are registered on the Balkan Carbon Credits Registry (BCCR) with unique serial numbers that encode project/country/farm/vintage. Farmers are listed as owners; Carbonsafe is the project developer and account manager. The registry structure and contractual attestations ensure no double issuance/use and no double claiming.

Farmers are listed as beneficial owners of carbon removals generated on their enrolled land; however, under the Participation Agreement, farmers grant Carbonsafe explicit authorization to act as project aggregator and registry account manager for the purposes of credit registration, serialization, issuance coordination, transfer execution, and retirement transactions within the applicable carbon registry framework.

This authorization is contractually defined and includes the right of Carbonsafe to submit project documentation, manage registry accounts, execute transfers to buyers in accordance with commercial agreements, and administer reserve and buffer allocations. Registry operations are conducted in compliance with applicable registry rules and BCCS requirements.

The Participation Agreement therefore establishes the legal basis for Carbonsafe to manage issuance and transactions on behalf of participating farmers while preserving beneficial ownership rights as contractually defined.

4.3.8. Leakage, production safeguards, and co-benefits.

The project ensures that practice changes do not negatively impact regional food security or displace emissions. Leakage is directly measured through monitoring of yield changes in farms and also supported by satellite data, ensuring that any material drop in production is identified and accounted for.

Key leakage pathways identified and mitigation strategies are described in Section 9.1.1. Plausible leakage pathways.

Форматирано: Интервал Преди: 10 пкт, След: 10 пкт, Редова разредка: единичен

4.3.9. Durability and reversal management.

Contracts bind farmers to maintain the practice bundle through the sub-project crediting period, and monitoring is annual. Farmers are encouraged to renew contracts at the end of their individual crediting periods. Where farm balance negative results occur in the final crediting year, these are covered by the farm's credit reserve and in cases where reserve is not enough – from the buffer pool.

4.3.10. Social safeguards and participation equity.

Carbonsafe maintains community engagement and grievance pathways.

Participation in the project requires demonstrable land tenure or legal operating rights, verified prior to enrolment through contractual documentation and eligibility checks to ensure that no third-party rights or existing land uses are adversely affected. Participation is voluntary and based on formal agreements with project participants, with no physical or economic displacement resulting from project activities.

The project applies safeguards against social harm through eligibility screening, a Do-No-Harm framework, structured risk assessment procedures, and an accessible grievance mechanism, ensuring that any potential adverse impacts are prevented, identified, and addressed in a timely manner .

Carbonsafe maintains a formal grievance mechanism, as described in the "Mechanism for Receiving and Reviewing Complaints and Grievances" document located at https://carbonsafe.bg/en/documents/ , to ensure transparent, accessible, and consistent handling of concerns related to project activities. Stakeholders — including participating farmers, landholders, local community members, and other interested parties — may raise grievances related to project implementation, social impacts, or compliance with contractual commitments.

Grievances may be submitted in writing via email, postal mail, or through designated contact channels provided by Carbonsafe (e.g. grievances@carbonsafe.bg) as documented in the grievance mechanism procedure. Upon receipt, grievances are recorded in the grievance register, assigned a unique reference number, and acknowledged in writing within a defined timeframe.

Each grievance is assessed for eligibility and completeness. Where required, Carbonsafe may request additional information from the complainant to clarify the matter. The grievance is then reviewed by the designated grievance focal point or committee, evaluated based on the available information, and, where appropriate, subject to fact-finding or consultation with relevant parties.

Carbonsafe provides a written response outlining findings, corrective actions (if any), and proposed resolution steps. For grievances that cannot be resolved at the operational level within the set response timeframe, escalation to senior management is available. Records of grievances, assessments, decisions, and closures are maintained to ensure traceability and continuous improvement.

The grievance mechanism is designed to align with the Do-No-Harm principles of the project and to ensure that risks of displacement, conflicts, or adverse social impacts are identified, mitigated, and addressed in a timely and equitable manner.

4.3.11. Expected performance and claims discipline.

The project does not make ex-ante sequestration claims. Performance is field-specific and ex-post measured. Over time, as adoption matures, sustained positive ΔSOC is expected in many fields; however, gains are credited conservatively, maintaining the integrity demanded by leading buyers and standard setters.

In essence, the project scenario operationalizes a locally adapted, scientifically rigorous, and verification-ready transition to regenerative agriculture in North, turning annual, geo-referenced SOC measurements into high-integrity ex-post credits with robust safeguards for high-level uncertainty, durability, leakage, and social equity.

5. ELIGIBILITY AND ADDITIONALITY[35][36][37][38][39][40][41]

5.1. Eligibility Criteria.

Participation in the Carbonsafe project is restricted to farms and fields that meet strict eligibility requirements, ensuring that all carbon credits generated are environmentally robust, legally sound, and free of double counting. These criteria are designed to provide clarity on land type, parcel size, land-use history, legal tenure rights, exclusivity in carbon accounting, and the responsibilities of participants in relation to monitoring and verification.

The project admits only lands in agriculture, which fall within a system of land use and taking into account the relevant national specificities in North Province. Plots falling into wetlands, peatlands and riverbeds are not allowed - they are not part of the National Land Use System. Projects located on the Forest Fund territory are inadmissible.

These lands must be under agricultural use prior to enrollment, with a five-year history of cropping, tillage, fertilization, and residue management. This management history serves both to establish the baseline scenario and to demonstrate additionality, as it shows that the regenerative practices promoted under the project were not in common use on these fields before joining. Lands that have recently been converted from forests, wetlands, or other high-carbon ecosystems are strictly excluded.

Within each farm, land is subdivided into fixed sampling plots of 4 to 25 hectares (+ 3% tolerance i.e., up to 25.75 ha), which form the basic unit of measurement, monitoring, and issuance. This ensures that SOC stock changes are measured and reported at a fine spatial resolution, with geo-referenced boundaries that remain constant throughout the project. Larger parcels are subdivided, while very small contiguous parcels may be grouped. Once a plot boundary is fixed, it is re-sampled annually on exactly the same geometry, providing the comparability necessary for the measure–remeasure approach.

Коментирал [S5]: The PDD introduces a "+3% tolerance" for the 4–25 ha plot size requirement in Section 5.1; however, it is unclear whether this represents an eligibility tolerance for plot inclusion, a measurement/surveying tolerance, or another provision. As plot area is subsequently used in SOC quantification calculations, the PDD must clarify the purpose of this tolerance and whether it has any bearing on the area values used for calculations and/or the uncertainty treatment.

Коментирал [DK6R5]: The Project Proponent confirms that the +3% tolerance refers solely to the maximum allowable size of an individual plot.
The methodology establishes a target maximum plot size of 25 ha (+ 3% tolerance). Accordingly, a plot may be accepted if its area does not exceed 25 ha plus the 3% tolerance (i.e., 25.75 ha). The tolerance does not represent a measurement uncertainty adjustment, surveying tolerance, or correction factor.
The plot area is determined and fixed at the time of project enrollment.
The +3% tolerance serves only as an eligibility criterion for plot enrollment. All calculations are performed using the actual enrolled plot area recorded in the MRV system.

[35] Climates to Travel. (n.d.). *Climate – Bulgaria*. Retrieved September 29, 2025, from https://www.climatestotravel.com/climate/bulgaria
[36] European Commission, Joint Research Centre (JRC). (2009). *Case study: Bulgaria – Sustainable agriculture and soil conservation (SoCo Project).* Retrieved from https://esdac.jrc.ec.europa.eu/projects/SOCO/Case%20Studies/casestudyBG_000.pdf
[37] Eurostat. (2023, October). *Agri-environmental indicator – Tillage practices.* Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Agri-environmental_indicator_-_tillage_practices
[38] World Bank. (n.d.). *Fertilizer consumption (% of fertilizer production, AG.CON.FERT.ZS).* World Development Indicators. Retrieved September 29, 2025, from https://databank.worldbank.org/source/world-development-indicators/Series/AG.CON.FERT.ZS#
[39] Trading Economics. (n.d.). *Fertilizer consumption (kilograms per hectare of arable land) – World Bank data*. Retrieved September 29, 2025, from https://tradingeconomics.com/country-list/fertilizer-consumption-kilograms-per-hectare-of-arable-land-wb-data.html
[40] Panagos, P., Borrelli, P., Poesen, J., Ballabio, C., Lugato, E., Meusburger, K., Montanarella, L., & Alewell, C. (2015). The new assessment of soil loss by water erosion in Europe. *Environmental Science & Policy, 54*, 438–447. https://doi.org/10.1016/j.envsci.2015.08.012
[41] Lugato, E., Smith, P., Borrelli, P., Panagos, P., Ballabio, C., Orgiazzi, A., ... & Montanarella, L. (2021). Soil erosion is unlikely to drive a future carbon sink in Europe. *European Journal of Soil Science, 72*(5), 2045–2060. https://doi.org/10.1111/ejss.13483

Only farmers with clear, verifiable tenure or operating rights are eligible. Ownership must be documented through property deeds or cadastral records, while tenants must demonstrate long-term lease agreements that extend for at least the sub-project crediting period.

Another central principle of eligibility is the prevention of double counting. Fields already enrolled in other carbon schemes or claiming carbon benefits under a separate project are not allowed to participate. Farmers are required to sign a statement of exclusivity. In the event of a breach, the affected fields are immediately excluded, and corrective action is taken to ensure the integrity of issued credits. Likewise, credits are labeled and tracked in the Balkan Carbon Credits Registry (BCCR) to prevent double issuance and to clarify that they are not simultaneously claimed.

Eligibility also depends on a farmer's willingness to participate fully in Monitoring, Reporting, and Verification (MRV). Each year, farmers must allow field teams and accredited verifiers to access their land for soil sampling and audits. They must also provide complete records of crop types, yields, tillage, residue management, fertilizer applications, irrigation and any other activities that affect SOC stocks. These records are collected by Carbonsafe, ensuring that an auditable trail exists for every participating field.

Finally, participants must commit to the adoption and maintenance of regenerative practices—including reduced or no-tillage, residue retention, crop diversification, and soil-test-based fertilization. While temporary flexibility is allowed in exceptional circumstances (such as strategic tillage in wet years), repeated departures from the agreed practices may result in suspension of eligibility or reduced credit issuance. All participants must also comply with national agricultural laws, EU Common Agricultural Policy requirements, and labor and safety standards.

5.1.1. Eligibility conditions.

A participant in the project can be any natural or legal person registered as an agricultural producer (AP), according to Ordinance No. 3 of January 29, 1999 on the creation and maintenance of a register of farmers whose holding is located on the territory of the Republic of Bulgaria.

In addition to farmer exclusivity declarations at enrollment, the Project Proponent conducts an external verification step prior to credit issuance by formally requesting confirmation from the Balkan Carbon Credit Registry (BCCR) that the enrolled land parcels are not registered under another carbon project within the registry system. This registry cross-check is performed based on cadastral and geo-referenced plot information and serves as an independent confirmation of exclusivity.

In the event that a breach of exclusivity is detected, including intentional misrepresentation or double registration attempts, the affected parcels are immediately excluded from the project, any pending credit issuance is suspended, and the case is recorded in an internal register of bad-faith participation.

Such breaches are subject to contractual remedies and potential legal liability under applicable national law.

Further eligibility criteria:

The farm can be crop-growing or mixed - crop-growing and animal-breeding. Minimum requirements for participation:

Areas

The holding must have a minimum total area of 2000 decares for cereals/ technical/ fodder crops/ fallow areas/ perennial medicinal and aromatic crops and/or 500 decares for perennial crops. In the case of holdings with annual and perennial crops, one of the two minimum area requirements is accepted. Plots with a minimum area of 40 decares are considered eligible.

The minimum holding size thresholds applied under the project (e.g., 2,000 decares for cereal-based systems and 500 decares for perennial crops) are programmatic criteria established by the Project Developer and are not requirements of the applied methodology or the BCCS standard.

These thresholds are introduced to ensure financial and operational feasibility of the project, particularly in relation to the fixed costs associated with soil sampling, laboratory analysis, data management, and verification processes. Smaller land areas would generate disproportionate monitoring and transaction costs relative to potential carbon removal outcomes, potentially undermining the economic viability of participation.

The thresholds therefore represent a developer-level implementation decision intended to maintain program sustainability and cost-efficiency, without affecting the environmental integrity or methodological compliance of credited removals.

Legal grounds

The AP must have/maintain legal grounds for a minimum of 5 years for the plots participating in the carbon farming project. The minimum term for participation in the project is 5 years, and it should be implemented on the same areas for the entire period;

Implementation of new practices

The farm must have opportunities to learn and apply new good agricultural practices. They must be consistent with mitigating climate and environmental impacts, but also not hinder the production of the necessary amount of food for food security. This criterion is related to the assessment of complementarity for upgrading the activities applied to the agricultural areas participating in the project and is a mandatory element for participation.

The Integrated Administration and Control System (IACS) is the official European Union system for the management and control of area-based interventions under the Common Agricultural Policy (CAP). A key component of IACS is the Land Parcel Identification System (LPIS), which constitutes a geospatial registry of reference parcels and includes specialized layers, including a legal entitlement layer.

Through this legal entitlement layer, the existence of valid legal grounds for the use of declared land areas (ownership, lease agreement, rental agreement, or other legal basis) is verified. The data is updated annually based on submitted documentation and applications for agricultural support.

IACS performs automated cross-checks between declared land areas and the data recorded in LPIS. Where valid legal grounds are not established, the respective areas are deemed ineligible. In this way, land eligibility and proof of legal tenure are ensured through an official, legally regulated, and verifiable system operating at both national and European levels.

Each agricultural producer is required to complete a standardized registration form and register initially with the Municipal Agriculture Service. The registered document is subsequently validated by the Regional Directorate of Agriculture. For this purpose, the agricultural producer submits a package of documents including proof of legal grounds for the use of agricultural land and/or registration documents for livestock holdings.

On an annual basis, agricultural producers submit copies of the validated survey card, registration card, and finalized IACS application, including attached parcel maps.

Contractual Safeguards and Enforcement Provisions

Participation agreements with farmers include structured contractual safeguards designed to ensure performance integrity, exclusivity, compliance with agronomic practices, and risk allocation clarity.

1. Term and Exclusivity

Participation agreements are concluded for a defined multi-year period (minimum five agricultural years). During this period:

- Farmers commit to enrolling the same identified land parcels for the duration of the agreed term.

- The enrolled areas may not be registered simultaneously in another carbon program for the same scope of activities and timeframe.
- The exclusivity provision ensures avoidance of double claiming and protects the environmental integrity of the project.

2. Compliance with Agronomic and Program Requirements

Participating farmers commit to:

- Implementing the agronomic recommendations provided by the Project Operator;
- Applying the production practices and management methods defined in their individual farm-level strategy;
- Maintaining compliance with enhanced good agricultural and environmental standards required for additionality under the carbon program.

Compliance is documented through structured monitoring activities conducted in accordance with the approved carbon methodology. Monitoring includes verification of practice implementation and consistency with program requirements.

3. Performance Obligations and Penalty Framework

The contracts establish a proportionate penalty framework applicable in cases of material non-performance or unjustified delay in fulfilling contractual obligations.

- Delays in contractual performance may trigger financial penalties calculated as a percentage of the outstanding obligation, subject to a predefined cap.

- In cases of significant breach of core program obligations, predefined contractual remedies may apply.

However, where non-performance results from circumstances outside the farmer's control — such as loss of legal grounds for a portion of enrolled land — financial penalties related to program participation do not automatically apply.

4. Treatment of Area Loss and Leakage Events

If a farmer loses legal control over part of the enrolled land during the contract period:

- The contractual penalty framework is adjusted accordingly.
- Any resulting shortfall in credited removals is managed through the project's buffer and risk management mechanisms, rather than through automatic financial sanctions against the farmer.
- This approach ensures balanced risk allocation and protects farmers from disproportionate liability in cases of legitimate tenure changes.

5. Alignment with MRV and Methodology

All contractual commitments are aligned with:

- The approved carbon methodology;
- The monitoring, reporting, and verification (MRV) framework;
- The additionality and permanence safeguards embedded in the program design.

Compliance is subject to documented monitoring and verification procedures to ensure transparency and auditability.

MRV non-compliance corrective actions are taken as per the established Corrections Mechanism Policy.

5.2. Baseline Justification & Conservativeness

The baseline for the Carbonsafe SOC project in North Province represents the most plausible set of agronomic conditions and management behaviors that would persist on enrolled fields in the absence of the project. It is anchored in three pillars: (i) the observed regional agronomic context (climate, soils, and prevailing practices), (ii) the five-year pre-enrollment management history at field level, and (iii) a field-specific, geo-referenced baseline SOC stock established through accredited laboratory analysis at Year 0 (the first sampling campaign)

5.2.1. Regional agronomic context

The Northern Region represents Bulgaria's agricultural heartland—its largest continuous arable zone and principal source of cereals and oilseeds. Climatic conditions are predominantly temperate-continental, with average annual precipitation of 480–650 mm and increasing irregularity. Hot summers, cold winters, and spring rainfall extremes shape the agronomic context.

Soils are highly productive but also sensitive to degradation. Key regional constraints include:

- Soil erosion (water and wind) on loess and chernozem plateaus;
- Declining SOC stocks from intensive tillage and residue removal;
- Soil compaction and loss of infiltration capacity;
- Drought vulnerability due to poor water retention.

These agronomic conditions confirm that, under BAU, the region's soils provide limited natural capacity for SOC accumulation and are structurally predisposed to further decline without regenerative management.

Agroclimatic Conditions – July

During the month of July, the recorded precipitation in the country's agricultural zone was below the climatological norms for the period. Only in certain locations in Northern Bulgaria were rainfall amounts recorded that had agricultural significance.[42]

By the end of July, the productive soil water reserve was almost completely depleted in many field regions across the country.

During the first ten-day period of July, dry and hot weather, with maximum temperatures in some areas of the Danubian Plain – Novo Selo, Svishtov, Ruse, and Silistra – reaching 40–42°C, put the survival of part of the spring crops grown under rainfed conditions at risk. In Northeastern Bulgaria – agro-stations Shumen, Ruse, Silistra, Provadia, and Preslav – as well as in southern regions, maize and sunflower exhibited severely impaired turgor. In some maize fields, yellowing and drying of leaves from the lower canopy layers were observed. At the end of the first ten-day period, a short-term decrease in temperatures occurred, temporarily normalizing agro-meteorological conditions.

During most of the second ten-day period, agro-meteorological conditions were characterized by temperatures above climate norms and a deepening soil moisture deficit.

During the third ten-day period, crop development continued to be determined by above-normal thermal conditions and a worsening soil moisture deficit. In many parts of the country, maximum temperatures exceeded 40–41°C, and in the regions of Vidin, Montana, Lom, Kneja, Ruse, and Sandanski, values up to and above 42°C were recorded. As a result of unfavorable agro-meteorological conditions, crop damage increased – leaf scorching in maize and sunflower, sterility in late vegetable production, and premature leaf fall in some perennial crops.

[42] National Institute of Meteorology and Hydrology (NIMH). (2025, July). Агрометеорологичен бюлетин – юли 2025 г. [Agrometeorological Bulletin – July 2025]. Sofia, Bulgaria: NIMH. Available at: https://bulletins.cfd.meteo.bg/bull/Buletin_NIMH_202507.pdf

Climate Overview 2025

The year 2025[43] was another warm year for Bulgaria since the beginning of the 21st century, with a national average temperature approximately 1.2°C above climatic norms. It was as warm as 2019 and about 0.8°C cooler than the record year 2024. It was characterized by a hot summer, the third warmest since 1930, after the summers of 2024 and 2012.

Evidence-Based Baseline Justification

Evidence 1 – Plant Protection Products

"The current application of plant protection products does not pose a contamination threat, but excessive use in the past still shows the presence of residual quantities of certain products."

The detected residual quantities resulting from excessive past use indicate long-term implementation of an intensive conventional management model. This demonstrates structural dependence of production systems on chemical inputs and the absence of a natural transition toward low-intensity or regenerative practices.

Evidence 2 – Soil Erosion

"Erosion significantly affects the ecological and economic functions of soil..."

Approximately 85% of soils in the country are affected by erosion processes, and around 30% are subject to wind erosion. The highest wind erosion intensity is observed in Dobrich (2.2 t/ha/year), Sofia Region (0.9 t/ha/year), and Varna (0.5 t/ha/year). Soil losses are greatest in Burgas and Varna, followed by Plovdiv, Sofia Region, Dobrich, Haskovo, and Stara Zagora.

These values confirm active degradation processes within parts of the project area. Wind erosion removes the surface horizon rich in organic matter, limiting the natural potential for soil carbon accumulation. In the absence of targeted measures to improve soil cover and reduce tillage intensity, continuation of conventional management represents the most plausible baseline scenario, under which sustainable SOC increase is not expected.

Evidence 3 – Humus Decline and Stubble Burning

"The total humus content in Bulgarian soils is not high and has declined over the past 20–30 years due to intensive and monoculture agriculture..."

These processes confirm that, without targeted intervention, continued dehumification is highly likely. Therefore, continuation of conventional management represents the most plausible baseline according to the methodology.

Evidence 4 – Decline in Soil Organic Matter (SOM)

The decrease in SOM over the past 20–30 years is due to:

- Intensive monoculture agriculture
- Lack of scientifically based crop rotations
- Limited or absent organic fertilization
- Predominantly nitrogen-based fertilization

These practices accelerate mineralization of organic matter and lead to depletion of soil resources. Therefore, under the current management model, stabilization or increase of soil organic carbon is not expected.

Evidence 5 – Short-Term Leasing Model

[43] National Institute of Meteorology and Hydrology (NIMH). (2025). Климатична характеристика на 2025 г. [Climate characteristics of 2025]. Sofia, Bulgaria: NIMH. Available at: https://meteo.bg/meteo7/bg/node/1255

Short-term leasing creates incentives for short-term yield maximization rather than long-term soil fertility maintenance. Tenants lack motivation to invest in balanced fertilization, organic amendments, or diversified crop rotations.

Existing Rural Development Program measures require agrochemical analyses but do not mandate restoration or increase of soil organic matter.

Therefore, in the absence of an additional economic incentive such as a carbon project, continuation of the current short-term management model is the most likely scenario.

National Programme for Sustainable Land Management – Key Findings[44]

- 10–40% reduction in soil organic matter in arable land compared to virgin soils
- High wind erosion risk in Dobrich, Pleven, Ruse, Silistra, and others
- Structural degradation due to compaction
- 35,500 ha affected by salinization
- Bipolar agricultural structure
- Land concentration in farms >100 ha
- Irrational crop rotation (72% of arable land)
- Dominant nitrogen fertilization
- Frequent stubble burning
- Insufficient rainfall during warm season (<300 mm)
- High rainfall erosivity index (USLE EI30 600–1000+)

Final Conclusion – Plausible Baseline Scenario

Based on national data indicating:

- Persistent climate pressure (+1.2°C above norm; frequent >40–42°C events)
- Insufficient precipitation
- High soil erosion levels
- Long-term dehumification trend
- Structural soil degradation
- Dominance of monoculture and intensive systems
- Unbalanced fertilization
- Short-term lease-driven management model

The most plausible scenario in the absence of a carbon project is the continuation of conventional management without systematic implementation of regenerative practices.

Climatic conditions increase mineralization of organic carbon, erosion losses, and water stress. Alternative interventions (cover crops, reduced tillage, increased soil cover) are unlikely without external incentives.

The production system is structurally conventional and intensive. The economic logic of short-term yield maximization does not create incentives for soil restoration investment.

Therefore, regenerative transition is unlikely without an external mechanism.

Under this scenario, sustainable increase in soil organic carbon is not expected. Rather, stabilization or further degradation processes are likely, which corresponds to the methodology-required plausible baseline.

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[44] Ministry of Environment and Water of the Republic of Bulgaria (MOEW). (2014). Национална програма за действие за устойчиво управление на земите и борба с опустиняването в Република България [National Action Programme for Sustainable Land Management and Combating Desertification in the Republic of Bulgaria]. Sofia, Bulgaria: Ministry of Environment and Water. Available at: https://www.moew.government.bg/static/media/ups/tiny/УООП/ПОЧВИ/НАЦИОНАЛНА%20ПРОГРАМА.pdf

5.2.2. Prevailing practices.

National and regional data confirm that reduced- and zero-tillage practices remain minimal in Bulgaria. According to Eurostat (2020), "zero till" systems represent only ~3–4% of EU arable land and are close to zero in Bulgaria. "Conservation tillage," as defined by ≥30% residue cover, may reach ~40% nationally, but the underlying practices often involve shallow tillage, not residue retention or cover cropping.

In Northern Bulgaria, this reality manifests as:

- Annual deep ploughing across most holdings;
- Residue removal for fodder, bedding, or energy;
- Sparse cover cropping, usually limited to pilot trials;
- Fertilization based on mineral inputs, not organic matter renewal;
- Lack of SOC monitoring or soil carbon accounting.

Farming systems therefore maintain productivity but fail to regenerate soil carbon or resilience. Anchoring the baseline in geo-referenced Year 0 SOC stocks and five-year management histories ensures conservative accounting, with credits issued only for measurable, additional improvements.

5.2.3. Regulatory and policy context.

Neither Bulgarian agricultural legislation nor CAP conditionality requires adoption of the regenerative bundle promoted by the project (annual cover crops or intercrops where feasible, residue retention, reduced disturbance, diversified rotations, soil test-guided fertilization, and annual SOC monitoring). Agro-environmental schemes exist but are voluntary and fragmented, and do not systematically drive SOC increases. Thus, absent project incentives, farms have no regulatory obligation to adopt comprehensive regenerative practices or to monitor SOC at field level.

5.2.4. Field-level definition of the baseline.

Five-year pre-enrollment management history is reviewed for completeness and plausibility. This historical profile establishes the business-as-usual (BAU) baseline management against which additionality is assessed. In parallel, Carbonsafe determines the baseline SOC stock for each plot (cell) through geo-referenced coring and accredited laboratory analysis. For every plot (cell), the baseline is defined as the SOC stock from the first sampling campaign. If there is an increase in the subsequent sampling campaign the baseline is moved to the highest measured SOC stock value ever recorded for that plot (cell). All subsequent measurements are compared exclusively against the maximum reference point. Because each plot (cell) baseline is dynamically anchored to its peak SOC result, the system prevents over-crediting and ensures that reductions are transparently recognized. At the farm level, the balance is reset annually and reflects the actual total net removals of all plots (cells) in that reporting year, rather than a cumulative projection. This approach avoids reliance on modeled counterfactual trajectories, applies strict conservativeness, and ensures that issuance is based solely on observed, verifiable improvements in soil carbon. Removals are credited ex post, and only when a positive farm balance is observed credits are issued.

The application of a dynamic baseline anchored to the highest historically measured Soil Organic Carbon (SOC) stock value is explicitly defined and permitted under the approved Methodology. The Methodology *section 3.2 Farm balance* establishes conservative baseline determination rules allowing or requiring the use of the highest historical SOC measurement within the defined reference period to prevent over-crediting and ensure environmental integrity.

This approach is therefore not a discretionary developer-level adjustment, but a methodological requirement implemented to align with the conservativeness principles embedded in the approved soil carbon accounting framework. The application of the highest historical SOC value as baseline ensures that only demonstrable net increases beyond the most conservative reference level are eligible for crediting.

Given North's climatic variability, the historical evidence of SOC vulnerability under conventional tillage, and the lack of regulatory drivers mandating regenerative practices, the most credible and conservative baseline is the continuation of pre-project management, with no systematic SOC enhancement. Anchoring the baseline in Year 0 SOC measurements and farm management histories ensures that only real, additional SOC gains are credited.

The Carbonsafe baseline is designed to err on the side of under-crediting, such that no carbon removal is issued unless it is demonstrably real, material, and statistically supported. Conservativeness is embedded in how the baseline is defined, measured, and compared to with-project results, in the statistics used to quantify change, and in the issuance policy that further buffers any residual over-statement risk.

The baseline is a field-specific, geo-referenced SOC stock established at Year 0 from accredited laboratory analysis of composite samples collected within fixed sampling plots. In the counterfactual (without project), the baseline assumes no systematic SOC increase; any gains attributable to improved management are a project effect.

5.2.5. Sampling and Laboratory Safeguards.

Field and lab QA/QC—certified reference materials and chain-of-custody—are mandatory. Inorganic carbon is excluded via pretreatment or correction to ensure only organic carbon is counted. Coarse fragments and bulk density are measured using agreed protocols to avoid stock inflation.

5.2.6. Spatial and depth boundaries.

Stocks are quantified to 0–30 cm, 30–60 cm, 60–90 cm. Although deeper horizons may contain additional carbon, the project does not claim beyond 90 cm, avoiding optimistic attributions in deep layers that are harder to influence and verify. Plot boundaries are fixed. The applied Methodology specifies sampling at 0–30 cm, 30–60 cm, 60–90 cm.

Коментирал [S7]: As per the PDD Template requirement, in Section 5.2.6, the PP is required to address the following requirement: '***Justify the spatial extent and soil depth included in baseline accounting***.' However, the description provided only addresses the soil depth portion of the PDD requirement.

The PP shall also justify the spatial extent of the project area included in baseline accounting.

Коментирал [DK8R7]: Section 5.2.6. Spatial and depth boundaries. Has been updated to include justification of the spatial extend.

Baseline accounting is conducted only within the enrolled and eligible project area included within the project boundary. The spatial extent is defined using georeferenced parcel boundaries established at enrollment and corresponds to the area where project activities are implemented, monitored, and credited. Plot boundaries are fixed at enrollment and range from 4 to 25 hectares (+3% tolerance, i.e., up to 25.75 ha). Restricting baseline accounting to this fixed and traceable project area ensures consistency between baseline and project carbon stock assessments and prevents the inclusion of non-project lands.

5.2.7. Temporal safeguards

The baseline year is established prior to any credited practice changes; any pre-enrollment improvements are not credited. If severe anomalies (e.g., extreme flood/drought) compromise data integrity, issuance for affected plots is deferred until re-measurement confirms direction and magnitude.

Under the grouped project structure, each participating farm (sub-project) establishes its own Year-0 baseline at the time of formal enrolment and completion of the initial soil sampling cycle. The baseline year corresponds to the year in which baseline sampling results are finalized for that specific sub-project.

No carbon credits are issued for any SOC stock changes occurring prior to the established Year-0 baseline. SOC changes are quantified exclusively relative to the sub-project's defined baseline and only for monitoring periods following enrolment.

5.2.8. Governance and Transparency

Independent validation and verification (VVB) review the baseline construction, sampling frames and calculation sheets. All issued credits are traceable in the registry with serials that encode project, farm and vintage. Any material correction discovered post-issuance results in adjustments to reserve releases or credit cancellation. In such cases Carbonsafe will enforce the established Corrections Mechanism Policy.

Carbonsafe is responsible for identifying, documenting, and proposing corrective actions based on monitoring data, verification findings, or internal procedures. The validation of such corrections is subject to independent review by the VVB where applicable. The registry (BCCR) retains the authority to execute all changes to issued credits, including serial adjustments, reserve reallocations, or cancellations, based on formally submitted and validated instructions. All actions are recorded within the registry system, ensuring full traceability, audit trail, and compliance with registry governance rules.

5.3. Additionality Demonstration

5.3.1. Legal Compliance & Non-Mandatory Nature

The Carbonsafe project for North region satisfies regulatory (legal) additionality because none of the practices credited, nor the project's MRV and issuance framework, are required by law for participating farms in North Province. In the absence of the project, farmers are obligated to meet general agricultural laws and CAP conditionality (e.g., good agricultural and environmental conditions, basic soil-erosion safeguards, crop diversification rules where applicable), but they are not required to:

(i) adopt the comprehensive regenerative bundle specified by the project (reduced/no-till with residue retention, annual cover/intercrops where feasible, diversified rotations, organic amendments, soil-test-based nutrient management),

(ii) implement annual, geo-referenced, multi-depth SOC measure–remeasure sampling to 90 cm using accredited labs, or

(iii) generate, verify, and register ex-post carbon removal credits traceable to farm-level serials.

The Common Agricultural Policy (CAP) was among the earliest comprehensive policy frameworks introduced by the European Economic Community, which later evolved into the European Union. Established under the Treaty of Rome in 1958 and formally implemented in 1962, its original purpose was to strengthen Europe's food supply resilience and address food shortages following World War II.

Today, the CAP supports broader socio-economic goals, including ensuring food security and sustaining rural livelihoods. It does so primarily through direct income payments to farmers and incorporates social safeguards, such as measures to facilitate access to support for smaller agricultural producers and initiatives aimed at strengthening farmers' positions within agricultural value chains.

CAP functions as a unified policy framework applicable across all EU Member States. It is financed and administered at the European level through the EU budget, representing approximately one-third of total EU expenditure during the 2021–2027 programming period. Member States are required to provide a set of mandatory income support payments, including a basic income support component and payments linked to climate, environmental protection, and animal welfare objectives. These environmental payments, often referred to as eco-schemes, are compulsory for Member States to offer but remain optional for farmers to participate in.

A central feature of the CAP is its internal compliance system, known as conditionality (previously cross-compliance). This mechanism establishes baseline standards that farmers must meet to qualify for EU income support.

Conditionality requirements are divided into two categories:

- Statutory Management Requirements (SMRs): These apply broadly to farmers, regardless of whether they receive CAP funding, and encompass EU legislation related to public health, animal health, plant health, animal welfare, and environmental protection.
- Good Agricultural and Environmental Conditions (GAECs): These apply specifically to farmers receiving CAP payments and go beyond general statutory obligations by setting standards for sustainable land management.

SMRs focus on compliance with overarching EU regulations and do not mandate particular cultivation techniques or activities relevant to the Project. GAEC standards provide general guidelines for responsible agricultural management and partially overlap with the Project's practices. However, adherence to GAECs is a prerequisite for receiving CAP support rather than a mandatory obligation imposed independently of participation in subsidy schemes. Consequently, these requirements do not conflict with the regulatory surplus condition necessary to demonstrate Additionality.

Within CAP, the primary income support instrument is the Basic Income Support for Sustainability (BISS), which replaced earlier schemes such as the Basic Payment Scheme. These foundational payments are contingent upon compliance with SMRs and GAECs. Beyond these base payments, farmers may voluntarily apply for additional support programs, including assistance for young farmers and eco-schemes introduced under the 2023–2027 CAP reform.

At the national level, GAEC standards are supplemented by domestic legislation and regulatory instruments that impose obligations on agricultural land management, including preventing soil degradation. However, none of these provisions require farmers to implement the specific practices included in the Project.

The 2023–2027 CAP reform introduced eco-schemes as voluntary instruments intended to encourage enhanced environmental performance beyond GAEC requirements. These schemes promote selected "green" agricultural practices. Eco-schemes[45] are not considered mandatory regulatory requirements. Their voluntary nature ensures they do not undermine the regulatory surplus criterion.

Although eco-schemes aim to improve environmental outcomes, including soil quality, they are structured in a way that limits farmers to selecting only one practice at a time, without combining multiple measures. Furthermore, participation is generally limited to one year, with incentives—but no binding obligation—to continue in subsequent years. Even where certain eco-scheme practices resemble those promoted by Carbonsafe, farmers may choose from a broader menu of nine different eco-schemes. Importantly, eco-schemes do not require long-term commitment, nor do they specifically mandate measurable soil organic carbon (SOC) enhancement. This absence of permanence and explicit SOC measurement confirms that participation in eco-schemes does not compromise the Project's compliance with regulatory surplus requirements.

As with other EU Member States, Bulgaria implements CAP through a national Strategic Plan that defines applicable GAEC standards and available eco-schemes. For example, GAEC 5, which is relevant to the Project, includes provisions related to tillage practices, particularly restrictions on cultivation along slopes and prohibitions against disturbing waterlogged or flooded soils. The purpose of GAEC 5 is to reduce erosion and surface runoff. However, it does not impose requirements aimed at increasing soil carbon stocks. Therefore, while farmers must comply with GAEC 5 to qualify for voluntary eco-scheme payments, it does not constitute a mandated carbon sequestration practice and does not affect the Project's additionality assessment.

It should be explicitly noted that none of the GAEC standards require monitoring of soil organic carbon (SOC) levels or the collection of soil samples. GAEC provisions establish general land management principles but do not mandate SOC measurement, laboratory analysis, or quantified carbon stock reporting.

