ACAP ALBANIA

VJOSË-NARTË A/R PROJECT

Document Prepared by Carbonsink Group S.r.l.

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Prepared By	Carbonsink Group S.r.l.
Contact	Piazza Beverini 4, 19121 La Spezia, Italy +39 055 4574675 info@carbonsink.it www.carbonsink.it

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The Vjosë-Nartë A/R project is part of the broader Italian ACAP - Azione Comunitaria per le Aree Protette dell'Albania (Community Action for the Protected Areas of Albania) project. This initiative, funded by Agenzia Italiana per la Cooperazione allo Sviluppo (AICS), the Italian Agency for Development Cooperation, aims at preserving some Albanian protected areas, created after Albania entered the European network of Natura 2000[1]. Besides the Protected Landscape of Vjosë-Nartë, the other areas concerned by ACAP project are, namely, Llogara National Park, Mount Tomori National Park, Bredhi I Hotoves-Dangelli National Park and Dajt National Park. The ultimate goal of ACAP project is to (i) improve the governance quality of the protected areas, (ii) reduce by 30% the environmental degradation of these same areas, (iii) reduce CO_2 emissions and (iv) improve by 10% the visitors in the protected areas.

Before the beginning of the Vjosë-Nartë A/R project, the project areas only presented scattered vegetation, but they did not present any other forest cover. The surroundings are characterised by the typical Mediterranean scrub, presenting several Pine species, such as *Pinus pinaster* and *Pinus pinea*, and other distinctive species of this ecological area. In this context, the Vjosë-Nartë A/R project, wants to address the CO_2 emissions reduction goal, by increasing the carbon stock in the Protected Landscape of Vjosë-Nartë through A/R activities. In order to achieve the objective, 9'302 trees have been planted, in an area of 3,37 hectares of surface, characterized by native vegetation, which is nowadays sparse, due to environmental extreme events occurred in the past. As indicated by the methodology in chapter 5.3, in situations of non-homogeneous forest cover, the stratification of the stand was divided by botanical genus. After these phenomena, the natural regrowing struggled to be accomplished and hence four different indigenous species of trees were put in the ground:

Pinus halepensis:	*4'604 specimens*
Pinus pinea:	*2'420 specimens*
Populus alba:	*1'143 specimens*
Laurus nobilis:	*1'135 specimens*

[1] https://ec.europa.eu/environment/nature/natura2000/faq_en.htm

The project is expected to remove 531.3 tons of carbon dioxide equivalent in the Protected Landscape of Vjosë-Nartë, in a temporal horizon of 20 years. However, this project has been thought as a first small instance of future reforestation activities in nearby areas.

1.2 Sectoral Scope and Project Type

The project is developed under VCS sectoral scope 14 (Agriculture, Forestry and Other Land Use) and is categorized as the AFOLU project category ARR: Afforestation, Reforestation and Revegetation.

1.3 Project Eligibility

The project is eligible under the scope of the VCS Program as the project includes AFOLU activities (project category ARR) which are supported by a methodology approved under the VCS Program. The project was designed in accordance with VCS general requirements (VCS Standard, v4.2) and it complies with the specific AFOLU ARR project category requirement, as demonstrated by Figure 4:

a) Project areas were not cleared of native ecosystems to create GHG credits [...]. Such proof is not required where such clearing or conversion took place at least 10 years prior to the proposed project start date.

1.4 Project Design

The project will be developed as a grouped project, as defined under the VCS (VCS Standard 4.2, 2022). During the project implementation, an increasing number of new areas are expected. Therefore, the project is likely to include multiple project activity instances subsequent to initial validation of the project. Future areas to be implemented in the project must meet the same requirements as those of this standard, which are listed below.

Eligibility Criteria

The eligibility of the new project activity instances, as part of the grouped project, is demonstrated in accordance with requirements of the VCS Standard. All the new instances need to:

1. Meet the applicability conditions set out in the methodology (AR ACM 0003, version 02.0) applied to the project.
2. Use and apply the forestry techniques as specified in the project description.
3. Locates within the geographic area of the Protected Landscape of Vjosë-Nartë and are subject to the baseline scenario “continuation of the pre project land use”.

