# Contents

## 1. SPECIFIC SITE ELEMENTS

### 1.1 SITE FRAMING

| | |
|---|---|
| **1. Project Code** | 24-006 |
| **2. Location of the Intervention:** | Nation: ITALY<br>Region: PUGLIA<br>City and Province: SANNICANDRO DI BARI - BARI<br>Street address and number: CONTRADA PESCO ROSSO<br>Cadastral data – SANNICANDRO DI BARI – F 21 – P 41-387-52-49<br>Geo-located location: 40°59'18"N 16°48'42"E |
| **3. Useful surface area of the project (Ha,00):** | 1,00 |
| **4. Possible expansion area of the project (Ha,00):** | 0,00 |

### 1.2 PROPERTY AND RIGHTS

| | |
|---|---|
| **5. Responsible for site management (Conductor)** | Last name and first name: RUSCIGNO ERASMINO |

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| **6. Does the Conductor also own the land?** | ☒ YES - ☐ NO |

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|---|---|
| **7. Land ownership title** | See **Annex 01** "Cultivation Contract" |

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| **8. In case the Conductor is NOT also the owner of the land, indicate the title for the use of the land subject to the intervention.** | **See Annex 04** All.Q 8.1-1 "Communication and involvement of interested parties" |

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| **9. Will the Project Developer also be the Owner of the future Carbon Credit title that will be created?** | ☒ YES - ☐ NO |

| | |
|---|---|
| **10. If NO to the previous question, indicate who will be the Owner of the Carbon Credits that will be created.** | Company Name:<br>CF/VAT:<br>Registered office:<br>Phone:<br>Email: |

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|---|---|
| **11. Document evidencing the right to the carbon offset certificate created by the Project** | Contract of cultivation and delivery of products from plantations made with selected giant bamboo mother plants "ONLYMOSO" between BambooPro Srl and "AZIENDA AGRICOLA RUSCIGNO ERASMINO" Undersigned on 06/02/2024 **(Annex 01)** |

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|---|---|
| **12. Conductor's Rules** | The Conductor signs the Cultivation Contract which contains references to the DAF (**see Annex 01).** |

| | |
|---|---|
| **13. Developer's Rules** | Bamboopro subscribes to the following rules as a reference for the development and management of the project and communications with the Registry:<br>• UNI/PdR 156:2024 (**Annex 03a**);<br>• Formalized Agronomic Specification (DAF) (**Annex 03b**);<br>• All.Q 8.1-1 FC Project management (**Annex 03c**);<br>• Pro.Q 8.1 Project Approval Management (**Annex 03d**);<br>• Ist.Q 8.1-1 Project application filling rules (**Annex 03e**);<br>• All.Q 8.1-4 Monitoring Plan-Report (**Annex 12bis).** |

## 1.3 STAKEHOLDER INVOLVEMENT AND CONSULTATION

**14. Identification of stakeholders**

The Site is 1 hectare in size, is located in an agricultural context, and the intervention, a tree crop, is neither new nor different from the usual and customary use of the site and surrounding areas. The site is not located in areas with special alleys or protections (see Sec. 2.2 point 23 below), but lies on an area of agricultural use.
The area of influence of the Project Intervention is therefore considered by evaluating the following aspects:

- visual impact: indifferent compared to the destination of the site (agricultural);
- legal distances from boundaries: cultivation is maintained at a distance of 3 meters from the boundary with third-party land, legal distance provided for tall trees;
- dust and noise emission from processing: the cultivation of bamboo involves minimal agricultural activities of only plant/weed management, much less than annual crops (in which the land is tilled several times each year), therefore there will be a reduction in dust and noise emissions.

Use of resources:

- irrigation water use: not different from or less than other tree or arable crops (e.g. orchard, corn, soybean);
- fertilizer use: equal to or less than other tree or arable crops;
- pesticide use: no phytosanitary treatments are carried out as bamboo does not suffer from fungal diseases or pest attacks.

The perimeter of the crop itself is therefore considered as the area of influence of the intervention.

That said, it is considered that the Parties involved in the project activities consist of the Conductor alone.

There are no obstacles in involving the stakeholders identified as being part of the local community, of working age, and without relevant language or cultural barriers.

## 15. Communication, consultation and involvement activities

People involved are:
Mr. Ruscigno – Conductor of the crop.

At the time of the start of the Project, on 06/02/2024 a meeting was held between the Conductor and Mr. Lomartire Luigi (technician consultant see point 1.4) to provide explanations and details of the bamboo plantation intervention and to sign the Cultivation and Delivery Contract.
The document Attachment All.Q 8.1-1 "Communication and involvement of interested parties" (**Annex 04**) was recently sent by email which covers the following topics:

- Activities of the intervention including technical/agronomic aspects;
- expected environmental benefits;
- expected risks/disadvantages;
- Compliance with the "No net harm" principle
- Regulatory compliance of the Intervention and the Project;
- environmental compatibility;
- Use of non-renewable resources (e.g., fossil fuels);
- Use of natural resources (e.g., water);
- use of chemicals substances (e.g., treatments);
- on-site validation/verification processes.

The Conductor replied that he understood the document and had no suggestions or proposals.