Eco-schemes, while promoted under the CAP framework, are considered compensatory and voluntary support mechanisms that go beyond statutory requirements. They fall outside the regulatory surplus test, as they are not mandatory obligations imposed by law. Participation in eco-schemes does not require long-term commitment, nor do these schemes mandate soil sampling, SOC monitoring, or quantified carbon accounting.

Eco-schemes are voluntary in nature and typically short-term. They provide comparatively lower and less predictable payments. Farmers may participate in an eco-scheme by selecting only one eligible practice and are not permitted to apply with a combination of practices under a single

[45] https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans/bulgaria_en

scheme. In contrast, the Project Activity as explained in Section 2.1 involves a structured, multi-step approach with long-term commitment, monitored implementation, and verified SOC measurement, which clearly distinguishes it from eco-scheme participation.

5.3.2. Legal compliance baseline

Participating farms must comply with Bulgarian law, CAP cross-compliance/conditionality, pesticide and fertilizer regulations, and any site-specific restrictions (e.g., protection rules if applicable). These rules set minimum environmental performance (e.g., erosion control, basic crop diversification) but do not prescribe the project's specific management system, do not mandate annual SOC measurements, and do not compel participation in a carbon crediting project. Consequently, all SOC increases credited by Carbonsafe arise from actions and monitoring that exceed legal minimums and therefore pass the "regulatory surplus" test.

5.3.3. Public Incentives and Eco-Schemes

Where farmers voluntarily enroll in eco-schemes or agri-environmental measures, these are incentive-based, not compulsory. Participation (or non-participation) does not alter the project's regulatory additionality: even when public support helps defray costs of practice adoption, there remains no legal requirement to produce measured SOC gains or to undertake certified MRV and issuance. Carbonsafe ensures no double counting of the same outcome across instruments; the creditable unit under this project is the measured increase in SOC stock ex-post, which is not awarded by law or regulation.

5.3.4. Evidence and Documentation.

Each farm provides:

1. Five-Year Pre-Enrollment Practice History – a record of land management activities over the previous five years, demonstrating that project practices will be newly adopted and not part of existing routine operations maintained practices will be improved.

2. Exclusivity Statement – a signed application including a section confirming that the enrolled land is not, and will not be, claimed under any other carbon project, thereby avoiding overlap or double-counting.

These records are reviewed by Carbonsafe and subject to third-party verification (VVB).

For evidence and validation checks Carbonsafe uses satellite data and also collects from farmers copies of the survey cards, registration cards, and IACS applications, including attached parcel maps for 5 years period prior to enrollement.

5.3.5. Dynamic Regulatory Assessment).

The project applies a dynamic regulatory screen: should Bulgarian or EU rules later mandate elements that materially overlap with credited activities (e.g., compulsory cover crops or legally required SOC monitoring), Carbonsafe will reassess additionality for affected practices or plots inaccordance to new emerged regulations. Depending on the scope and timing, the project will (i) adjust baselines or accounting boundaries, (ii) cease crediting for now-mandated elements, and/or (iii) require an update of the methodology and issuance policy to preserve environmental integrity.

5.3.6. Separation from compliance obligations

Credits issued under Carbonsafe are not used to satisfy legal pollution limits or agricultural compliance obligations, nor are they double-claimed against the national GHG inventory. Registry procedures (BCCR) and project contracts enforce no double issuance/use and clear ownership and claim boundaries. This separation ensures that credited removals remain voluntary and additional to statutory requirements and government accounting.

Carbon credits issued under this project are generated exclusively within the voluntary carbon market and are intended for corporate sustainability purposes, including ESG reporting, CSR commitments, and carbon neutrality marketing claims.

These credits are not part of Bulgaria's nationally determined contribution (NDC) accounting framework and are not integrated into the systems used by Member States to report or meet legally binding national greenhouse gas targets under the UNFCCC or EU climate legislation.

As of the date of this PDD, the Bulgarian government has not established any formal mechanism under Article 6 of the Paris Agreement or equivalent regulatory framework to authorize, adjust, or integrate voluntary soil carbon removals into national compliance accounting [46].

Credits issued under this project are clearly identified within the applicable registry as voluntary carbon removals and are not labeled, authorized, or eligible for compliance use.

This structural separation between voluntary credit issuance and national GHG accounting prevents double claiming between corporate sustainability use and national inventory reporting.

5.3.7. Non-Common Practice Analysis.

Carbonsafe demonstrates practice-based additionality by showing that the specific regenerative bundle credited by the project—and the associated annual, parcel-level SOC measure–remeasure MRV—is not common practice in North Bulgaria and would not plausibly occur at scale without the project's incentives, technical support, and verification pathway.

What "non-common practice" means in this project.

For the purpose of eligibility and crediting, "common practice" refers to prevailing management in the same agro-ecological context across comparable farm sizes and crop systems. Carbonsafe defines the following practices that can be included in the credited bundle:

- Zero till;
- Cover crops/intercrops and residue management;
- Organic fertilization (manure, compost and others) and pesticides;
- annual, geo-referenced SOC measure–remeasure (0–30 cm, 30–60 cm, 60–90 cm) in accredited labs and ex-post issuance.

We evaluate the required bundle as a system of at least one practice implemented or improved plus annual, geo-referenced SOC measure–remeasure (0–30 cm, 30–60 cm, 60–90 cm) in accredited labs and ex-post issuance.

Legend of Practices		
I.	**Zero-till**	1. Conservation without processing
II.	**Cover crops/intercrops and residue management**	2. Treatment of beds 3. Minimal processing 4. Biological agriculture 7. Diversification of crops 10. Cultivation of nitrogen-fixing crops 11. Mulching treatment 13. Processing of stripes

[46] United Nations Framework Convention on Climate Change (UNFCCC). (n.d.). *Article 6.4 mechanism: National authorities*. Retrieved April 2, 2026, from https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism/national-authorities#country_AtoZ

	14. Pasture and/or crop rotation and crop rotation management 15. Weeding of the rows in perennial crops and vineyards 16. Joint cultivation of more than one agricultural crop 17. Implementation of strip farming 18. Improvement measures in permanently grassed areas
III. Organic fertilization (manure, compost and others) and pesticides	5. Integrated production 6. Precision agriculture 8. Fertilization with microbial fertilizers 9. Green fertilization (Sideration) 12. Use of organic/natural pesticides

1. Method applied

Per methodology: to show the activity (or suite) is not common, the area-weighted mean adoption rate of the two (or more) predominant proposed activities in each region must be < 20%. When no statistics exist for their combined adoption, multiply pre-project adoption rates of the individual activities.

Carbonsafe applies the internationally recognized <20% common-practice threshold from the UNFCCC/CDM tool, which sits below the diffusion 'critical mass' and minimizes free-rider risk; where joint-adoption data are absent, we multiply individual adoption rates as a conservative proxy for suite adoption.

We use national adoption signals as conservative upper-bounds (regional data are sparser; using national maxima is conservative for regions with even lower uptake):

- Cover crops (BANCIK/MAFF 2000–2022):

EA_{cover} = 2% = 0.02

- Zero tillage in EU (According to Eurostat, Bulgaria's zero-till % is close to zero, but we will take the EU zero-till adoption rate for the purposes of the calculation) (Eurostat/MAFF 2016 & 2020):

$EA_{zero\text{-}till}$ = 3.7% = 0.037

1.1 Base calculation (two-activity product):

$EA_{bundle,base} = EA_{cover} \times EA_{zero\text{-}till}$ = 0.02 x 0.037 = 0.00074

Expressed as percent:

AR_{base} = 0.074% (<20%)

1.2. Conservative 3-activity extension (when manure/organic inputs are considered):

Using manure application share as an upper-bound proxy for organic inputs:[54]

- Manure application: EA_{manure} = 5.30% = 0.053

$EA_{budle,\ 3\text{-}act}$ = 0.02 x 0.037 x 0.053 = 0.00003922 → $AR_{3\text{-}act}$ = ~0.003922% (<20%)

1.3. Adding MRV rarity (upper-bound stress test):

Routine annual SOC testing to 90 cm in accredited labs with geo-referencing is assumed to be effectively near-zero in commercial practice. Applying a lenient upper bound of 1%:

$EA_{bundle+MRV}$ = 0.02 x 0.037 x 0.053 x 0.01 = 0.0000003922 → 0.00003922% (<20%)

1.4. Sensitivity (conservative "inflation" of adoption to test robustness):

- Scenario A (double both inputs):
  Cover = 4.00% (0.04); Zero-till = 7.4% (0.074)

0.04 x 0.074 = 0.00296 → 0.296% (<20%)

- Scenario B (10× zero-till; 2× cover):
  Cover = 4.00% (0.04); Zero-till = 37% (0.37)

0.04 x 0.37 = 0.0148 → 1.48% (<20%)

Even with aggressively inflated assumptions, the area-weighted mean adoption remains orders of magnitude below the 20% threshold.

2. Regional application (grouped project)

For grouped projects, additionality is demonstrated on the initial instances and applies to subsequent instances within comparable agro-ecological contexts. For example, Carbonsafe's regions (Dobrich, Lovech, Pleven, Targovishte, Shumen, Varna, Vratsa,) share arable systems where:

- Zero-till is marginal nationally;
- Cover-crop prevalence is low and heterogeneous;
- Annual, geo-referenced 0–90 cm SOC MRV in accredited labs is exceptional.

Accordingly, the area-weighted mean adoption of the two predominant practices (zero-till + cover crops) in each region remains < 20%. The Carbonsafe bundle + MRV is rarer still.

3. Not-Common Practice Test — Passed

- Quantitative test (per methodology): Using conservative national adoption maxima for cover crops (2%) and zero-till at EU level (3.7%), the combined adoption is 0.074%—far below the 20% threshold. Incorporating a third activity (manure inputs 5.30%) and the rarity of annual 0–90 cm accredited MRV drives the implied combined prevalence to ~0.003922% and ~0.00003922%, respectively.
- Regional relevance: The same conclusion applies across all project regions; none approach the 20% bar.
- Governance: Ex-post issuance, annual measure–remeasure, and VVB oversight ensure ongoing confirmation.

Therefore, Carbonsafe's credited bundle + MRV is demonstrably *not common practice*.[47][48][49][50][51][52][53][54][55]

5.3.8. Evidence sources and triangulation.

To establish that the bundle is not common practice, the project employs a triangulated evidence framework:

1. Farm-level pre-enrollment history (5 years) of operations: For evidence and validation checks Carbonsafe uses satellite data and also collects from farmers copies of the survey cards, registration cards, and IACS applications, including attached parcel maps for 5 years period prior to enrollementRegional agronomic intelligence. Interviews with local

[47] UNFCCC. (2015). *Tool for the demonstration and assessment of additionality (Version 07.0): Market penetration approach* (EB 88, Annex 1). CDM Executive Board. Retrieved from https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20220713215726950/MP88_EA01_CN_Market%20Penetration.pdf

[48] Agrostatistics Department, Ministry of Agriculture and Food of Bulgaria (MAFF). (2000–2022). *BANCIK Survey of Land Cover and Land Use*. North: MAFF. [Available in Bulgarian].

[49] Eurostat. (2016, 2020). *Agri-environmental indicator – Tillage practices.* Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Agri-environmental_indicator_-_tillage_practices

[50] Eurostat. (2016, 2020). *Crop production methods – soil management (ef_mp_prac)* [Data set]. Eurostat Data Browser. Retrieved from https://ec.europa.eu/eurostat/databrowser/view/ef_mp_prac/default/table?lang=en

[51] Eurostat. (2016, 2020). *Land use by NUTS 2 regions (ef_lus_main)* [Data set]. Eurostat Data Browser. Retrieved from https://ec.europa.eu/eurostat/databrowser/view/ef_lus_main/default/table?lang=en

[52] Ministry of Agriculture and Food of Bulgaria (MAFF), Agrostatistics Department. (2016, 2020). *National agristatistics on soil management*. North: MAFF. Retrieved from https://www.mzh.government.bg/bg/statistika-i-analizi/

[53] Ministry of Agriculture and Food of Bulgaria (MAFF). (2016). *Farm Structure Survey (FSS) – Bulgaria*. In *Научни трудове на АУ – Пловдив, том LXIV, кн. 2.* Retrieved from http://nauchnitrudove.au-plovdiv.bg/wp-content/uploads/2021/10/02_02_2020.pdf

[54] Eurostat. (n.d.). *Glossary: Farm structure survey (FSS).* Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Farm_structure_survey_(FSS)

[55] Eurostat. (n.d.). *Farm structure survey – Survey coverage.* Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Farm_structure_survey_%E2%80%93_survey_coverage

agronomists, cooperatives, and input retailers, and review of extension materials, provide qualitative indicators of adoption barriers (equipment cost, weed control in dry springs, seed availability for cover crops, moisture competition risks) and the relative rarity of the practice bundle.

2. Regulatory and subsidy mapping. We distinguish incentivized but voluntary practices (eco-schemes) from mandated measures (cross-compliance). The existence of a subsidy does not imply common practice; enrollment rates, agronomic feasibility, and persistence matter. This is further discussed in section 5.3.1 Legal Compliance & Non-Mandatory.

3. We review EU and national signals on reduced/zero till adoption, winter cover prevalence, and SOC trends in arable systems.

5.3.9. Handling partial or transitional practices.

Not applicable.

This section is not applicable to the current project design. The project applies a forward-looking measure–remeasure approach, under which soil organic carbon (SOC) changes are quantified exclusively based on monitored results following the implementation of project-prescribed regenerative practices.

No assumptions or credits are attributed to partial, historical, or transitional practices prior to project enrolment. All eligible removals are determined based on ex-post measured SOC changes, ensuring full alignment with conservativeness and additionality principles. Therefore, a dedicated framework for transitional practices is not required.

5.3.10. Practice Bundle Assessment

Across Northern Bulgaria, the combination of climatic, economic, and structural factors prevents widespread adoption of the Carbonsafe regenerative bundle—reduced disturbance, residue retention, winter cover cropping, nutrient management, and organic fertilization guided by soil testing, and accredited SOC MRV.

- Climatic barriers: Hot, dry summers and irregular rainfall discourage cover cropping, perceived as water-competitive and costly.
- Economic barriers: Straw and stalks remain valuable commodities; their removal limits residue retention.
- Operational habits: Deep ploughing is embedded in farm routines and seen as essential for weed and pest control.
- Organic fertilizer barriers: The use of organic fertilizers, including manure, is limited due to the declining number of livestock farms, the insufficient availability of organic raw materials, and the separation of crop production from livestock production. Additional barriers include the high costs of transporting, storing, and applying organic fertilizers, as well as less precise nutrient management compared to mineral fertilizers.
- Information and infrastructure gaps: SOC monitoring and regenerative know-how are limited; laboratory access remains centralized and costly.

As a result, even where elements of reduced tillage or partial cover exist, they are rarely combined or sustained over time. The full regenerative system promoted by Carbonsafe—supported by rigorous MRV—remains non-common practice across all provinces of Northern Bulgaria.

5.3.11. Governance safeguards

To prevent over-crediting where practice novelty is ambiguous, Carbonsafe embeds two safeguards:

Коментирал [S9]: In Section 5.3.7, the PP has stated that the following practices can be included in the credited bundle:
•Zero till;
•Cover crops/intercrops and residue management;
•Organic fertilization (manure, compost and others) and pesticides;
•annual, geo-referenced SOC measure–remeasure (0–30 cm, 30–60 cm, 60–90 cm) in accredited labs and ex-post issuance.

In Section 5.3.10 of the PDD, the PP has described the barriers for cover cropping, residue retention, and tillage practices. However, the PP has not explained why organic fertilization remains additional.

The PP shall revise Section 5.3.10 to include the relevant barriers and justification for all applicable practices in the credited bundle, including organic fertilization.

Коментирал [DK10R9]: Section 5.3.10. Practice Bundle Assessment has been updated to include organic fertilization barriers.

Форматирано: английски (Съединени американски щати)

(1) Ex-post issuance only when measured SOC increases in sub-projects (no credit for intent alone); and

(2) a sub-project 25% issuance / 75% performance reserve that delays most value until verified gains are demonstrated.

5.4. Barrier Analysis

In the agro-ecological and market context of North Province, the transition from conventional or mixed tillage to a comprehensive regenerative bundle faces a set of material financial and behavioral barriers. Absent a credible incentive mechanism and structured technical support, these barriers keep most farms locked in path-dependent routines that are operationally familiar, cash-flow compatible, and perceived as lower risk.

Institutional/Practical Barriers:

- Investment barriers: specialized drills/planters, roller-crimpers, precision technology; lumpy capex; scarce working capital.
- Technological barriers: know-how gaps on cover crop species/termination; local seed availability; moisture management in semi-arid springs; agronomy for reduced disturbance.
- Policy/payment uncertainty: CAP eco-schemes are voluntary, modest (€16–€38/ha, lower for large farms), administratively complex, and were under-subscribed; reforms ongoing.
- Behavioral/cultural: risk aversion; reliance on established tillage/weed-control routines; transition-year yield risks.
- Tenure/organizational: short leases; fragmented land; contractor/labor coordination.
- MRV burdens: annual geo-referenced multi-depth coring (0–30/30–60/60–90 cm), accredited labs, chain-of-custody, and third-party VVB—not done under BAU.

5.4.1. Financial Barriers

Many farms in North Province lack the specialized equipment (no/low-till drills, high-residue planters, roller-crimpers, precision applicators) needed to consistently implement reduced disturbance and managed cover. While some peri-urban vegetable producers own small-scale mechanization, larger grain farms in the North Valley may rely heavily on deep ploughs and conventional seeders. Converting fleets or purchasing suitable regenerative machinery could require non-trivial capital investments that are difficult to amortize under fragmented land tenure and short lease terms. On the operating side, cover crop seed and termination may add costs and management complexity—particularly in a climate where spring wet spells complicate planting and summer droughts intensify water-competition risks. Retaining crop residues also poses opportunity costs, as straw and stover are valuable for feed, bedding, or household use in the mixed farming systems prevalent around North.

5.4.2. MRV and transaction barriers.

High-integrity carbon accounting requires annual, geo-referenced SOC sampling across fixed plots (4 to25 ha), multi-depth coring and accredited laboratory analysis, plus third-party validation/verification and registry issuance. For an individual farm, the coordination, documentation, and audit overhead is significant: scheduling field access, handling samples, maintaining chain-of-custody, and entering complete activity data (rotations, tillage, residues, applications, yields). Without aggregation, per-hectare MRV costs and transaction friction often exceed any near-term revenue from credits, eliminating the economic case for individual farm participation.

5.4.3. Market and policy uncertainty.

Farmers in North perceive participating on their own in the voluntary carbon market as costly, complex and volatile: buyer standards evolve, ratings and due diligence create additional scrutiny, and price expectations are uncertain.

5.4.4. Behavioral and organizational barriers.

Farming is inherently risk-managed; decision heuristics emphasize operational reliability over experimental gains. Local norms, agronomic advice traditions, and peer influence often discourage deviation from established seedbed preparation and weed-control routines. Knowledge gaps exist around species selection for cover mixes, termination methods, and fine-tuning nutrients under reduced disturbance. Where farms depend on seasonal or migrant labor, introducing new operations (cover establishment, alternative termination) raises training needs and coordination risk—costs that are rarely priced into conventional budgets.

5.4.5. Project Design Response to Barriers

Aggregation to reduce cost and friction - Carbonsafe aggregates multiple farms across North and standardizes MRV through fixed-plot geometry, automatic geo-referenced probing, consolidated logistics, and accredited lab contracts. Economies of scale reduce per-ha costs for sampling, analysis, verification, and registry issuance. The ERP is developing processes to capture operations data once at the source and format it for audit, while Carbonsafe manages chain-of-custody, validator coordination, and registry workflows—removing the transaction burden that would be prohibitive for individual farms.

Performance-based, ex-post revenue with risk-sharing - Credits are ex-post and strictly tied to measured SOC increases. To align incentives and protect buyers and producers against reversal risk, Carbonsafe issues 25% of verified net removals each year and retains 75% in reserve, releasing the reserve in subsequent period only if positive performance is shown. This structure shares risk across the portfolio and smooths cash flow while safeguarding integrity. Importantly, Carbonsafe's revenue-sharing model directs a material share of proceeds to farmers, strengthening the micro-economics of practice conversion.

Targeted agronomic support that lowers transition risk - Each farm receives an annual, plot-level soil profile (SOC plus macro/micro nutrients, pH) and custom agronomic recommendations that optimize fertilization and rotations under reduced disturbance. This data-driven advisory helps preserve yields, reduce unnecessary inputs, and manage water—key for North's drought-prone environment. Where agronomic necessity dictates (e.g., weed outbreaks, wet years), the design allows temporary, strategic tillage without automatic exclusion; instead, issuance follows measured outcomes, avoiding punitive responses to legitimate risk management.

Tenure-aware contracting to solve split incentives - Carbonsafe requires clear land tenure or long-term leases, with contracts that tie credit ownership and revenue allocation to the implementing operator.

Trust, transparency, and market access - All issued units are traceable in the Balkan Carbon Credits Registry (BCCR) with public serials linked to farm and vintage, and the project undergoes independent validation/verification. The methodology is measurement-only and the credits are ex-post, two features that directly address buyer concerns about over-crediting and forecast risk—improving price discovery and off-take reliability for farmers.

Learning loop and de-risking over time - Annual measure–remeasure creates a feedback loop: if a plot (cell) underperforms, advisory shifts minimizing persistent losses. The sub-project reserve and release mechanism provide a prudential security that covers unexpected negatives—giving producers confidence that participation will not expose them to net financial penalties beyond foregone issuance in weak years.

In the absence of Carbonsafe's financial incentives, aggregation, MRV infrastructure, and agronomic advisory, most farms in North region, Bulgaria would rationally delay or avoid adopting the full regenerative bundle at scale. Capital intensity, drought-related transition risk, MRV and transaction costs, and uncertainty about carbon revenues are binding constraints. Carbonsafe's design directly relaxes these constraints—lowering unit costs, sharing risk, clarifying tenure and claims, and converting measured soil carbon gains into bankable, traceable credits—thereby unlocking adoption that is unlikely to occur without the project.

5.5. Financial Additionality

Carbonsafe looks into financial additionality by comparing (i) the counterfactual—continuation of business-as-usual (BAU) management in North Province—with (ii) the with-project case, in which farms adopt the full regenerative practice bundle and submit to annual SOC measure–remeasure MRV, third-party validation/verification, and ex-post issuance. We investigate whether, absent carbon revenue, the with-project case is (a) not financially attractive and/or (b) unlikely to clear adoption benchmarks commonly used by producers (e.g., short payback expectations, working-capital neutrality, volatility tolerance). We also explore whether carbon revenue is the decisive factor that converts an otherwise unattractive or delayed investment into a feasible one.[56][57][58][59][60][61]

We also consider the cost side for farmers associated with their participation in the project. We carry out a comparison of cash flows – revenues and costs – with the cost side including input costs: operational costs of project participation, the risk of reduced yields due to the transition, capital costs, and costs for measurement, verification and reporting (MRV). These data are presented in a cost-benefit analysis.

Cost-benefit analysis – Assumptions

Annual costs for farmers

Type of cost	**Euro/ha**
Soil samples and agronomic recommendations (operational costs)	11.78
Implementation of cover crops	40.00
Allowance for temporary yield loss when introducing new practices	40.00
Total costs	**91.78**

Note: The cost of yield loss is included as a conservative assumption for the purposes of the risk analysis. At present, no systematic yield loss is observed on the farms participating in the project, but the assumption has been made to reflect potential transitional effects when introducing new agricultural practices.

Annual benefits for farmers

Type of benefit	**€/ha**
Revenue from carbon credits	75.00
Savings from optimised fertilisation	60.00
Total benefits	**135.00**

Note: Revenue from carbon credits for farmers is presented with the farmer's share at 50% of total revenue.

Коментирал [DK11]: Text in this section is added for further clarification.
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[56] European Court of Auditors. (2021). *Special Report 16/2021: Common Agricultural Policy and climate – Half of EU climate spending but farm emissions are not decreasing*. Luxembourg: Publications Office of the European Union. Retrieved from https://op.europa.eu
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[60] Carbonsafe. (2024). *Project Registry: Issued credits from projects in Bulgaria*. Retrieved from https://carbonsafe.bg
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Economic indicators per hectare

Indicator	Value
Total benefits	€135.00/ha
Total costs	€91.78/ha
Net benefit	**€43.22/ha**
Benefit-to-cost ratio	**1.47**
Return on investment (ROI)	**47.1%**

Interpretation of results

Even when a conservative assumption of a yield loss of €40/ha is included, the analysis shows a positive financial result. The Benefit-to-Cost Ratio remains above 1 (Benefit-to-Cost Ratio), which means that the expected benefits exceed the costs

Analysis by farm size

Area (ha)	Benefits (€)	Costs (€)	Net benefit (€)
300	40,500	27,534	12,966
500	67,500	45,890	21,610
750	101,250	68,835	32,415
1,000	135,000	91,780	43,220
1,500	202,500	137,670	64,830

The results show that as the size of the farm increases, so does the absolute amount of the net annual benefit from participating in the project – from approximately €13,000 for 300 ha to nearly €65,000 for 1,500 ha. This creates greater financial capacity to cover capital costs associated with the implementation of soil-conserving agricultural practices. For farms (500–1,500 ha), the additional revenue and savings generated can help finance investments in specialised machinery such as direct-drill seeders, minimum tillage cultivators, harrows and other equipment necessary for implementing regenerative agricultural practices. The larger area under cultivation allows capital expenditure to be spread over more hectares, which improves the economic efficiency of the investment and shortens the payback period. Consequently, the economic benefits of participating in the project in terms of capital expenditure are more significant for farms with a larger cultivated area, where there is a real opportunity for the revenue generated to be used to modernise the machinery fleet and accelerate the adoption of sustainable agricultural practices.

Based on the data presented and the conservative assumptions made, participation in the project remains economically justified. The analysis shows that:

- the expected annual benefits exceed the annual costs;
- the net financial benefit remains positive for all farm sizes analysed;
- the project demonstrates sustainability even under a scenario involving a potential temporary loss of yield;
- the Benefit-to-Cost ratio of 1.47 indicates that every €1 invested generates approximately €1.47 in economic benefit.

Participation in the project can be assessed as financially viable and with an acceptable level of economic risk. Additional long-term benefits such as improved soil fertility, better water retention, increased resilience to climate risks and a potential increase in yields are not included in this assessment; therefore, the results can be regarded as a conservative estimate of the economic impact.

5.5.1. With-Project vs Baseline Financial Comparison

1. CAP Eco-schemes vs. Carbon Credit Revenues in Bulgaria

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In 2023 Bulgaria launched new voluntary eco-schemes under the EU Common Agricultural Policy (CAP) to encourage sustainable farming (e.g. reduced pesticide use, crop diversification, green manuring, etc.). These schemes had a combined budget of roughly €134 million and were intended to reward environmentally friendly practices. However, farmer uptake was limited – only about 20,000 farmers (under 36% of those eligible) applied for the new eco-schemes in 2023, compared to ~54,000 who used to receive "green" payments under the prior CAP period. The most popular were the easy measures (crop diversification, pesticide reduction, soil preservation), while more demanding schemes (like maintaining on-farm biodiversity areas) saw low participation. This low uptake, due to complexity and uncertainty, already signals that many farmers do not rely on or fully benefit from these policy incentives – an important context for additionality (whether carbon projects provide benefits beyond business-as-usual).

Crucially, CAP payments per hectare under these eco-schemes are relatively low – and even lower for large farms. Bulgaria's plan explicitly favors small farms with higher payments (and sets a cap on payouts to big farms). For example, a small farm might earn around €38/ha from a given eco-scheme, whereas a large landholding might get only about €16/ha for the same practice (a reflection of redistributive support limits). By contrast, the potential income from carbon credits in Carbonsafe soil projects far exceeds these figures. Carbon credit revenues – even at conservative prices – dwarf the CAP eco-scheme payments. For instance, one Bulgarian soil carbon project (~700–760 hectares) issued ~8,600 credits; if sold at €30 each, that would yield roughly €258,000 total, or about €340 per hectare. With 50% farmer share, this equates to €170 per hectare. Even at a lower price of €15/credit, the farmer share would be about €85/ha, which is still more than double to five times greater than the €16–38/ha from typical eco-scheme subsidies. At €45/credit, farmer income would reach roughly €255/ha, making the gap even wider.

Furthermore, the reliability of CAP incentives going forward is uncertain. Implementation of the new schemes was delayed and plagued by administrative complexity in 2023, and it's unclear if specific Carbonsafe projects even received any funding. Policymakers are now considering adjustments to these schemes due to the poor initial results. The shifting political and policy landscape (e.g. ongoing CAP reform tweaks) casts doubt on the long-term consistency of these payments. Notably, past "greening" measures in the CAP (2014–2020) delivered limited environmental outcomes – €100 billion in EU spending had little impact on reducing farm emissions – suggesting that these subsidies have not fundamentally changed business-as-usual. This all bolsters the additionality argument for Carbonsafe projects: the carbon credit revenue is a decisive, extra incentive driving climate-friendly farming, above and beyond what existing policies provide. Below, we examine this financial additionality in each targeted region of Bulgaria, under three carbon price scenarios (€15, €30, and €45 per credit, with a 50% farmer share and realization of the initial 25% of credits plus the remaining 75% of credits in reserve).

Northern Bulgaria's farms—both large corporate holdings and smaller family producers—receive modest CAP eco-scheme payments, typically €15–38/ha depending on holding size and compliance level. These incentives are insufficient to drive structural change.

By contrast, the Carbonsafe program provides performance-based carbon revenues linked to verified SOC gains:

- ~€85/ha at €15/credit;
- ~€170/ha at €30/credit;
- ~€255/ha at €45/credit.

This new income stream transforms regenerative agriculture from a compliance measure into a viable, profit-generating system, unlocking the region's potential for large-scale soil carbon restoration and climate resilience.

Cross-Regional Analysis: For example, across Plovdiv, Dobrich, Lovech, Pleven, Sofia, Targovishte, Burgas, Shumen, Varna, Vratsa, and Yambol, the pattern is consistent. The financial returns from carbon credits (with farmers receiving 50% share) dramatically exceed those from overlapping policy incentives.

- CAP eco-schemes: ~€16–38/ha (lower for large farms).
- Carbonsafe farmer share: ~€85–255/ha at €15–45/credit.

- Additionality proof: Carbon farming delivers 2–15× higher revenues than subsidies.

This demonstrates that the adoption of regenerative practices and SOC gains in Carbonsafe projects are clearly financially additional: they would not occur at scale under business-as-usual subsidies, but they do under the robust, market-driven incentive of carbon credits.

Across example regions – Plovdiv, Dobrich, Lovech, Pleven, Sofia, Targovishte, Burgas, Shumen, Varna, Vratsa, and Yambol – the pattern is consistent. The financial returns from carbon credits under the Carbonsafe program dramatically exceed those from overlapping policy incentives (CAP eco-schemes). While Bulgaria's CAP eco-schemes provide a helpful but small payment (roughly €16–38 per hectare), the carbon credit revenues at even modest market prices are an order of magnitude higher (roughly €85–255 per hectare under €15–45/credit scenarios). This means that the carbon projects' climate mitigation activities are not financially attractive under business-as-usual conditions (i.e. they wouldn't be adopted at scale for a €15–€30 subsidy alone), but they become attractive when carbon income is introduced. Multiple factors reinforce this conclusion:

- Policy overlap is limited and uncertain: Some practices rewarded by Carbonsafe (e.g. soil carbon sequestration via no-till, cover crops) might receive token support from CAP, but the new eco-schemes in Bulgaria had low uptake and are subject to change. Delays and reforms in CAP implementation mean farmers cannot count on them reliably, whereas a forward sale of carbon credits or a long-term carbon contract provides clearer income expectations.

- Large farmers get very little from subsidies: Many regions (North, Pleven, Vratsa, etc.) have large farming companies that hit CAP payment caps, making the eco-scheme payout per hectare almost negligible. Carbonsafe projects give these farms a substantial revenue source that simply did not exist before – a strong additionality argument.

- Carbon revenue eclipses any single subsidy: Even where a farmer could stack multiple eco-schemes or agri-environment payments, the total would still be far below the carbon credit earnings in our scenarios: credits at €30 fetch ~€170/ha, *with no upper limit on area*. Thus, carbon finance clearly provides an additional financial flow that goes beyond the scale of conventional incentives.

- Evidence of limited prior impact: The track record since 2013 shows that EU farm environmental payments alone did not significantly reduce emissions or change practices. In our case, however, the introduction of carbon payments has triggered new actions (measured soil carbon increases and verified credit issuance). This indicates the projects are delivering climate benefits that would not have happened otherwise, satisfying the core of financial additionality.

2. Financial forecast of Carbonsafe Projects (Forecast:350 ~~500~~k credits, 100k ha by 2029~~7~~)

Key Assumptions:

- Forecast (by 20298~~7~~): 350~~500~~,000 credits across 100,000 ha ~~= ~5 credits/ha/year.~~
- Market prices tested: €15, €30, €45 per credit.
- Farmer share: 50% of revenues.
- Resulting farmer income per hectare:
  - At €15 → €37.5/ha
  - At €30 → €75/ha
  - At €45 → €112.5/ha
- CAP eco-scheme reference: ~€16–38/ha (higher for small farms, lower for large farms).

North region - Financial incentive forecast (with 50% farmer share):

- CAP support: €16–38/ha (many small/medium farms, closer to upper range).

Коментирал [S12]: This assumption does not match those in the Financial Sustainability document.

Коментирал [DK13R12]: Text updated to reflect the Financial Sustainability document.

- Carbon income: €37.5–112.5/ha
- Additionality: At €15/credit, carbon income is higher than average CAP rates, but at €30–45, it clearly surpasses eco-schemes. This demonstrates additionality, especially for mid- and large-sized farms.

The two revenue ranges presented above correspond to different analytical scenarios and should not be interpreted as conflicting projections.

The €85–255 per hectare range reflects observed results derived from existing monitored farms within the program, based on verified SOC performance and realized credit generation under current market conditions. This represents empirical performance data from specific sub-project examples.

The €37.5–112.5 per hectare range reflects a forward-looking 2027 forecast scenario based on conservative assumptions regarding expected SOC performance, projected market pricing conditions, and scaled program participation.

Both scenarios are presented to provide transparency regarding realized results and anticipated future performance under evolving market conditions.

The financial comparison presented in this section focuses on incremental revenue streams directly associated with participation in the project, including carbon credit revenues and applicable CAP eco-scheme payments.

5.5.2. Capital expenditures

Most participating farms require investment and/or re-tooling to reliably implement reduced disturbance with high residue loads and cover/intercrops: no/low-till drills, high-residue planters, roller-crimpers, precision applicators, and—case by case—upgrades to storage/handling for organic amendments. These are lumpy expenditures that are difficult to amortize under short leases or variable cashflows.

5.5.3. Operating expenditures

Direct costs increase in transition years: certified cover seed, establishment and termination passes (mechanical or chemical), adjusted weed-control projects under reduced tillage, and enhanced scouting. Where residues have market value (e.g., straw), in-field retention implies an opportunity cost. Agronomic advisory tailored to plot-level soil profiles also adds cost in the first years (training, field days, decision support).

5.5.4. MRV and transaction costs.

High-integrity accounting requires annual geo-referenced sampling, accredited laboratory analysis, independent validation/verification (VVB), and registry fees. Without aggregation, the per-hectare cost is material and often exceeds any near-term input savings.

5.5.5. Cost of capital.

Farm businesses carry higher effective hurdle rates than corporate benchmarks due to seasonality, collateral limitations (soil health gains are not bankable collateral), and revenue volatility.

5.5.6 Financial Scenarios

A scenario analysis supporting additionality is stated in *section 5.5.1.* above.

5.5.7. Treatment of public support and stacking.

Where farms access eco-schemes or agri-environment support, these payments are disclosed and treated as cost-offsets, not as creditable outcomes. They do not eliminate the need for carbon revenue because:

1. they do not remunerate measured SOC increases,
2. they typically do not cover MRV/transaction costs, and
3. they do not address the cashflow timing of ex-post issuance.