4. Have characteristics with respect to additionality that are consistent with the initial instances (i.e., the new instances face the same investment and technological barriers as the initial instances).

Moreover, to evaluate each eligible area added to the grouped project, the following activities will be carried out:

5. Field observations will be made to study the conditions of the areas that will be introduced in the project.

6. Each afforestation instance that will be added to the project area will be tracked through GPS coordinates and a KML file will be available in which the boundaries of each planting area will be represented.

1.5 Project Proponent

Organization name	Carbonsink Group S.r.l.
Contact person	Ernesto Gonnella
Title	Portfolio Manager
Address	Via Madonna del Piano, 6 50019 Sesto Fiorentino - Firenze (Italy)
Telephone	+39 055 4574675
Email	ernesto.gonnella@carbonsink.it

1.6 Other Entities Involved in the Project

Organization name	National Agency of Protected Areas (NAPA)
Role in the project	Project executor and beneficiary
Contact person	Zamir Dedej
Title	Napa general director
Address	Blv. "Deshmoret e Kombit" Nr.1, Tirane/ Rr.Sazani 9429, ish.Godina e DSHP Vlorë, Vlorë
Telephone	-
Email	info@akzm.gov.al;

Organization name	Vlora Regional Administration of Protected Areas (RAPA Vlore)
Role in the project	Project executor and beneficiary
Contact person	Lorela Lazaj
Title	RAPA Vlore director
Address	Address: Rr.Sazani 9429, ish.Godina e DSHP Vlorë, Vlorë
Telephone	+35569693419147
Email	Lorela.Lazaj@akzm.gov.al

Organization name	CELIM Onlus – Impact to change
Role in the project	Scientific collaborator on the field
Contact person	Manuel Castelletti
Title	Projects coordinator for Albania
Address	Rr."ISMAIL QEMALI" Nd 154, H.14, Ap.13 - 9401 VLORE
Telephone	+ 39 3401277415; +355 674063020
Email	castelletti@celim.it

1.7 Ownership

On the 4th of February 2015, with the establishment of NAPA and RAPA, namely National and Regional agencies for the Protected areas, it was defined, by the Decision of the Council of Ministers nr. 102, that these entities are in charge for the administration of what is within the borders of Albanian protected areas. Moreover, with the article nr. 7 of the Law 81/2017, it is established that protected areas within national borders are national heritage and, with article nr. 46 of the same law, that forests and waters, public or private, within protected areas, are to be managed by the authorities, which have to implement the activities directly, together with the local community or with some other authorized entity.

Hence, the evidence of the project ownership is provided in accordance with point nr. 2 of section 3.6.1 Requirements of VCS Standard v4.2, as project ownership arising under law.

1.8 Project Start Date

The project start date is 19/01/2021, which corresponds to the date when the first seedlings were planted, after the purchasing, dated 18/01/2021.

1.9 Project Crediting Period

The project crediting period is 20 years, from 19/01/2021 to 18/01/2041.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	X
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
2021	25
2022	28
2023	27
2024	27
2025	27
2026	27
2027	27
2028	27
2029	27
2030	27
2031	27
2032	27
2033	27
2034	27
2035	27

2036	27
2037	27
2038	27
2039	27
2040	27
Total estimated ERs	531
Total number of crediting years	20
Average annual ERs	27

Due to lack of data, no mortality rate was taken into account in the ex-ante estimation. However, these results will be reviewed during monitoring phase and adjusted according to future findings.

1.11 Description of the Project Activity

The Vjosë-Nartë afforestation project is part of the broader Italian Azione Comunitaria per le Aree Protette dell'Albania (ACAP) project. This initiative, funded by Agenzia Italiana per la Cooperazione allo Sviluppo (AICS), the Italian Agency for Development Cooperation, aims at preserving some protected areas, created after Albania entered the European network of Natura 2000. Besides the Protected Landscape of Vjosë-Nartë, the other areas concerned by ACAP project are, namely, Llogara National Park, Mount Tomori National Park, Bredhi I Hotoves-Dangelli National Park and Dajt National Park. The ultimate goal of ACAP project is to (i) improve the governance quality of the protected areas, (ii) reduce by 30% the environmental degradation of these same areas, (iii) reduce CO_2 emissions and (iv) improve by 10% the visitors in the protected areas.