Opinions, suggestions, observations provided:
Mr. Ruscigno considers theyselves interested in the environmental issues and the possibility of finally adequate economic revenue for a crop. Other than that, he did not make any observations or doubts about the arguments discussed (**Annex 04**).

## 16. Actions taken following the consultation

No action had to be taken as there were no suggestions.

## 17. Complaint management

The methods of communication and reporting to the Project have been defined and communicated to the Parties concerned through the delivery of the document All.Q 8.1-2 "Conductor's Rules," also in relation to the handling of Complaints.

## 18. Public consultation

This section will be updated after the 30-day public consultation phase.

## 2. INTERVENTION

### 2.1 SITUATION PRIOR TO INTERVENTION

**19. Baseline scenario**

The Intervention site is an agricultural field currently used to grow annual crops for food, human or livestock production, or biomass.
The context in which it is set is the same, therefore an areable/arboreal area of agricultural economy.
The current land management implemented by farmers in the area is a traditional methodology, therefore with plowing activities and subsequent refinement steps and mechanical and chemical weeding, as well as phytosanitary treatments.
Continuous tillage, which both conventional and organic agriculture has in common, is the recognized cause of organic matter depletion in soils and subsequent sterilization, reduced biodiversity, erosion, water and groundwater pollution, flooding and hydrogeological disruption, and greenhouse gas emissions.
Soil compaction: Tillage determines the fragmentation of the macro-aggregate structure of soil compounds, the overturning of the stratigraphy by bringing deep layers to the surface, and the disruption of the porous structure, all elements that lead to soil compaction, which makes it more difficult for water and plant roots to penetrate the soil, impairing its ability to absorb water and nutrients.
Erosion and runoff: Soil compaction increases the risk of soil erosion and runoff. When the soil is compacted, it becomes more difficult for water to penetrate the soil and the ability to retain moisture is lost. As a result, during heavy rains, water may run off the soil surface instead of infiltrating, carrying away fertile soil and organic matter. This phenomenon causes soil erosion and nutrient leaching, further compromising soil fertility.
Loss of biodiversity: with tillage, natural habitats in the soil are disturbed and destroyed. This includes soil microorganisms, small invertebrates (among them earthworms) and other organisms living in the surface layers of the soil.
Hydrogeological disruption and flooding: tillage causes the loss of soil structure, with consequent compaction, and the removal of vegetation cover compromises the stability and ability of the soil to absorb and retain rainwater resulting in the creation of torrential forms of runoff which cause erosion of the land and bring enormous quantities of water into the river courses causing sudden and devastating floods.
Water pollution: with tillage and subsequent compaction, the water-soluble component (e.g., chemicals and fertilizers) and lighter particles are eroded, washed out and leached, contaminating surface and deep water resources causing water quality problems.
Greenhouse gas emissions: with soil tillage, organic matter is brought to the surface and in contact with atmospheric oxygen. This process accelerates the oxidation of organic matter and leads to an alteration of the soil's natural carbon and nitrogen cycle, resulting in the release of greenhouse gases such as carbon dioxide ($CO_2$) and nitrous oxide (N2O). In addition, tillage requires the use of mechanical combustion vehicles which cause the emission of $CO_2$ .
Reduction of the organic component (humus): in tillage, organic matter in the soil is exposed to atmospheric oxygen. This increase in oxygen accelerates the decomposition process of organic matter, thus reducing the amount of organic material available for humus formation and subsequent mineralization and sterilization of the soil.
Increased use of chemical fertilizers: tillage depletes natural soil resources, such as soil fertility, making it necessary to apply synthetic chemical

fertilizers to maintain agricultural productivity.

There is nothing to suggest that in the medium term there may be a change in approach to agriculture with epoch-making changes, such as the transition to conservative agriculture, without tillage, which requires large investments in different equipment and dubious agronomic and short-term economic issues, resulting in the creation of a strong psychological-cultural barrier.

Agricultural greenhouse gas (GHG) emissions ($CO_2$, CH4 and N2O) contribute about 12 % of the total anthropogenic GHG (Linquist et al. 2011), second only to the energy sector (ISPRA, 2018).

The contribution of the cereal sector represents about one-third of total emissions from the agricultural sector (ISPRA, 2018) mainly related to fertilizer use and soil tillage (Oertel et al., 2016).

From the above, the importance of the environmental impact on $CO_2$ emissions from the agricultural sector is clear, both in terms of intensity and breadth of the phenomenon.

The carbon baseline for conventional arable crops, is certainly negative, due to the intensity of tillage and extensive use of nitrogen fertilizers, which the literature indicates for a cereal crop between 0,43 and 0,93 ton/$CO_2$/hectare, and for a corn crop between 0,87 and 1,95 ton/$CO_2$/hectare (Linquist et al., 2012).