5.5.8. Financial Additionality Conclusion

Given (a) the up-front and recurring costs of practice conversion and high-integrity MRV, (b) transition risk to yields in a moisture-limited environment, and (c) the higher hurdle rates faced by farms, the regenerative bundle is not financially viable at scale without carbon revenue. Carbon credit proceeds—issued only when measured SOC increases are verified—are the decisive enabler that converts an otherwise unattractive or delayed transition into a feasible, investable pathway. Therefore, the Carbonsafe project meets the financial additionality test.

5.6. Carbon Finance Framework

Carbon finance is the enabling mechanism that converts measured increases in soil organic carbon (SOC) into a reliable, auditable revenue stream for participating farms in North Province, Bulgaria. It underwrites adoption of the full regenerative bundle (reduced disturbance with residue retention, cover/intercrops where feasible, diversified rotations, nutrient optimization), funds high-integrity MRV, and provides buyers with ex-post, traceable, science-backed removals. The financial architecture is deliberately conservative: issuance is strictly ex-post, risk is shared via sub-project reserves and a permanence buffer, and all credits are serialized and publicly traceable on the Balkan Carbon Credits Registry (BCCR).

5.6.1. Credit Characteristics and Unit Economics

Asset definition: Each Carbonsafe unit represents 1 tCO_2e of net atmospheric CO_2 removed via measured SOC stock increase in the project boundary (0–90 cm). No forward projections, models, or ex-ante issuances are used.

Price drivers: Prices reflect a removals premium for (i) ex-post issuance, (ii) 100% physical soil sampling (measure–remeasure), (iii) annual agronomic plot (cell) level benefit, (iv) independent VVB validation/verification, and (v) full traceability at farm/plot/vintage on BCCR. Additional premia may arise from co-benefits disclosure (soil health, water retention, biodiversity indicators).

Buyer segments: Primary demand is expected from EU/UK corporates with Net Zero and high-integrity VCMI claims frameworks, sustainability-led SMEs seeking credible removals, and intermediaries (brokers/exchanges) curating quality supply. Transactions occur bilaterally (OTC) or via platforms/aggregators.

Issuance policy (ex-post): Credits are minted after verification confirms a positive SOC results for each farmer/year: 25% current + 75% performance reserve. This protects buyers against transitory gains and aligns cash flows with persistence of outcomes.

Permanence risk management: buffer pool (force majeure reversal coverage). Separate from the sub-project reserve, a buffer pool of 5 % holds a fixed share of verified removals to compensate for force majeure reversals (e.g., SOC losses due to extreme drought, erosion, fire etc.).

Serialization and registry controls: All credits are issued with unique serial numbers reflecting project, geography, sub-project/farm ID, vintage, and range. Serial blocks map to specific farms and plots (cells), and are publicly searchable on BCCR. Transfers and retirements are on-chain/book-entry in the registry to prevent double issuance or double use.

Anti-double-counting and exclusivity: Each farm signs exclusivity declarations (no participation in parallel carbon projects) and provides evidence for no double claiming against national inventories where applicable. BCCR listing includes declarations of non-overlap.

KYC/AML and sanctions screening: For OTC sales executed by Carbonsafe as developer-seller, KYB/KYC, beneficial-ownership attestations, and sanctions screening are performed on buyers (and upstream counterparties where relevant). BCCR enforces onboarding checks for account holders. Transaction monitoring aligns with prevailing EU AML expectations for environmental commodity markets.

Retirement: Final use of credits occurs through registry retirement to a named (except explicitly stated by the beneficiary not be publicly disclosed) beneficiary - end buyer or their designee. Retirement statements include project/farm references, vintage, and (where consented) narrative of co-benefits.

5.6.2. Contractual and Offtake Structures.

Spot and pay-on-issuance: Default contracting is spot or pay-on-issuance against a defined serial block. Title transfers upon registry issuance/transfer, not before.

Forward offtake (conditional): Where buyers seek multi-year volumes, Carbonsafe may enter forward offtake with pay-on-issuance settlement, incorporating price floors/collars and downward volume flex keyed to verified outcomes. No pre-sale of unissued units occurs without such contingencies; delivery risk rests explicitly on measured SOC performance.

Escrow and settlement assurance: For larger trades, proceeds can be routed via escrow with release conditioned on registry transfer/retirement confirmations. This protects farmers and buyers and reduces receivables risk.

5.6.3. Risk Management and Governance

Inventory and liquidity: Issued inventory equals the 25% current issuance plus any released reserves. Liquidity is managed through sub-project staging.

Counterparty risk: Buyer credit risk is mitigated via pay-on-issuance, escrow, or staged deliveries. Brokered transactions use counterparties with market reputation and adequate AML/KYC.

FX and pricing currency: Contracts are denominated in EUR (BGN-pegged), minimizing FX volatility. Where buyers pay in other currencies, conversions occur at settlement with disclosed reference rates.

Auditability: Financial flows from issuance to farmer disbursement are recorded and auditable. The registry's public ledger plus internal ERP reconciliations provide end-to-end traceability.

5.6.4. Alignment with Integrity Initiatives

Carbonsafe structures MRV, governance, and registry transparency to be auditable, including documentation of additionality, conservative accounting, and robust reversal management. The BCCR registry publishes methodology acceptance, serials, and project documents to meet buyer due diligence expectations.

5.6.5. Conflict of Interest and Ring-Fencing

Separation of roles: The Registry (BCCR), VVB, and Project Developer have distinct roles: BCCR administers registration/serialization; the VVB validates and verifies; Carbonsafe develops projects and executes sales for farmer accounts. Where Carbonsafe sells credits on behalf of farmers, it operates under agency terms with transparent commissions and no discretion to re-pledge or encumber farmer assets.

Decision controls: Changes to issuance pacing or reserve release rules follow documented governance. Any material change triggers stakeholder notice and, where required, VVB review and confirmation.

6. MONITORING PLAN (MRV).

6.1. Sampling Design.

The Carbonsafe monitoring plan is founded on the principle of direct measurement only, applying an annual measure–remeasure approach to soil organic carbon (SOC). Its objective is to ensure that every issued credit corresponds to a physically observed increase in soil carbon, verified with statistical rigor, and documented with full traceability from the field to the registry. To achieve this, the sampling design is deliberately conservative, scientifically robust, and fully auditable.

Each participating farm in the North region is divided into fixed sampling plots, ranging in size from four to twenty-five hectares. Once established, the plot boundaries remain constant throughout the sub-project's renewable crediting period, ensuring that re-measurement is conducted on the same areas year after year. This permanence of sampling units is a cornerstone of the project, as it allows genuine SOC changes to be tracked over time with high confidence.

Sampling within these plots (cells) follows a systematic yet flexible field design. In each plot (cell), twenty-five soil cores are collected along a zig-zag or diagonal transect, designed to evenly cover the entire polygon while avoiding areas that would distort results, such as field margins, tractor ruts, or manure piles. The overall pattern ensures both representativeness and repeatability. The sampling track of the ATV vehicle is georeferenced and logged in the project's ERP system, creating a permanent digital record of sampling activities.

The depth profile of sampling is critical to capturing true changes in SOC. Carbonsafe measures soil carbon to a depth of 90 centimeters, subdivided into three layers: 0–30 cm, 30–60 cm, and 60–90 cm. This horizon reflects the bulk of carbon storage in arable soils and aligns with international best practice and reporting frameworks. For each depth, the 25 cores from a plot (cell) are composited into a single representative sample, resulting in three samples per plot (cell) each year. A retained sample of each composite is archived for period of two years to allow for future re-analysis, ensuring dispute resolution and cross-laboratory checks remain possible.

Accurate SOC stock accounting requires not only concentration data but also bulk density and coarse fragment corrections. These measurements, together with stone content assessments, allow the conversion of laboratory concentrations into reliable carbon stock values. Quality assurance thresholds are applied such as accredited lab standard operating procedures.

Samples are transported under chain-of-custody procedures, labeled with barcodes that encode all relevant metadata, and delivered to accredited laboratories. Laboratory processing follows strict protocols: samples are dried, sieved, ground, and analyzed using dry combustion methods. Total inorganic carbon is measured so that only organic carbon is credited. Laboratories are required to run certified reference materials, blanks, duplicates, and control charts to verify accuracy.

The entire process is supported by a digital audit trail. Field teams record data and photographs directly into a mobile app synchronized with the ERP. GPS tracks, timestamps, and barcodes link every sample back to its origin plot (cell) and depth. This ensures that any future verifier or buyer can trace each credit to its physical evidence. Exceptions, such as delayed sampling due to weather or management interventions (e.g., deep tillage, conversion to orchard), are logged.

Carbonsafe sampling design ensures that the project's monitoring is systematic, conservative, and transparent. By combining fixed plot boundaries, rigorous core counts, multi-depth analysis and accredited laboratory testing, the project delivers a data foundation of the highest scientific quality. This framework provides buyers with confidence that every issued credit is backed by direct, measurable, and verifiable increases in soil carbon stocks, making Carbonsafe fundamentally distinct from methodologies that rely primarily on modeling or infrequent sampling.

6.2. Sampling Frequency.

Carbonsafe applies a strict, annual measure–remeasure cadence to every active sampling plot, so that soil organic carbon (SOC) stock changes are observed over a consistent intervals. Each farm in the North project area is scheduled into a fixed monitoring year that mirrors the regional agronomic cycle: sampling is performed within 10 to 14 months intervals in the same seasonal window for that plot (cell) each year. This temporal discipline of revisiting the same plot in the same interval minimizes bias and ensures that the observed ΔSOC reflects true year-on-year change rather than timing effects.

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Коментирал [S14]: The sampling design specifies 25 cores composited into a single sample per depth layer, resulting in one analytical result per depth and plot. While Section 7.3.4 states that sampling uncertainty is incorporated into the uncertainty assessment,it is unclear how variability in SOC across a plot is quantified under the single-composite sampling approach and how this uncertainty is incorporated into ΔSOC calculations. The PP is requested to clarify whether any replicate composite sampling is undertaken (e.g., QA/QC subsets) or whether this uncertainty component is derived from literature-based or assumed parameters.

Коментирал [DK15R14]: The project does not routinely perform replicate composite sampling for each plot. For each depth interval, 25 georeferenced soil cores are collected and composited into a single sample that is analysed to determine the mean SOC concentration for the plot.

The uncertainty associated with sampling is not derived from replicate composite samples collected during each monitoring event. Instead, sampling uncertainty is quantified using the RANOVA 3 approach based on Analysis of Variance (ANOVA), as described in the project uncertainty assessment (file Uncertainty model determination sent with Round 1, Supporting documents-VAL, VAL-CAR 17.3) . Under this approach, total variability is partitioned into between-sample and within-sample variance components. The between-sample variance component represents the sampling effect and is used to quantify sampling uncertainty as a contribution to the overall measurement uncertainty.

The resulting sampling uncertainty of 15% is incorporated together with the uncertainties associated with organic carbon analysis and bulk density determination and is propagated through the SOC stock and ΔSOC calculations. Therefore, although a single composite sample is analysed per depth layer and plot, the uncertainty associated with the sampling process is explicitly accounted for within the project uncertainty framework.

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In North's continental–Mediterranean setting, the preferred window is post-harvest and pre-primary tillage, when fields are accessible, residues have settled, and soil moisture is relatively stable. Where a plot's rotation or logistics demand a different window (for example, early spring prior to planting), that alternative is locked in as the reference window and used consistently thereafter.

Bulk density must be taken by core method (ISO 11272 or equivalent) and registry of the land areas with bulk density samples taken must be maintained.

Each populated land area has an identification code - The Unified Classifier of Administrative-Territorial and Territorial Units (EKATTE). Bulk density is taken from a specific plot (cell), selected randomly from the first farm enrolled within a specific land area (EKATTE) and this bulk density is valid for the whole sub-project renewable crediting period. If subsequent farm is enrolled in the same land area (EKATTE), the already registered bulk density is taken into account. Bulk density samples are taken from the three soil layers: 0-30 cm, 30-60 cm, and 60-90 cm, and are sent for testing in an accredited laboratory.

The current approach for bulk density (BD) determination, whereby BD values are derived from representative sampling within defined EKATTE regions and applied across farms within the same regional unit, is implemented in accordance with the provisions defined in the approved Methodology.

The Methodology specifies the framework under which bulk density may be established and applied for SOC stock calculations. The project applies this rule consistently across sub-projects within the defined geographic scope.

Laboratories analyze every composite sample every year for SOC by dry combustion, and they also determine total inorganic carbon so that only organic carbon contributes to credited removals. The lab's internal QA/QC reflects every batch, not intermittently.

Quarantine period must be observed after fertilization - 180 days for rotted manure. For all mineral fertilizers, we observe a quarantine of 40-60 days until sampling Quarantine periods are in accordance with the provisions defined in the approved Methodology.

For a given monitoring year, a plot's samples must be collected, received by the lab by the close of the issuance cycle. Where a plot (cell) misses its window and cannot be re-sampled in time, its data are carried forward for inclusion in the next annual issuance once compliant re-measurement is completed. No forward crediting is allowed: ex-post only issuance relies strictly on data from that plot's most recent, on-schedule re-measurement.

6.3. Data Collected.

Carbonsafe's monitoring system captures a complete and auditable record of the physical, chemical, and managerial conditions that determine soil organic carbon (SOC) stocks and their year-on-year change. The data model is structured around the plot–depth–year triad: every observation is anchored to a fixed sampling plot (4–25 ha), a defined depth horizon (0–30, 30–60, 60–90 cm), and a monitoring year, with immutable links to the farm, field, and later to credit serial numbers on the registry. All entries carry timestamps, user IDs, and GPS metadata, creating a verifiable chain from the field to accredited laboratories and ultimately to issuance.

At the core are the primary biophysical measurements required to compute SOC stocks. For each plot (cell) and depth, composite samples produced from twenty-five individual cores are analyzed for soil organic carbon concentration by dry combustion. Where stones or coarse fragments larger than 2 mm occur, their proportion is quantified so that stocks are expressed on a fine-earth basis. The three parameters—SOC concentration, bulk density, and coarse fragments—form the minimum viable set for stock (Mg C/ha) and stock change (ΔSOC) calculations. The laboratory logs preparatory steps (drying, sieving, grinding), instrument identifiers, calibration runs, and quality controls, ensuring that every reported value is traceable to method performance (ISO 10694, ISO 11465).

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Коментирал [S16]: The PD indicates that carbon credit distribution percentages may vary between participating farms depending on contractual arrangements and project activities. To enhance transparency, please demonstrate/clarify how credit allocation is determined for a typical participating farm and how the final distribution is communicated to participants

Коментирал [DK17R16]:
Credit allocation is determined individually for each participating farm in accordance with the applicable participation agreement and the specific services and activities provided within the project framework. While contractual terms may vary, the allocation is based on a predefined distribution mechanism established prior to enrollment and agreed upon by the participant.

For a typical participating farm, the number of carbon credits attributed to the farm is first determined based on the verified net SOC removals generated on the enrolled area, following application of all methodology requirements, uncertainty deductions, buffer contributions, and verification procedures. The resulting issued credits are then allocated between the project participant and the project developer according to the contractual arrangement in force.

Following each issuance event, participants are provided with a statement/protocol summarizing verified removals, applicable deductions, and the final number of credits attributed to the participant.

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Because Carbonsafe is designed to deliver agronomic value alongside climate outcomes, each composite is also profiled for soil fertility and health indicators. The project routinely captures pH and a panel of macro- and micro-nutrients (for example N, P, K, S, Ca, Mg, and micronutrients such as Fe, Mn, Zn, Cu, B). These data do not directly enter the carbon accounting but are critical to generating the plot-level agronomic recommendations that support practice persistence, nutrient optimization, and long-term soil resilience.

The field context is ovserved at the time of sampling. The ATV GPS track is stored. Photographic evidence (geotagged) is appended where useful. These contextual fields ensure that any subsequent reviewer can reconstruct how and where the sample was obtained.

Equally important is the management dataset, collected for each plot (cell) and year to document the practices whose adoption constitutes the project scenario. Carbonsafe reviews the crop grown (including cultivar where available), sowing and harvest dates, rotation history, cover/intercrop species and their termination method, tillage regime (type, depth, dates). Nutrient management is captured at high resolution: fertilizer types (synthetic/organic), formulations and rates, application dates and methods, and any lime or organic amendments (compost, manure, digestate). Where applicable, irrigation and plant protection applications will be recorded. This management data is used for three purposes: (i) to verify eligibility and additionality (non-common practice at enrollment), (ii) to attribute SOC changes to practice bundles at audit, and (iii) to enable direct quantification of N_2O effects derived from nitrogen inputs, which are measured and integrated into the net emission removal calculations.

To maintain full transparency and accountability, every physical sample is bound to a chain-of-custody record that travels from field to laboratory and then to the data warehouse. The chain-of-custody includes the farm/field/plot codes; depth; barcodes; GPS track reference; sampler identity; date, time, and conditions; and any anomalies. Laboratory intake records link these identifiers to the batch, while ERP integrations lock the records after QA sign-off and retain an immutable audit log of edits, approvals, and data exports used for verification.

Together, these data streams—primary SOC stock inputs, fertility and health profiles, field context, management practices, and custody metadata—form a cohesive and conservative evidence base. They allow independent verifiers to confirm that each tonne of CO_2 credited by Carbonsafe corresponds to a measured, well-documented, and statistically robust increase in soil carbon, achieved through practices that are explicitly recorded and persistently managed at the plot (cell) scale.

6.4. Geo-referencing.

Geo-referencing underpins Carbonsafe's claim that every issued unit is traceable to a specific piece of land where the increase in soil organic carbon (SOC) was physically measured. The system is designed to (i) locate, with audit-grade precision, each sampling plot (cell) and field operation; (ii) ensure spatial comparability across years; and (iii) maintain an immutable spatial record that links field data to laboratory results and, ultimately, to registry serial numbers.

At project initiation, each participating farm is digitized into fixed sampling plots (4–25 ha) using a controlled GIS workflow. Source layers include cadastral boundaries (for legal clarity). Plot polygons are stored in a versioned geodatabase; the geometry of a plot, once confirmed with the farmer, becomes the reference spatial unit for the full monitoring term. Any later change (e.g., consolidation or subdivision) is treated as a material spatial change: the previous geometry is archived, a new version is created with a timestamp and rationale.

All field operations are captured with GPS -enabled equipment. The automated probe mounted on an ATV records a continuous GPS track during sampling.

The within-plot sampling pattern is spatially balanced and reproducible at the polygon scale rather than at permanent point coordinates. Twenty-five cores per depth are collected along a systematic zig-zag/diagonal transect that spans the plot and intentionally avoids biasing features. In the course of sampling, it is mandatory to avoid the boundaries of the plot (cell), where it is possible to have a deviation from the normal values of the results due to various reasons, such as: over-fertilization, over-drying, waterlogging of the soil; overcrowding as a result of agricultural machinery; various impacts and specifics of the relief; independent and uncontrolled by the project actions on adjacent areas performed by unspecified persons. This design choice—anchoring the pattern to the plot polygon, not to fixed points—reduces the risk of disturbance artifacts (e.g., repeatedly coring the same microsite). The complete ATV track is saved and bound to the plot (cell) ID, monitoring year, operator ID, and sample barcodes.

Every composite sample (per plot and depth) carries a unique geo-linked identifier that encodes Farm, Field, Plot (cell), Depth, and Year. Barcodes are scanned in the field (at bagging), at lab intake, and at analysis. The chain-of-custody record references the plot polygon ID and the GPS track, so that any later review can reconstruct exactly where the operator drove and how the composite was formed. Photographs (geotagged) are attached for contextual evidence and the mobile app enforces completion of mandatory spatial metadata before a sampling job can be closed.

The ERP validates that all cores were collected inside the target polygon and that the traverse adequately covers the plot. The app of the soil sampler does not permit them to cross the boundary of the soil sampling task created from the ERP.   Year-to-year overlays of GPS tracks are recorded.

Spatial data provide the backbone for traceability to the registry. When credits are issued, the serial-number block for each issuance explicitly references the farm. This creates a verifiable link from a buyer-visible credit back to the exact farm sampled. The registry can, at any time, map a serial back to its geographic origin. All spatial records are retained under immutable audit logs, with controlled access and GDPR-compliant safeguards for landowner privacy.

Through this architecture—fixed, versioned polygons; GPS tracking; polygon-anchored sampling geometry; and end-to-end geo-linked custody—Carbonsafe ensures that each tonne credited is spatially unambiguous, re-locatable, and auditable, meeting the demands of high-integrity buyers, independent verifiers, and registry oversight.

6.5. QA/QC Protocols

Field sampling activities are conducted in coordination with and under the QA/QC Protocols of an accredited laboratory operating in accordance with ISO/IEC 17025. The accreditation scope includes procedures governing sampling methodologies, staff competence, calibration of equipment, traceability of samples, documentation control, and internal quality assurance processes.

Sampling personnel are trained and qualified in accordance with the laboratory's accredited quality management system. Sampling procedures, including core placement, depth control, GPS-based geo-referencing, sample handling, labeling, transport, and chain-of-custody documentation, are performed under standardized protocols defined within the laboratory's accredited system.

Quality control measures during field sampling include documented sampling instructions, verification of sampling depth, GPS accuracy checks, sample integrity controls, and procedural oversight consistent with accreditation requirements.

As sampling is performed within the laboratory's accredited framework, field procedures are subject to internal audits, external accreditation audits, and continuous compliance verification.

6.6. MRV Lifecycle Design.

The Carbonsafe MRV system is engineered as a lifetime framework that governs how evidence is created, audited, and preserved from project start through the end of liability. It is built on direct, annual measure–remeasure of soil organic carbon (SOC) at fixed geo-referenced plots (cells), backed by accredited laboratories and an auditable data backbone. The plan defines what is measured, when, by whom, how it is quality-assured, how uncertainty is treated, and how decisions to issue, defer, or reverse credits are made throughout the project's life.

6.6.1. Scope and time horizon.

The MRV plan of the project spans a total of 40-year crediting period consisting of 5-year renewable individual farm (sub-project) crediting periods (annual monitoring and accounting each year). During crediting, every active plot (cell) is measured annually; after crediting, targeted surveillance continues to detect and manage reversals. The plan is renewable subject to re-validation of scope and performance.

Monitoring period after sub-project crediting periods

Satellite-based monitoring will be conducted annually for a period of five (5) or ten (10) years at the expense of the Project Developer after the crediting period of each sub-project.
The purpose of the satellite monitoring is to provide independent, remote verification of project integrity and permanence safeguards throughout the project crediting period.

Monitored Parameters
The following parameters will be assessed on an annual basis:

- Confirmation that enrolled project areas have not been reduced or modified outside approved procedures;
- Verification that declared land management practices remain consistent with project commitments;
- Detection of any potential reversal events that may negatively affect accumulated soil carbon stocks;
- Assessment of potential leakage risks, including unintended land-use displacement outside the enrolled project boundary.

Satellite observations would be integrated into the annual monitoring review process and documented as part of the project's MRV records. Any anomalies or inconsistencies identified through remote sensing will be subject to further investigation and, where necessary, corrective action in accordance with project governance procedures.

6.6.2. Annual evidence cycle

Each farm is partitioned into fixed sampling plots (4–25 ha) that remain constant over the MRV lifetime unless a documented material change occurs. For every plot (cell) and each depth horizon (0–30, 30–60, 60–90 cm), the project executes one annual, geo-referenced campaign.

6.6.3. Roles, competence, and calibration.

1. Field Operations: Trained samplers operate GPS automatic probes on ATVs, following SOPs for composite formation, chain-of-custody, and safety. Equipment (probes, balances, GPS) is calibrated to schedule with logs retained; out-of-tolerance instruments trigger halt/remediate rules.

2. Laboratory: ISO/IEC 17025 or equivalent–accredited labs perform SOC by dry combustion with carbonate correction where required; bulk density and coarse fragments are measured on dedicated cores. Full QC is mandatory per batch; non-conformities trigger re-runs or re-preparation.

3. Data & QA: The MRV platform (ERP) enforces data integrity, immutable audit logs, and role-based approvals.

4. VVB: An accredited validator/verifier reviews design, field execution, lab QC, calculations, uncertainty, and issuance proposals; conducts site checks as needed.

6.6.4. Data model and traceability.

All observations are anchored to a plot–depth–year key and bind to farm, field, GPS track, sampler ID, and laboratory batch. Barcoded samples, digital chain-of-custody, and GPS tracks create an end-to-end evidence thread from farm to registry serial numbers. Spatial QA verifies that cores lie within polygons and that the traverse sufficiently covers the plot (cell); exceptions require corrective passes or documented waivers.

6.6.5. Conservativeness and issuance rules.

Issuance follows a precautionary policy:

1. 25% of verified net removals are issued ex-post in the monitoring year.
2. 75% of verified net removals are withheld in a performance reserve at the sub-project level. Withheld units are released in subsequent measurement period if the same farm shows positive performance, and 75% from the new issuance are allocated to the reserve to substitute the released ones. This rolling substitution ensures that the reserve remains fresh (non-aging) while protecting integrity if final farm balance measurements show losses.
3. Uncertainty is assessed and quantified as part of the MRV system, based on measurement data, sampling design, and laboratory analysis, and is incorporated into the calculation of net greenhouse gas removals..

6.6.6. Non-conformity management.

If a plot's sampling falls outside time tolerances, QC fails, or material anomalies are detected, the plot (cell) results are withheld, re-sampling is ordered (if feasible), and the event is logged. Credit issuance from that plot (cell) is paused until the VVB accepts the corrective action outcome.

6.6.7. Reversals and buffer interface.

Reversals in the final year of farm's crediting period first consume the farm performance reserve; if insufficient, the project draws from the shared buffer pool.

6.6.8. Change management and version control.

The MRV plan is adaptive. Any change to instruments, labs, or calculation parameters follows a controlled change process: documented rationale, possible validation and VVB notification. Material changes (that could affect credited quantities) are reflected and verified by VVB upon new issuance cycles. All documents carry version identifiers, effective dates, and supersession history.

6.6.9. Verification cadence and materiality.

Verification is conducted periodically (including annual or other periodical issuance batches) for renewable farmer contracts during Years 1–5 to establish a high-confidence performance baseline and subsequent SOC changes. Verification is initiated upon completion of at least one full monitoring cycle, defined as the availability of two consecutive measurements enabling the calculation of net greenhouse gas removals, and is carried out in accordance with the requirements of the applicable Standard.

The timing of verification may be determined based on the accumulation of verifiable results, provided that monitoring periods are clearly defined and non-overlapping, all reported quantities are fully documented and traceable, and no double counting occurs.

For operational efficiency, verification and issuance may be conducted on aggregated results from multiple monitoring periods or groups of project participants (issuance batches), provided that such aggregation does not compromise accuracy, transparency, or the integrity of the MRV system.

Materiality thresholds (e.g., for minor arithmetic corrections) are pre-defined; any adjustment beyond thresholds triggers re-statement of the affected issuance and, if needed, credit revocation and buffer compensation.

6.6.10. Data security, privacy, and retention.

Documents related to Project Participants, including those associated with carbon credit transactions and their lifecycle, shall be retained for the duration of their validity, including until the retirement of credits and completion of any buffer pool compensation obligations.

Administrative and operational records not directly related to monitoring, reporting, and verification (MRV) may be retained for a period of 5 to 10 years, unless otherwise required by applicable law.

In accordance with the Project's Data Retention Policy, all data and documentation related to monitoring, reporting, verification (MRV), soil organic carbon (SOC) measurements, carbon accounting, and permanence shall be securely retained for a minimum period of 40 years, including the post-crediting liability period.

This includes, but is not limited to:

- the Project Design Document (PDD);
- Monitoring Reports (MR);
- Verification Reports, including Final Verification Reports (FVR);
- soil sampling data and laboratory results;
- activity data and calculation records used for emission reductions and removals;
- records related to the issuance, transfer, and retirement of carbon credits.

Data shall be maintained in a manner that ensures long-term traceability, accessibility, and auditability, allowing independent third parties to reproduce and verify the reported results throughout the entire project lifetime and liability period.

6.6.11. Registry Integration and Serialization

When the VVB approves issuance, the registry is instructed to create traceable serial numbers that encode the project, farm identity, monitoring year (vintage), and issuance tranche. Retirement events are publicly visible; transfers maintain chain-of-title. Any confidential annexes (e.g., commercial terms) are kept separate from public MRV artifacts.

6.6.12. Governance and accountability.

The Head of Integrated Management Systems (IMS) within Carbonsafe owns the schedule, QA gates, and VVB liaison. The Agronomic team reviews farm level diagnostics annually and recommends adjustments. The executive director signs off on SOP updates after recommendation from the Head of IMS and the Agronomic Committee. All decisions and rationales are minuted and archived.

In essence, the MRV Lifetime Design Plan ensures that every credited tonne is supported by fresh, annual, geo-referenced measurements, conservative treatment, disciplined QA/QC, and verifiable traceability—year after year, through issuance, reserve management, and the post-crediting liability window.

6.7. MRV Plan Review Protocol.

Carbonsafe's MRV Plan Review Protocol is the governance mechanism that keeps the monitoring system scientifically robust, operationally disciplined, and aligned with evolving best practice over the entire life of the project. It defines who reviews the MRV system, what is reviewed, when reviews occur, which evidence is required, and how decisions lead to controlled updates of SOPs, calculations, issuance rules, and training. The protocol integrates quality management (QA/QC), risk management, and change control into a single, auditable process.

6.7.1. Governance and Accountability.

The MRV Review team is led by the Head of IMS and includes the Head of Administration, Agronimic team, Laboratory Liaison, the Registry Liaison and the VVB Liaison. Where needed, external scientific advisors and independent statisticians join as invited experts. The Team's mandate is to assure that the MRV design remains fit for purpose; that execution evidence supports annual issuance; and that all material changes follow controlled, documented pathways. The Team maintains authority to recommend partial issuance, deferral, or suspension at the plot (cell), farm, or project level.

6.7.2. Review Cadence and Levels

1. Annual Comprehensive Review aligns with the issuance cycle: after laboratory results and preliminary calculations, but before VVB submission.

2. Field readiness and Lab capacity Review prior to the next sampling.

3. Event-Triggered Reviews are convened when non-conformities or risk signals arise (e.g., unusually high variance, instrument failure, extreme weather, VVB observations, or stakeholder complaints).

4. Periodical Reviews of new science or regulation.

Each review covers design adequacy, execution quality, calculation integrity, concervativeness treatment, and decision consistency:

1. Design Adequacy: Are the sampling windows and fixed plot (cell) geometry still appropriate? Are depth intervals and BD protocols followed?

2. Execution Quality: Does evidence show that all active plots (cell) were sampled within time tolerances; that GPS tracks are complete and within polygons?

3. Calculation Integrity: Are SOC stock and ΔSOC calculations correct, reproducible, and transparently documented? Are unit conversions and bulk density consistently applied?

4. Conservativeness: Is the issuance rule applied without exception?

5. Decisions to Issue/Defer/Reverse: Do issuance proposals respect materiality thresholds, non-conformity rules, and reserve/ buffer logic? Is negative performance transparently recognized and recorded?

The Team reviews a standard evidence pack: ERP exports binding field IDs to lab batches; GPS track files with spatial QA; complete chain-of-custody; Laboratory valid accreditation certificate; bulk density; calculation workbooks with version hashes. Any missing or inconsistent artifact triggers an immediate corrective action before decisions proceed.

In case non-conformity is observed, the Team is obliged to resolve it internally before proceeding with VVB review.

Farmers are briefed annually on MRV performance, and any protocol updates that affect their fields. Where changes alter obligations or benefits, updated agreements are executed.

The MRV Review Team prepares a Monitoring Report (MR) with Evidence Package available for VVB review. VVB comments are logged and formally closed, with outcomes folded into the next review.

The protocol integrates results monitoring: if ΔSOC is negative no credits are issued.

The Review Team verifies that all evidence remains complete, consistent, and enduring. Retention meets "crediting period + five years" with immutable audit trails. Any data incident (corruption, loss, or unauthorized access) is treated as a critical non-conformity with immediate remediation and reporting.

Insights from reviews drive targeted training, SOP refinements, and technology upgrades. The Team tracks the impact of these improvements in subsequent cycles, aiming for declining uncertainty, fewer non-conformities, and tighter alignment with emerging standards and buyer criteria-without compromising conservativeness.

7. QUANTIFICATION AND CALCULATION.

7.1. Carbon Sequestration Calculation.

1. Parameters measured:
   - Organic carbon (mg/kg)
   - Bulk density

Data according to obtained results from accredited laboratory.

2. Calculations following the control soil sample:

3.1 Soil quantity

Amount of soil (ton) = area * 10000 * 0.3 * bulk density

Where:

- Area = plot (cell) size (ha)
- 10000 = ha to m^2 area conversion factor
- 0.3 m = Depth (m), soil samples were taken from three soil layers 0-30 cm, 30-60 cm and 60-90 cm.
- Bulk density (g/cm^3) is measured once during first control year and is valid for the entire sub-project crediting period. The current approach, under which soil bulk density (BD) is measured during the initial control year and applied consistently throughout the defined 5-year crediting period, is implemented in accordance with the provisions specified in the approved Methodology.

3.2 Difference in organic carbon (OC) at the plot (cell) level.

3. Calculation method for the reporting period of the first control:

Measured organic carbon (OC) mg/kg in the first control year (-) Measured organic carbon (OC) mg/kg in the baseline year.

The method is applied to all plots (cells) on the farm.

4. Calculation method for subsequent reporting periods after the first control:

A) Measured organic carbon (OC) mg/kg in the current control year (-) Measured organic carbon (OC) mg/kg in the previous control year

The method is applied to all plots (cells) on the farm with a reported positive result for measured organic carbon (OC) mg/kg in the previous control year.

B) Measured organic carbon (OC) mg/kg in the current control year (-) Measured organic carbon (OC) mg/kg in the base year.

The method is applied to all plot (cells) on the farm with a net-zero or negative result for measured organic carbon (OC) mg/kg in the previous control year and for which no increase above measured organic carbon (OC) mg/kg in the base year was detected.

C) Measured organic carbon (OC) mg/kg in the current control year (-) Measured organic carbon (OC) mg/kg above the base year

The method is applied to all plots (cells) on the farm with a reported result for measured organic carbon (OC) mg/kg above the base year, where a subsequent decrease in the levels of measured organic carbon (OC) mg/kg is observed.

5. (OC) content in soil per depth.

Difference in organic carbon (OC) * Soil quantity (mg/kg) per depth

6. Total (OC) content in the soil per plot (cell).

Sum of (OC) content in soil of the tree soil depths (0-30 cm, 30-60 cm and 60-90 cm)

7. Gross amount of removed greenhouse gas emissions Carbon dioxide CO2.

Total (OC) content in the soil * 3.667

Where: 3.667 is a conversion factor for tC to tCO_2 (IPCC)

8. Data on fuel emission footprint from production equipment.
   - Average fuel consumption (tons/ha)

The average fuel consumption determined by the Methodology of the Ministry of Agriculture for determining the individual annual quotas in connection with the implementation of the state aid scheme "Aid in the form of a discount on the value of the excise duty on gas oil used in primary agricultural production.

- Total fuel consumption per plot (cell) (tons/ha)

Average fuel consumption (tons/ha) * plot (cell) area (ha)

- Total fuel consumption (t CO_2 eq)

Total fuel consumption per plot (cell) (tons/ha) * 3.42

Where: 3.42 is conversion factor for tons/ha to tCO_2 eq

1l of diesel is equal to 36 MJ (Ordinance No. H-18 of August 8, 2016).

1MJ is equivalent to 95.1 g CO_2 (Methodology for determining the intensity of greenhouse gas emissions from the entire life cycle of fuels and energy of non-biological origin in transport). Therefore 36 * 95.1 / 1000 = 3.42 (kg CO_2/L diesel)

Fuel consumption values used in the calculation are obtained from the Ministry of Agriculture benchmark table, which provides equivalent values in litres/ha. Those values are converted in tonnes/ha using a 1,000 L = 1 t conversion. When fuel consumption is expressed in tonnes, the same numerical coefficient corresponds to 3.42 t CO_2/t diesel.

9. Net amount of removed emissions of greenhouse gas carbon dioxide CO_2 (ton).

Gross amount of removed greenhouse gas emissions Carbon dioxide CO_2 (ton) - Total fuel consumption (tCO_2e)

10. Uncertainty deduction.

Net amount of removed emissions of greenhouse gas carbon dioxide CO_2 (ton) - Uncertainty deduction = Net amount of GHG removed carbon dioxide (CO_2) after uncertainty deduction

7.1.1 Quantification of Nitrogen-related Emissions

Methodology for Calculating Nitrous Oxide (N_2O) Emissions in Agricultural Systems

The calculation of nitrous oxide (N_2O) emissions and carbon emissions associated with the use and production of nitrogen fertilizers is conducted in accordance with the IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4 (Agriculture, Forestry and Other Land Use), Chapter 11: *N_2O Emissions from Managed Soils*, as well as industry reference data for fertilizer production from Fertilizers Europe.

Коментирал [S18]: A similar comment related to the units of fuel consumption is raised in Section 4.1.7. The derivation of the 3.42 coefficient appears to result in a litre-based emission factor, whereas the quantification equation applies it to fuel consumption expressed in tonnes/ha. The PP is requested to clarify the units and basis of the conversion factor and demonstrate consistent application throughout.

Коментирал [DK19R18]: Fuel consumption values used in the calculation are obtained from the Ministry of Agriculture benchmark table, which provides equivalent values in litres/ha. Those values are converted in tonnes/ha using a 1,000 L = 1 t conversion. Consequently, when fuel consumption is expressed in tonnes, the same numerical coefficient corresponds to 3.42 t CO_2/t diesel, ensuring consistency between the activity data and the resulting tCO_2e values.

The calculations for both direct and indirect emissions are fully based on Chapter 11 of Volume 4 of the 2006 IPCC Guidelines (including the 2019 Refinement). The methodology categorizes soil emissions into three main pathways and applies default emission factors.

N_2O emissions are calculated for both the project and baseline scenarios using the IPCC 2006 Tier 1 methodology. Results are compared annually, and emission reductions are determined as the difference between baseline and project emissions expressed in CO_2e. A reduction in N_2O emissions under the project scenario represents an improvement in the emissions profile of the agricultural system and is accounted for as part of the environmental benefit of the project. If project emissions are higher than baseline emissions, no reductions are generated.

The methodology follows the principles of:

- conservativeness
- transparency
- avoidance of underestimation of emissions
- application of the IPCC Tier 1 approach for soil emissions

The methodology compares values from the project year against the baseline and includes two main components:

I. EMISSIONS FROM PRODUCTION AND SUPPLY OF NITROGEN FERTILIZERS (CO_2e)[62]

Emissions related to the production and supply of nitrogen fertilizers are calculated based on the applied quantity of nitrogen as an active substance (kg N). An emission factor (kg CO_2e/kg N) is applied, reflecting emissions from the full production lifecycle:

CO_2e emissions = applied nitrogen (kg N/ha) × emission factor (kg CO_2e/kg N)

Emissions from mineral nitrogen fertilizer production are assessed using emission factors that reflect regional differences in technologies and energy sources. The selected emission factor depends on the origin and production technology of the fertilizer.

Adopted emission factor categories:

- European production (standard): reflecting typical EU industrial conditions and BAT level

- European low-carbon production (premium): BAT + N_2O abatement, including catalytic reduction and optimized energy efficiency, supported by validated PCF/EPD data

- Non-EU production (conservative scenario): reflecting higher carbon intensity, lower efficiency, and absence of BAT

II. SOIL PROCESS EMISSIONS (N_2O)

1. Determination of nitrogen input (N) depending on crop type (according to Table 11.2 of IPCC 2006 Guidelines)

2. N_2O emissions from soils are calculated via three main pathways defined by IPCC:

Direct emissions

Nitrogen converted directly into N_2O in the soil:

[62] Fertilizers Europe https://www.fertilizerseurope.com/wp-content/uploads/2020/01/The-carbon-footprint-of-fertilizer-production_Regional-reference-values.pdf

N_2O emissions (kg CO_2e) = N (kg N) × 1% (kg N_2O-N/kg N) × 1.57 (kg N_2O/kg N_2O-N) × 273 (kg CO_2e/kg N_2O)[63]

This follows the IPCC Tier 1 method, assuming 1% of nitrogen is converted to N_2O-N, then converted to N_2O (using the molecular weight ratio (44/28 = 1.57), -and finally converted to CO_2e using a GWP100 of 273 (IPCC AR6).

Indirect emissions from volatilization

Nitrogen volatilized as NH_3/NO_x and redeposited:

N_2O emissions (kg CO_2e) = N (kg N) × 10% × 1% × 1.57 × 273

Where:

- 10% = fraction of N volatilized as NH_3/NO_x
- 1% = emission factor for volatilized N converted to N_2O-N
- 1.57 = conversion from N_2O-N to N_2O
- 273 = GWP100 of N_2O

IPCC assumes 10% volatilization and 1% conversion to N_2O-N.

Indirect emissions from leaching/runoff

Nitrogen leached into soil and water systems:

N_2O emissions (kg CO_2e) = N (kg N) × 30% × 0.75% × 1.57 × 273

Where:

- 30% = fraction of N subject to leaching/runoff
- 0.75% = emission factor for leached N converted to N_2O-N
- 1.57 = conversion from N_2O-N to N_2O
- 273 = GWP100 of N_2O

IPCC assumes 30% leaching and 0.75% conversion to N_2O-N.

The applied methodology for N2O emission calculations ensures a consistent and conservative approach to greenhouse gas accounting by covering the full nitrogen cycle—from fertilizer application to soil transformation and indirect emissions. The combination of IPCC Tier 1 soil emission calculations and differentiated emission factors for fertilizer production provides a comprehensive view of the agricultural system's climate footprint.

The comparison between baseline and project scenarios enables the determination of the net GHG impact (CO_2e), reflecting changes in environmental performance resulting from project implementation.

7.2. Farm / Project Balance

The farm balance is equal to the net amount of greenhouse gas emissions removed carbon dioxide CO_2.

Net amount of greenhouse gas emissions removed carbon dioxide CO_2 (=) Gross amount of greenhouse gas emissions removed carbon dioxide CO_2 (-) Total fuel consumption CO_2 equivalent

Gross amount of greenhouse gas emissions removed carbon dioxide CO_2 (=) the sum of all cells, positive and negative for the specific calculation period.

[63] According to the IPCC Guidelines for National Greenhouse Gas Inventories, it is assumed that 1% of the applied nitrogen is directly converted into N_2O-N in the soil; the factor 1.57 represents the conversion from nitrogen (N_2O-N) to the N_2O molecule; and 273 is the Global Warming Potential (GWP) used to convert N_2O into CO_2e.

Коментирал [S20]: The N_2O emissions equations appear dimensionally consistent; however, the variable labeling is unclear. The formula converts applied nitrogen to N_2O-N, then N_2O, and finally CO_2e through application of the GWP factor, yet the final result is still labeled as "N_2O". The PP should clearly define intermediate variables and units (e.g., kg N_2O-N, kg N_2O, kg CO_2e) to improve transparency and avoid ambiguity regarding the quantity being reported.

Коментирал [DK21R20]: This section has been updated.

Форматирано: Шрифт: (по подразбиране) Montserrat, 10 пкт, Лигатури: Няма

Форматирано: Шрифт: 10 пкт, Лигатури: Няма

Форматирано: Шрифт: (по подразбиране) Montserrat, 10 пкт, Лигатури: Няма

Форматирано: Списък на абзаци, С водещи символи + Ниво: 1 + Подравнено на: 0,63 см + Отстъп на: 1,27 см

Форматирано: Шрифт: (по подразбиране) Montserrat, 10 пкт, Лигатури: Няма

Форматирано: Шрифт: (по подразбиране) Montserrat, 10 пкт, Лигатури: Няма

Форматирано: Списък на абзаци, С водещи символи + Ниво: 1 + Подравнено на: 0,63 см + Отстъп на: 1,27 см

Форматирано: Шрифт: (по подразбиране) Montserrat, 10 пкт, Лигатури: Няма

Total fuel consumption CO_2 equivalent (=) the sum of all cells, positive and negative for the specific calculation period.

7.3. Uncertainty Management

Carbonsafe's issuance policy is deliberately more conservative than standard practice to ensure that no tonne is overstated at issuance and that future variability in soil carbon stocks is prudently absorbed without passing risk to buyers. The mechanism rests on the nested safeguards that operate together across the full project life: (i) a sub-project level performance reserve, (ii) a shared project buffer for force majeure reversals, and (iii) uncertainty in carbon accounting.

7.3.1. Performance or Uncertainty Reserve

Carbonsafe imposes a sub-project level performance reserve that explicitly manages future-year variability and operational non-conformities that cannot be captured at a single measurement point:

1. Issuance ratio. In the monitoring year, only 25% of verified net removals are issued ex-post. The remaining 75% are held as a farm-specific performance reserve.
2. Release. In subsequent re-measurement period, if the same farm shows positive ΔSOC, the reserved balance is released for issuance.
3. Stop-loss rules. If a farm records a negative ΔSOC, no credits are issued and release is paused until positive performance is re-established.

7.3.2. Justification of reserve levels.

Even with annual measure–remeasure, soils respond non-linearly to climate and management. The reserve transforms year-to-year noise into buyer-grade certainty, letting the project "self-insure" operational variability without reaching prematurely into the project buffer.

7.3.3. Project reversal.

If the overall balance of the farm is negative in the final year of the farm's crediting period, this is treated as reversal and compensation from the reserve is triggered.

In the rare event that farm performance reserves prove insufficient the project accesses a shared project buffer coordinated with the registry. Draws from this buffer are transparently recorded.

7.3.4. Uncertainty deductions

Uncertainty associated with the quantification of greenhouse gas removals and emissions is systematically assessed, measured, and incorporated into the project's accounting framework. The approach ensures that all reported results reflect a conservative and reliable estimate of net climate impact.

Uncertainty is evaluated across all relevant stages of the measurement and calculation process, including soil sampling, laboratory analysis, data processing, and aggregation of results at plot and farm level.

The quantification of uncertainty follows recognized international principles and standards for measurement quality and confidence, including established approaches for the expression and propagation of uncertainty. These principles are applied consistently across the project to ensure robustness, comparability, and transparency of results.

.7.4. Buffer Pool and Risk Mitigation

7.4.1. Release of Reserves.

Carbonsafe's conservative issuance model is designed not only to safeguard the environmental integrity of credits but also to reward farms that demonstrate sustained, measurable progress in removing CO_2 from the atmosphere. A central part of this model is the release for issuance of credits from the reserve, which occurs only when positive trend in the farm balance is evident once the measure–remeasure results are out. The results must be then verified by the VVB. If discrepancies are found in the released removals before the VVB verification, the data from the verification report shall be considered valid, and corrective actions will be taken. Each sub-project has its own reserve.

This release structure serves several vital purposes. It protects buyers and the market by preventing premature issuance of large credit volumes when performance improvements are still modest or uncertain. At the same time, it aligns farmer incentives with climate impact, ensuring that greater soil carbon sequestration and higher farm balances directly translate into greater credit income.

By embedding this performance-based release mechanism, Carbonsafe provides a system that is both risk-averse and motivating. Farmers are encouraged to adopt and maintain regenerative practices that deliver stronger and more consistent carbon benefits, while buyers gain confidence that each credit released represents not just a removal in the past but part of a verified trajectory of improvement. In this way, the reserve functions as a performance escrow, releasing value only when farms continue to deliver measurable climate impact.

The sub-project credits reserve consists of verified net sub-project removals before serial number issuance. The reserve is allocated in the Carbonsafe's sub-project internal registry. If the sub-project's SOC balance in the final year of the sub-project's crediting period is negative, the reserve is used to cover this reversal. Carbonsafe submits to the Registry the necessary verified net sub-project removals needed to cover the reversal. The Registry issues serial numbers for those removals and allocates them to the Buffer pool for direct retirement.

7.4.2. Buffer pool management.

In addition to Carbonsafe's conservative issuance and reserve release policies, the project for North region maintains a centralized buffer pool equivalent to 5% of all verified net removals across participating farms. This buffer is specifically designed to address force majeuree events—rare, large-scale, and unpredictable occurrences that are beyond the control of individual farmers or the project developer, yet capable of undermining the permanence of stored soil organic carbon.

Force majeuree risks include, but are not limited to, severe droughts, floods, wildfires, pest infestations, geopolitical disruptions, or major systemic shocks to agricultural practices. The 5% buffer pool exists as a collective insurance mechanism to cover these low-probability but high-impact scenarios.

Every project participant contributes equally on a proportional basis—5% of their verified removals—into the buffer pool. This ensures that the burden of risk management is shared across the entire Carbonsafe project for North region rather than borne by individual farms disproportionately affected by natural disasters or extreme events.

The buffer is drawn upon when a documented force majeuree event leads to a clear and irreversible reversal of soil organic carbon at the farm or regional level, as determined through monitoring evidence and third-party verification. Examples include widespread crop failure due to prolonged drought that diminishes belowground carbon inputs, or catastrophic flooding that strips topsoil layers.

All claims on the buffer are subject to VVB review and must be validated as genuine force majeuree occurrences. Approved claims are recorded in the registry, and credits are permanently retired from the buffer pool to compensate for the loss. This process guarantees that environmental integrity is preserved and that no buyer holds credits linked to unmitigated reversals.

The buffer pool is continuously replenished with each issuance cycle, ensuring that the collective insurance mechanism remains active and adequately capitalized.

The buffer pool is a last-resort safeguard. Only when reserves are insufficient to cover negative farm balance results in the final year of the farm's crediting period or due to force majeuree circumstances, the shared 5% buffer is used. This layered structure ensures that the buffer remains dedicated to extraordinary risks.

Buyers of credits generated from Carbonsafe North region project are protected not only by the conservativeness of issuance and by farm-level reserves, but also by a project-wide safety net that guarantees compensation for unexpected, large-scale events beyond the control of any individual farmer. The buffer thereby ensures long-term permanence and market confidence.

8. DURABILITY, PERMANENCE & RISK MITIGATION.

8.1. Overview

One of the central challenges in soil carbon projects is ensuring durability, or the capacity of stored carbon to remain sequestered in the soil for long periods without being re-emitted into the atmosphere. In the context of the Carbonsafe North region project, durability is treated not as a fixed assumption but as a continuum of managed risk, governed by agronomic practice design, conservative accounting, and institutional safeguards such as reserves and buffer pools.

Soil organic carbon (SOC) is inherently dynamic. Unlike geologic storage, where permanence may span millennia, SOC stocks fluctuate in response to land management, climatic variation, and external shocks. In poorly managed systems, carbon can be quickly lost through intensive tillage, monoculture cropping, or soil erosion. Conversely, under regenerative agriculture practices—reduced tillage, cover cropping, crop rotation, organic amendments—SOC can be progressively stabilized into humified pools that persist for decades or longer. Carbonsafe acknowledges this duality: soils have enormous potential for durable carbon storage, but also carry inherent risks of reversal.

To address this, Carbonsafe defines permanence not simply as the "lifetime" of a credited tonne, but as a governed durability term, supported by annual monitoring and layered safeguards. The project's MRV system ensures that all removals are measured annually using geo-referenced sampling and accredited laboratory analysis. This creates a transparent time series of evidence, allowing declines in SOC to be detected immediately. Rather than relying on assumptions or modeled permanence horizons, Carbonsafe grounds its durability claims in empirical annual data.

Complementing this measurement-first philosophy is a crediting architecture designed to manage uncertainty and variability – credits reserves and buffer pool.

Durability in Carbonsafe also extends beyond physical safeguards to behavioral and contractual mechanisms. Farmers enter legally binding individual 5-year agreements requiring adherence to regenerative practices and are strongly encouraged to renew their participation every 5 years for the whole duration of the project. These contractual frameworks reduce the risk of premature abandonment of practices, which is one of the principal threats to SOC permanence.

Durability is understood within a broader policy and buyer context. The EU's Carbon Removal Certification Framework (CRCF) emphasizes that soil-based removals must be coupled with robust monitoring, conservative accounting, and liability mechanisms. Similarly, buyers demand clear evidence that durability is actively managed, not simply asserted. Carbonsafe's system of annual verification, conservative issuance, performance reserves, and buffer pools is designed to meet these requirements, offering a level of prudence and transparency that distinguishes it from projects relying heavily on models or sporadic sampling.

8.2. Reversals and leakage.

Within Carbonsafe, durability is safeguarded by treating reversals and leakage as distinct but interlinked risks, each addressed through conservative accounting and layered liability.

8.2.1. Reversal

A reversal is defined as a verified net loss of the overall farm balance in the final year of the farm's crediting period. The farm balance for each reporting period is equal to the net amounts of removed greenhouse gas carbon dioxide (CO_2) emissions and includes the sum of all plots (cell) with reported positive and/or negative results regarding the soil organic carbon content for the specific calculation period. The overall farm balance is equal to the net amounts of removed greenhouse gas carbon dioxide (CO_2) emissions reported in the final year of the sub-project crediting period. The sub-project shall be deemed successfully implemented when the overall farm balance is positive. The sub-project shall be deemed unsuccessful when the overall farm balance is negative. In the event of a reported negative farm balance in the final year of the sub-project crediting period, the corresponding reserve shall be used to cover the reversal.

8.2.2. Leakage

In agriculture, the principal risk is activity-shifting: if practices reduce yields materially and consistently, a producer—or the local market—might compensate by expanding cultivation elsewhere or intensifying inputs, resulting in net emissions increases beyond the project's perimeter. Leakage is directly measured through monitoring of yield changes in farms and also supported by satellite data to ensure that carbon gains are not offset by production displacement elsewhere.

8.3. Durability and Operational risk.

Carbonsafe recognizes that permanence is fundamental to the credibility of soil carbon projects. While soil carbon sequestration can deliver long-lasting climate benefits, its integrity depends on the continuity of regenerative practices over the contracted crediting period. In agriculture, however, circumstances such as changes in land tenure, farmer decisions, or unforeseen external pressures may lead to land or participant withdrawal ("dropout"). To maintain environmental integrity and buyer confidence, Carbonsafe applies contractual safeguards, land-rights due diligence, and a conservative land buffer mechanism that collectively minimize risks without imposing disproportionate burdens on farmers.

8.3.1. Contractual obligations.

All farmer agreements contain explicit clauses requiring that:

- Enrolled practices and processes recommended by Carbonsafe are followed throughout the sub-project crediting period.
- The project is implemented on the same legally defined land parcels for the duration of enrollment.

This ensures continuity and traceability of credited activities and prevents "land shifting" that could undermine additionality or permanence.

8.3.2. Land-rights due diligence.

Prior to enrollment, Carbonsafe verifies the legal rights of participating farmers over the land they seek to include in the project. This due diligence reduces risks of dropout linked to contested tenure, lease expirations, or ownership disputes, thereby protecting both project integrity and participating farmers.

8.3.3. Land Buffer or Risk Reserves

Recognizing that some level of change in land tenure or farmer participation is unavoidable and in relation to managing the risk of non-permanence in land use, Carbonsafe recommends that farmers set aside a minimum of 10% of their agricultural area outside the project boundary. This reserve land is not credited but serves as a risk management measure in case of:

1. Land consolidation
2. Land swaps
3. Reallocation of land to non-project uses and business ventures other than agriculture

By applying this land buffer, the project strives to ensure that issued credits remain fully backed and insulated from credibility risks.

A fixed 5% buffer deduction is applied to all credited removals at the project level. This deduction also functions against residual uncertainty and minor land-use disruptions, including small-scale parcel loss. The buffer is withheld prior to issuance and serves as a first-level permanence risk mitigation tool.

The project applies a structured 25/75 issuance-reserve mechanism in relation to performance and risk management. Under this framework:

- A defined share of verified carbon removals~~generated value~~ remains temporarily retained at sub-project level reserve to secure long-term integrity and manage risk exposure.
- The remaining share of verified removals is allocated according to contractual arrangements with participating farmers.

The reserve component is not a benefit-sharing or revenue-allocation mechanism. Its sole purpose is to provide an additional layer of environmental integrity and permanence protection. Subject to continued project performance and verification outcomes, reserved removals may be released in accordance with the requirements of the BCCS and project procedures.

This mechanism ensures that sufficient project-level control and reserves exist to address potential land withdrawals or underperformance without compromising already issued credits.

If land exclusion occurs before credit issuance for a monitoring period:

- The affected area is removed from the calculation prior to verification.
- SOC gains attributable to the excluded parcel are not credited.

If land exclusion occurs after credit issuance:

- The 25/75 mechanism or the 5% buffer mechanism applies.
- If material reversal or over-crediting is identified, corrective adjustments are applied in subsequent monitoring cycles.
- Where necessary, credits may be compensated through buffer retirement or recalculation adjustments consistent with BCCS permanence principles.

The PP maintains a formal internal registry of excluded or lost land parcels ("registry of dropped areas").

8.3.4. Monitoring and governance.

Farmer adherence to contractual obligations is reviewed annually through Carbonsafe's MRV process, which integrates farm-level data, site inspections, and verification by independent VVBs. Any dropout cases are recorded and disclosed in annual reporting.

8.3.5. Penalties and Exit Provisions

Individual contracts with farmers contain explicit clauses addressing premature withdrawal. These penalties are designed not as punitive measures, but as necessary safeguards to preserve program integrity and fairness among participants. Key provisions include:

- Repayment of unearned benefits: Farmers who withdraw before the end of a reporting cycle may be required to return any advance payments or unverified revenue shares linked to projected credits.

Коментирал [S22]: The PDD consistently describes a 25/75 issuance-reserve mechanism in which a portion of verified removals is placed into a reserve and may subsequently be released subject to project performance. However, the description in Section 8.3.3 refers to a share being "retained at project level" and the remaining share being "allocated to participating farmers", which could be interpreted as a benefit-sharing or revenue-allocation arrangement rather than a temporary reserve mechanism. The PP must clarify the relationship between the reserve allocation mechanism and any benefit-sharing arrangements to avoid ambiguity regarding the purpose and treatment of the retained share.

Коментирал [DK23R22]: The wording in this section has been updated to avoid ambiguity regarding the purpose and treatment of the retained share.

- Withholding of future payments: Pending disbursements from verified credits are forfeited if dropout occurs prior to verification.
- Administrative penalties: To cover the costs of monitoring, and verification already incurred, a fixed administrative fee is applied in cases of dropout without justified cause.
- Grace provisions: Penalties are waived in cases of force majeuree (e.g., severe drought, flooding, natural disaster) or where withdrawal is linked to documented hardship beyond the farmer's control.

In the event of early termination of a farm's participation in the project, all carbon credits issued, realized, or sold that were generated by this farm shall be considered invalid. The cancellation shall be certified by an additional document, and its entry and notation in the Registry is mandatory. The farmer shall be subject to the penalties for early withdrawal provided for in the contract and the general terms and conditions, and shall bear full responsibility for the consequences incurred. In the event that the issued credits have already been transferred to third parties, the project organizer shall be obliged to compensate the buyers by replacing them with credits of equivalent quality and value, issued under other projects, until their rights are fully restored. All actions taken shall be duly certified and recorded in full and transparent manner in the official Registry.

By embedding these provisions in contracts, Carbonsafe creates accountability while maintaining fairness and avoiding disproportionate burdens on vulnerable farmers.

9. LEAKAGE.

9.1. Leakage Risk Analysis.

In Carbonsafe, "leakage" is treated as an economic displacement risk: greenhouse gas (GHG) emissions that may increase outside the credited project boundary as an unintended consequence of in-boundary practice changes. Unlike reversals (loss of previously credited SOC within the boundary), leakage concerns market- and behavior-driven effects that might offset part of the climate benefit. This section identifies the plausible leakage pathways for a soil-carbon (SOC) project, evaluates their likelihood and magnitude.

9.1.1. Plausible leakage pathways.

1. Activity-shifting (production displacement).

If regenerative practices were to reduce yields persistently, the farm (or market) might compensate by bringing *new land* into production elsewhere or intensifying production off-site, increasing emissions beyond the project boundary. Examples include converting marginal grassland or scrub outside the farm to cropland, or a nearby producer increasing tillage/fertilizer intensity to fill supply gaps.

Mitigation strategy: Monitored with the support of satellite data. Annual technological maps, monitoring of agrotechnical operations, inspections of the entire farm, GIS overview (shapefiles) of the used areas.

2 Expansion of Cropland

There is a plausibility for farmers to expand agricultural activities into new areas to compensate for possible changes in soil management - potential emissions from new soil cultivation or land conversion.

Mitigation strategy and project context: Arable land Report - a small change in arable land in Bulgaria over the past years - negligible risk[64]. LPIS/ISAK checks, land use analysis through GIS review (shapefiles) of the areas used. Document for annual re-registration of the participant.

[64] https://ec.europa.eu/eurostat/databrowser/view/tag00025/default/table?lang=en&category=t_agr.t_apro.t_apro_cp

3 Yield Compensation Leakage & Indirect market effects.

A decrease in yields in the project areas may lead to increased production in other areas - potential increase in emissions outside the project.

Mitigation strategy: Leakage is directly measured through the monitoring of yield changes in farms. Agronomic strategies for maintaining yields; productivity monitoring - technological maps, laboratory testing of soil samples, optimization of fertilization, costs and economic cost of production The project does not reduce production or limit crops; yield monitoring and agronomic support. GIS overview (shapefiles) of the areas used. Document for annual re-registration of the participant

Conclusion: the assessment of leakage pathways is integrated into the annual MRV cycle. The project specifies that leakage is directly measured through monitoring of yield changes in farms and also supported by satellite data. This dual-verification approach ensures that any displacement of agricultural activity is quantified and deducted from the net removals.

9.1.2. Likelihood assessment.

The likehood assessment is presented in *9.1.1. Plausible leakage pathways*.

10. ENVIRONMENTAL, SOCIAL AND ECONOMIC CO-BENEFITS AND SAFEGUARDS.

10.1. Environmental Co-benefits .[65][66][67][68][69][70]

10.1.1. Biodiversity

Carbonsafe treats crop rotation as a core ecological lever that expands habitat diversity in time, stabilizes trophic interactions, and rebuilds below- and above-ground biological communities. In contrast to single-crop or short, repetitive sequences, multi-species, multi-year rotations provide heterogeneous resources (root exudates, residues, canopy structure, phenology) that create more niches for organisms from soil microbes to beneficial insects, birds, and small mammals. This temporal heterogeneity—when coupled with reduced soil disturbance and residue retention—drives measurable gains in species richness, functional diversity, and ecosystem stability.

Ecological mechanisms. Rotating botanical families alternates root architectures and exudate profiles, which select for different microbial guilds (e.g., actinomycetes with fibrous cereals; arbuscular mycorrhizae with many legumes and oilseeds). Legume phases add reactive nitrogen, increasing residue quality and stimulating microbial biomass and enzyme activity; brassica or deep-rooted phases improve soil structure, porosity, and water infiltration, enabling broader habitat for soil fauna such as earthworms and predatory arthropods. At the field surface, varied canopy heights, flowering windows, and residue structures support pollinators and natural enemies (e.g., hoverflies, lady beetles, parasitoids) and disrupt pest and pathogen life cycles that thrive in monoculture. Over time, this reduces the need for broad-spectrum pesticides and encourages integrated pest management (IPM) based on ecological regulation.

Anticipated biodiversity outcomes. By diversifying botanical families and phenologies, rotations broaden resource spectra across seasons, elevating soil microbial richness and functional redundancy (greater resilience to stress), increasing earthworm abundance and epigeal predator

[65] State Fund Agriculture (Bulgaria). (2023). *Разнообразяване на отглежданите култури – еко-мерка (Crop diversification eco-scheme)*. Retrieved from https://dfz.bg/diversification-of-cultivated-crops/

[66] Bowles, T. M., Atallah, S. S., Campbell, E. E., Gaudin, A. C. M., Wieder, W. R., & Grandy, A. S. (2018). Addressing agricultural nitrogen losses in a changing climate. *Ecosphere, 9*(10), e02335. https://doi.org/10.1002/ecs2.2235

[67] Beillouin, D., Cimon-Morin, J., Makowski, D., ... & Loreau, M. (2023). Benefits of crop diversification for biodiversity and ecosystem services. *Nature Communications, 14*, 7869. https://doi.org/10.1038/s41467-023-44464-9

[68] Li, Y., Zhang, J., Wang, Y., & Zhang, S. (2024). Effects of crop rotation on soil microbial communities and nutrient cycling: A global meta-analysis. *Plant and Soil*. Advance online publication. https://doi.org/10.1007/s11104-024-06994-z

[69] Michigan State University Extension. (2018). *Study shows crop rotation has positive impact on soil microbes and long-term sustainability*. Retrieved from https://www.canr.msu.edu/news/study_shows_crop_rotation_has_positive_impact_on_soil_microbes_and_long_ter

[70] Ministry of Agriculture of Bulgaria. (2022). *Прессъобщение: Дерогация за определени изисквания в земеделието* [Press release]. Retrieved from https://www.mzh.government.bg/media/filer_public/2022/10/31/press_derogaciya_1.pdf

activity, and improving plant species richness in inter-row and margin zones. At landscape scale, staggered flowering pulses from different crops and covers extend forage availability for pollinators, while rotational disruption of host-specific pests reduces chemical input pressure and non-target impacts. These gains are expected to co-stabilize yields over time by dampening pest outbreaks and enhancing soil water and nutrient cycling.

Biodiversity is treated as a reported co-benefit:

1. Rotation diversity per plot and farm (e.g., number of crop families over a rolling period),
2. Botanical surveys and/or statistics based on regenerative practices
3. Practice-linked proxies, including pesticide treatment frequency trends, as a signal of ecological regulation replacing chemical control.

Crop rotation multiplies ecological niches across time, rebuilds soil food webs, and supports beneficial fauna, while interacting synergistically with reduced disturbance and cover cropping to deliver durable, system-level biodiversity gains.

10.1.2. Agrochemical Use

Within the Carbonsafe framework, reduction in pesticide use is recognized as a critical ecological and agronomic co-benefit of regenerative practices, particularly when integrated with diversified crop rotations, cover cropping, residue retention, and reduced soil disturbance. By shifting away from monoculture-based systems and creating ecological conditions that foster natural pest regulation, farms can gradually lower their reliance on synthetic chemical controls. This not only reduces greenhouse gas emissions associated with pesticide manufacturing and application but also enhances soil biodiversity, water quality, and farm ecosystem resilience.

Ecological mechanisms.

Pesticide dependence arises primarily from simplified agroecosystems, where repetitive monocropping, bare fallows, and heavy soil disturbance create environments conducive to pest and weed dominance. Carbonsafe directly addresses these drivers by requiring farmers to adopt multi-species crop rotations that disrupt pest and disease cycles, while cover crops and permanent ground cover reduce opportunities for weed germination and competition. Furthermore, reduced tillage maintains habitat for predatory arthropods and soil-dwelling organisms (e.g., carabid beetles, spiders, nematode antagonists), which suppress pest populations naturally. By layering these ecological processes, farms progressively shift pest control dynamics from chemical reliance to ecological regulation, thereby reducing the need for broad-spectrum synthetic inputs.

Implementation within Carbonsafe for North region, Bulgaria.

Farmers participating in the project are guided through a transition plan that emphasizes the gradual reduction of pesticide use rather than abrupt elimination. Each farm’s pesticide use is monitored including total quantities applied and treatment frequency. Consequently, farms adopt practices such as:

1. Diverse crop rotations that reduce host-specific pest populations.

2. Catch and cover crops that suppress weeds by limiting bare soil exposure.

3. Mulching and residue retention that physically inhibit weed emergence.

4. Integrated Pest Management (IPM) strategies, such as pest scouting, threshold-based application, and the introduction or conservation of natural enemies.

5. Selective or reduced-rate chemical applications where necessary, ensuring that synthetic use is minimized and targeted rather than systemic.

The project does not mandate complete elimination of synthetic inputs, recognizing that responsible, selective use may be necessary in some circumstances. Instead, Carbonsafe sets a target trajectory of progressive reduction, anchored in annual monitoring and adaptive farm-specific recommendations.

Anticipated outcomes.

The anticipated impact of this transition may include a reduction in the total volume of active ingredients applied, fewer treatment applications per season, and a decline in pesticide dependence as cover crops and mechanical suppression take over weed control functions. Over time, participating farms could be expected to show:

1. Lower treatment frequency compared to previous years.
2. Reduced pesticide expenditure, directly lowering farm input costs.
3. Increased abundance of beneficial organisms (predatory insects, pollinators, soil microbes) due to reduced chemical disturbance.
4. Improved soil microbial diversity and activity, which further contributes to nutrient cycling and disease suppression.
5. Decreased risk of pesticide resistance in weed and pest populations, as reliance on single-chemistry solutions is broken.

Monitoring and indicators.

Monitoring of pesticide reduction is integrated into the Carbonsafe MRV framework. Each year, participating farms submit input-use records that detail:

1. Types and quantities of fertilizers or pesticides used.
2. Frequency and timing of applications.
3. Treated areas..

These metrics are compared to previous years, providing a transparent measure of reduction progress.

Risk management.

Carbonsafe recognizes that during the early transition years, pest and weed pressures may fluctuate, and chemical applications may temporarily rise in isolated cases to prevent crop loss. To manage this risk, the project employs a “no backsliding” rule: farms that increase pesticide use above baseline without documented agronomic justification (e.g., extreme pest outbreak, force majeuree event) are flagged, and issuance of credits for the affected monitoring year may be suspended or reduced until compliance is restored. Training and extension support are provided to minimize reliance on emergency treatments and to strengthen resilience against such shocks.

Attribution and conservativeness. As with biodiversity co-benefits, reductions in pesticide use are treated as qualitative and quantitative co-benefits, not netted into carbon credit issuance. This ensures transparency and avoids overstating climate outcomes. Nonetheless, these reductions provide tangible environmental value—lower chemical runoff into waterways, healthier soils, and improved biodiversity—that strengthen the overall sustainability profile of the Carbonsafe credits.

By embedding crop diversification, cover cropping, IPM, and reduced soil disturbance, Carbonsafe creates conditions where chemical reliance declines naturally and progressively. This delivers measurable benefits to farmers (reduced input costs and risks), to ecosystems (healthier soils, greater biodiversity), and to society (lower chemical residues and improved water quality). Importantly, by monitoring input-use trends annually and tying reductions to transparent reporting, Carbonsafe ensures that claims of pesticide reduction are credible, traceable, and consistent with the project's high-integrity standards.[71][72]

10.1.3. Water Resources.

Carbonsafe treats water as a co-equal outcome of soil-carbon restoration. By rebuilding soil structure, increasing organic matter, and maintaining year-round cover, participating farms in the North region progressively shift from fast runoff and episodic water stress to higher infiltration, greater plant-available water, and cleaner edge-of-field discharges. These water benefits are reported as co-benefits (they are not netted into carbon accounting), but they are tightly integrated with the agronomic guidance and annual MRV cycle.

Hydrological mechanisms. The project's regenerative practice set—reduced soil disturbance, diversified rotations, cover/catch crops, residue retention, and targeted organic amendments—promotes aggregate formation and stability. As macro-aggregates develop and pore networks reconnect, saturated hydraulic conductivity and infiltration rates increase, while bulk density declines. Rising soil organic carbon (SOC) elevates field capacity (FC) and, when paired with moderated compaction, can also lower permanent wilting point (PWP), expanding plant-available water (PAW = FC – PWP). Continuous cover reduces kinetic energy of raindrops and shear stress at the surface, suppressing crusting and sediment detachment. Root channels from cover and rotation species act as biopores, accelerating preferential flow into the profile rather than across the surface. The net effect is less runoff and erosion, greater soil moisture buffering during dry spells, and lower risk of waterlogging following intense rainfall.

Water-quality pathways.

With reduced runoff and gentler overland flow, sediment-bound phosphorus (P) losses decline, and filtration through residue and cover slows transport of dissolved nutrients and pesticides to ditches and canals. Diversified rotations and nutrient recommendations grounded in full soil panels (macro/microelements, pH) temper over-fertilization, which lowers nitrate (NO_3-N) leaching risk, particularly when cover crops capture residual N post-harvest. Minimizing broad-spectrum pesticide applications (via IPM and ecological regulation) further reduces the chemical load in edge-of-field water.[73]

Implementation in the North context.