That said, the value calculated as follows is considered as the baseline:
(0,43+0,93)/2 = 0,68 ton/$CO_2$/ha (average $CO_2$ emissions among the least impactful arable crops);
(0,87+1,95)/2 = 1,41 ton/$CO_2$/hectare (average $CO_2$ emissions among the most impactful arable crops);
averaging the two figures
(0,68+1,41)/2 = 1,1 ton/$CO_2$/hectare/year - baseline value of $CO_2$ emission of existing crops in the project reference area

**20. General description of the context of the intervention site**

# Puglia Region

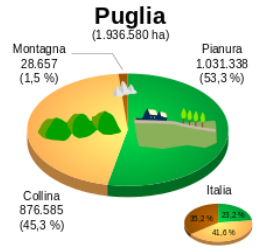
Puglia is an Italian region with ordinary statute in southern Italy, with 3.883.839 inhabitants, with Bari as its capital. It borders Molise to the north-west and Campania and Basilicata to the west, while it is bathed to the east and north by the Adriatic Sea and to the south by the Ionian Sea. It includes the metropolitan city of Bari (capital) and the provinces of Foggia, Barletta-Andria-Trani, Taranto, Brindisi and Lecce.

**General information**

Its territory is 53% flat, 45% hilly and only 2% mountainous, which makes it the least mountainous region in Italy. The highest peaks are found in the Daunia mountains, in the north-western area, on the border with Campania , and on the Gargano promontory, in the north-east.

The Puglua hilly territory is divided between the Murge and the Salento greenhouses.

The Murge constitute a very large subregion of Puglia, corresponding to a rectangular-shaped karst plateau largely included in the metropolitan city of Bari and in the province of Barletta-Andria-Trani.




**CLIMATE**

In Puglia the climate is typically Mediterranean : the coastal and flat areas have hot, windy and dry summers and mild winters, snowfalls are not uncommon in the plains. Precipitation, concentrated during late autumn and winter, is scarce and mostly rainy in the plains, while on the Murge plateau and especially on the Daunia mountains, snowfalls are frequent in the event of cold currents from the east. In late autumn and winter, morning and night fogs are frequent in the Capitanata and Murge areas. The temperature variations between summer and winter are very notable in the internal plains: in the Tavoliere you can go from over 40 °C in summer to -3 °C/-4 °C on winter mornings.


**ECONOMY**

The Puglia economy is worth 76 billion euros in GDP. Secondary activities employ less than 19% of regional value added, in Puglia the macro-sector of services accounts for 77 percent of regional value added. In particular,

businesses active in the trade and accommodation and food services supply sectors represent in the Puglia economy 39.5 percent of the entrepreneurial fabric. A fundamental part of the potential that characterizes the productive fabric are certain excellences that make Puglia known far beyond national borders. In particular: The aerospace industry, agricultural products of excellence, clean energy for the land, coastal and quality tourism, the cultural and creative industry.

**ENVIRONMENT**

From a geological point of view, Puglia is made up of almost 80% limestone and dolomite rocks in all their varieties.

The karst nature of much of the Puglia territory and the scarcity of rainfall make the region particularly poor in surface watercourses. the Puglia rivers are mostly characterized by short and torrential courses The natural lakes in the region are mainly coastal. Lakes, separated from the Adriatic Sea by narrow sandy bars.

## Metropolitan city of Bari

The **metropolitan city of Bari** is a territorial body with a vast area of 1.221.291 inhabitants, in Puglia, which, since 1 January 2015, replaces the suppressed province of Bari.

**TERRITORY**

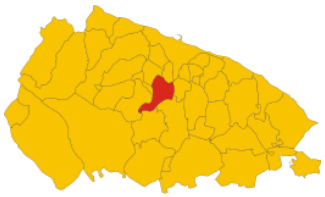
Facing the Adriatic Sea to the north-east, it bordered to the south with the provinces of Brindisi and that of Taranto, to the west with Basilicata, to the north with the province of Barletta-Andria-Trani.

The metropolitan city of Bari is located in the central part of Puglia, in the area that was previously called Terra di Bari. The territory is dominated by the Murge, a system of reliefs that even exceed 600 meters above sea level.

**Muncipality of Sannicandro di Bari**

Sannicandro di Bari is an Italian municipality of 9.566 inhabitants in the metropolitan city of Bari in Puglia.

Altitude is 183 m above sea level.



**21. Specific description of the site area in terms of ecosystem and environment before the intervention**

The site subject to intervention is agricultural land, previously used for arable agricultural purposes.
The bordering areas are always agricultural land used for arable or arboreal crops.
The site is inserted in an agricultural territorial context (large area examined of 1 km) intended for arable, arboreal and livestock breeding use.
The land is all exploited for agricultural purposes.

**22. Description of the socio-economic conditions of the stakeholders (who will benefit from the intervention) prior to the intervention**

Mr. Ruscigno has been a farmer for generations, and as such he knows the difficulties of agriculture, the uncertainties that dominate it, and the meager returns from it. Agriculture is a sector that lives/survives only thanks to European Community contributions, and despite this, margins are still low and subject to all the uncertainties of weather/climate conditions, which have become increasingly extreme in recent years. Energy increases have led to significant increases in production costs, both in reference to traction diesel fuel, increases in fertilizer and phytosanitary treatments, and general increases in machinery and equipment, squeezing profit margins even more.