On lighter textured soils and in foothill transitions, intense events can create short, destructive runoff pulses; on heavier textures, summer deficits constrain yields without irrigation. Carbonsafe's practices are therefore tuned to: (i) maintain surface cover ahead of storm seasons, (ii) build deep and fibrous rooting in rotations to open pore channels, (iii) protect soil structure by limiting passes and axle load during wet conditions, and (iv) optimize N timing and forms to reduce nitrate flushes. Where irrigation is used, improved soil water holding and reduced evaporative losses from mulched surfaces can lower irrigation demand and stabilize crop water productivity.

10.1.4. Soil Health.

Carbonsafe treats soil structure and soil health as foundational outcomes that enable—and stabilize—carbon sequestration, yield performance, and ecosystem services. Through reduced disturbance, continuous cover, diversified rotations, and targeted organic and mineral amendments, participating farms progressively rebuild aggregate architecture, porosity, and

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[71] Ministry of Agriculture, Food and Forestry of Bulgaria. (2021). *Наредба № 9 от 26 февруари 2021 г. за интегрирано производство на растения, растителни продукти и храни от растителен произход* [Ordinance No. 9 of February 26, 2021, on integrated production of plants, plant products, and foods of plant origin]. Retrieved from https://www.mzh.government.bg/media/filer_public/2021/03/12/naredba__9_ot_26_fevruari_2021_g_za_integrirano_pr_0.pdf

[72] Guo, X., Li, Y., Xu, Z., Zhang, C., Shen, J., & Liang, W. (2023). Diversified cropping systems enhance soil biodiversity and ecosystem multifunctionality. *Nature Communications, 14*, 7320. https://doi.org/10.1038/s41467-023-43234-x

[73] University of Wisconsin–Madison Division of Extension. (n.d.). *Cover crops for improved surface water quality: Benefits and limitations.* UW–Madison Extension Agricultural Water Innovations. Retrieved September 29, 2025, from https://agwater.extension.wisc.edu/articles/cover-crops-for-improved-surface-water-quality-benefits-and-limitations/

biological function. The result is a soil system that resists erosion, infiltrates and holds more water, cycles nutrients efficiently, and buffers climatic and operational stress.

Mechanisms of structural change.

At the core of structural improvement is the formation and stabilization of macro- and micro-aggregates. Living roots (including cover crops) exude polysaccharides and organic acids that feed microbial communities; fungi (notably arbuscular mycorrhizae) produce glomalin and hyphal networks that act as biological binding agents; bacteria secrete extracellular polymeric substances (EPS) that cement particles. Retained residues and organic inputs increase particulate organic matter (POM)—a key substrate for macro-aggregate formation—while progressive accrual of mineral-associated organic matter (MAOM) contributes to long-term stabilization. Reduced tillage preserves these bonds and pore networks, minimizing the collapse of aggregates and biopores that typically follows intensive mechanical disturbance. Structurally, this translates to lower bulk density, greater total and effective porosity, improved hydraulic conductivity, and higher mean weight diameter (MWD) of aggregates—properties that underpin infiltration, aeration, and root exploration.

Nutrient cycling and chemical health.

Rising soil organic carbon (SOC) increases cation exchange capacity (CEC) and improves base saturation where appropriate amendments and residue regimes are used, supporting more stable pH and reduced nutrient losses. Diverse rotations and organic inputs foster microbial biomass and enzyme activities (e.g., β-glucosidase, phosphatase, dehydrogenase), accelerating mineralization–immobilization dynamics and enhancing availability of N, P, S, and micronutrients while reducing reliance on synthetic inputs. Where sodium risks exist (elevated ESP/SAR), structure-friendly calcium amendments and drainage management are advised to prevent dispersion and surface sealing.

Biological health and soil food web.

As disturbance declines and organic inputs increase, fungal:bacterial ratios typically rise, earthworm populations recover, and trophic complexity expands (from bacterivorous/fungivorous to predatory nematodes). These biological communities help suppress pathogens, fragment residues, and create biopores that extend rooting depth and drainage. In turn, improved root architecture enhances carbon inputs to the subsoil, supporting deeper SOC gains and resilience to drought.

Implementation within Carbonsafe.

Each farm's transition plan specifies compatible combinations of:

1. Reduced or strip tillage, with controlled traffic where feasible to confine compaction;
2. Residue retention and multi-species cover crops to maintain year-round soil cover and living roots;
3. Rotation diversification (including legumes and deep-rooted phases) to vary root exudates and break pest/disease cycles;
4. Targeted amendments (lime/gypsum/compost/manures) based on plot-level chemistry to correct pH and Ca:Mg ratios, support aggregation, and supply balanced nutrition.

The plan is adapted annually using the project's 100% measured evidence base: geo-referenced composites from 25 cores per 4–25 ha plot at 0–30, 30–60, and 60–90 cm, analyzed in accredited laboratories. This unusually dense, multi-depth sampling supports plot-specific recommendations that protect structure (e.g., tillage exemptions in wet years, residue management to avoid spring crusting on fine textures, cover crop termination windows to prevent moisture competition).

Soil structure and health are tracked as co-benefits (separate from carbon crediting) yet integrated with MRV for agronomy:

1. SOC (primary), pH, CEC, base saturation, macro-/micronutrients,
2. C:N ratio and P fractions where relevant to erosion/leaching risk.

Sampling windows are harmonized seasonally; chain-of-custody and geo-tags maintain traceability and all results flow into the ERP, where trends are visualized per plot and each plot receives tailored agronomic recommendations.

Attribution, conservativeness, and reporting.

Because structure and health reflect multiple drivers (weather, management history, texture), Carbonsafe interprets trends conservatively, emphasizing directionality and full macro and micro nutrient analysis. These outcomes are reported as co-benefits in MRV annexes (agronomic recommendations) and not netted into carbon issuance, aligning with high-integrity buyer expectations and CRCF principles.

Outcome.

Over successive seasons, participating fields move from compacted, weakly aggregated soils to well-structured profiles characterized by stable aggregates, continuous pores, vigorous roots, and active soil biota. This elevated soil health underpins durable SOC gains, yield stability, water efficiency, and ecosystem resilience—co-benefits that strengthen the credibility and long-term value of Carbonsafe's carbon removals.[74][75][76][77][78]

10.1.5. Input Efficiency

Within the Carbonsafe framework, the reduction of synthetic fertilizer use is not only an agronomic outcome but also a climate-critical co-benefit. Fertilizer inputs—particularly nitrogen-based products—are major contributors to agricultural greenhouse gas emissions through the release of nitrous oxide (N_2O), a gas with nearly 300 times the global warming potential of CO_2 over a 100-year period. By designing a system that improves soil organic carbon (SOC), enhances nutrient cycling, and leverages targeted agronomic recommendations based on detailed soil testing, Carbonsafe enables farms to achieve stable or improved yields with progressively lower reliance on synthetic fertilizers.

Mechanisms of Fertilizer Reduction.

The project reduces fertilizer dependency through multiple synergistic mechanisms:

1. Improved nutrient retention via SOC gains.

   Higher organic matter increases cation exchange capacity (CEC) and enhances nutrient-holding ability, reducing leaching losses of cations like potassium (K^+), calcium (Ca^{2+}), and magnesium (Mg^{2+}). SOC also buffers pH, creating more favorable conditions for nutrient uptake.

2. Biological nutrient cycling.

   Enhanced microbial biomass and activity, supported by residue retention and reduced tillage, promotes mineralization–immobilization cycles. Soil organisms release nutrients

[74] Fialkowski, F., Taffarello, D., Côrtes, J. C., & McGrath, J. M. (2024). Exploring soil health indicators and sustainability metrics for agricultural systems: A review. *Journal of Environmental Management, 363*, 122590. https://doi.org/10.1016/j.jenvman.2024.122590
[75] Ramesh, T., Lal, R., & Smith, P. (2024). Advances in soil organic carbon research: Implications for sustainable agriculture and climate change mitigation. *Soil & Tillage Research, 236*, 105140. https://www.sciencedirect.com/science/article/abs/pii/S0167198724001983
[76] Williams, A., Schipanski, M. E., Robertson, G. P., & Drinkwater, L. E. (2024). Soil carbon dynamics in diversified cropping systems: Integrating cover crops and reduced tillage. *Agronomy Journal, 116*(2), 405–421. https://doi.org/10.1002/agj2.21156
[77] Panagos, P., Borrelli, P., Ballabio, C., Meusburger, K., & Montanarella, L. (2024). Continental assessment of soil carbon erosion in Europe. *SOIL, 10*(1), 139–153. https://doi.org/10.5194/soil-10-139-2024
[78] Silva, R. F., Oliveira, D. M. S., Pereira, F. F., Souza, L. C., & Andrade, R. (2024). Agricultural biodiversity and ecosystem resilience: A global perspective. *Diversity, 16*(12), 734. https://www.mdpi.com/1424-2818/16/12/734

gradually and more synchronously with crop demand, lowering the need for blanket fertilizer applications.

3. Nitrogen fixation by legumes.

   Rotations that include leguminous crops or legume cover crops (e.g., clovers, vetch, peas) biologically fix atmospheric nitrogen, reducing synthetic N requirements for subsequent crops.

4. Nutrient capture by cover crops.

   Catch crops intercept residual nitrogen after harvest, preventing leaching into groundwater and re-releasing nutrients when incorporated or terminated. This closes nutrient cycles and improves efficiency.

5. Precision fertilization based on soil data.

   Carbonsafe's 100% soil sampling model provides not only SOC data but also full macro- and micronutrient profiles for each plot. Annual individualized recommendations are issued to optimize rates, timing, and types of fertilizers. This avoids over-application and targets inputs to actual soil and crop needs.

Implementation in Carbonsafe.

At enrollment, every farm undergoes baseline soil testing across all sampled plots. This includes SOC but also N, P, K, S, pH, and trace elements (Zn, Fe, Mg, Mn, Cu). Each year, updated sampling allows recalibration of fertilizer recommendations. These recommendations are farm-specific and plot-specific, ensuring that inputs are not applied uniformly but in proportion to actual requirements.

Farmers are trained to adopt 4R nutrient stewardship (Right source, Right rate, Right time, Right place). Carbonsafe advisors encourage practices such as:

1. Using split nitrogen applications instead of single heavy doses, aligning release with crop demand.

2. Prioritizing organic amendments (compost, manures) where locally available.

3. Incorporating legume rotations and cover crops to naturally supply nitrogen.

4. Reducing tillage to prevent nutrient volatilization and erosion.

Anticipated Outcomes.

Over time, Carbonsafe expects participating farms to demonstrate:

1. Reduced synthetic N application rates (typically 10–30% reductions in the first 3–5 years, depending on baseline practices and adoption of legumes/cover crops).

2. Stabilized or improved yields despite lower inputs, due to more efficient nutrient cycling and improved soil structure.

3. Reduced nitrous oxide emissions, lowering the risk of over-crediting when only SOC is measured.

4. Lower input costs, improving farm profitability and resilience.

Monitoring and Indicators.

The reduction in fertilizer use is tracked through:

1. Annual input-use reporting: farmers submit records of fertilizer types, rates, timing, and treated areas.

2. Soil nutrient panels: repeated annually, confirming nutrient availability trends and documenting reduced need for external inputs.
3. Nutrient balance sheets: calculated per farm, comparing inputs to outputs and tracking nutrient surpluses/deficits.
4. Proxy indicators of efficiency: crop yields relative to N input, nitrogen use efficiency (NUE), and nitrogen surplus per hectare.

Risk Management.

Carbonsafe recognizes that overly aggressive reductions could jeopardize yields, prompting re-intensification and potential leakage. To avoid this, the project applies a stepwise reduction trajectory, focusing on efficiency rather than elimination. Soil data ensures that any cutbacks are evidence-based, not arbitrary. In drought or stress years, exemptions allow for strategic nutrient adjustments to preserve yields and prevent farmer dropout.

Attribution and Conservativeness.

N_2O emissions from fertilizer inputs are measured and directly netted into the project's carbon credit issuance to provide a high-integrity climate outcome.

By coupling annual full-soil nutrient diagnostics with regenerative practices, Carbonsafe systematically reduces fertilizer dependence while maintaining yields. This not only cuts on-farm costs and N_2O emissions but also reduces nutrient runoff to waterways, improving environmental integrity. The result is a more circular, resilient nutrient economy at the farm level, one that delivers climate, agronomic, and community co-benefits without compromising credit integrity.

The Carbonsafe program introduces mandatory quantitative thresholds, linked to the project's MRV system, to ensure that reductions in fertilizers and pesticides do not lead to unintended consequences such as yield declines or deviations from targets.

Threshold for reducing nitrogen fertilizer

1. Description of the Approach

As part of the carbon farming project, an individual nutrient management strategy is developed for each participating farm. Farmland is divided into spatially distinct plots (management units), which serve as the basis for precise planning and monitoring.

For each cell, an agronomic recommendation is prepared annually based on the results of laboratory soil analyses, including available (reserve) nitrogen content.

2. Determining the Required Amount of Nitrogen

The required amount of nitrogen is calculated based on:

- a predefined target yield for the respective crop;
- agronomic nitrogen application rates;
- results of soil analyses for available nitrogen.

The goal is to ensure sufficient crop nutrition without allowing over-fertilization.

3. Threshold for nitrogen fertilizer application

For each crop and field, a maximum permissible amount of nitrogen (in active ingredient) is determined, which must not be exceeded. This threshold is based on the balance between:

- the crop's needs to achieve the target yield;
- available nitrogen in the soil;
- contributions from alternative sources.

Example:

For a target yield of 200 kg/ha of wheat, requiring approximately 5 kg/ha of active nitrogen, the total amount applied (from all sources) should not exceed this value.

The amount of nitrogen required to produce 100 kg of wheat is 2.5 kg of active nitrogen. Data from Fertilization of Agricultural Crops, Author: Prof. Stefan Goranov, Ph.D..

4. Strategy for Reducing Mineral Nitrogen

A balanced approach to nitrogen management takes into account micro- and macroelements in annual laboratory tests. The project envisages a phased reduction in the use of mineral nitrogen fertilizers through their partial replacement with:

- microbial fertilizers;
- organic fertilizers;
- nitrogen-fixing and/or cover crops in the crop rotation;
- dividing the nitrogen into portions for application throughout the growing season rather than applying the entire amount at once.

Include legumes in the rotation.

Over a 5-year period, the goal is to reduce mineral nitrogen by approximately 15%, while maintaining agronomic efficiency and yield levels.

5. Monitoring and Verification

Compliance with the nitrogen fertilization threshold is ensured through:

- annual soil analyses;
- documentation of all applied fertilizers (mineral and alternative);
- yield tracking;
- technology maps for the agronomic practices used.

The data is used for internal control and external verification in accordance with the requirements of the carbon standard.

6. Expected Effect

The implementation of this threshold could lead to:

- a reduction in greenhouse gas emissions (including N_2O);
- improved soil health;
- increased nutrient use efficiency;
- mitigation of the risk of environmental pollution.

Relationship between nitrogen reduction and yield stability

The reduction of mineral nitrogen fertilizers within the project is carried out in a controlled and conditional manner, and is directly linked to the yield stability threshold.

The threshold requires that the average yield not fall below 95% of the baseline (Ybase).

This threshold represents the limit of natural variation ("statistical noise") and serves as a key indicator of agronomic stability.

A drop below 95% triggers a mechanism for calculating leakage (MLK), as the missing production can be compensated for by additional production elsewhere. Therefore, nitrogen reduction is permissible only if it does not lead to a yield drop below this threshold.

2. Nitrogen Balance Threshold:

A baseline yield is determined for each farm:

Y(base) = average yield over the 5 years prior to project enrollment

The following threshold applies within the project:

Y(proj) ≥ 95% of Y(base)

This threshold accounts for natural variation in agriculture (~5%) and serves as a key indicator of agronomic sustainability. If yields fall below 95%, an analysis of the causes (climatic, economic, agronomic) is conducted, and if necessary, a market leakage calculation (MLK).

3. Nitrogen Reduction Threshold

The project envisages a phased reduction of mineral nitrogen (~15% over 5 years) through:

- replacement with organic fertilizers
- use of microbial products
- inclusion of nitrogen-fixing crops
- application of split fertilization

The reduction is applied under the following conditions:

- no disruption of the nitrogen balance is allowed
- no drop in yield below 95% of the baseline is allowed

4. Link to the leakage mechanism

In the event of a yield drop below the threshold:

4.1. Trigger Condition - Y(proj) < 95% of Y(base)

4.2. Root Cause Analysis - a check is performed to determine whether the decline is due to:

- climatic conditions
- regional trends
- the farmer's economic decisions
- agronomic practices (including reduced fertilization)

4.3. Leakage Quantification - if a proven effect on production is identified, the following formula is applied:

MLK (yield) = (Y(95%) – Y(proj)) × A × EFcrop × β

where:

β = 20% (conservative coefficient for market leakage)

EFcrop – according to IPCC and LCA databases

EFcrop – crop-specific emission factor (tCO_2e/t crop), determined through the project's crop emission calculation model based on IPCC methodologies and supported by recognized LCA datasets (including Ecoinvent, Agri-footprint and Fertilizers Europe where applicable). EFcrop is calculated individually for each crop type and reflects emissions associated with fertilizer production and use, soil N_2O emissions (direct and indirect), crop residue management, organic fertilization and field operations. The resulting crop-specific EFcrop value (tCO_2e/t crop) is then applied in the leakage calculation.

Коментирал [S24]: The PP is requested to provide a clear and verifiable source for the parameter Efcrop values and describe how crop-specific EFcrop values are selected and applied.

Коментирал [DK25R24]: The PDD has been revised to clarify the source and application of EFcrop values. EFcrop is not a generic default factor but a crop-specific emission factor (tCO_2e/t crop) calculated through the project's emission calculation model. The calculation is based on IPCC methodologies and supported by recognized LCA datasets, including Ecoinvent, Agri-footprint and Fertilizers Europe where applicable. For each crop, a specific EFcrop value is generated from the crop emission calculation worksheet (please see "ER calculation_N2O_leakage_v1" provided with round 1 of the verification findings in folder VER-CL 01.2-3) and subsequently applied in the market leakage calculation. The revised text clarifies both the source of the factors and the procedure used to select and apply crop-specific EFcrop values.

10.2. Contribution to Sustainable Development Goals (SDGs).

10.2.1. SDG Mapping

The Carbonsafe project is not only a carbon removal initiative but also a multi-dimensional sustainability intervention that contributes directly and indirectly to the achievement of the United Nations Sustainable Development Goals (SDGs). By linking measured carbon removals with regenerative agriculture practices, Carbonsafe generates tangible environmental, social, and economic co-benefits across farm communities in Bulgaria, with ripple effects that extend into regional markets and ecosystems. This section situates Carbonsafe within the SDG framework, articulating how the project addresses multiple global goals in an integrated and traceable manner.

SDGs Monitored and reported

	SDG 2 – Zero Hunger (End hunger, achieve food security, improve nutrition, and promote sustainable agriculture).
2.4.1	Proportion of agricultural area under productive and sustainable agriculture
	Project activities and contributions:
	The project actively promotes sustainable agricultural practices by working directly with farmers. It tracks the number of farmers adopting these practices to measure progress and impact. Indicator: No. of farms participated in the Project Evidence: Farmers contracts
	Individualized land management strategies are developed and issued to farms to support the transition toward more sustainable methods. Indicator: No. of individual strategies issued
	Agronomic recommendations are provided at the plot level, guiding farmers to implement sustainable practices in their daily operations. Indicator: No. of agronomic recommendation issued

Carbonsafe directly enhances soil fertility and food production capacity by improving soil organic matter, nutrient availability, and water retention. By issuing agronomic recommendations based on annual soil tests (including SOC, macro- and micronutrients, and pH), the project helps farmers maintain or increase yields while reducing input costs. Improved soil health underpins more stable and nutritious crop production, contributing to long-term food security.

	SDG 13 – Climate Action.
13.2	Integrate climate change measures into national policies, strategies and planning
	Project activities and contributions:

	Net CO_2e sequestered in soils using verified soil carbon measurement and reporting methods. (Total greenhouse gas emissions per year) by lowering net emissions through sequestration) Indicator: Ammount of C sequesterd C/t/year
	Tons of CO_2 equivalent removed from the atmosphere (tCO_2e) (Total greenhouse gas emissions per year) by reducing net emissions through verified carbon removals) Indicator: Net ammount of GHG removed from the atmosphere (tCO_2)

The core of Carbonsafe is climate mitigation through carbon removal. Each credit represents 1 tonne of CO_2 removed from the atmosphere and stored as SOC, validated through annual measure–remeasure sampling and verified by accredited third parties. Ex-post issuance ensures that all credits are tied to removals already achieved, eliminating the risks of forward crediting. By contributing to the European Union's climate neutrality goals and aiming to align with CRCF standards, Carbonsafe strengthens the region's contribution to global climate action.

	SDG 15 – Life on Land.
15.3.1	Proportion of land that is degraded over total land area
	Project activities and contributions:
	Annual measurement of soil organic carbon and nutrient content through systematic soil sampling Soil carbon and nutrient monitoring are direct measures of land degradation or restoration. Indicator: No. of soil samples/ lab analyses held
	Improved soil conservation practices. Soil conservation directly improves land quality, reducing degradation. Indicator: ha with improoved soil conservation practices

Carbonsafe practices—diverse rotations, cover cropping, reduced tillage—directly enhance biodiversity in soils, field margins, and agroecosystems. Increased earthworm populations, pollinators, and beneficial insects are supported by reduced pesticide use and more heterogeneous crop landscapes. Soil erosion is reduced, organic matter is stabilized, and natural habitats are protected by strict no-conversion covenants. This supports not only productive landscapes but also adjacent ecosystems, contributing to conservation of biodiversity and improved ecosystem services.

Co-benefits are monitored and evidenced via the SDG_CS-Tool and SDG indicators are reported for the corresponding verification period.

Other SDGs that are ssumed and related to the project

SDG 6 – Clean Water and Sanitation.

By implementing cover crops, reduced tillage, and optimized nutrient management, Carbonsafe may reduce nutrient runoff, nitrate leaching, and pesticide use, that could lead to improved water quality in surrounding landscapes. Enhanced infiltration and water retention mitigate flood risks and bolster drought resilience, thereby promoting sustainable water resource management.

SDG 12 – Responsible Consumption and Production.

Through annual monitoring and tailored soil strategies, Carbonsafe could help farmers optimize fertilizer use, avoiding waste and lowering the environmental footprint of production. Reduced pesticide use may further promote responsible input management.

10.2.2. Ecosystem services.

The Carbonsafe project is designed not only as a carbon farming initiative but also as a comprehensive ecosystem services enhancement framework. By embedding regenerative practices into farming systems across North region in Bulgaria, Carbonsafe actively strengthens the capacity of agricultural landscapes to provide multiple ecosystem services that extend well beyond carbon sequestration. These services include soil fertility and nutrient cycling, water regulation, biodiversity conservation, climate resilience, and landscape-level ecological connectivity.

1. Soil Fertility and Nutrient Cycling.

Healthy soils are the cornerstone of functioning ecosystems. Carbonsafe directly improves nutrient cycling through increased organic matter, enhanced microbial activity, and optimized fertilizer use. The measure–remeasure approach provides farmers with annual data on macro- and micronutrients (N, P, K, Mg, Fe, Zn, Cu, etc.), enabling targeted fertilization strategies that reduce nutrient surpluses and prevent runoff. Over time, soils accrue organic matter that increases cation exchange capacity (CEC), buffers pH, and reduces the dependency on synthetic inputs. Enhanced fertility translates into more sustainable production and long-term soil capital, providing a continuous ecosystem service of nutrient supply.

2. Water Regulation and Quality.

Carbonsafe practices improve the hydrological function of soils by increasing infiltration, water retention, and reducing erosion. Residue cover and cover crops act as a natural armor against rainfall impact, reducing sediment runoff and associated nutrient losses. This stabilizes catchments by lowering peak flows during storms and maintaining higher base flows during dry periods. At the same time, optimized fertilizer recommendations and reduced pesticide use decrease the risk of nutrient and chemical contamination of rivers and groundwater, contributing to the ecosystem service of clean water provision.

3. Biodiversity and Habitat Provision.

Diverse rotations, reduced disturbance, and continuous cover foster conditions for increased soil biodiversity (microbes, earthworms, nematodes), as well as beneficial above-ground fauna such as pollinators and predatory insects. Carbonsafe requires rotational designs that introduce legumes, brassicas, and multi-species cover crops, creating temporal and spatial heterogeneity in food and habitat availability. This reduces pest outbreaks, supports natural regulation, and contributes to functional biodiversity. In combination, these actions enhance the ecosystem service of habitat provision and increase landscape-level resilience.

4. Climate Resilience and Regulation.

Through SOC accumulation, increased water-holding capacity, and improved soil structure, Carbonsafe farms are more resilient to both drought and flooding. Reduced pesticide dependence and improved soil biological communities foster systems less vulnerable to external shocks. At the global scale, carbon removals contribute to climate regulation, while at the local scale, improved resilience ensures continuity of production and protection of livelihoods. These outcomes strengthen the ecosystem service of climate stabilization and align with EU climate neutrality pathways.

5. Landscape Connectivity and Cultural Services.

By coordinating efforts across 80+ farms nationally, Carbonsafe creates clusters of regenerative practices that support landscape-level ecological connectivity. Contiguous areas of cover crops, hedgerows, and low-till management reduce habitat fragmentation, providing corridors for pollinators and wildlife. This enhances ecological networks across the agricultural matrix, particularly important in intensively cultivated areas of North region, Bulgaria. In addition, healthier soils, more diverse cropping landscapes, and visibly improved ecosystem services strengthen cultural and community services: farmers take pride in environmental stewardship, local communities benefit from cleaner water and reduced agrochemical exposure, and consumers gain confidence in the sustainability of their food systems.

6. Monitoring and Verification of Ecosystem Services

Carbonsafe integrates ecosystem service monitoring into its MRV system, ensuring that these co-benefits are monitored rather than treated as qualitative claims. Specific indicators include:

- Soil nutrient status, SOC.
- Biodiversity indicators such as crop rotation diversity indicators
- Resilience indicators such as yield stability and nitrogen use efficiency via tailored agronomic recommendations
- Landscape connectivity via GIS-based mapping of regenerative practice adoption and cover crop extent.

Carbonsafe's ecosystem services enhancement positions the project as a multi-benefit sustainability initiative, not merely a carbon removal scheme. By embedding regenerative practices into everyday farm management, the project actively delivers measurable improvements in soil fertility, water regulation, biodiversity, climate resilience, and landscape connectivity, ensuring that Carbonsafe credits reflect not just tonnes of CO_2 removed, but also broader ecosystem value. In doing so, Carbonsafe contributes meaningfully to resilient rural landscapes, thriving farm communities, and long-term environmental integrity in Bulgaria and beyond.

10.2.3. Monitoring of Co-benefits

1. Monitoring objectives and scope.

We monitor several service domains that are mechanistically linked to regenerative practice adoption and SOC accumulation: soil fertility and nutrient cycling; soil physical condition and structure; and farm performance and resilience.

Design and sampling frame: Census-style measurements embedded in the carbon MRV (every enrolled cell of 4–25 ha): annual, geo-referenced composite sampling (25 cores per cell) at 0–30, 30–60, and 60–90 cm, analyzed by accredited labs for SOC, pH, macro/micro-nutrients, practice bundle, and ancillary chemistry. These data power plot-level agronomic decisions and provide population-scale trends for fertility and chemical health.

2. Indicators and methods.

Soil fertility & nutrient cycling.

- OC, pH, N/P/K/S, micronutrients Zn, Mn, Cu, Fe, B, Ca, Mg, Mo.
- How we measure: annual lab panels on MRV composites (census); nutrient balance sheets (inputs/outputs) and nitrogen use efficiency (NUE) derived from farmer records and yield data.
- Decision triggers: rising nutrient surpluses or declining NUE prompt fertilizer rate/timing adjustments, cover-crop species changes, or pH amendments.

1. Farm performance & resilience.
   - What we track: yields and input intensity (kg nutrient per tonne product)
   - How we measure: farmer records, and cross-checks against soil data
   - Decision triggers: deteriorating stability or margins triggers plot-specific agronomic interventions to avoid re-intensification and leakage.

2. Data capture and traceability.

All field activities use geo-referenced mobile data collection (sampling paths, waypoints, timestamps) synced to the ERP. Chain-of-custody is maintained from field to lab. Farmer logs (inputs, pesticide applications, field operations) are collected. Every record is tied to the persistent plot ID used for carbon MRV.

3. QA/QC and lab management.

All data and analysis are processed in accredited laboratory facilities.

4. Data governance and interoperability.

All data are handled under GDPR-compliant access controls, with role-based permissions in the ERP. Confidential farm-level details are aggregated or anonymized in public outputs unless explicit consent is granted.

5. Outcome.

The project not only quantifies carbon removals but also demonstrates how regenerative practices strengthen soil function and farm resilience across the project area.

Co-benefits are monitored and evidenced via the SDG_CS-Tool and SDG indicators are reported for the corresponding verification period.

10.3. Social Co-benefits.

10.3.1. Farmer Income

One of the most significant socio-economic outcomes of the Carbonsafe project is the improvement of farmer income through the generation and sale of verified carbon credits. Beyond its role as a climate mitigation initiative, Carbonsafe functions as a new economic model for Bulgarian agriculture—turning the environmental service of carbon sequestration into a direct and measurable source of revenue for farmers. This ensures that the transition to regenerative agriculture is not only ecologically sustainable but also financially viable for farm households and rural communities.

10.3.2. Benefit-Sharing Mechanism

Farmers enrolled in Carbonsafe receive annual income derived from the verified issuance and sale of ex-post carbon credits. Each credit represents one tonne of CO_2 removed from the atmosphere and stored in the soil as organic carbon, measured through Carbonsafe's rigorous 100% soil sampling and annual remeasurement protocol. The revenues from credit sales are distributed according to a transparent benefit-sharing mechanism.

By ensuring that revenues flow to farmers, Carbonsafe aligns financial incentives with regenerative practice adoption. This structure corrects one of the central barriers to sustainable agriculture—the lack of immediate economic return on ecological practices—making climate-positive actions profitable in the short term as well as beneficial in the long term.

10.3.3. Economic Resilience

Carbon credit revenues provide a new, non-commodity income stream that complements traditional agricultural earnings from crops or livestock. This diversification reduces farmers' exposure to risks associated with volatile crop prices, fluctuating input costs, and climate-induced yield variability. In regions where extreme weather events (e.g., droughts and floods) can destabilize farm budgets, the stability of carbon income acts as a financial buffer, improving household resilience and enabling reinvestment into sustainable farm improvements.

Moreover, because credits are ex-post and independently verified, revenues represent already-achieved removals rather than speculative forward promises. This ensures that farmer income is tied directly to real, measurable performance, further reinforcing long-term sustainability of the revenue stream.

10.3.4. Community-Level Impacts

While income levels vary depending on farm size, soil potential, and practice adoption, modeling scenarios suggest that a medium-sized farm (300–600 ha) could generate several thousand euros annually from credits alone. With premium pricing for high-integrity, fully measured SOC credits—Carbonsafe's credits are positioned at the upper end of the voluntary carbon market, reaching levels such as €30/credit—farmer participation translates into meaningful supplementary income.

The following benefits extend beyond the farm level and could contribute to community-wide outcomes:

- Improved public health, due to reduced agrochemical use and lower environmental exposure
- Enhanced food security, through improved soil fertility and yield stability at local level
- Biodiversity improvement, across the wider agricultural landscape
- Strengthened social resilience, via increased farm viability and knowledge sharing within rural communities

10.3.5. Incentive alignment and behavioral impact.

Carbonsafe's model ensures that farmers are financially rewarded not only for enrolling but for maintaining and improving soil carbon stocks over time. The conservative issuance system links farmer income to continuous performance. This approach mitigates risk for buyers while motivating farmers to persist with regenerative practices, ensuring both durability of climate impact and continuity of income.

10.3.6. Community-level effects.

Beyond individual farms, carbon credit revenues have the potential to revitalize rural economies. Additional income can support local services, improve farm infrastructure, and reduce rural poverty. As clusters of farms participate, entire communities benefit from more stable incomes, healthier soils, and cleaner water, creating positive multiplier effects across the agricultural landscape. Importantly, the financial benefits are equitably distributed: small and medium-sized farms, which are often most vulnerable economically, have equal access to credit revenues since payments are tied to SOC gains per hectare rather than to absolute farm size.

10.3.7. Transparency and verification of income distribution.

To maintain integrity, Carbonsafe develops ERP-based accounting systems that track credit issuance, revenue flows, and farmer payments in a transparent and auditable manner. Records of benefit-sharing is verifiable by third parties and prevents disputes or inequitable allocation.

Farmers receive formal documentation of credits generated from their plots, along with payment records, strengthening trust and accountability.

10.4. Benefit-Sharing Statement.

The Benefit-Sharing Statement of Carbonsafe is a central pillar of the project's integrity framework, ensuring that the economic value generated from carbon credits is fairly, transparently, and equitably distributed among all participating stakeholders, with farmers as the primary beneficiaries. This policy reflects international best practices for carbon projects and aligns with principles of equity, inclusiveness, and accountability. It addresses one of the most critical barriers to the adoption of regenerative agriculture: the lack of financial incentives for farmers to invest in long-term ecosystem health.

10.4.1. Equity and Inclusion

Carbonsafe recognizes farmers as the frontline providers of ecosystem services. Without their active participation and sustained adoption of regenerative practices, carbon sequestration outcomes would not be possible. Therefore, the project guarantees that payments of net revenues from carbon credit sales will flow directly to farmers as financial compensation.

Equitable and inclusive participation is ensured through transparent and non-discriminatory eligibility criteria, equal access to training and advisory services, standardized contractual terms, and a stakeholder feedback mechanism.

10.4.2. Transparency and Accountability

The distribution of benefits under Carbonsafe follows a structured model:

Farmers (50-60% of credit revenues or individual agreements between the farmer and the buyer/investor such as: priority purchase of the produce at a higher price and advance provision of investment for production).

1. Direct monetary payments derived from carbon credit sales, allocated proportionally to the measured carbon removals (tCO_2e) from each farmer's land.

2. Access to agronomic recommendations derived from annual soil analyses (macro- and micronutrients, SOC, pH), delivering added economic value through yield improvements and input optimization.

3. Training and technical assistance to support adoption of regenerative practices, further reducing farm costs and risks.

Project Operations (20-30%).

1. Costs associated with administration, agronomists, R&D, ERP management, on-ground advisory services, business development
2. This ensures that the MRV framework remains robust, transparent, and scientifically credible, benefiting both farmers and buyers.
3. Independent validation and verification (by VVBs) and registration fees (e.g., BCCR).
4. These costs guarantee that credits meet high-integrity buyer standards and are traceable on a registry.

Carbon credit sales (15%).

1. Engagement with international rating agencies, brokers, and buyers to ensure premium pricing and market access.
2. This enables Carbonsafe to secure better-than-average market prices for farmers' credits, maximizing their income.

Buffer pool (5%).

1. Force majeuree events

2. Serves as an insurance policy

To safeguard equity, all financial flows are recorded and are to be managed through Carbonsafe's developing ERP and accounting system, which records issuance, sales, and revenue distribution. Each farmer receives:

1. An annual statement detailing the number of credits issued from their land, and in the event of sale of their credits: the sales price achieved, the revenues generated, and their corresponding share.

2. A digital record within the Balkan Carbon Credits Registry (BCCR) showing credits issued to their farm ID, ensuring traceability from sequestration to credit monetization.

3. Access to grievance and dispute resolution mechanisms in case of disagreements regarding benefit allocation.

This transparency not only builds farmer trust but also assures buyers that Carbonsafe's credits are tied to equitable benefit-sharing agreements, a key component of voluntary carbon market integrity assessments.

Carbonsafe ensures inclusivity by:

1. Providing equal access to participation for smallholder and medium-sized farms, not just large enterprises.

2. Women-led farms and marginalized groups are equally eligible and represented in benefit distribution.

10.5. Agronomic support

A cornerstone of the Carbonsafe project is the comprehensive agronomic support system provided to all participating farmers. This support ensures that regenerative practices are not only adopted but are sustained and optimized to deliver measurable gains in soil organic carbon (SOC), soil fertility, yield stability, and long-term farm resilience. Carbonsafe recognizes that successful carbon farming is inseparable from robust agronomic guidance; therefore, support is embedded as both a technical service and a value-adding co-benefit for farmers, delivered alongside carbon credit revenues.

10.5.1. Annual Soil Diagnostics as the Foundation.

The agronomic support begins with Carbonsafe's 100% soil sampling protocol. Carbonsafe's approach includes a full nutrient panel: macronutrients (N, P, K, S), secondary nutrients (Ca, Mg), micronutrients (Fe, Zn, Cu, Mn, B), as well as soil pH, bulk density, and cation exchange capacity.

This dataset provides a scientifically rigorous foundation for agronomic planning. Farmers receive detailed reports that compare current nutrient levels against crop-specific requirements, highlighting deficiencies, surpluses, or imbalances. These results are contextualized against the previous year's baseline, providing a clear trajectory of soil health improvements or risks.

10.5.2. Tailored Agronomic Recommendations.

From the annual soil diagnostics, Carbonsafe develops plot-specific agronomic strategies for each farmer. These recommendations are not generic but customized, taking into account:

1. Soil nutrient status: optimizing fertilizer application rates and timing, avoiding excess application while preventing nutrient mining.

2. Crop rotation design: introducing or adjusting crop sequences to increase rotation diversity, reduce pest pressure, and incorporate legumes for natural nitrogen fixation.

3. Cover crop species selection: identifying multi-species cover crop mixes tailored to crop needs.

4. Residue management: balancing residue retention for SOC gains with the practical needs of field operations.

5. Tillage decisions: implementing reduced or strip tillage, with defined exemptions for compaction or wet years, ensuring both soil protection and operational feasibility.

6. pH and structure correction: recommending liming, gypsum, or other amendments where acidity, sodicity, or compaction risks threaten soil function.

These recommendations are communicated through the Carbonsafe ERP platform, ensuring farmers have real-time access to their field data, recommendations, and trend analyses.

10.5.3. Training and Knowledge Transfer.

Carbonsafe goes beyond data delivery by providing 1 on 1 conversations between farmers and Carbonsafe agronomists, training and capacity-building farmer discussions. These sessions cover:

1. Best practices in regenerative agriculture (reduced tillage, crop diversification, catch crops).

2. Precision nutrient management and the use of soil diagnostics for decision-making.

3. Integrated pest management (IPM) approaches to reduce pesticide dependence.

4. Soil and water conservation techniques to minimize erosion and runoff.

5. Use of Carbonsafe's ERP and mobile tools for digital record-keeping and compliance.

Farmer discussion are complemented by one-on-one consultations with Carbonsafe agronomists, ensuring farmers can adapt the guidance to their unique operational realities.

10.5.4. Continuous Monitoring and Adaptive Management.

Agronomic support is not static but dynamic and adaptive. Each year's soil results and farm performance data are reviewed, and recommendations are updated accordingly. If a farmer experiences declining SOC, yield penalties, or unforeseen agronomic challenges (e.g., drought stress, pest outbreak), Carbonsafe advisors intervene with targeted strategies to restore trajectory.

For example, If nutrient surplus is detected, fertilizer recommendations are scaled back, reducing both costs and environmental risk. This feedback loop ensures that farmers remain aligned with project goals while safeguarding productivity.

10.5.5. Added Value Beyond Carbon Credits.

Carbonsafe's agronomic support provides farmers with benefits that extend beyond participation in the carbon market:

1. Cost savings through reduced fertilizer and pesticide use.

2. Yield improvements driven by better nutrient availability and soil health.

3. Resilience to droughts and floods thanks to enhanced soil structure and water retention.

4. Long-term sustainability by improving soil capital, reducing erosion, and maintaining productive capacity.

These agronomic benefits often outweigh direct credit revenues in the medium term, creating a compelling value proposition for farmers to remain engaged with the project.

10.6. Land Use and Access Protection

The Land Use and Access Protection Statement of Carbonsafe (No Displacement Declaration)is designed to safeguard the rights of farmers, landowners, and rural communities while ensuring that carbon farming activities do not result in any form of displacement, restricted access, or unintended negative impacts on land tenure systems. This policy is a cornerstone of the project's social and environmental safeguards framework, ensuring compliance with international best practices.

At its core, the statement recognizes that land is both a productive resource and a social asset—providing livelihoods, cultural heritage, and community identity. For this reason, Carbonsafe commits to the principle of "no harm, no displacement". Participation in the project is strictly voluntary, and land use rights remain entirely with the farmer or landowner. No physical or economic displacement of communities will occur, and the project structure is designed to reinforce, rather than compromise, secure access to land.

10.6.1. Voluntary Participation and Informed Consent.

All farmers and landowners who join the Carbonsafe project do so on a voluntary basis, underpinned by clear and transparent contractual agreements. Before enrollment, participants are provided with detailed information about:

1. The scope and objectives of the project, including the practices required and benefits expected.
2. The carbon crediting process, including measurement, verification, issuance, and revenue distribution.
3. The legal implications of participation, including their ownership of credits.

Consent is obtained in accordance with the principle of Free, Prior, and Informed Consent (FPIC). No farmer is pressured or coerced into joining, and contracts are reviewed in accessible language to ensure clarity and full understanding.

10.6.2. Land Tenure and Legal Safeguards.

Carbonsafe requires legal proof of land ownership or long-term access rights (e.g., lease agreements, usufruct rights) before any farm can be enrolled. This ensures that only legally secure lands are included in the project, thereby preventing disputes and protecting the rights of legitimate landholders and tenants.

All contracts explicitly state that carbon revenues belong to the farmer or tenant implementing the regenerative practices, ensuring that improvements in soil health translate directly into benefits for the practitioner rather than being captured by landlords.

All contracts specify that carbon revenues accrue to the project participant implementing the regenerative practices, who must demonstrate legal ownership or legally valid operating rights over the land. Participation is limited to entities that have the legal authority to manage the land and implement agricultural practices.

Where land is operated under tenancy or other legal arrangements, eligibility is conditional upon the existence of formal, legally valid rights to use and manage the land. The project does not require separate landlord consent where such rights are already established contractually.

Landlords do not participate in the project and do not receive carbon revenues unless they are directly enrolled as project participants.

Treatment of Lease Expiry and Change of Land Operator

The MRV plan of the project spans a total of 40-year crediting period consisting of 5-year renewable individual farm (sub-project) crediting periods (annual monitoring and accounting each year). Satellite-based monitoring will be conducted annually for a period of five (5) or ten (10) years at the expense of the Project Developer after the crediting period of each sub-project as stated in PDD Section 6.6.1. Scope and time horizon.

Коментирал [S26]: Where participation is based on leasehold or tenancy rights, it is unclear how previously credited SOC removals are treated if a tenant-operator's lease expires or is not renewed and operational control of the land transfers to a new operator who may not continue project participation. While Section 8.3.5 addresses early termination of a farm's participation, it does not appear to distinguish between voluntary project withdrawal and routine lease expiry. Given that participation through formal lease or tenancy arrangements is an eligible pathway and the project duration is 40 years, the PDD should clarify how permanence obligations, monitoring continuity, reversal liability, and accounting treatment of previously credited SOC are maintained following changes in land operators or tenure arrangements.

Коментирал [DK27R26]: Section 10.6.2. Land Tenure and Legal Safeguards has been updated to include how permanence obligations, monitoring continuity, reversal liability, and accounting treatment of previously credited SOC are maintained following changes in land operators or tenure arrangements.

Where project participation is based on a valid leasehold, rental, or tenancy arrangement, project eligibility is linked to the participant's operational control of the land rather than ownership.

If a lease or tenancy agreement expires and operational control transfers to another operator, the project will first seek to maintain continuity by inviting the new operator to assume project participation and continue implementation of the relevant project activities. Where the new operator accepts participation, monitoring and accounting may continue in accordance with project procedures.

Where the new operator does not participate, the affected land parcels are removed from future project accounting from the date operational control ceases. No additional SOC removals are credited for the affected area after that date. The affected area is recorded in the project's registry of dropped areas and excluded from future crediting

The losses are covered by the buffer, as per the provisions in the Issuance Policy and farmer contracts.

10.6.3. Access Protection and Community Rights.

The project is designed so that carbon farming activities do not restrict access to land or resources for local communities. Farmers retain full access to their land for food and commodity production, while regenerative practices enhance rather than reduce productivity. Community use rights, such as shared access to water, grazing lands, or field margins, are respected and protected.

Furthermore, the project does not include lands of cultural or ecological significance to local communities. Areas with heritage value or sensitive ecosystems can not be agricultural land.

10.6.4. Monitoring and Enforcement.

The protection of land rights and access is actively monitored throughout the project lifecycle. Key mechanisms include:

1. Baseline land tenure mapping for each participating farm, including documentation of ownership, lease status, and use rights.
2. Annual audits by the Carbonsafe team, cross-referenced with national cadastral records to ensure land rights remain valid and uncontested.
3. Grievance mechanisms available to farmers and communities, allowing concerns about land use or access to be raised and resolved promptly.
4. Third-party verification (by VVBs), which includes review of land access policies and compliance with international safeguards.

10.6.5. Risk Management and Contingencies.

If a land dispute emerges after enrollment, credits associated with the disputed land are automatically withheld from issuance until the matter is resolved. This ensures that no credits are generated from contested land and protects both farmers and buyers from reputational or legal risks.

In the event of policy changes at the national or EU level that affect land rights or carbon ownership, Carbonsafe will adapt its contractual and registry structures to remain compliant while ensuring that farmers' ownership of credits is maintained.

10.7. Flexibility in producer practices

The Flexibility in Producer Practices statement within the Carbonsafe project is designed to balance the integrity of carbon sequestration outcomes with the practical realities of farming operations in North region and Bulgaria. Recognizing that agricultural systems are highly dynamic and subject to external influences such as climate variability, input availability, and market fluctuations, Carbonsafe ensures that farmers are not locked into rigid prescriptions but are instead supported through flexible, adaptive management pathways that maintain the project's credibility while respecting the complexities of agricultural livelihoods.

10.7.1. Rationale for Flexibility.

Agriculture is inherently uncertain. Weather extremes—such as prolonged droughts, unseasonal heavy rains, or late frosts—can alter the feasibility of applying certain regenerative practices in a given season. In addition, Carbonsafe suggest regenerative practices based on the machinery and inventory that farmers can afford to use. Similarly, constraints in seed supply, market access, or unexpected pest outbreaks may require temporary adjustments in practice implementation. International best-practice standards emphasize that flexibility. Carbonsafe embeds this principle into its operational model.

10.7.2. Practical Examples of Flexibility.

No-Till and Reduced-Till Practices.

- Farmers are encouraged to implement reduced or no-till practices to enhance SOC accumulation.
- However, the framework acknowledges exceptions in extreme circumstances, such as wet years that risk soil compaction, or weed infestations that cannot be controlled without mechanical intervention.

Catch Crops and Cover Crops.

- Catch and cover crops are a cornerstone of the project. Yet, under severe drought conditions, establishment may fail. In such cases, farmers are permitted to adapt rotations by including drought-resilient crops or delaying planting.
- Where seed supply chains are disrupted, Carbonsafe provides guidance on approved alternative species mixes that maintain soil cover and biodiversity benefits.

Rotation Adjustments.

- Rotational diversity is required, but flexibility is permitted when market or pest pressures necessitate temporary monoculture extensions. For example, a farmer may extend cereal production for an additional season if disease pressure in legumes is unusually high.
- Such changes are accompanied by mitigation strategies (e.g., introduction of a restorative crop the following year) to ensure that the long-term rotation trajectory is preserved.

Soil Amendments and Fertility Inputs.

- While the project emphasizes reductions in synthetic fertilizer use and optimized nutrient management, farmers may temporarily increase inputs if required to address acute nutrient deficiencies or crop failure risks.
- These interventions are monitored carefully to prevent negative GHG impacts, with associated emissions (fertilizer use increases).

Any temporary increase in synthetic or organic nutrient inputs during a monitoring period does not exempt the participant from the project accounting requirements. All additional nutrient applications are recorded and incorporated into the GHG assessment, including direct and indirect N_2O emissions calculated under Section 7.1.1 (ER calculations) and Section 4.1.14. Where increased inputs contribute to higher emissions, the resulting CO_2e impact is reflected in the net project removals.

Коментирал [S28]: Section 10.7.2 permits temporary increases in fertility inputs under specific circumstances; however, the PDD does not clearly explain how this provision interacts with other project accounting requirements. In particular, the relationship between temporary input increases, associated N_2O deductions (Section 7.1.1/4.1.14), yield-threshold/leakage provisions (10.1.5), and applicable practice restrictions is described across separate sections without explicit cross-referencing. The PP shall clarify how these mechanisms are jointly applied when the flexibility provision is exercised during a monitoring period.

Коментирал [DK29R28]: The PDD has been revised to clarify the interaction between the temporary fertility-input flexibility provision and the project accounting framework. The revised text explicitly states that any temporary increase in nutrient inputs is incorporated into the GHG assessment through the applicable N_2O emission calculations, does not exempt the participant from yield-threshold and leakage provisions, and does not alter project eligibility or permanence requirements. Net credited removals continue to reflect SOC gains after accounting for all applicable emissions and deductions

Temporary input increases also do not alter the application of yield monitoring and market leakage provisions described in Section 10.1.5. Yield performance continues to be assessed against the applicable thresholds, and any leakage deductions remain applicable where the specified conditions are met.

The flexibility provision is intended solely to address agronomic risks and does not waive project eligibility requirements or permanence obligations. All credited removals continue to be determined based on the net balance of SOC gains, GHG emissions, uncertainty deductions, and any applicable leakage adjustments.

Flexibility does not mean compromise in transparency. Each deviation from the prescribed regenerative practices is reviewed annually by Carbonsafe agronomists.

10.7.3. Farmer-Centric Approach.

By integrating flexibility, Carbonsafe recognizes the expertise of farmers as land stewards. Rather than imposing rigid, top-down prescriptions, the project provides a framework of regenerative principles with room for adaptive management. Farmers are empowered to make context-specific decisions in consultation with Carbonsafe agronomists, ensuring practices remain practical, locally relevant, and sustainable. This flexibility builds trust and long-term commitment, reducing the risk of farmer dropout.

The Flexibility in Producer Practices ensures that Carbonsafe remains both scientifically credible and operationally viable. It acknowledges that regenerative agriculture is not a one-size-fits-all formula but a set of adaptive strategies that must evolve in response to climatic, ecological, and economic conditions. By embedding transparent monitoring and agronomic support, Carbonsafe ensures that flexibility strengthens rather than undermines the project—protecting farmers from undue risk while maintaining the integrity of carbon credits issued.

10.8. Impact on producers

A fundamental principle of the Carbonsafe project is that participation must strengthen, not weaken, the economic viability of farms. While the core objective is to increase soil organic carbon (SOC) stocks and generate verified carbon credits, the adoption of regenerative practices inevitably affects farm-level agronomy, productivity, and input structures.

10.8.1. Baseline Situation.

In conventional farming systems across the North region and Bulgaria more broadly, yields are often maximized through intensive use of synthetic fertilizers, pesticides, and frequent tillage. While this system produces stable short-term output, it leads to soil degradation, nutrient imbalances, erosion, and increased vulnerability to drought and climate variability. Production costs are high and rising, due to increasing fertilizer and pesticide prices, while net farm margins remain under pressure.

Farmers entering Carbonsafe therefore begin from a baseline where profitability is heavily dependent on input intensity, and soil fertility is increasingly fragile. This context underscores the importance of ensuring that regenerative shifts under the project improve rather than compromise farm economics.

10.8.2. Yield Dynamics under Regenerative Practices.

Carbonsafe acknowledges that transitions to regenerative practices can have short-term yield variability, especially during the initial adjustment period when soil biological activity is rebuilding. Reduced tillage and cover cropping may temporarily suppress yields of certain crops (particularly cereals) due to cooler soils in spring or early nutrient immobilization. However, empirical evidence and international case studies consistently show that after the first two to three years, regenerative practices lead to yield stabilization or gradual improvement as soil organic matter, nutrient cycling, and water retention improve.

To minimize transitional risks, Carbonsafe provides annual agronomic recommendations based on soil analyses, including nutrient correction strategies, crop rotations adapted to local conditions, and optimized fertilizer inputs. This ensures that yield penalties, if any, remain limited and temporary. In the medium to long term, regenerative practices contribute to greater yield resilience, particularly under extreme climate events such as droughts or floods. [79][80][81][82][83][84][85][86]

10.8.3. Changes in Management Costs.

One of the potential impacts for producers is the reduction in input costs:

- Fertilizers: Soil analyses enable precise nutrient management, that could leading to reductions of 10–50% in fertilizer use while maintaining yields. Over time, improved nutrient retention and the use of legumes as nitrogen-fixing crops further may reduce dependence on synthetic fertilizers.

- Pesticides: Diversified crop rotations, cover crops, and improved soil health could reduce pest and weed pressure, and could lower chemical use by 15–25% in most systems.

- Fuel and Machinery: Reduced tillage or no-till systems assume a decrease in fuel consumption and machinery hours, cutting operational costs.

- Water Use: Improved water retention and infiltration assume a reduction in the need for irrigation, translating into savings on energy and water fees.

These reductions collectively assume an offset of any transitional yield declines, projecting that producers may benefit financially even in the early years.

10.8.4. Carbon Credit Revenues as a Financial Buffer.

In addition to cost reductions, farmers receive direct monetary revenues from carbon credits, providing an important income buffer during the transition phase. Even if yields experience slight reductions, carbon credit revenues ensure that overall farm profitability is not negatively impacted. This mechanism significantly reduces the risk of financial loss and provides farmers with the security to continue regenerative practices.

10.8.5. Monitoring and Evaluation of Producer Impact.

Carbonsafe tracks farm-level data on yields, input use, and production costs. This allows the project to:

- Monitor how regenerative practices affect farm economics year by year.

- Compare trends across different farm sizes, soil types, and management strategies.

- Provide tailored advice to mitigate negative economic impacts.

- Document positive outcomes as evidence of co-benefits for external stakeholders.

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10.8.6. Risk Management and Safeguards.

Carbonsafe includes several safeguards to protect farmers against negative economic outcomes:

1. Conservative credit issuance model - this ensures that credits—and therefore revenues—remain available even in years of poor yield or negative SOC performance.
2. Flexibility policy – Farmers are allowed exemptions (e.g., one-off tillage under wet conditions, rotation adjustments) to protect crop yields without risking expulsion from the project.
3. Agronomic support – Continuous soil testing and personalized recommendations ensure that management costs are minimized, and yield risks are proactively addressed.

10.9. Do-No-Harm and Risk Management

10.9.1. Purpose and scope.

This Do-No-Harm (DNH) Assessment sets out how the Carbonsafe Soil Organic Carbon (SOC) Project identifies, prevents, and mitigates potential adverse environmental and social (E&S) impacts associated with project activities in the North region of Bulgaria. The assessment applies to all participating farms and operational partners (sampling teams, laboratories, logistics providers) across the full project lifecycle—enrolment, MRV execution, credit issuance, and post-issuance monitoring.

10.9.2. Process.

Carbonsafe takes into consideration the following about the participating farmers:

1. Legal tenure verification; recent conversion from forests/wetlands/HCV areas; Natura 2000 sensitivities; protected species/habitats; labor and H&S readiness; community access/use conflicts; fertilizer and plant-protection baselines.
2. Ongoing surveillance via annual MR (Monitoring Report), farm self-declarations, ERP-logged field operations, verifier site-visits, and a grievance log.

10.9.3. Legal compliance.

- Full compliance with Bulgarian law (land tenure, CAP cross-compliance, agrochemical use, occupational H&S, waste) is mandatory.
- Participation requires evidence of ownership or legally valid right to operate (lease, usufruct) and confirmation of no illegal land conversion since the relevant cut-off date.
- Where lands lie within or near Natura 2000 sites, management prescriptions are respected.

10.9.4. Land, biodiversity, and habitat safeguards.

- No-conversion. Lands converted from forests, or natural/semi-natural habitats are ineligible.
- Integrated rotations & cover. Crop rotations and cover crops are designed to enhance on-farm biodiversity (pollinators, natural enemies), minimize bare soil days, and reduce erosion.
- Pesticide risk management. Integrated pest management (IPM) implementation.

10.9.5. Water resources and quality.

- Abstraction safeguards. Irrigation, where present, must comply with permits and local restrictions.

- Water quality protection. Nutrient management planning (N, P balance, timing, placement) reduces runoff and leaching; storage/handling of agrochemicals follows legal and manufacturer guidance.
- Erosion control. Reduced tillage, cover crops, and residue retention minimize sediment loads to surface waters.

10.9.6. Soil, air, and emissions management.

- Soil protection. The project targets measurable SOC gains; compaction is avoided through controlled traffic.
- N_2O and other GHGs. Nutrient management is optimized to avoid induced N_2O increases; where risk is identified (e.g., high N rates, legume phases), mitigation is applied.
- Air quality & dust. Reduced tillage lowers dust emissions.

10.9.7. Agrochemical use and waste.

- Fertilizers. Compliance with labels and national registries is mandatory. Project guidance prioritizes reduced rates, targeted applications, and safer alternatives consistent with IPM.
- Waste handling. Empty containers and hazardous waste are collected through licensed schemes; storage is bunded and ventilated; record-keeping is mandatory and auditable.

10.9.8. Community health, safety, access, and cultural heritage.

- No displacement. The project guarantees no physical or economic displacement of communities; agricultural production continues, with practices aimed at improving, not restricting, land utility.
- Access protection. Customary access to shared resources (e.g., ways, water points) is respected.
- Cultural heritage. If cultural artifacts are discovered competent authorities should be notified.
- Nuisance prevention. Operations (e.g., soil sampling with ATVs) follow safe routes and time windows to minimize disturbance.

10.9.9. Labor and occupational health & safety (OHS).[87][88][89][90]

- ILO Core Standards. No forced, child, or discriminatory labor. Equal pay for equal work; non-discrimination and inclusion (including women and young farmers) are project commitments.
- OHS plan. Soil-sampling teams use PPE; ATV operation requires training and route planning; lifting/handling protocols for cores and sample bags; lab partners operate under ISO/EN safety standards; incident reporting is mandatory.

[87] https://www.gli.government.bg/sites/default/files/upload/documents/2021-01/kodeks-na-truda.pdf
[88] https://www.mlsp.government.bg/uploads/1/blgarsko-zakonodatelstvo/zakon-za-zasita-ot-diskriminaciq-zagl-izm-dv-br-68-ot-2006-g.pdf
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10.9.10. Land tenure, FPIC, and leaseholder protections.

- Free, Prior, and Informed Consent (FPIC). Participation is voluntary, based on clear contracts and plain-language disclosures.
- Credits and revenues flow to the practicing leaseholder.

10.9.11. Data privacy, transparency, and integrity.

- GDPR. Personal data (farmer identities, parcel maps) are processed under lawful bases; access is role-based; retention limits are defined.
- Traceability. Credit serials are traceable to farm and monitoring period via BCCR; public transparency balances privacy and buyer disclosure needs.
- Anti-corruption & AML. Basic AML/KYC controls are applied to counterparties where relevant; conflicts of interest (e.g., between project developer, verifier, registry) are disclosed and managed.

10.9.12. Grievance redress and stakeholder engagement.

- Multi-channel grievance mechanism. Farmers and community members can submit concerns via website, email, or phone. Acknowledge within 5 business days, resolve or propose corrective action within 30.
- Continuous engagement. Annual meetings, surveys, and feedback loops inform adaptive management and targeted improvements.

10.9.13. Do-No-Harm Statement.

Carbonsafe concludes that project activities are not expected to cause significant adverse environmental or social impacts. Residual risks—principally nutrient runoff, occasional pesticide use, soil compaction in wet years, and potential community nuisance from field operations—are low, site-specific, and effectively managed.

The project further commits to continuous improvement: if monitoring reveals material adverse trends, Carbonsafe will adjust practice guidance, intensify training, or suspend/enforce conditions on non-compliant sites. This statement will be re-affirmed annually in the Monitoring Report, ensuring that Carbonsafe's climate outcomes are delivered without harm—and, wherever possible, with measurable co-benefits for biodiversity, water, soil health, and rural livelihoods.

10.9.14. Community impact & safeguards.

This analysis evaluates how project activities under Carbonsafe's project may influence environmental determinants of health for nearby communities.

Soil health and tillage intensity

- Positive: Reduced tillage and permanent cover could lower dust generation, decrease machinery passes, and improve soil structure, infiltration, and drought resilience—indirectly lowering heat- and flood-related health risks.
- Risks: Greater reliance on targeted pesticide applications in some systems; potential for drift if unmanaged.
- Mitigation: Application is guided by agronomic recommendations

Nutrient management and organic amendments

- Positive: Precision application, split dosing, and organic matter build-up may reduce nitrate leaching and phosphorus runoff

- Risks: If amendments are inadequately composted or poorly timed, there is potential for microbiological contamination (e.g., E. coli in runoff) and temporary odors; mismanaged manure can elevate NH_3.
- Mitigation: The project promotes incorporation of organic amendments, supported by soil testing and agronomic guidance.

Crop diversification, cover crops, and agroforestry

- Positive: Windbreaks and ground cover could reduce wind-blown dust and soil loss; shade trees and microclimate buffering may reduce heat stress exposure; enhanced pollinator and natural-enemy habitat can lower pesticide pressure.
- Risks: Allergenic pollen from certain species; unmanaged standing water near riparian plantings can create mosquito habitat.
- Mitigation: Management practices are adapted to local conditions.

Pesticide use and integrated pest management (IPM)

- Positive: IPM and threshold-based decisions may reduce overall pesticide loads; drift-reduction technologies minimize off-site exposure.
- Risks: Pesticide substitution in low-tillage systems if not balanced by mechanical/biological controls; acute exposure risks for workers without adequate PPE and training.
- Mitigation: The project applies IPM-based recommendations, promotes reduced and targeted pesticide use, and requires adherence to safety standards.

Traffic, noise, and logistics

- Positive: Fewer field passes could reduce traffic volume and noise over time.
- Risks: Short-term traffic peaks during soil sampling or harvest; localized noise and dust near settlements.
- Positive: Prohibition of open burning eliminates smoke-related acute respiratory exposures and fire risk.
- Risks: None significant when residues are mulched/incorporated correctly.
- Mitigation: Activities are planned and managed to minimize disturbance, with limited duration and adherence to standard agricultural operating practices.

Assessment outcome

With good agricultural practice, the project is expected to deliver a net positive community environmental health outcome, characterized by lower dust and exhaust exposure, improved water quality protection, reduced open burning, and greater climate resilience.

Compliance alignment

The project's processes are designed to be consistent with applicable national law and relevant EU requirements.

Carbonsafe anticipates a net positive environmental health outcome for neighboring communities—characterized by lower exposure to dust and smoke, better protection of water resources, reduced heat-stress vulnerability through ecological enhancement, and strengthened trust through transparent engagement and grievance redress.

10.10. Legal Compliance Statement.

Carbonsafe affirms its unwavering commitment to the full observance of all applicable legal, regulatory, and administrative requirements relevant to the design, implementation, and operation of its carbon farming project. The company recognizes that legal compliance is not only a matter of statutory obligation but also an essential foundation for building credibility, ensuring transparency, and safeguarding the rights and interests of all stakeholders engaged in the project.

The project has been developed in alignment with the relevant national legislation governing agricultural practices, land tenure, and environmental protection. This includes adherence to statutory frameworks regulating land use, soil management, biodiversity protection, and sustainable farming practices. All project activities must uphold the dignity, well-being, and security of the farmers and workers involved.

In addition to national laws, the project acknowledges the significance of international and regional legal frameworks that establish the context for voluntary carbon markets and environmental integrity. This encompasses following of the principles set out under the United Nations Framework Convention on Climate Change (UNFCCC), as well as consideration of the Paris Agreement and the Sustainable Development Goals (SDGs) as guiding instruments. While voluntary in nature, these frameworks provide critical standards of conduct to which Carbonsafe aspires.

To guarantee ongoing conformity, Carbonsafe has instituted internal compliance mechanisms that include:

- Due diligence procedures to verify the legality of land tenure and access rights, ensuring that project activities are carried out exclusively on lands where the legal status is clear, uncontested, and formally documented.
- Monitoring of regulatory developments at both national and international levels, enabling proactive adaptation of project practices to reflect evolving legal and policy requirements.
- Transparent contracting and disclosure practices, ensuring that leaseholders, landowners, and participating farmers are fully informed of their rights and obligations under the project, and that contractual arrangements meet statutory enforceability standards.
- Data protection and confidentiality protocols, aligned with applicable national and European data privacy legislation, to safeguard the personal information of all project participants and partners.

Carbonsafe further makes sure that its carbon credit generation and trading activities will conform to the legal standards applicable to financial and environmental instruments, including alignment with the emerging EU framework for the certification of carbon removals. All project-level claims will be substantiated through verifiable evidence and presented in compliance with applicable disclosure and reporting requirements.

10.11. NDC & policy interaction statement.

Carbonsafe recognizes that voluntary carbon farming projects must operate in a manner that is both aligned with, and complementary to, the broader climate policy architecture at the national, regional, and international levels. In particular, the company acknowledges the central role of Nationally Determined Contributions (NDCs) under the Paris Agreement as the primary vehicle through which countries articulate their commitments to mitigate climate change, enhance resilience, and contribute to the collective global effort to limit warming to 1.5°C.

The Republic of Bulgaria, as a Member State of the European Union, contributes to the collective EU NDC submitted under the Paris Agreement. This NDC outlines ambitious targets for reducing greenhouse gas (GHG) emissions, enhancing carbon removals through land use, land-use change, and forestry (LULUCF) activities, and supporting sustainable agricultural practices that contribute to climate neutrality by 2050. Carbonsafe's carbon farming project has been designed to support these national and EU-level commitments by increasing soil organic carbon, improving farm-level resilience, and generating measurable environmental co-benefits that strengthen the long-term sustainability of agricultural landscapes.

The project's interventions—focused on regenerative farming practices, soil health improvement, and biodiversity protection—are consistent with the mitigation pathways identified in Bulgaria's climate and energy policy documents, including the National Energy and Climate Plan (NECP) and the strategic objectives of the Common Agricultural Policy (CAP). By incentivizing farmers to adopt practices that simultaneously enhance productivity and reduce emissions, Carbonsafe aligns its voluntary carbon credit generation with national policy frameworks that seek to balance agricultural competitiveness, environmental stewardship, and rural development.

At the same time, Carbonsafe takes care to avoid any risk of double counting or misrepresentation of carbon benefits in relation to NDC accounting. All carbon credits generated through the project are rigorously quantified, verified, and tracked within a registry to ensure full transparency and traceability. This approach safeguards environmental integrity while preserving the additionality of voluntary carbon market activities.

In addition to mitigation, the project contributes to policy objectives on adaptation and resilience. By improving soil fertility, increasing water retention, and reducing vulnerability to climate extremes, the project reinforces national priorities for climate adaptation in agriculture. Moreover, the enhancement of ecosystem services—such as pollination, erosion control, and biodiversity habitat—reflects the broader goals of the EU Green Deal, the Farm to Fork Strategy, and the Biodiversity Strategy for 2030.

Carbonsafe also engages in ongoing policy dialogue with relevant stakeholders, including agricultural institutions, regulatory bodies, and environmental authorities. This ensures that the project evolves in harmony with emerging policies, such as the EU framework for the certification of carbon removals, and remains a constructive contributor to Bulgaria's climate action landscape.

By aligning with Bulgaria's and the EU's NDC commitments, supporting the delivery of strategic policy objectives, and embedding safeguards against double counting, Carbonsafe demonstrates that voluntary carbon farming projects can serve as an essential complement—not a substitute—to state-led climate action. This approach strengthens the legitimacy of voluntary carbon markets, enhances synergies between private and public initiatives, and ensures that the project delivers real, durable, and policy-consistent climate benefits.[91][92]

10.12. Employee compensation safeguards.

Carbonsafe affirms its unequivocal commitment to ensuring that all Carbonsafe empolyees engaged in the implementation and operation of its carbon farming project receive fair, transparent, and lawful compensation for their labor. The company recognizes that equitable remuneration is not only a legal requirement but also a moral obligation that underpins social sustainability, safeguards human dignity, and enhances the trust and long-term success of the project.

All workers directly employed by Carbonsafe, are compensated in strict compliance with applicable national labor laws, European Union directives, and international standards, including the principles enshrined in the International Labour Organization (ILO) conventions. This includes adherence to statutory minimum wages, overtime compensation, social security contributions, and occupational health and safety standards. No worker is employed under conditions that fall short of these legal or ethical benchmarks.

Carbonsafe embeds principles of fairness, non-discrimination, and inclusivity into its compensation policies. Equal pay for equal work is guaranteed regardless of gender, ethnicity, age, or other personal characteristics. Workers are informed in advance, in accessible language, of the terms of their engagement, ensuring full transparency and informed consent.

10.12.1. Distributive Equity & Inclusion Statement.

Carbonsafe recognizes that the success and legitimacy of a carbon farming project depends not only on its environmental integrity but also on its capacity to equitably distribute benefits and ensure the inclusion of all relevant stakeholders.

[91] European Commission. (2023). *Bulgaria – CAP Strategic Plan 2023–2027*. Directorate-General for Agriculture and Rural Development. Retrieved from https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans/bulgaria_en
[92] European Commission. (2025). *Bulgaria: Final updated National Energy and Climate Plan (NECP) 2021–2030*. Directorate-General for Energy. Retrieved from https://commission.europa.eu/publications/bulgaria-final-updated-necp-2021-2030-submitted-2025_en

The project has been designed with equity as a guiding principle. Carbon revenues generated through the issuance of high-quality credits are shared with participating farmers in a manner that is transparent, predictable, and proportionate to their contribution. This ensures that those who invest time, effort, and resources in adopting sustainable practices are recognized and rewarded for their stewardship. To safeguard fairness, Carbonsafe applies standardized benefit-sharing mechanisms and clear contractual arrangements, eliminating ambiguity and protecting the interests of smallholder and tenant farmers who might otherwise be vulnerable in market-driven systems.

By ensuring that project benefits are not limited to large landowners or well-capitalized enterprises, the project contributes to reducing rural inequality and building resilient farming communities.

To operationalize these commitments, Carbonsafe has established the following measures:

- Farmers of different scales, genders, and backgrounds are informed about opportunities.
- Tailored technical support, ensuring that less experienced or resource-constrained farmers can access the same agronomic guidance, training, and carbon revenue opportunities as their larger peers.
- Safeguards for vulnerable groups, guaranteeing that no farmer or community is excluded due to socio-economic status, land tenure type, or limited initial resources.

Local communities benefit from co-benefits such as improved soil fertility, biodiversity enhancement, and climate resilience. These broader benefits contribute to rural sustainability and strengthen social cohesion in agricultural landscapes.

10.13. Health & Safety Statement.

Carbonsafe places the highest priority on the health, safety, and overall well-being of all individuals engaged in the design, implementation, and operation of its carbon farming project. The company understands that sustainable agricultural transformation is only possible when the people driving it are protected, empowered, and able to work under conditions that minimize risk and safeguard human dignity.

The project operates in strict compliance with national labor legislation, European Union directives, and internationally recognized health and safety standards, including the conventions of the International Labour Organization (ILO).

In the agricultural context, Carbonsafe acknowledges that hazards may include exposure to agrochemicals, risks associated with heavy machinery, prolonged outdoor work in variable climates, and physical strain linked to field operations. To address these, the project emphasizes regenerative practices that often reduce chemical dependency, integrates mechanization with safety training, and provides support for adaptive measures against heat stress and other climate-related health risks.

The company also upholds the principle of shared responsibility: health and safety are not treated as a one-directional obligation but as a collaborative effort among Carbonsafe, partner organizations, farmers, and workers.