The following is the Abstract of the Study for the AGRI Committee - "The challenge of land abandonment after 2020 and possible mitigation measures" - Promoted by the European Parliament:
"• About 30 % of agricultural areas in the EU (approximately 56 million hectares) are subject to at least a moderate risk of land abandonment. The phenomenon of farmland abandonment in the EU-27 could extend to 5 million hectares by 2030, or 2,9 % of the Utilized Agricultural Area (173 million hectares).
• Land abandonment is a local phenomenon determined by a complex of causes including biophysical, agricultural, structural, market, regional, institutional and political factors. Management problems and structural adjustment are the main factors affecting this process.
• Current land abandonment trends will be exacerbated by external factors (climate change, globalization, health crises). Key policy tools that can minimize the impact of land abandonment factors include improving conditions

for farmers, appropriate support for areas under natural constraints, silvicultural and environmental measures as well as support for rural communities."

That said, it is more evident than ever that agriculture needs support even beyond the current forms of public aid.

**23. Maps for spatial framing of the site, highlighting possible sensitive situations (e.g., Protected Areas, etc.)**

See **Annex 06** (Site image on Puglia Region parks and protected areas cartography).
No relevant situation is found.

**24. Photos of the site prior to interventions**

The Conductor declared in the Communication and involvement of interested parties form (**Annex 4**) that the previous crops present and replaced by the intervention's bamboo plantation were made up of arable crops, such as cereals, protein crops and oilseeds.
See **Annex 05** (image of the Site before the intervention), which highlights its arable agricultural vocation.

## 2.2 INTERVENTION AND POST-INTERVENTION SITUATION

**25. Intervention to be carried out**

The intervention consists of establishing a giant bamboo plantation, of the Phyllostachys edulis variety, from potted nursery plants, which allows for easier and safer rooting and reduced risk of crop failure.
The stages of the intervention are outlined below:
Preparation of the land with subsoiling or plowing and subsequent thinning;
Creation of mounds in the ground;
Creation of the external containment ditch/creation of the crop perimeter and its ripping (which prevents trespassing);
Preparation of irrigation system and laying of dripline;
Cover with mulch cloth (made of biodegradable material);
Transplanting potted seedlings;
Beginning of cultivation with phases of:
Periodic irrigation and fertilization;
Minimal surface tillage to contain weeds (for the first 2-3 years of the crop's life);
Thinning (for 3 years from the 3rd to the 5th year);
Harvesting the canes or not.
End of Project Life.
Maintenance of the crop (harvesting of canes and shoots)
Decommissioning of the crop - Eradication of the plantation.

**26. Supply of plants**

The plants were supplied by a nursery specializing in bamboo plant production (OnlyMoso Nurseries), and this allowed us to have several advantages:

- high quality of the plants;
- sufficient availability and certainty of plant delivery;
- greater assurance of crop success;
- known and controlled level of development;
- uniformity of development within the crop itself.

The planting was done with 500 plants/ha.
Attached as **Annex 07** is the purchase invoice for the plants.

OnlyMoso Nurseries possess the requirements defined in UNI/PdR 156 in Paragraph 5.1, whose demonstration of which is contained in **Annex 02.**

**27. Management of the intervention**

The operational management aspects of the intervention are regulated by the requirements contained in UNI/PdR 156 “Guidelines for the establishment of giant bamboo (Phyllostachys edulis) plantations for $CO_2$ absorption” and the Formalized Agronomic Specification (DAF), which must be adhered to by those operating in the Project.
The Conductor shall subscribe to the “Conductor's Rules” All.Q 8.1-2, which summarizes all applicable requirements of the two documents above **(see Annex 08a e Annex 8b).**
See also “Project references” above.

**28. Technical-agronomic interventions**

The agronomic aspects of the intervention are regulated by the references contained in the Formalized Agronomic Specification (DAF) to which reference is made (see **Annex 3b**).
The Conductor subscribes to the “Conductor Rules” All.Q 8.1-2, which summarizes the applicable requirements of the DAF (see **Annex 08a e Annex 8b**).

The Conductor defines its own Fertilization Plan (type and amount of fertilizer used) in the “Conductor's Rules.”

Compliance with the DAF is a fundamental requirement for the Project's conformity and the validity of the $CO_2$ removal calculated ex-ante through the Calculation Methodology.

Bamboo is not a plant prone to plant diseases or pests, therefore treatments are commonly not required.

In case there is a need, its use is allowed only under the guidance of a licensed technician who must draw up a treatment plan in which the following are prescribed: active ingredient, dosage and frequency of application.
The Technician must follow the crop until the problem is resolved in order to monitor the effectiveness of the treatment and the state of the crop, limiting treatments to the minimum necessary. A record of these interventions is left in the specific logbook.

The Conductor is equipped with appropriate qualification for phytosanitary

treatments (license) and suitable equipment, calibrated and gauged according to legal frequency, and Personal Protective Equipment suitable for the treatments used.

**29. Situation of the site after the intervention**

The intervention consists of planting land, previously used as arable land, with giant bamboo Phyllostachys edulis plants.
The site will therefore become a bamboo forest over time.

## 2.3 EXPECTED BENEFITS

**30. $CO_2$ reduction**

The first advantage consists in the reduction of emissions into the atmosphere determined by the replacement of the crops grown before the introduction of the Intervention. Referring to what has already been indicated previously, replacing an arable crop with a crop with a negative net balance allows a reduction in $CO_2$ emissions equal to an estimated 0,7 ton/$CO_2$/ha.
Bamboo cultivation, on the other hand, allows for permanent and very efficient net sequestration of $CO_2$.
Employing the calculation methodology of UNI/PdR 156, the amount of $CO_2$ captured by the Intervention was calculated ex-ante (**Annex 3a**). As the Intervention has already started, planting was carried out in 2021, the ex-post calculation of captured $CO_2$ was also carried out through a Monitoring campaign carried out on 16/04/2024 and whose results are in **Annex 12bis**.

**31. Socio-economic benefits**

As mentioned in the previous point "Description of the socio-economic conditions of the stakeholders prior to the intervention" the agricultural economy based on arable crops is a subsistence activity, with very small profit margins and subject to numerous and increasingly frequent weather-climate and crop health contingencies.

The cultivation of bamboo for the purpose of CO2 capture allows the Conductor to obtain an immediate and secure economic return **(see Annex 3a)** Cultivation and Consignment Contract), which compared with the revenues obtained from traditional arable crops, with values highly variable from year to year and uncertain due to possible crop losses, ranging from €200 to €350 per hectare up to a maximum of €700 for irrigated crops, constitutes an important income supplement.

Another advantage is the lower amount of effort to be devoted to the crop in terms of machine use and fuel consumption, thanks to the reduction of mechanical tillage to zero when the plantation is fully developed. Given the significant increase in the cost of diesel fuel and machinery, reducing their use becomes a significant economic advantage considering precisely that the cost of tilling one hectare of arable land is now between € 1,000 and € 1,500 per hectare.

It is believed that the local community is indifferent to the project and is not benefited by it (as not even disadvantaged - see specific next point)

| **32. Benefits to the environment and ecosystem** |
|---|
| There is a vast literature testifying to the environmental benefits of bamboo in protecting and restoring the environment through many aspects, from $CO_2$ absorption, water saving, soil regeneration, high efficiency organic matter production, etc.<br>Bamboo has a very high growth rate (up to one meter per day) and therefore has a high ability to transform natural inorganic elements into organic matter, thus water, nutrients, and $CO_2$, into woody biomass, consisting of culms (canes) and rhizomes (roots), as well as the ability to accumulate $CO_2$ in the surrounding soil. It is a stoloniferous plant that has the ability to generate culms and reproduce from the same initial strain for 80-100 years.<br><br>For a detailed discussion of the environmental benefits of bamboo, the Technical Paper "Ecosystem Services From Bamboo Forests" 2022 INBAR (International Bamboo and Rattan Organization) is attached.<br><br>The main environmental benefits involved are listed below.<br>Capture $CO_2$ more efficiently and extensively than other plant forms;<br>Soil water preservation and purification;<br>Regeneration of organic matter in soil and re-fertilization;<br>Prevention of nutrient leaching from soil;<br>Consolidation of soils, with prevention of erosion and landslides;<br>Production of woody materials for multiple uses;<br>Food production;<br>Bio-habitat creation and biodiversity (above and below ground). |

## 2.4 EXPECTED DISADVANTAGES

| **33. Direct and indirect consequent to the implementation of the interventions** |
|---|
| Disadvantages associated with the implementation of the project, compared to the baseline situation.<br><br>The only consideration regarding any disadvantages of the Intervention concerns the aspect of the potential and presumed invasiveness of bamboo.<br><br>In this regard, it should be noted that the species Phyllostachys edulis is a variety with very large rhizomes and this results in its slow propagation, preventing the rhizome from projecting out of the ground (e.g., to pass ditches), once exposed to the sun it dries up, and does not produce seeds until the end of its vegetative life, which can last as long as 60 and up to 100 years.<br><br>That being said, it is noted that in the DAF there is a procedure for creating and maintaining a ditch perimeter to the crop to prevent rhizome propagation or alternatively a constant ripping of the perimeter to break up and flush the rhizomes out of the soil resulting in desiccation. The application of these management practices allows the containment of the crop within the project boundary and is subject to periodic verification by monitoring.<br><br>With regard to seed production, the project has a maximum duration of 30 years, which is less than the assumed flowering age of 60-100 years, and in any case the planting is constantly monitored about the development of early flowering |

by the Conductor and verifications by the Developer and VVB during periodic Monitoring activities. If flowering plants are detected these are promptly cut and the seeds present collected, from the plant and possibly also from the ground, and disposed of as waste.

There is also a clause in the "Conductor's Rules" whereby in the event of abandonment of the plantation, the Conductor undertakes to uproot the crop and the Developer to report the presence of the bamboo grove to the competent authorities about the danger of potential invasiveness of the crop.

**34. Release of $CO_2$**

For the planting of the crop, with the related soil preparation and subsequent crop management, $CO_2$ emissions are created which are quantified and considered in the general carbon offset calculation.
Compared to the baseline carbon losses, bamboo cultivation still determines a net reduction in carbon loss from the soil.
See next item "Project carbon budget statement" for details.

**35. Consumption of non-renewable resources**

WATER
Although water is a renewable resource, given the scarcity of water in recent years, it is regarded as a precious resource.
The bamboo grove needs irrigation in the first years of planting, which is necessary for rooting and good establishment for proper and rapid development of the crop in accordance with the $CO_2$ calculation methodology. Consumption is estimated to be between 1.000 and 2.000 $m^3$/y, for the first 3-4 years.
The use of water in this phase is however compensated by the reduction in evaporation of water from the soil which occurs thanks to the shading of the leaves, the mulching and the retention carried out by the rhizomes of the plant itself. Therefore, the water distributed, among other things with a high-efficiency drip system, is released and maintained in the soil allowing the creation of the moisture that contributes to the organic processes of proliferation of microbial flora and microfauna necessary to create and maintain soil vitality.