10.14. Local Supply Chain and Partnership Statement.

Carbonsafe recognizes that sustainable climate action in agriculture cannot be achieved in isolation. The success of the carbon farming project depends on strong, transparent, and resilient local supply chains, as well as durable partnerships that extend across farming communities, service providers, research institutions, and market actors. For this reason, Carbonsafe has embedded a deliberate strategy to foster local value creation, strengthen rural economies, and ensure that project activities generate benefits that extend beyond participating farms.

10.14.1. Commitment to local supply chains.

Wherever feasible, Carbonsafe prioritizes the procurement of goods and services from local suppliers and contractors. This includes agricultural inputs, soil sampling and laboratory services, logistics, field equipment, training materials, and professional expertise. By sourcing locally, the project not only reduces its environmental footprint linked to transportation but also stimulates rural economies, supports job creation, and contributes to the vitality of agricultural service ecosystems.

10.14.2. Partnership with farmers and cooperatives.

Farmers are not only beneficiaries but also strategic partners in the project. Through direct engagement and collaboration with farmer associations, cooperatives, and producer groups, Carbonsafe ensures that knowledge, resources, and decision-making processes are shared. Partnerships are structured to empower farmers with access to agronomic expertise, technological tools, and carbon market opportunities, thereby reinforcing long-term resilience and competitiveness.

10.14.3. Collaboration with institutions and knowledge providers.

Carbonsafe seeks partnerships with universities, agricultural research institutes, and technical experts to follow innovative practices, methodologies, and monitoring frameworks. Such collaborations strengthen scientific rigor, enable capacity building, and ensure that farmers are supported with the most up-to-date knowledge on regenerative agriculture, soil carbon measurement, and sustainable land management.

10.14.4. Engagement with local authorities and communities.

Local municipalities and community organizations play an important role in ensuring that project activities are aligned with regional development priorities. Carbonsafe holds workshops and seminars to harmonize carbon farming initiatives.

10.14.5. Market partnerships.

On the demand side, Carbonsafe builds relationships with responsible buyers of carbon credits, emphasizing transparency, high-quality standards, and alignment with corporate sustainability goals. By connecting farmers directly to premium carbon markets, Carbonsafe ensures that local benefits are amplified by global commitments to climate action.

10.14.6. Long-term vision.

Through these partnerships, Carbonsafe aspires to establish a regional ecosystem of innovation and sustainability, where farmers, local businesses, research institutions, and communities co-benefit from the transition to regenerative agriculture. The company envisions a virtuous cycle in which local supply chains are strengthened, rural livelihoods are improved, environmental services are enhanced, and carbon markets are supplied with verifiable, high-integrity credits.

By placing local supply chains and partnerships at the heart of its strategy, Carbonsafe ensures that the project delivers not only measurable carbon outcomes but also enduring socio-economic value. This approach reflects a holistic understanding of sustainability.

10.15. Impact on cultural & ecologically significant lands.

10.15.1. Statement of commitment.

Carbonsafe acknowledges that agricultural landscapes are not only productive spaces but also repositories of cultural heritage, ecological value, and community identity. The company affirms its commitment to protecting lands that hold cultural, historical, or ecological significance, ensuring that carbon farming interventions do not cause degradation, displacement, or irreversible change to such areas. Any potential overlap with culturally or ecologically sensitive land will be treated as a matter of highest priority, guided by the principles of precaution, respect, transparency, and participation.

Carbonsafe has individual contracts with farms which operate only on registered farmland.

11. STAKEHOLDER ENGAGEMENT.

The project applies a structured and systematic approach to stakeholder identification and mapping in accordance with the Carbonsafe Stakeholder Engagement Policy.The project applies a structured and systematic approach to stakeholder identification and mapping in accordance with the Carbonsafe Stakeholder Engagement Policy.

Stakeholders are defined as all individuals, groups, or organizations that participate in, are affected by, or have a role in the project. This includes, but is not limited to: farmers, landowners (where different from farmers), local communities, neighboring land users, government authorities, validation and verification bodies (VVBs), laboratories, carbon registries and standards, service providers, credit buyers, NGOs, and other relevant parties.

Stakeholders are assessed based on their level of influence and interest, and appropriate engagement approaches are applied, including information sharing, consultations, direct communication, and access to grievance mechanisms.

All stakeholder engagement activities are documented to ensure transparency, traceability, and continuous improvement.

11.1. Participation Agreements with Stakeholders

11.1.1. Purpose and principles.

Carbonsafe recognizes that trust, transparency, and fairness are the foundations of its relationship with participating farmers. To ensure that these principles are upheld, all farmers enrolled in the project enter into individual contracts with Carbonsafe. These contracts serve not only as legally binding agreements but also as instruments of mutual commitment, guaranteeing clarity of rights, responsibilities, and benefit-sharing.

The contractual framework is built on four guiding principles: transparency, fairness, accountability, and sustainability. Each contract is written in clear, accessible language and is explained in detail to farmers to ensure informed consent. Carbonsafe ensures that no farmer is disadvantaged by lack of legal literacy or technical knowledge and provides guidance to ensure that all parties fully understand their obligations and entitlements.

11.1.2. Structure of Agreements.

The individual contracts include the following key components:

Eligibility and land verification.

- Clear definition of the farm, fields, and land parcels enrolled in the project.
- Verification of land tenure or lease agreements to confirm the farmer's legal right to participate and receive carbon-related benefits.

Scope of participation.

- Description of the regenerative practices to be adopted
- Specification of monitoring and reporting obligations, including cooperation with soil sampling, data collection, and site visits.

Benefit-sharing and compensation**.**

- Explicit terms for the distribution of carbon revenue, ensuring farmers receive a fair share of income from the sale of credits generated through their efforts.

Support and capacity building.

- Carbonsafe's commitment to providing agronomic advice, technical assistance, and training.

Compliance and standards.

- Requirements to adhere to Carbonsafe's sustainability standards, including restrictions on practices that could compromise carbon outcomes or environmental integrity

Duration and renewal.

- Contracts are structured over 5-year renewable periods, and farmers are strongly encourage to renew, reflecting the long-term nature of soil carbon sequestration.

Participation agreements between Carbonsafe and participating farmers and related policies explicitly define key contractual provisions required for transparency and auditability. These agreements include clauses addressing:

- Ownership rights to carbon credits and authorization for registry management;
- Duration of participation and alignment with the crediting period;
- Permanence commitments and associated responsibilities;
- Liability allocation and obligations in case of non-compliance or reversal events;
- Exit and termination conditions, including treatment of enrolled land and issued or pending credits;
- Dispute resolution mechanisms and escalation procedures;
- Farmer grievance rights and access to the formal complaints mechanism.

11.1.3. Risk-sharing and protection

Transparent insurance or buffer mechanisms are included to manage risks of carbon reversal, ensuring that individual farmers are not unfairly penalized for uncontrollable events.

The project applies a structured multi-layer risk management framework combining a sub-project reserve mechanism and a buffer pool, designed to manage reversal risk, performance variability, and force majeure events.

(1) Sub-Project Reserve (75%)

A defined proportion of verified net removals (75%) is retained as a performance reserve at sub-project level. These credits are not immediately transferred or commercialized and serve as a structured safeguard against future underperformance, monitoring variability, or potential SOC decline. Release of reserve credits occurs following successful monitoring cycles and verification confirmation of continued SOC stability.

(2) Buffer Pool (5%)

A fixed 5% deduction is applied to verified net removals and allocated to a project-level buffer pool. The buffer is intended to compensate for unforeseen reversals, force majeure events, or systemic risks. Buffer credits may be cancelled if required to address verified reversal events.

Risk Allocation Between Parties:

Farmers are responsible for maintaining agreed land management practices and avoiding intentional actions that would cause reversals. However, financial liability of farmers is limited to cases of proven intentional breach, fraud, or contractual non-compliance.

Unintentional reversals resulting from natural events, force majeure, or systemic risks are managed primarily through the buffer and reserve mechanisms, and do not automatically result in direct financial claims against participating farmers.

Carbonsafe, as project developer and aggregator, assumes responsibility for registry management, buffer administration, and coordination of corrective actions.

11.1.4. Long-Term Engagement

The contract is a foundation of a long-term partnership. Carbonsafe treats farmers as co-creators of climate solutions, ensuring that their perspectives are valued and that benefits extend beyond carbon revenues to include improved soil health, reduced input costs, and stronger market opportunities.

These agreements are designed to balance rigor with flexibility, ensuring that farmers remain motivated partners in the collective pursuit of climate resilience and sustainability.

11.2. Training and Capacity Building

The adoption of regenerative practices requires farmers to move beyond familiar routines and into a new paradigm of soil stewardship, biodiversity integration, and climate-conscious management. The agronomic recommendations and individual strategies provided connect scientific knowledge with practical application, ensuring that farmers are not only informed but also empowered to implement change at scale.

Farmers are advised on how to address soil constraints such as compaction, imbalances in carbon and nitrogen, and pH, and are guided toward interventions that improve organic carbon stocks and overall soil resilience. This foundation is immediately translated into practical strategies while protecting both yield and biodiversity.

Agronomic advice is consatantly delivered and ensures knowledge is gained at the moment of relevance.

Farmers of all scales—smallholders, tenant farmers, and larger commercial operators—are given the necessary attention. Training and one-on-one sessions with our agronomists are delivered in accessible language.

The training is comprised of a technical group composed of Carbonsafe agronomists, and when needed of external scientists, and farmer representatives.

Carbonsafe's training transforms the abstract principles of regenerative agriculture into concrete and repeatable practices. It integrates knowledge into the natural cadence of the farming year, prioritizes inclusion and equity, and establishes a culture of peer learning and continuous improvement.

The project implements a structured training framework in accordance with the Carbonsafe Farmer Training Policy and Programme.

Training is provided to all participating farmers and includes:

- Online training sessions conducted 3–4 times annually, and
- At least one in-person training per year, supplemented by advisory support and optional demonstration activities.

The training programme covers key topics including regenerative agricultural practices, soil carbon management, MRV requirements, carbon credit fundamentals, data reporting, and risk prevention.

Trainings are delivered in accessible formats using practical examples and are adapted to the agricultural calendar.

Participation is documented through attendance records, and all training materials and records are maintained and archived. Feedback and, where applicable, knowledge assessments are used to support quality assurance and verification.

11.3. No Displacement Declaration.

Carbonsafe hereby affirms, in explicit and unequivocal terms, that the implementation of its carbon farming project does not, and will not, cause the physical or economic displacement of individuals, households, or communities. The project has been designed and operationalized on the basis of respect for existing land tenure, community rights, and the socio-economic stability of farming regions. This principle of non-displacement is central to the ethical integrity of the project and reflects Carbonsafe's broader commitment to ensuring that climate action never comes at the expense of human dignity, cultural continuity, or community well-being.

11.3.1. Land tenure safeguards.

Participation in the project is entirely voluntary, and only farmers or landholders with verified and uncontested rights to their land may enroll. Prior to contracting, Carbonsafe conducts due diligence on land tenure documents, lease agreements, and customary use rights, ensuring that project activities are carried out solely on lands where legal and social legitimacy is clear.

The project explicitly prohibits the acquisition, lease, or use of land in ways that would displace local people or interfere with their access to essential resources. Communal lands, customary-use areas, and lands of cultural or ecological significance are excluded from project activities unless full, informed, and freely given consent is obtained from affected communities.

11.3.2. Protection against economic displacement.

Economic displacement, defined as the loss of income, livelihoods, or access to resources resulting from project activities, is also proactively prevented. Carbonsafe ensures that regenerative practices introduced through the project do not limit farmers' ability to grow food crops for their own consumption or for local markets. On the contrary, the project is designed to enhance soil fertility, increase resilience to climate extremes, and improve long-term productivity, thereby strengthening rather than undermining economic security.

Any temporary increases in production costs associated with the transition to regenerative agriculture are addressed through technical support, capacity-building, and the provision of additional income streams from the sale of carbon credits. These mechanisms ensure that farmers are not economically disadvantaged by participation, but rather supported through a just and equitable transition.

12. REGISTRATION, VALIDATION, AND VERIFICATION.

12.1. Registry

12.1.1. Purpose and role of the Registry

At the heart of any credible carbon project lies the integrity of its accounting system. Carbonsafe recognizes that the environmental and financial value of carbon credits depends entirely on their uniqueness, transparency, and traceability. To safeguard these principles, the project operates under the framework of an independent carbon credit registry, which serves as the official ledger of issuance, transfer, and retirement of all credits generated through the project.

12.1.2. Core Registry Functions

The registry fulfills multiple critical functions:

1. Uniqueness and avoidance of double counting

   Each carbon credit is assigned a permanent, tamper-proof serial number upon issuance. This number links back to the sub-project farm parcels, vintage, and verification report, ensuring that credits cannot be duplicated, resold without record, or claimed more than once.

2. Transparency and accountability

   The registry provides public-facing access to project documentation, including project design documents (PDDs), monitoring and verification reports, issuance records, and retirement records. This transparency enhances market confidence and allows stakeholders—including farmers, buyers, auditors, and regulators—to verify the provenance and status of credits.

3. Traceability across the credit lifecycle

   The registry maintains a clear chain of custody from issuance through to retirement. Transfers between accounts are logged, and final retirements are made visible to confirm that credits have been used and can no longer circulate on the market.

4. Integration with market standards

   Registry operations are designed to align with recognized international best practices, ensuring compatibility with existing voluntary carbon markets and emerging compliance systems.

12.1.3. Stakeholder access.

Participating farmers and landowners are provided with clear, accessible information about how credits linked to their farms are tracked within the registry. While registry accounts are generally held by Carbonsafe for aggregation and issuance efficiency, farmers receive transparent reporting of credit issuance and sales, ensuring that their share of revenues can be independently verified. Buyers of credits, in turn, receive registry-based retirement certificates as proof of their contribution to climate action.

12.2. Validation

Validation is the independent, ex-ante determination that the Carbonsafe project for North region, Bulgaria has been designed in conformance with the applicable standard/methodology, that its quantification logic is sound, and that the institutional controls necessary to deliver the stated climate and social outcomes are in place. It is the point at which the project's architecture—methodology selection, additionality rationale, monitoring design, safeguards, and governance must withstand external scrutiny before any issuance of credits can occur.

Carbonsafe profect for North region, Bulgaria will undergo validation by a third-party Validation and Verification Body (VVB) accredited for greenhouse gas projects under internationally recognized schemes. The VVB must demonstrate competence for land-sector and soil-organic-carbon projects, operate under an accredited quality management system, and be demonstrably independent from Carbonsafe, its buyers, and its technical advisors.

The scope of validation is defined to cover the full project boundary geographical, temporal, and functional. The validator assesses the applicability of the chosen methodology for soil carbon projects and confirms that the baseline scenario, project scenario, and leakage risks are identified and justified.

A central pillar of validation is the evaluation of the project's monitoring, reporting, and verification (MRV) design. The validator examines the soil sampling framework. Chain-of-custody controls for samples are reviewed end-to-end, from field to laboratory, including labeling, custody forms, and storage conditions. Laboratory competence is verified through accreditation status and method specifications suitable for soil organic carbon measurement. Digital data flows farm shapefiles, geotagged records, and database audit trails are assessed for integrity, version control, and user access management.

Because permanence is intrinsic to the credibility of soil carbon, the validator assesses the project's long-term management model: the contractual obligations entered into with farmers, the reversal risk analysis, and the provisions for buffer allocations at issuance. The validator confirms that the proposed buffer is conservative relative to quantified risks, and also reviews safeguards against double counting: registry integration, serialization logic, and claims controls.

Evidence for validation is organized in a structured data room. Core artifacts include: the executed project design document; methodology applicability analysis; land tenure verification and farm enrollment records; spatial boundary files; baseline justification; MRV protocols and SOPs for soil sampling, laboratory methods; registry onboarding confirmations; template farmer contracts with benefit-sharing terms; and records of stakeholder engagement where applicable. Each artifact is cross-referenced to the relevant requirement in the governing standard/methodology, creating an auditable thread from requirement to evidence to validator conclusion. Data privacy is preserved throughout, with farmer-identifying information minimized or pseudonymized as permitted.

The validation process itself proceeds in phases. A readiness review (desk) confirms completeness and identifies obvious gaps. The main assessment includes interviews with Carbonsafe management, agronomists, and the data steward; walkthroughs of the data systems; and on-site sampling of representative farms to test the operational reality behind the documented design. Where the validator identifies non-conformities, they are classified by materiality and risk. Corrective Action Requests (CARs) require documented remediation and evidence of change; Clarifications (CLs) require additional justification or minor edits; Observations (OBs) flag opportunities for improvement without blocking validation. Carbonsafe treats CARs as design improvement opportunities; responses are logged, reviewed by the internal quality lead, and resubmitted with objective evidence before the validator can conclude.

At the close of the assessment, the VVB issues a validation opinion that states the project and methodology/standard assessed, the scope and boundaries, the evidence basis, the list of CARs/CLs and their closure status, and any conditions precedent that must be met prior to crediting. If conditions apply, Carbonsafe must satisfy them and provide evidence before issuance can proceed. The final validation statement, together with a non-confidential validation report, is published through the registry interface to ensure transparency for farmers, buyers, and other stakeholders.

The project embeds change-management procedures that trigger re-assessment where material modifications are proposed such as expanding into new agro-ecological zones or introducing new practice types with different risk profiles. Scaling is governed by inclusion criteria and a standardized on-boarding protocol; the validator confirms that these controls allow additional farms to be added without reopening the entire design, provided the criteria and MRV architecture remain intact. In parallel, lessons from verification cycles feed back into design updates; significant updates are documented in revision memos and, where required by the standard, submitted to the validator for approval prior to implementation.

12.3. Verification

Verification is the independent, ex-post test of truth that stands between monitoring and market claims. Each reporting period, Carbonsafe submits its Monitoring Report and evidence pack to a Validation and Verification Body (VVB) that is accredited for greenhouse-gas verification in the land sector and demonstrably independent of the project, buyers, and service providers.

The scope of verification spans the full crediting chain for the period under review. The VVB designs a sampling plan which covers activity data (practice adoption), stock-change measurements (soil organic carbon), emission sources and deductions, permanence controls, registry safeguards, and social and environmental safeguards that are pre-conditions to crediting.

The evidence pack submitted by Carbonsafe is organized for end-to-end traceability. It links parcel boundaries and geospatial layers to farm contracts, practice declarations, and machine logs; ties soil sampling frames to field coordinates, and depth protocols; and carries sample chain-of-custody from field to laboratory. Laboratory competence is evidenced by accreditation and method sheets suitable for soil organic carbon, with internal quality control.

Field reality is verified rather than presumed. Each cycle, the VVB undertakes site visits to a subset of sampled farms—timed to observe relevant practices or, where necessary, to witness soil sampling events. The verifier interviews farm personnel to corroborate records.

Calculations for removals are checked to ensure formulas match the approved methodology and that any software updates have not altered outputs.

Findings are classified by materiality and risk. Issues that could overstate climate benefits or compromise safeguards are treated as material by default and trigger Corrective Action Requests (CARs) that must be closed—through objective evidence before a positive verification statement is issued. Lesser issues may be raised as Clarifications (CLs) where additional justification or small adjustments suffice; improvement suggestions are logged as Observations (OBs) for management attention in subsequent cycles. Carbonsafe maintains a verification response log that traces each finding to its root cause, corrective action, verification evidence, and the internal control strengthened to prevent recurrence.

The verification outcome is a formal opinion that states the standard and methodology verified, the boundaries and period covered, the assurance level applied, the sampling approach and the status of CARs/CLs/OBs. Only after all conditions are met does Carbonsafe proceed to issuance; the final Verification Statement and a non-confidential Verification Report are published through the registry interface so that farmers, buyers, and stakeholders can see the basis for crediting.

Verification is periodic by design but adaptive in practice. Carbonsafe seeks annual verification to establish a high-confidence baseline of performance and control effectiveness; as the project matures and the governing standard permits, multi-year reporting periods may be adopted for soil-stock change, with interim checks to assure practice continuity and safeguard compliance. Outside the normal cycle, event-driven verification may be commissioned when significant design changes are proposed, when allegations of non-conformance arise, or when reversal events exceed predefined thresholds.

12.4. Issuance Model

12.4.1. Ex-post principle

Carbonsafe adopts a strictly ex-post issuance model, meaning that credits are only created and entered into the registry after the underlying carbon sequestration or emissions removal has been monitored, verified, and independently confirmed by an accredited Validation and Verification Body (VVB). This approach eliminates the risk of over-crediting based on ex-ante projections and ensures that every credit corresponds to a real, additional, and fully measured climate benefit that has already occurred in the soil and on the land.

The ex-post model reflects Carbonsafe's core philosophy: that climate integrity must come before market expedience. Farmers, buyers, and regulators can therefore trust that all issued units represent durable carbon outcomes, backed by documented field evidence and subject to rigorous permanence buffers.

12.4.2. Traceability to Source.

Each credit issued is not only linked to the project as a whole but is also traceable to the individual farm. This fine-grained traceability is enabled by the project's monitoring, reporting, and verification (MRV) architecture:

- Geospatial delineation: All enrolled fields are mapped with high-resolution geospatial data, ensuring that carbon gains are linked to exact coordinates.
- Soil sampling integration: Soil samples are stratified and collected according to defined sampling frames at the plot (cell) level, and their results feed directly into credit quantification.
- Data chain of custody: Every data point—farmer practice logs, field operations, laboratory results—is tagged to the corresponding plot.

- Registry metadata: Upon issuance, credits carry metadata linking them to the farm of origin, the monitoring period, the applied methodology, and the verification report.

This degree of traceability ensures that credits are not fungible abstractions, but auditable records tied to the real actions of identifiable farmers managing specific pieces of land.

12.4.3. Participantr benefit and transparency.

The issuance model is designed to ensure fairness and transparency in farmer compensation. Because credits are calculated and issued at the farm level, revenue shares can be allocated proportionally based on each farmer's actual contribution to sequestration. Farmers receive periodic issuance reports that specify:

- the number of credits generated from their land,
- the deductions applied (buffer contributions),
- the net credits available for revenue distribution, and
- the registry transaction references associated with their credits.

This system protects smallholders and tenant farmers, ensuring that their contributions are recognized, rewarded, and independently verifiable.

12.4.4. Market integrity.

For buyers, the ex-post issuance model provides maximum confidence. Each credit purchased is backed by a clear chain of evidence from soil measurement to registry serialization. Credits cannot be issued in advance, cannot be duplicated, and cannot be claimed by both farmers and national accounting systems due to registry safeguards. Retirement of credits is also transparently documented at the registry level, closing the loop of traceability.

12.4.5. Buffer allocation

Before credits are issued to the market, a proportion of verified carbon gains is set aside in a shared buffer pool to insure against risks of reversal, farmer dropout, and force majeuree events. This buffer is held at the registry level and is non-tradable. Only the net amount after all deductions and buffer allocations—is serialized and made available for distribution and sale. This ensures that credits remain conservative and that buyers are never exposed to overstated claims.

12.4.6. Adaptive governance.

The issuance model is periodically reviewed to align with evolving best practices in carbon accounting and regulatory requirements, including the European Union's emerging framework for certification of carbon removals.

Any modification to issuance rules, reserve allocation mechanisms, calculation parameters, or other elements affecting credit quantity, timing, or value shall follow a formal change-management process under the governance structure defined in the MRV Protocol and the Carbonsafe Issuance Policy.

The change-management process includes:

1. Initiation of Change Proposal:

Changes may be initiated due to methodological updates, registry requirements, VVB findings, internal MRV reviews, scientific recommendations, or risk-management considerations.

2. Technical Assessment:

The MRV Team evaluates the proposed change for methodological consistency, conservativeness, and potential impact on issued and pending credits.

3. VVB and Registry Consultation (where applicable):

For material changes affecting issuance rules or credit calculations, consultation with the Validation and Verification Body (VVB) and the carbon registry is conducted prior to implementation.

4. Approval and Governance:

Final approval is granted by Carbonsafe management in accordance with the Issuance Policy, which defines roles, responsibilities, and decision-making authority for credit issuance and related rule changes .

5. Stakeholder Communication:

Where changes materially affect credit issuance, timing, or value, relevant stakeholders (including farmers and credit buyers) are informed through updated project documentation and/or direct communication.

6. Documentation and Traceability:

All change proposals, assessments, approvals, and communications are documented and archived within the MRV system and made available for audit and verification.

This process is governed and further detailed in the Carbonsafe Issuance Policy and MRV Protocol.

12.5. Double Counting & Double Claim Prevention.

Carbonsafe treats the uniqueness of each carbon unit and the clarity of any associated public claim as non-negotiable conditions for market integrity. The project's controls are therefore designed to prevent two distinct failure modes: double issuance (the creation of more than one credit for the same quantified climate benefit) and double claiming (two entities asserting the same climate outcome). The system integrates contractual safeguards, geospatial and data-governance controls, registry architecture, and buyer-facing claim rules to ensure that every serialized unit is unique, traceable, and used exactly once.

During enrollment, Carbonsafe establishes exclusivity at the plot (cell) level through geospatial delineation and legal/contractual attestation. Farmers warrant that enrolled parcels are not simultaneously committed to other carbon projects for the same GHG attribute.

The monitoring architecture links each data element (activity logs, soil samples, laboratory results) to an immutable plot (cell). Version-controlled data records are reconciled to issuance.

Claims are governed by Registry Terms of Use that bind buyers to a clear claim taxonomy. Offset claims require prior retirement in the buyer's name and cannot be use further.

Carbonsafe prohibits attribute stacking that would monetize the same tonne of CO_2e twice under different instruments. Soil-carbon removals credited from this project cannot be simultaneously credited as another GHG unit under a separate standard for the same period and area.

To avoid off-ledger duplication, delivery is performed either by transfer to the buyer's registry account or by immediate retirement on their behalf. Custodial or omnibus accounts used for brokerage are strictly segregated; inventory, pending delivery, and retired balances are reconciled continuously, and client-level sub-ledgers are available for inspection. OTC contracts incorporate delivery identifiers that must match the exact serial set later retired, preventing substitution or partial double use.

The project's contracts, registry terms, and buyer agreements provide for remedies in case of breach: suspension of transfer rights, cancellation of deliveries, public correction of claims, and, where necessary, retirement of buffer units to protect third parties. Intentional misconduct such as knowingly attempting to re-use retired serials or making deceptive neutrality claims may result in registry exclusion and referral to relevant authorities or standards bodies.

13. GROUPED STRUCTURE DETAILS.

13.1. Sub-project) Definition.

Within the Carbonsafes project's architecture for North region, Bulgaria, a sub-project—also referred to as a project participant—is the smallest accountable delivery unit through which land, practices, data, and responsibilities are organized for monitoring, verification, and issuance. Sub-projects (project participants) are all the farms participating in the project for North region, Bulgaria. The sub-project concept allows the regional project to scale while preserving traceability to individual farms and plots (cells), ensuring that operational diversity across geographies and farm types can be accommodated without diluting methodological rigor.

A sub-project is defined as an MRV and carbon-accounting unit. A sub-project represents a discrete set of eligible land parcels operated under consistent management conditions and included in the project for the purposes of baseline establishment, monitoring, and quantification of soil organic carbon stock changes.

The legal contracting entity may be an individual farm operator, a tenant, or a group of farms operating under a single contractual arrangement with the project developer.

Carbon credits are issued and held in the registry at project level with one ID and inside the project ID for North region Bulgaria credit serial numbers hold a designation number corresponding to each sub-project in accordance with the contractual arrangements. Reversal liability, compliance obligations, and exposure to sanctions are governed by the participation agreement and apply to the responsible legal counterparty. This structure ensures clear separation between legal responsibility, MRV accounting, and registry representation within the grouped project framework.

To facilitate participation of smaller landholders who do not individually meet the minimum area thresholds, the project allows the formation of a Group of Farmers under two possible contractual arrangements.

Option 1 – Grouped Contract Without Land Exchange

In cases where Farmers 1, 2, and 3 do not exchange land parcels during the five-year program period and are grouping solely to meet minimum area requirements, a single participation agreement is concluded covering all farmers within one contract.

Under this arrangement:

- All participating farmers are listed individually as contracting parties within the agreement.
- Each farmer receives:
    - Individual agronomic recommendations,
    - An individual strategy,
    - A technological map,
    - Carbon certificates issued in their own name.
- Each farmer is registered separately within the MRV system.
- Each farmer receives a separate invoice for services rendered.

In this structure, the grouping is administrative and contractual only; operational management and credit allocation remain individual.

Option 2 – Grouped Contract with Land Exchange (e.g., for Crop Rotation)

In cases where Farmers 1, 2, and 3 exchange land parcels during the program period (for crop rotation or other agronomic reasons), a grouped participation agreement is also concluded.

Under this arrangement:

- All farmers are listed in the contract.
- The group designates one Lead Farmer (Lead Contracting Party).
- The Lead Farmer:
  - Receives consolidated agronomic recommendations covering all enrolled parcels of all participating farmers.
  - Receives a unified strategy covering all grouped land areas.
  - Completes technological maps on behalf of all participating farmers.
  - Receives carbon certificates issued in the name of the Lead Farmer.
- All grouped land parcels (belonging to Farmers 1, 2, and 3) are registered under the Lead Farmer within the MRV system.
- A single invoice is issued to the Lead Farmer.

In this configuration, participating farmers are responsible among themselves for internal accounting arrangements. Re-invoicing of services between the group members is permitted where applicable.

A sub-project is constituted when an eligible legal or natural person enters into an individual contract with Carbonsafe and enrolls one or more clearly delineated agricultural parcels under a defined crediting period. Eligible participants include single farms, farm enterprises, tenant operators with documented lease rights, and group of smaller farms unified with one contract. Whatever the organizational form, the sub-project possesses three essential attributes: (i) legal standing to implement practices and receive benefits, (ii) spatial and temporal boundaries that are unambiguous and exclusive, and (iii) operational control sufficient to meet monitoring and safeguard obligations.

Boundary definition begins with geospatial delineation at the plot (cell) level. Each enrolled field is mapped to an authoritative cadastre or equivalent georeferenced dataset, assigned a persistent plot key, and linked to the participant's legal identity. Temporal boundaries are established by the sub-project's crediting period start date and synchronized with soil sampling cycles and reporting cut-offs. Parcels cannot be simultaneously enrolled in other GHG crediting schemes for the same attribute or period; exclusivity is warranted contractually

Eligibility and additionality are assessed at enrollment. The participant must demonstrate right of use (ownership, lease, or other lawful entitlement) and freedom from encumbrances that would preclude the adoption of regenerative practices. Baseline characterization confirms that targeted practices are not already mandated or common practice to a degree that would undermine additionality; evidence may include local adoption statistics, agronomic histories, and input records. Where public subsidies exist, they are reviewed to ensure they do not fully remove the need for carbon revenue to enable the transition. Only farms that meet these criteria are admitted into the sub-project boundary.

Each sub-project commits to a practice package for example, reduced or no-till, diverse cover crops, residue retention, nutrient stewardship, and integrated pest management—tailored to crop rotations and agro-ecological conditions. The package is documented through farm-level plans, and equipment configurations, creating an auditable bridge between intention and field reality. Because the project issues credits ex-post, adoption is corroborated by activity data (machine logs, and input records, photo evidence,) and by independent verification of soil organic carbon changes over time.

Monitoring, reporting, and verification (MRV) responsibilities are anchored at the sub-project. Participants maintain field records according to Carbonsafe templates, host soil sampling events, and cooperate with data quality checks and site visits. Chain-of-custody from field to laboratory is preserved through labeled sampling kits, custody forms, and secure transfer protocols. Records are stored in a version-controlled environment where each datum—practice event, input application, sampling location, laboratory result—is time-stamped and bound to the corresponding plot (cell).

Governance and change control ensure that sub-projects remain stable units of accounting even as farms evolve. Additions or removals of parcels (cells) follow documented procedures: new fields undergo the same eligibility screening and baseline logic; merged or split parcels (cells) retain lineage through plot-key inheritance.. Corporate restructurings (e.g., transfer of farm ownership) trigger due diligence to confirm continuity of rights and obligations. Throughout, Carbonsafe maintains a sub-project register with unique identifiers, contract status, parcel inventory, and verification history, enabling cross-checks against issuance volumes and retirement records.

Financial transparency and claims discipline are embedded in the sub-project relationship. Issuance reports specify the credits attributed to the participant, the deductions applied for buffer and reserve contributions, and the net amount eligible for revenue sharing. Payments follow verification and registry events, and participants receive references to serialized units or retirement certificates corresponding to their contribution. Participants are prohibited from making offsetting or neutrality claims unless credits are retired in their name.

13.1.1. Addition of New Participants

New participants may be added to the project, provided they meet the same eligibility, land tenure, and safeguard requirements established at project inception. Their inclusion does not trigger a full re-validation of the project; instead, the Validation and Verification Body (VVB) assesses whether the onboarding procedures, baseline logic, and MRV controls applied are consistent with the validated design. Where additions represent new agro-ecological conditions, significant expansion of scope, or material changes in risk, the VVB conducts a targeted review to confirm continued methodological applicability and environmental integrity before credits from the new participants are eligible for issuance.

For farms or land parcels added to the grouped project after the initial registration, baseline establishment follows predefined and conservative rules set out in the applied methodology. Baselines for new entrants are established using historical land management data and soil sampling at enrolment. The baseline date for each new sub-project is determined by the first soil sampling campaign.

Minimum historical data requirements and baseline determination are applied consistently to all late-joining participants to prevent strategic entry and to preserve baseline integrity across the grouped project.

13.2. PDD Amendment Rules.

13.2.1. Purpose andprinciples

The Project Design Document (PDD) is the authoritative reference for the design, scope, and operational framework of the Carbonsafe carbon farming project for the North region, Bulgaria. Because agricultural, regulatory, and market conditions evolve, it is essential that the PDD remain both stable enough to guarantee investor and buyer confidence and flexible enough to accommodate justified improvements. To balance these needs, Carbonsafe has established clear rules governing when and how amendments may be made, the processes for their approval, and the mechanisms for transparent disclosure.

13.2.2. Types of amendments

Amendments are classified into three categories, based on their potential impact on project integrity and the eligibility of issued credits:

1. Material amendments.

Changes that alter the project boundary, methodology, quantification approach, eligibility criteria, or permanence safeguards in ways that could affect crediting outcomes require full review by the Validation and Verification Body (VVB), and in some cases re-validation, before they can take effect.

2. Substantive but non-material amendments.

Changes that refine or clarify project procedures without altering the underlying crediting logic or safeguards require documentation in a formal amendment memo, internal approval by Carbonsafe governance bodies, and review by the VVB at the next verification cycle.

3. Minor editorial amendments.

Changes limited to formatting, language clarification, or correction of typographical errors that do not alter meaning, are logged internally and disclosed in periodic reporting, but do not require VVB review.

13.2.3. Amendment process

All proposed amendments follow a standardized workflow:

1. Initiation – The proposed change is submitted by Carbonsafe staff, technical advisors, or stakeholders, supported by a justification note and evidence of necessity.
2. Screening – The Head of IMS within Carbonsafe classifies the amendment as material, substantive, or minor, and determines the required level of review.
3. Consultation – For material and substantive changes, affected stakeholders (e.g., farmers, buyers, community representatives) are informed.
4. Validation/Verification Body review – Where required, the amendment is presented to the VVB.
5. Registry update – Once approved, the amendment is recorded in the project's registry entry, ensuring transparency for all market participants.

14. DATA MANAGEMENT & IT INFRASTRUCTURE.

14.1. Data Collection and Storage.

Carbonsafe uses an integrated software platform to serve as the digital backbone of its monitoring, verification, and farmer support ecosystem. The platform ensures that every soil sample, laboratory result, and agronomic recommendation is traceable, auditable, and actionable. By embedding data integrity and user-centered design, the software not only guarantees credibility of carbon credit issuance but also provides farmers with practical insights for continuous improvement in regenerative practices.

The data of the integrated software platform are physically stored in a dedicated server room located at the Carbonsafe offices. Logically, the data are stored in an MS SQL database, to which access is limited to: (1) a system administrator, and (2) the integrated software application itself, in accordance with best practices for password aging and rotation, both for system administration access and for application-level access.

The software application operates in an isolated environment (Docker containers), without direct access to the physical server machine. As a result, the data are not exposed to risk in the event of a security breach affecting the software application of the integrated platform.

In addition, data protection applies to information related to natural persons as defined under Regulation (EU) 2016/679 (GDPR).

Within the meaning of applicable legislation, data are protected within the application through an automated backup system: full backups are performed once per week, and differential backups of the MS SQL database are performed daily in between.

14.2. Chain of custody.

The platform manages the full lifecycle of soil samples, from field collection to laboratory analysis, ensuring transparency and reliability at every step. Each sample is assigned a unique identifier, linked to the geospatial coordinates of the plot (cell), the farmer's enrollment record, and the sampling protocol applied. When samples are collected in the field, technicians log metadata (date, time, GPS location, depth, sampler ID) via a mobile application that uploads entries to the central database.

Chain of custody is preserved through barcode, scanned at each handover point—from field to laboratory, and from laboratory to data upload. Custody forms are recorded within the system, producing an immutable log of custody events. This eliminates the risk of sample mislabeling, substitution, or tampering and provides verifiers with a clear audit trail during validation and verification.

Partner laboratories could be connected to the platform directly or could use approved template for data upload to the platform.

14.3. Data processing and interpretation.

Beyond storing laboratory data, the platform transforms raw results into actionable insights for farmers. Soil carbon content is integrated with other soil health indicators providing a comprehensive picture of soil fertility and resilience, allowing the system and Carbonsafe agronomists to generate tailored agronomic recommendations for each plot (cell) in the farm.

Recommendations are designed to be practical and plot-specific, highlighting regenerative practices that can improve soil health, increase productivity, and enhance carbon sequestration.

14.4. Participant Interface and Access

Farmers access their results and recommendations through a secure web portal. Dashboards present data in clear, non-technical visualizations—such as trend graphs, and maps—making complex laboratory outputs accessible to all users. Farmers can compare year-on-year results and understand how their choices influence both carbon crediting and agronomic outcomes.

14.5. Integration with MRV.

All sample and laboratory data feed directly into Carbonsafe's software. This ensures that credit issuance is backed by a digitally auditable, tamper-proof chain of evidence from soil to VVB. Data from the platform is also used to populate registry entries, linking credits to specific farms, monitoring periods, and laboratory-confirmed results.

14.6. Data Security and Privacy

Given the sensitivity of both farmer data and laboratory results, the platform incorporates robust data protection protocols. All records are secured with role-based access controls limiting visibility to authorized users. Admin logs can track all edits and access events, ensuring accountability. Compliance with the EU General Data Protection Regulation (GDPR) is mandatory, and farmers retain ownership of their farm-level data, with explicit consent required for any third-party sharing beyond crediting processes. Farm-level data could be shared with the relevant Authorities in case requested by law.

Data are protected at multiple levels:

1. Firewall filtering
2. VPN

3. JWT token/hash-based authentication for API communication between the application and external software products
4. Username and password authentication with two-factor authentication (via Google Authenticator)

In addition, the server authenticates itself to clients, and data are protected during transmission (Data in Transit) through SSL encryption using the HTTPS protocol.

Automated penetration testing of the platform is conducted using Tenable / Nessus, and all identified non-conformities and vulnerabilities are remediated.

14.7. Continuous Improvement.

The software is not static. Carbonsafe applies an adaptive development model, updating algorithms, dashboards, and interfaces in response to farmer feedback, verifier comments, and advances in soil science.

Through its integrated software, Carbonsafe ensures that every soil sample and laboratory result is traceable, every agronomic recommendation is grounded in data, and every issued carbon credit is backed by a defensible evidence trail.

15. PROJECT DEVELOPER SUSTAINABILITY, SCALE & FINANCIAL ANALYSIS.

15.1. Organizational Capacity and Growth

Carbonsafe has been conceived as a scalable national carbon farming project developer capable of delivering both environmental impact and financial sustainability. As of 2025, the Carbonsafe projects have enrolled over 100 farmers across Bulgaria, covering approximately 50,000 hectares of agricultural land, with a retention rate of 99% of farm plots (cells). These early milestones demonstrate both the farmer appetite for participation and the robustness of the contractual and technical framework that underpins the project.

Looking ahead, the Carbonsafe projects are designed to grow significantly in scale. By 2029~~7~~, Carbonsafe targets an enrolled area of over 100,000 hectares, expanding further to 150,000 hectares in the longer term. This trajectory positions the projects as one of the largest soil carbon initiatives in Eastern Europe, rooted in Bulgaria but with regional significance across the Balkans. The scaling strategy is grounded in two reinforcing drivers: farmer demand for regenerative farming solutions that deliver both economic and ecological benefits, and the rapidly growing appetite in voluntary carbon markets for high-quality, ex-post, soil-based carbon removals.

Коментирал [S30]: The assumption here does not match those made in the Financial Sustainability document.

Коментирал [DK31R30]: Text updated to reflect the Financial Sustainability document.

15.2. Estimated Emission Reductions or Removals

The projects' central climate contribution lies in removing atmospheric CO_2 through regenerative agriculture practices, measured as increases in Soil Organic Carbon (SOC) stocks. By implementing diverse crop rotations, reduced or no-till systems, cover crops, residue retention, and optimized nutrient use, participating farmers contribute to both emissions reductions (e.g., lower fertilizer use, fewer machinery passes) and removals (increased SOC sequestration).

Independent soil sampling and laboratory analysis form the basis for quantifying removals. This 100% physical measurement approach ensures that credits are based on observed, verifiable changes in carbon stocks. Based on aggregated field data and conservative accounting, Carbonsafe anticipates issuing over 175,000 verified carbon credits by 2027, each corresponding to one metric ton of CO_2 equivalent genuinely removed from the atmosphere.

The long-term sequestration potential is even greater, with annual removals expected to scale in proportion to the land area growth. At expansion of 100,000 hectares, Carbonsafe is expected to deliver 350,000 credits contributing directly to both corporate offsetting commitments and the EU's and Bulgaria's net-zero pathways.

15.3. Financial sustainability

The financial model of Carbonsafe is designed to ensure sustainability at both the project and farmer levels. Farmers receive direct compensation tied to their verified sequestration outcomes, creating a new, reliable revenue stream in addition to yield improvements and reduced input costs. Field evidence already shows that regenerative practices can deliver up to 50% reductions in fertilizer use and 10% yield gains, translating into substantial farm-level economic resilience.

At the sub-project level, revenues are generated through the sale of premium, registry-backed carbon credits into voluntary markets. These credits are differentiated by their soil-based, ex-post measurement methodology, which enhances buyer confidence and enables premium pricing. With an expanding farmer network, the national projects's credit pipeline is both diverse and resilient.

The financial sustainability of Carbonsafe is further reinforced by its alignment with corporate sustainability and development of carbon markets. Buyers are increasingly seeking removal-based credits, which currently represent only 9% of retired credits globally but are projected to grow rapidly in demand. This demand dynamic positions Carbonsafe's credits as a scarce, high-value product in a market that could exceed $35 billion by 2030[93]

15.4. Long-term viability.

The combined effect of robust MRV, farmer-centered incentives, and strong market positioning ensures that Carbonsafe is financially and environmentally sustainable. Carbonsafe projects create long-term stability for both supply and demand. The use of a buffer pool, credits reserve and conservative issuance practices protects against reversal risks, ensuring that issued credits retain their integrity over decades.

Carbonsafe's financial analysis demonstrates that the projects in development are not merely a short-term initiative but a sustainable, scalable business model that balances farmer welfare, climate integrity, and market demand. By 20299~~7~~, with over 100,000 hectares enrolled and ~~more than half a million~~estimated at least 350k verified credits issued, Carbonsafe projects will stand as a cornerstone of carbon farming in the region—contributing measurable removals, strengthening rural economies, and offering buyers credible climate solutions grounded in science and transparency.

Коментирал [S32]: The assumption here does not match those made in the Financial Sustainability document.

Коментирал [DK33R32]: Text updated to reflect the Financial Sustainability documen

The Project Developer acknowledges that voluntary carbon markets are subject to price volatility, fluctuations in buyer demand, evolving regulatory frameworks, and increasing competition. Financial planning and business plan are conducted accordingly.

16. ANNEXES.

16.1. GLOSSARY

Glossary of Terms and Abbreviations

Additionality – The principle that credited climate benefits would not have occurred in the absence of the project. Demonstrated by showing practices are not common (<20% adoption), not legally required, and only possible with carbon finance.

Agronomic Team – Carbonsafe's internal technical staff responsible for field sampling supervision, practice monitoring, and farmer engagement.

Area-Weighted Mean Adoption – A method of calculating adoption rates of practices across a region by weighting farm-level adoption by their relative land area.

[93] https://www.msci.com/research-and-insights/blog-post/frozen-carbon-credit-market-may-thaw-as-2030-gets-closer

Baseline Year – Year 0 in which initial soil organic carbon (SOC) values are established before project activities.

BCCR (Balkan Carbon Credits Registry) – Public registry administering serialization, issuance, transfer, and retirement of carbon credits generated under the project.

BCCS (Balkan Carbon Credits Standard) – carbon credit standard in the voluntary carbon market. BCCS sets rules and requirements for carbon credit projects to ensure measurable, high-integrity outcomes, maintains a public registry of projects and issued carbon credits, and oversees rigorous independent validation and verification processes.

Buffer Pool – A pool of non-tradable credits withheld at issuance to insure against reversal, force majeuree, or systemic risk.

Bulk Density (BD) – Mass of dry soil per unit volume (g/cm^3). Required for converting SOC concentrations (mg/kg) into stock per hectare.

Carbon Credit – A verified unit representing one metric tonne of CO_2 equivalent (tCO_2e) removed or reduced, serialized in the registry.

Carbon Removal Certification Framework (CRCF) – European Union regulation establishing requirements for certification of carbon removals, including soil carbon.

Chain-of-Custody – Documented process ensuring traceability of soil samples from field collection through accredited laboratory analysis.

Conservativeness – A principle in carbon accounting that prioritizes underestimation over overestimation to maintain integrity.

Control Year – The year in which soil samples are re-measured and compared to baseline or previous control years to determine ΔSOC.

Crediting Period – The time span (e.g., 2023–2063) during which project activities are monitored and credits may be issued.

ΔSOC (Delta SOC) – The change in soil organic carbon between baseline and control years, expressed in mg/kg or converted to tonnes of CO_2.

Durability – The capacity of stored carbon to remain in the soil over time, supported by safeguards, buffer allocations, and ongoing monitoring.

ERP (Enterprise Resource Planning system) – Carbonsafe's digital system linking field IDs, lab batches, GPS data, and calculation workbooks. (ISACO2- Specialized software for Integrated Administration, Control and Reporting System.)

Ex-Post Issuance – Credits are only issued after verified SOC gains are measured, avoiding over-crediting or reliance on projections.

Farm Balance – The net CO_2 removals per farm after deducting on-farm emissions (fuel) and applying conservativeness rules.

FPIC (Free, Prior and Informed Consent) – Safeguard ensuring that farmers and communities participate voluntarily, with full information.

Geographic Information System (GIS) - For the purposes of the present project, this represents a system integrating specialized software and data for the management, analysis, and visualization of geographically referenced information — including closed area polygons of project-participating land plots and sampling track polylines within the boundaries of those polygons, visualized on an interactive map.

GPS Coordinates - For the purposes of the present project, this represents a system of GPS coordinates with unique numerical values (latitude and longitude) that define the exact location of closed polygons of project-participating land plots and sampling track polylines within the boundaries of those polygons, visualized on an interactive map of the Earth's surface.

GHG (Greenhouse Gas) – Gases contributing to climate change, primarily CO_2, CH_4, and N_2O.

GPS Tracks – Geospatial files confirming that soil sampling occurred within the defined plot boundaries.

ICVCM / ICROA – Integrity initiatives (Integrity Council for Voluntary Carbon Markets / International Carbon Reduction and Offset Alliance) providing guidelines for high-integrity carbon credits.

Issuance Ratio – Portion of verified removals immediately credited (e.g., 25%) with the remainder held in reserve for prudence.

Laboratory Accreditation – Certification (ISO/EN standards) that ensures soil analysis methods are credible and reproducible.

Leakage – The displacement of emissions outside the project boundary as an unintended consequence of project activities.

Materiality Threshold – The significance level at which discrepancies or errors are deemed to affect credit issuance.

MRV (Monitoring, Reporting, and Verification) – System covering sampling, lab analysis, calculation, reporting, and independent verification.

Net Removals – Gross CO_2 removals from SOC minus on-farm emissions and uncertainty deductions.

Non-Conformity (NC) – A deviation from prescribed procedures, categorized as minor, major, or critical depending on severity.

OC (Organic Carbon) – Carbon contained in soil organic matter, measured in mg/kg.

Permanence – The duration over which credited CO_2 removals are expected to remain stored.

Plot (Cell) – The smallest monitoring unit in the project, georeferenced and linked to farm contracts.

Registry – Independent system ensuring credit uniqueness, traceability, and transparency.

Reversal – A verified net loss of SOC at the final year of the crediting period. Covered by reserves and buffer pools.

SOC (Soil Organic Carbon) – Carbon stored in soil organic matter, the key reservoir targeted by the project.

Sub-Project (Project Participant) – An individual farm or group of farms enrolled under a contract, forming the delivery unit for monitoring and issuance.

tC (Tonne of Carbon) – Measurement unit of carbon mass. Used for conversion to CO_2 via IPCC factor.

tCO_2e (Tonne of Carbon Dioxide Equivalent) – Standardized metric for quantifying GHGs.

Uncertainty Deduction – Uncertainty is assessed and quantified as part of the MRV system, based on measurement data, sampling design, and laboratory analysis, and is incorporated into the calculation of net greenhouse gas removals..

Validation – Initial third-party assessment of the PDD and methodology alignment.

VVB (Validation and Verification Body) – Independent accredited auditor responsible for validating and verifying project results.

Verification – Ex-post review of evidence packs and site visits confirming project outcomes before credits are issued.

16.2 GEOGRAPHICAL COORDINATES OF THE NORTHERN BULGARIA PROJECT

COORDINATE REGISTER

Carbonsafe Carbon Farming Project – Northern Bulgaria, code CSBG-BG-N

№ точка	Координати в BG2005г.		UTM зона 35		Coordinates	
	X	Y	X	Y	latituted - B	longitude - L
1	4901291,89	273967,13	4904657,73	154243,53	44°12'47.186"	22°40'19.290"
2	4885113,33	303263,12	4887909,89	183244,28	44°04'33.062"	23°02'39.169"
3	4863127,53	286106,34	4866237,97	165661,27	43°52'24.373"	22°50'19.770"
4	4854806,28	309138,08	4857478,06	188549,19	43°48'17.125"	23°07'41.234"
5	4859506,39	334723,73	4861700,44	214232,74	43°51'11.040"	23°26'40.285"
6	4853064,61	358989,00	4854804,75	238382,98	43°48'00.105"	23°44'52.324"
7	4839306,80	392725,63	4840422,31	271867,22	43°40'54.383"	24°10'10.819"
8	4847931,55	420097,89	4848543,10	299395,11	43°45'45.962"	24°30'28.182"
9	4839067,67	438411,38	4839345,88	317542,31	43°41'04.968"	24°44'10.368"
10	4843448,27	459078,15	4843348,24	338282,81	43°43'31.923"	24°59'31.836"
11	4831441,98	490817,63	4830770,64	369792,09	43°37'06.717"	25°23'10.499"
12	4842434,08	523370,28	4841169,76	402527,28	43°43'01.749"	25°47'23.909"
13	4871375,56	549938,06	4869614,89	429599,70	43°58'34.677"	26°07'20.129"
14	4882584,55	598212,36	4879951,20	478038,69	44°04'20.654"	26°43'32.686"
15	4891112,23	623363,30	4888025,14	503320,86	44°08'43.505"	27°02'29.480"
16	4889269,28	642013,05	4885853,97	521922,81	44°07'31.977"	27°16'26.467"
17	4876895,38	652333,64	4873307,78	532017,25	44°00'43.997"	27°23'57.942"
18	4881333,94	671809,27	4877400,75	551556,29	44°02'52.648"	27°38'36.860"
19	4871037,17	679403,56	4866978,28	558964,63	43°57'12.846"	27°44'05.581"
20	4877472,50	693818,98	4873156,98	573482,60	44°00'28.385"	27°54'59.968"
21	4859335,34	700570,75	4854913,77	579913,14	43°50'34.738"	27°59'38.850"
22	4850542,72	720354,06	4845780,96	599531,48	43°45'30.198"	28°14'11.151"
23	4849310,02	748002,66	4844067,87	627144,71	43°44'19.482"	28°34'44.171"
24	4827457,13	751371,22	4822165,69	630131,80	43°32'27.946"	28°36'38.667"
25	4806739,32	740293,19	4801649,43	618696,18	43°21'29.977"	28°27'53.196"
26	4812508,41	729730,91	4807601,15	608239,21	43°24'48.543"	28°20'13.003"
27	4807640,12	710157,19	4803078,35	588588,86	43°22'31.246"	28°05'36.761"
28	4790644,57	703801,97	4786202,38	581937,64	43°13'26.989"	28°00'32.180"
29	4769840,95	694657,81	4765569,36	572430,65	43°02'21.699"	27°53'21.098"
30	4749287,77	696355,47	4744995,12	573764,16	42°51'14.331"	27°54'10.264"
31	4748432,76	682438,48	4744386,86	559838,15	42°50'58.995"	27°43'56.465"
32	4753607,68	673482,86	4749717,98	550978,25	42°53'54.126"	27°37'27.865"
33	4751413,82	658060,98	4747798,28	535524,83	42°52'55.047"	27°26'06.038"
34	4760196,34	648811,98	4756740,36	526435,92	42°57'46.261"	27°19'26.899"
35	4762435,41	639466,28	4759143,91	517134,54	42°59'05.138"	27°12'36.599"
36	4755073,26	622974,33	4752077,84	500520,33	42°55'16.760"	27°00'22.952"

37	4757951,90	606114,95	4755254,16	483720,45	42°56'59.106"	26°48'01.562"
38	4752926,22	593909,81	4750447,64	471432,13	42°54'21.986"	26°39'00.153"
39	4765168,96	582740,36	4762882,80	460485,62	43°01'03.343"	26°30'54.262"
40	4766100,16	563291,91	4764159,44	441063,06	43°01'40.197"	26°16'35.746"
41	4748133,48	543794,08	4746547,61	421254,27	42°52'02.865"	26°02'09.480"
42	4738614,33	538016,58	4737135,07	415309,97	42°46'55.478"	25°57'52.636"
43	4741450,63	516185,77	4740358,29	393537,87	42°48'30.170"	25°41'52.432"
44	4734618,68	508246,45	4733669,80	385479,84	42°44'49.210"	25°36'02.618"
45	4736191,66	494644,18	4735484,01	371909,74	42°45'40.281"	25°26'04.437"
46	4734421,86	478972,22	4733993,25	356210,46	42°44'41.955"	25°14'35.384"
47	4739332,32	473725,10	4738995,90	351051,87	42°47'20.515"	25°10'43.843"
48	4736401,76	461584,71	4736281,91	338861,72	42°45'43.701"	25°01'50.363"
49	4730529,81	438900,18	4730814,04	316075,62	42°42'28.117"	24°45'14.940"
50	4731698,10	433456,03	4732079,03	310652,58	42°43'04.353"	24°41'15.215"
51	4739970,74	423736,88	4740524,43	301080,95	42°47'29.196"	24°34'04.055"
52	4740255,26	417708,86	4740916,40	295057,95	42°47'36.177"	24°29'38.668"
53	4735427,77	414708,23	4736142,21	291971,22	42°44'58.557"	24°27'29.253"
54	4738646,77	387727,31	4739842,31	265044,64	42°46'30.387"	24°07'40.640"
55	4755743,70	390876,60	4756885,85	268500,19	42°55'46.032"	24°09'47.274"
56	4770379,95	381410,81	4771694,83	259295,84	43°03'35.218"	24°02'38.762"
57	4772071,09	358069,56	4773807,61	235978,92	43°04'15.703"	23°45'25.886"
58	4767195,42	353115,06	4769019,65	230934,65	43°01'34.368"	23°41'51.530"
59	4770855,10	347371,24	4772784,47	225254,65	43°03'28.891"	23°37'34.302"
60	4763847,58	342358,31	4765864,42	220113,06	42°59'38.200"	23°33'59.904"
61	4775713,84	333214,73	4777901,63	211179,63	43°05'55.660"	23°27'03.661"
62	4781810,38	335280,92	4783963,66	213357,45	43°09'14.779"	23°28'28.547"
63	4782619,59	322885,90	4784998,61	200970,67	43°09'31.009"	23°19'19.181"
64	4778407,02	321217,51	4780813,94	199224,75	43°07'13.145"	23°18'10.201"
65	4777671,23	305318,27	4780366,59	183301,89	43°06'35.326"	23°06'28.058"
66	4787126,97	297331,22	4789974,79	175481,33	43°11'34.138"	23°00'22.609"
67	4809693,73	276680,56	4812939,56	155228,58	43°23'24.262"	22°44'35.901"
68	4830737,39	256561,80	4834377,49	135482,57	43°34'23.467"	22°29'09.239"
69	4858775,83	247615,75	4862612,80	127056,77	43°49'20.721"	22°21'44.482"
70	4878496,66	252440,42	4882259,93	132262,60	44°00'04.890"	22°24'48.007"
71	4884812,97	270046,20	4888243,65	150003,27	44°03'49.452"	22°37'48.011"

16.3 CROPS GROWED IN BULGARIA AND SOIL SAMPLING PERIODS

No	Crop	Crop group	Soil Sampling period
1	CEREALS	CEREALS	Initial phase of vegetation and after harvest
2	CEREALS AND GRAIN CROPS	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
3	SOFT WINTER WHEAT	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
4	SOFT SPRING WHEAT	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
5	MONOGRAIN SPELLED	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
6	TWO-GRAIN SPELLED	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
7	DURUM WHEAT	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
8	WINTER RYE	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
9	SPRING RYE	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
10	TRITICALE-WINTER	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
11	TRITICALE-SPRING	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
12	CORN FOR GRAIN	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
13	WINTER BARLEY	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
14	SPRING BARLEY	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
15	WINTER OATS	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
16	SPRING OATS	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
17	MILLET	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
18	SORGHUM	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
19	RICE	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
20	OTHER CEREALS	CEREALS AND GRAIN CROPS	Initial phase of vegetation and after harvest
21	CEREAL-LEGUME CROPS	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
22	FIELD BEANS	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
23	CHICKPEAS	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
24	OTHER CEREALS AND LEGUMES	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
25	PEAS FOR GRAIN - WINTER	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
26	PEAS FOR GRAIN - SPRING	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
27	GRAIN COB	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
28	LENS	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
29	SQUEALED	CEREAL-LEGUME CROPS	Initial phase of vegetation and after harvest
30	TECHNICAL CROPS	TECHNICAL CROPS	Initial phase of vegetation and after harvest
31	INDUSTRIAL CROPS	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
32	HOPS	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
33	TOBACCO	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
34	BASMI	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
35	KABA-KULAK	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
36	VIRGINIA	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest

37	BURLEY	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
38	SUGAR BEET	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
39	OTHER INDUSTRIAL CROPS	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
40	CHICORY	INDUSTRIAL CROPS	Initial phase of vegetation and after harvest
41	OIL CROPS	OIL CROPS	Initial phase of vegetation and after harvest
42	SUNFLOWER	OIL CROPS	Initial phase of vegetation and after harvest
43	SESAME	OIL CROPS	Initial phase of vegetation and after harvest
44	RAPESEED - WINTER	OIL CROPS	Initial phase of vegetation and after harvest
45	RAPESEED - SPRING	OIL CROPS	Initial phase of vegetation and after harvest
46	SOY	OIL CROPS	Initial phase of vegetation and after harvest
47	PEANUTS	OIL CROPS	Initial phase of vegetation and after harvest
48	OILED FLAX	OIL CROPS	Initial phase of vegetation and after harvest
49	OTHER OILSEEDS	OIL CROPS	Initial phase of vegetation and after harvest
50	PUMPKINS FOR SEEDS	OIL CROPS	Initial phase of vegetation and after harvest
51	FIBER CROPS	FIBER CROPS	Initial phase of vegetation and after harvest
52	COTTON	FIBER CROPS	Initial phase of vegetation and after harvest
53	FLAX FIBER	FIBER CROPS	Initial phase of vegetation and after harvest
54	HEMP	FIBER CROPS	Initial phase of vegetation and after harvest
55	OTHER FIBER CROPS	FIBER CROPS	Initial phase of vegetation and after harvest
56	MEDICINAL AND AROMATIC CROPS	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
57	ANISE	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
58	SLICE	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
59	CORIANDER	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
60	CUMIN	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
61	VALERIAN	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
62	BASIL	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
63	WHITE THORN	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
64	CHAMOMILE	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
65	MARJORAM	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
66	TATTOO	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
67	BLACK CUMIN	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
68	OTHER MEDICINAL AND AROMATIC CROPS	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
69	FORAGE CROPS	FORAGE CROPS	Initial phase of vegetation and after harvest
70	ANNUAL FORAGE CROPS	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
71	CORN FOR SILAGE	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
72	FODDER BEET	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
73	ANNUAL CEREALS	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
74	ANNUAL CEREALS AND LEGUMES	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
75	VETCH	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
76	BITTER VETCH	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
77	TURNIP	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest

78	MUSTARD	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
79	MIXED ANNUALS	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
80	ANNUAL FORAGE VEGETABLES	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
81	OTHER FODDER VEGETABLES	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
82	OTHER FORAGE CROPS	ANNUAL FORAGE CROPS	Initial phase of vegetation and after harvest
83	PERENNIAL FORAGE CROPS	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
84	ARTIFICIAL WHEAT MEADOWS	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
85	ARTIFICIAL BEAN MEADOWS	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
86	ALFALFA	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
87	CLOVER	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
88	STARRY	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
89	ASPARAGUS	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
90	LUPINE	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
91	ARTIFICIAL MEADOWS-MIXED PLANTATIONS	PERENNIAL FORAGE CROPS	Initial phase of vegetation and after harvest
92	FRESH VEGETABLES	FRESH VEGETABLES	Initial phase of vegetation and after harvest
93	FRUIT AND VEGETABLE CROPS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
94	TOMATOES OUTDOORS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
95	PEPPER OUTDOORS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
96	EGGPLANT	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
97	CUCUMBERS OUTDOORS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
98	GHERKINS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
99	GHERKINS OUTDOORS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
100	ZUCCHINI	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
101	PUMPKINS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
102	WATERMELONS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
103	MELONS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
104	GREEN BEANS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
105	GREEN PEAS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
106	GREEN BEAN	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
107	OKRA	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
108	SWEET CORN	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
109	OTHER FRUIT-YIELDING VEGETABLE CROPS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
110	LEAFY VEGETABLE CROPS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
111	CABBAGE	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
112	CAULIFLOWER	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
113	BROCCOLI	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
114	SALAD	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
115	LETTUCE	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest

116	SPINACH	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
117	OTHER LEAFY CROPS	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
118	FENNEL	FRUIT AND VEGETABLE CROPS	Initial phase of vegetation and after harvest
119	ROOT VEGETABLE CROPS	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
120	CARROTS	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
121	PARSLEY	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
122	CELERY	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
123	BEETROOT SALAD	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
124	RADISHES	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
125	TURNIP	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
126	OTHER ROOT CROPS	ROOT VEGETABLE CROPS	Initial phase of vegetation and after harvest
127	BULBOUS VEGETABLE CROPS	BULBOUS VEGETABLE CROPS	Initial phase of vegetation and after harvest
128	ONION	BULBOUS VEGETABLE CROPS	Initial phase of vegetation and after harvest
129	GARLIC	BULBOUS VEGETABLE CROPS	Initial phase of vegetation and after harvest
130	LEEK	BULBOUS VEGETABLE CROPS	Initial phase of vegetation and after harvest
131	SEED ONION /ARPAJIK/	BULBOUS VEGETABLE CROPS	Initial phase of vegetation and after harvest
132	OTHER BULBOUS VEGETABLE CROPS	BULBOUS VEGETABLE CROPS	Initial phase of vegetation and after harvest
133	OTHER VEGETABLE CROPS	BULBOUS VEGETABLE CROPS	Initial phase of vegetation and after harvest
134	PERENNIAL VEGETABLE CROPS	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
135	ARTICHOKE	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
136	ASPARAGUS	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
137	OTHER PERENNIAL VEGETABLE CROPS	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
138	POTATOES	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
139	FLOWERS AND DECORATIVE PLANTS	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
140	FLOWERS GROWN FOR CUT BLOSSOM	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
141	FLOWERS GROWN FOR BULBS	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
142	POT CULTURES	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
143	ORNAMENTAL SHRUBS	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
144	OTHER ORNAMENTAL PLANTS	PERENNIAL VEGETABLE CROPS	Initial phase of vegetation and after harvest
145	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
146	INDUSTRIAL CROPS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
147	SUGAR BEET	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
148	FODDER BEET	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
149	HOPS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest

150	TOBACCO	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
151	OTHER INDUSTRIAL CROPS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
152	FIBER CROPS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
153	MEDICINAL AND AROMATIC CROPS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
154	VEGETABLES	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
155	STRAWBERRY	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
156	FLOWERS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
157	ARTIFICIAL MEADOWS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
158	GREENHOUSE AREAS	AREAS FOR THE PRODUCTION OF SEED AND PLANTING STOCK	Initial phase of vegetation and after harvest
159	FRUIT-YIELDING VEGETABLE CROPS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
160	TOMATOES - HEATED GREENHOUSES	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
161	TOMATOES - UNHEATED GREENHOUSES	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
162	PEPPER - HEATED GREENHOUSES	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
163	PEPPER - UNHEATED GREENHOUSES	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
164	CUCUMBERS - HEATED GREENHOUSES	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
165	CUCUMBERS - UNHEATED GREENHOUSES	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
166	LEAFY VEGETABLE CROPS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
167	ROOT VEGETABLE CROPS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
168	BULB VEGETABLE CROPS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
169	OTHER VEGETABLE CROPS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
170	FLOWERS AND ORNAMENTAL PLANTS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
171	FLOWERS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
172	AREA WITH FALLOW LAND	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
173	VINEYARDS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
174	WINE VINEYARDS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
175	DESSERT VINEYARDS	FRUIT-YIELDING VEGETABLE CROPS	Initial phase of vegetation and after harvest
176	FRUIT TYPES	FRUIT TYPES	Initial phase of vegetation and after harvest
177	SEED FRUIT SPECIES	SEED FRUIT SPECIES	Initial phase of vegetation and after harvest
178	APPLES	SEED FRUIT SPECIES	Initial phase of vegetation and after harvest
179	PEARS	SEED FRUIT SPECIES	Initial phase of vegetation and after harvest
180	QUINCES	SEED FRUIT SPECIES	Initial phase of vegetation and after harvest
181	MEDLARS	SEED FRUIT SPECIES	Initial phase of vegetation and after harvest

182	OTHER SEED FRUIT SPECIES	SEED FRUIT SPECIES	Initial phase of vegetation and after harvest
183	STONE FRUIT SPECIES	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
184	PLUMS	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
185	PEACHES	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
186	NECTARINES	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
187	APRICOTS/GREENS	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
188	CHERRIES	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
189	SPUR CHERRIES	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
190	DOGWOOD	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
191	OTHER STONE FRUIT SPECIES	STONE FRUIT SPECIES	Initial phase of vegetation and after harvest
192	NUT (SHELL) SPECIES	NUT (SHELL) SPECIES	Initial phase of vegetation and after harvest
193	WALNUTS	NUT (SHELL) SPECIES	Initial phase of vegetation and after harvest
194	ALMONDS	NUT (SHELL) SPECIES	Initial phase of vegetation and after harvest
195	HAZELNUTS	NUT (SHELL) SPECIES	Initial phase of vegetation and after harvest
196	CHESTNUTS	NUT (SHELL) SPECIES	Initial phase of vegetation and after harvest
197	PISTACHIOS	NUT (SHELL) SPECIES	Initial phase of vegetation and after harvest
198	OTHER NUT (SHELL) SPECIES	NUT (SHELL) SPECIES	Initial phase of vegetation and after harvest
199	BERRY VARIETIES	BERRY VARIETIES	Initial phase of vegetation and after harvest
200	STRAWBERRIES	BERRY VARIETIES	Initial phase of vegetation and after harvest
201	RASPBERRIES	BERRY VARIETIES	Initial phase of vegetation and after harvest
202	BLACKBERRIES	BERRY VARIETIES	Initial phase of vegetation and after harvest
203	CURRANT	BERRY VARIETIES	Initial phase of vegetation and after harvest
204	ARONIA	BERRY VARIETIES	Initial phase of vegetation and after harvest
205	BLACK CURRANT	BERRY VARIETIES	Initial phase of vegetation and after harvest
206	ACTINIDIA (KIWI)	BERRY VARIETIES	Initial phase of vegetation and after harvest
207	GOOSEBERRY	BERRY VARIETIES	Initial phase of vegetation and after harvest
208	BLUEBERRIES	BERRY VARIETIES	Initial phase of vegetation and after harvest
209	FIGS	BERRY VARIETIES	Initial phase of vegetation and after harvest
210	OTHER BERRY CROPS	BERRY VARIETIES	Initial phase of vegetation and after harvest
211	OTHER FRUIT TYPES	BERRY VARIETIES	Initial phase of vegetation and after harvest
212	PERENNIAL MEDICINAL AND AROMATIC CROPS	PERENNIAL MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
213	MEDICINAL AND AROMATIC CROPS	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
214	ESSENTIAL OIL-YIELDING ROSE	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
215	LAVENDER	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
216	MINT	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
217	BELLADONNA	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
218	MARSH SNOWDROP	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
219	DAYDREAMING	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
220	WHITE OREGANO	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
221	ECHINACEA	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
222	YELLOW POPPY	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest

223	WINTER-GREEN	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
224	VINCA MINOR	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
225	LEUZEA	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
226	LEMON BALM	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
227	THYME	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
228	MEDICINAL ALTHAEA	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
229	MONARDA	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
230	NEPETA MUSSINI	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
231	WORMWOOD	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
232	PYRETHRUM	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
233	ROSEMARY	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
234	SAGE	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
235	BLITUM BONUS HENRICUS	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
236	ROSE HIP	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
237	OTHER PERENNIAL AROMATIC CROPS	MEDICINAL AND AROMATIC CROPS	Initial phase of vegetation and after harvest
238	NURSERIES	NURSERIES	Initial phase of vegetation and after harvest
239	VINE PLANTING MATERIAL	NURSERIES	Initial phase of vegetation and after harvest
240	FRUIT PLANTING MATERIAL	NURSERIES	Initial phase of vegetation and after harvest
241	NURSERIES FOR ORNAMENTAL PLANTS	NURSERIES	Initial phase of vegetation and after harvest
242	NURSERIES FOR FOREST SAPLINGS	NURSERIES	Initial phase of vegetation and after harvest
243	OTHER PERMANENT PLANTATIONS	OTHER PERMANENT PLANTATIONS	Initial phase of vegetation and after harvest
244	TREE CROPS WITH A SHORT ROTATION CYCLE	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
245	POPLARS	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
246	BLACK POPLAR	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
247	WHITE POPLAR	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
248	ASPEN	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
249	WILLOWS	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
250	WHITE WILLOW	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
251	TRITIUM WILLOW	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
252	BRITTLE WILLOW	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
253	OISIER WILLOW	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
254	SALIX WILLOW	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
255	BLACK ALDER	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
256	SILVER-LEAVED LINDEN	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
257	POLISH ELM	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
258	HAZELNUT	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest

259	EASTERN PLANE TREE	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
260	WHITE MULBERRY	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
261	BLACK MULBERRY	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
262	OTHER PERMANENT PLANTATIONS	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
	PERENNIAL GRASS SPECIES	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
263	PERMANENT OR TEMPORARY PASTURES FOR GRAZING ANIMALS (PASTURES AND PASTURES)	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
264	MEADOWS FOR MOWING	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
265	PERMANENTLY GRASSED AREAS MAINTAINED IN A CONDITION SUITABLE FOR GRAZING OR MOWING	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
266	FAMILY GARDENS	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest
267	CULTIVATED MUSHROOMS	TREE CROPS WITH A SHORT ROTATION CYCLE	Initial phase of vegetation and after harvest