ELECTRIC ENERGY
The only electricity consumption is related to the use of the pump for water distribution in the irrigation system.
Electricity consumption is expected to be about 1.100 kwh/year, calculated through the consumption of 8 KWh/day for 6 months for all years of the project.

FOSSIL FUELS
Mechanical combustion vehicles are used for the pre-planting soil preparation operations and for the containment activities of wild herbs (see Annex 13 for details of consumption relating to the activities carried out).

**36. Increase in road traffic/movement of people**

The intervention does not lead to a significant increase in vehicular traffic considering the fact that a reduction occurs, compared to the baseline, at least in the first 5 years as no product collection is carried out. Then, once

a year, a small tractor (about 15 hp) handles the harvest within the plantation and a transport vehicle, truck type, comes to the plantation to load.

**37. Abandonment**

The implementation of the Project does not lead to the abandonment of activities relevant to the maintenance of ecosystems, social or environmental, on the contrary, as mentioned above the creation of a bamboo plantation allows the establishment of natural ecosystems and positive phenomena for the environment.

**38. Waste production**

The following waste production is expected:
Plastic (recyclable) pots of the bamboo plants (No. 1.200) each weighing about 40 g, determine the overall production of 48 kg of recyclable plastic.

The Conductor has opted to use both granular and liquid fertilizer therefore:
Each plastic bag of granular fertilizers weighs approximately 100 g for a use of 500 kg/year, divided by 25 kg per bag, this makes 20 bags, i.e. 2 kg of recoverable plastic per year.
Each 30 liter plastic container of liquid fertilizers weighs approximately 4 kg for a use of 150 liters/year of fertilizer, divided by 30 liters per tank makes 5 tanks/year, i.e. 20 kg of recoverable plastic/year.

The bamboo canes produced are tied together for shipping using polyethylene tape of negligible weight.

The waste produced is deposited so that it does not get lost while awaiting delivery to the collector, an entity licensed to recover plastic waste. The waste is classified with appropriate EER code according to the case and is transported with Waste Identification Form (FIR).
With reference to the baseline situation, in which every agricultural year waste is produced relating to:

- Seed packs (paper);
- Fertilizer packages (plastic);
- Pesticide treatment packages (plastic).

The Intervention's waste production over the life of the Project is expected to be lower than the baseline because, beyond the initial production due to plant pots, the Intervention's waste production is minimal.

## 2.5 OBSTACLES

**39. At the implementation of the intervention**

The main obstacle to the implementation of the Intervention was overcome at the time when the conductor agreed to participate in the Project. In fact, the novelty of the crop and the insecurity of agronomic success, the investment to be made, the lack of certainty of where the crop's products would go in the market, and the absence of sales quotations discouraged many farmers from joining the Project.
The Conductor believed in it and regarding the obstacles:
Financial: passed as the investment has already been made;

Legal/regulatory: no obstacles are seen since the Intervention is a permitted crop on a site used for agricultural production;
Technical: the crop is well successful and therefore technical aspects are also no longer an obstacle;
Agronomic: as above;
Cognitive: as above;
Cultural: as above.
No further particular obstacles to the implementation and continuation of the Project are seen.

## 2.6 RISKS AND MITIGATIONS

**40. Reversibility**

Risk of crop loss that would result in reduced $CO_2$ absorption capacity:
Floods/flooding/landslides: not significant
Fire: not significant
Theft: not significant
Crop failure: being ex-post activities, the degree of crop development is evaluated - at the current state the crop results:

- 6, sufficiently developed

That said, the assessed risk of reversibility is considered to be: Low.

For these reasons, we believe that it is not necessary to implement mitigation activities in addition to the 17% buffer.

**41. Environmental risks**

- Risk assessment in relation to any negative environmental impacts as a result of the Intervention.
- Pollution (Air, Soil, Water): the intervention does not lead to an increase, rather a decrease, in pollution for the reasons well argued above. Insignificant risk.
- Use of non-renewable resources/energy: diesel fuel is used for the operation of several endothermic engine powered machines - the Intervention is much less impactful than the baseline and in any case the calculations made (see point 48) result in a production of 140,4 tons of $CO_2$ for the duration of the entire project. Very low risk.
- Waste production: low risk-based on the above results in a plastic waste production, totaly recycled, for the entire project duration of 660 kg (see par. 38). Considering that an average European citizen produces about 188 kilograms of plastic/year, equivalent to 5640 kg in 30 years, the quantities produced by the project are really small compared to the benefits.
- Introduction of a potentially invasive species such as bamboo: medium risk. Mitigation actions implemented are shown in point 33 above.
- Biodiversity reduction: the intervention leads to the replacement of one monoculture with another monoculture, while the bamboo plantation creates a stable forest that allows the establishment of considerable hypogean and epigeal biodiversity. Zero risk.
- Ecosystems: the Intervention creates a new stable ecosystem where there was previously an intensive annual crop. Negligible risk.
- Climate change: the Intervention net of emissions, reductions and absorptions results in a net reduction in the amount of $CO_2$ in the atmosphere, as demonstrated by calculations (in point 48), leading to a

positive factor toward climate change reduction. Low risk

- The “No Net Harm” principle is widely respected for environmental aspects, as the beneficial effects far outweigh the negative ones.

**42. Socio-economic risks**

The intervention presents no socio-economic risks, but is a relevant and secure contribution to the farmer's economy (see point 31), in the context of an agricultural economy characterized by low income and many uncertainties.
No other local stakeholders are involved in the project.

The principle of “No Net Harm” is widely respected for the socio-economic aspects, as it has only beneficial aspects, of economic yield and reduction of labor to be devoted to cultivation (see point 31).

**43. Financial risks**

The intervention presents a financial risk as the initial investment of the system is of a certain importance and is totally borne by the Conductor.
The Conductor does not provide information about the source of financing (whether personal or through a credit institution). Having no data about the source of the financing, it is not possible to assess its sustainability.
Common sense suggests that given the amount, which is not low but also not disproportionate, and that the Conductor has already covered it, as it has already been seven years since the planting began, the financial risk is considered to be low.

Mitigation of the financial aspect is implemented through the provision of $CO_2$ financing as benefit sharing of the Environmental Project.

| **44. Natural risks** |
|---|
| Natural risks that would lead to a reduction in $CO_2$ absorption capacity:<br><br>Floods/inundations: The Conductor declares in the "Communication and Involvement of Interested Parties form" that as far as they can remember he has never had problems with flooding. Furthermore, from consulting the regional cartography, the site appears not to be in an area at risk of flooding. Low risk.<br><br>Landslides: From consulting the regional cartography, the site appears not to be in hydrogeological risk area (RME area). Low risk.<br><br>Fire: bamboo wood in its green state is difficult to flammable as it is very humid (contains at least 40% water) and does not have dry bark that can be attacked by flames. For this reason, even any fire in the substrate of dry leaves is unlikely to spread to the stems. Furthermore, bamboo is a highly resilient plant and after a fire it re-emits new shoots and reconstitutes itself entirely within one growing season.<br>From consulting the regional cartography, the site appears not to be in an area at risk of fire. Low risk.<br><br>Infestations/diseases: bamboo is naturally resistant to pathogens/infestants and does not suffer from particular vulnerability to fungal diseases. Non-existent risk<br>No mitigation activities are expected to be implemented. |

## 2.7 METHODOLOGY AND CALCULATIONS

| **45. Applied methodology for calculating the amount of $CO_2$ absorbed** |
|---|
| UNI/PdR 156 Chapter 6 and Appendix B, with the customizations to the Project below.<br><br>Soil lithology, i.e., presence of lithic component in the growing medium, which negatively affects the $CO_2$ capture capacity of the SOCnet (soil) component, was calculated by direct sampling at the intervention site and carried out according to the methodology in All.Q 8.1-6.<br>The percentage of lithic component was evaluated on the sample, which was found to be 0% (see **Annex 09**).<br>The quantity of $CO_2$ compensated is indicated in point 48 below. |

| **46. Method of calculating the tons of $CO_2$ reduced/removed** | ☒ Ex-ante<br>☐ Ex-post |
|---|---|

| **47. Project Duration** | Years: 30 |
|---|---|

| **48. Project carbon budget statement (All progect long)** | |
|---|---|
| **$CO_2$eq absorbed by bamboo cultivation (tons per hectare)** | **7.917,6** |
| **CO2 emissions avoided due to the replacement of the previous crop (baseline)** | **1,1** |
| **$CO_2$eq emission due to use of fossil fuels (tons per hectare)** | **-23,4** |
| **$CO_2$eq emission due to irrigation (tons per hectare)** | **-14,2** |
| **$CO_2$eq emission due to supply and use of fertilizers (tons per hectare)** | **-43,1** |
| **Bamboo plant supply** | **-2,0** |
| **Net contribution of the $CO_2$eq reduction (tons per hectare)** | **7.836,0** |

| | |
|---|---|
| **Intervention area (hectare)** | **1,0** |
| **Net contribution of the $CO_2$eq reduction of the Intervention (in tons)** | **7.836,0** |
| **-2% Prudential rounding** | **-156,7** |
| **-17% Buffer provision** | **-1.332,1** |
| **Net contribution of the $CO_2$eq reduction of the Intervention (in tons)** | **6.347,2** |

(*) a value with a + sign indicates $CO_2$ reduction a - sign indicates $CO_2$ production.

For details of the calculations see **Annex 15a-b-c-d-e-f-g.**

## 2.8 LEAKAGE

| **49. Losses due to displacement of pre-project agricultural activities** |
|---|
| For the Leakage risk analysis, the following is evaluated:<br>the Conductor does not need pre-project cultivation for his own sustenance and can easily do without it; given the small surface area occupied by the Intervention and the non-particular profitability of the replaced crop, the Conductor has no interest in relocating the replaced crop to areas of land external to the company and in any case in addition to its baseline scenario (see Communication form and stakeholder involvement **Annex 04**)<br>That said, it can be stated that there is no danger of Leakage in this intervention. |

## 2.9 ADDITIONALITY

| **50. Additionality is assessed through an analysis performed on the Baseline, which includes the following criteria and must be site-specific and conservative.** | |
|---|---|
| **Common practice** | The cultivation of bamboo is not in the tradition of local agricultural practice, encountering for this reason a certain amount of closure on the part of growers reluctant to deal with a cultivation about which not much is yet known.<br>The areas cultivated with bamboo are negligible in the |

| | |
|---|---|
| | national territory and there is not even a census.<br>The economic boost of the $CO_2$ contribution made the intervention attractive to the plantation Conductor. |
| **Legal-Regulatory Requests** | There is no legislation in national or European legislation that makes the planting of bamboo groves mandatory. The search was carried out by accessing the European Union website https://eur-lex.europa.eu and https://www.gazzettaufficiale.it using keywords such as bambù, bamboo, bambuseto. |
| **Investments and costs** | The initial investment of the Intervention is absolutely significant and especially for the agricultural sector, which is notoriously "poor" (see business plan – Annex xx) Bamboo cultivation to date is not yet profitable, due to the absence and in any case uncertainty of market outlets for the products obtained (reeds and/or shoots).<br><br>That said, the consideration about the socio-economic benefit is that the farmer would have struggled to make an initial investment, without having a certain market for the crop's products, if it were not for the $CO_2$ contribution that provides him with an income that covers the initial investment and the lost harvest for the first few years of raising the plantation in which the crop produces nothing. |
| **Local habits** | Bamboo cultivation is not in the tradition of local agriculture and therefore can be a major psychological brake on the development of the Projects. If one can say “fortunately,” the agricultural sector is “poor,” and thus the contribution of $CO_2$ is a decisive factor in the Conductor's choice to participate in the Environmental Project. |

## 2.10 DOUBLE COUNTING

| **51. Exclusion of the site being used for other $CO_2$ offset Projects.** |
|---|
| In order to prevent this aspect from arising, a prohibition has been contractually included with the Conductor on using the crop of the Intervention which is the subject of this Environmental Project also for other environmental purposes and projects that have $CO_2$ capture as their object (**Annex 01**). |

## 2.11 RELEVANT LEGISLATION

| **52. Identification of regulations and policies pertaining to carbon credits and $CO_2$ offsets.** |
|---|
| Italy does not have national legislation regulating carbon absorption activities through land use in agriculture.<br>There is a proposal for a European Regulation for the “certification of carbon absorptions,” which is currently still under development. |

| **53. Legislative compliance** |
|---|
| The relevant legislation is:<br>• D.Lgs 81/2008 Consolidated Work Safety Act;<br>• D.Lgs 152/2006 Consolidated Environment Act;<br>• D.Lgs 150 del 14/08/2012 "Implementation of Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides";<br>• DM 22 January 2014 “Adoption of the National Action Plan for the Sustainable Use of Plant Protection Products”. |

| **54. Authorities to be considered** |
|---|
| There are no mandatory national or European Authorities to be taken into consideration in relation to carbon credits and $CO_2$ offsets. |

## 2.12 MONITORING

| **55. Project monitoring activities and related indicators.** |
|---|
| Monitoring activities are implemented according to the Monitoring Plan in **Annex 12 bis** herein, which provides the indicators, frequencies, and verification methods.<br>The aspects considered in the monitoring are as follows:<br>- planting density<br>- useful planting area<br>- breeding methodology<br>- plantation confinement<br>- irrigation<br>- fertilization<br>- weed control<br>- thinnings<br>- production cuts<br>- waste management<br>- deviations<br>- baseline<br>- risks and mitigations<br>- additionality<br>- legislation<br>- invasiveness<br>- plantation abandonment |

| **56. Monitoring plan** | The Monitoring Plan has been developed and shared with the Conductor of the Intervention (**Annex 12 bis**) |
|---|---|

## 2.13 PROJECT START AND END DATE

| **57. Project start date** | Year: 2021 |
|---|---|
| **58. Project end date** | Year: 2051 |

## 3. ANNEXES

| N | Title |
|---|---|
| **Annex 1** | **Cultivation contract** |
| **Annex 2** | **OnlyMoso Nurseries Requirements** |
| **Annex 3a** | **UNI/PdR 156** |
| **Annex 3b** | **DAF** |
| **Annex 3c** | **DF Project Approval** |
| **Annex 3d** | **Project Approval Management** |
| **Annex 3e** | **Project application filling rules** |
| **Annex 4** | **Communication interested parties** |
| **Annex 5** | **Image of Site before intervention** |
| **Annex 6** | **Image of Piemonte Region** |
| **Annex 7** | **Purchase invoice of plants** |
| **Annex 8a** | **Conductor Rules** |
| **Annex 8b** | **Fertilization plan** |
| **Annex 9** | **Percentage of lithic component** |
| **Annex 12 bis** | **Monitoring Plan** |
| **Annex 15a-b-c-d-e-f-g** | **Calculator CO2** |

## 4. REVIEW AND APPROVAL

| For approval: | The Administrator | |
|---|---|---|
| Date: | | Signature |
| Rev. N. | | |
| Rev. N. | | |
| Rev. N. | | |
| Rev. N. | | |