In this context, the Vjosë-Nartë afforestation project, wants to address the CO_2 emissions reduction goal, by increasing the carbon stock in the Protected Landscape of Vjosë-Nartë through A/R activities. In order to achieve the objective, 9'302 trees have been planted, in an area characterized by native vegetation, which is nowadays sparse, due to environmental extreme events occurred in the past. As indicated by the methodology[2] in chapter 5.3, in situations of non-homogeneous forest cover, the stratification of the stand was divided by botanical genus. After these phenomena, the natural regrowing struggled to be accomplished and hence four different indigenous species of trees were put in the ground:

[2] CDM methodology AR-ACM0003. Afforestation and reforestation of lands except wetlands. Version 2.0

Pinus halepensis: 4’604 specimens

Commonly known as Aleppo Pine, it grows in the hotter parts of the Mediterranean coast where brush and forest fires are more frequent. They are commonly scattered on sunny hills or on slopes that lead down to the seashore. This is a tree that cannot survive in the shade but needs available access to the sunlight. The Aleppo Pine is a small to medium sized evergreen tree that grows on average to 15-25 m tall with a trunk diameter up to 60 cm at a medium growth rate. The leaves are needle-shaped, and between 6-12 cm in length. The tree itself has orange-red coloured bark that near the base of the tree is very thick while nearing towards the top of the tree it becomes thinner. Pine cones can be found scattered throughout the tree's branches. These pine cones are a narrow cone shape about 5-12 cm long on average[3][4][5].

Pinus pinea: 2’420 specimens

Pinus pinea is native to coastal areas of Mediterranean Europe and the Near East It is found on coastal dunes and flats, and also on the lower slopes of hills and mountains up to 600 m above sea level. Also known as Stone Pine, it is usually an emergent tree above shrubs or in low, open forests, but it can also occur with P. halepensis. It usually grows up to 20-25 m tall, either with a single trunk up to 1 m in diameter, or a trunk that forks into multiple stems not too far above the ground, assuming a peculiar umbrella shape. The bark is orange-brown to reddish-brown with grey patches and is thick and scaly, breaking into large, hard plates divided by deep irregular fissures. The leaves (needles) have minutely toothed margins and are borne in groups of two, held by a basal sheath. The seed cones are borne singly, or sometimes in groups of two or three on short stems, and persist for several years, ripening in the third year. They are 9-13 cm long and up to 13 cm wide. The egg-shaped seeds are brown, 15-20 mm long and 8-10 mm wide, with a rudimentary wing[6].

Populus alba: 1’143 specimens

The White Poplar is a medium-sized tree commonly occurring in coastal and riparian forests of central and southern Europe. Its wide range covers from the Mediterranean region to Central Asia. It is a fast-growing pioneer tree, which thrives in borders and sunny habitats in sandy alluvial soils and dunes. It reaches at maturity 30 m in height and 1 m in diameter, rarely up to 40 m, and it lives up to 300-400 years. The trunk is never straight, usually leaning to one side. The crown is normally broad and rounded with large branches inserted irregularly, often bifurcated. Above or in young trees the bark is creamy white pitted with small black diamonds; it is black and coarsely cracked at the base of older trees. The leaves are alternate,

[3] Hernandez-Tecles et al. (2015) Vegetation structure of planted versus natural Aleppo pine stands along a climatic gradient in Spain. INRA. University of Redlands Armacost Library- (8200707519): https://link.springer.com/article/10.1007%2Fs13595-015-0490-9

[4] Mill, Pinus Halepensis. Plants For A Future: http://www.pfaf.org/user/Plant.aspx?LatinName=Pinus+Halepensis

[5] Aaron White ‘21, FYS 20: Plants in Our World, Fall 2017

[6] Royal Botanic Gardens, Kew. http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:263221-1

morphologically variable, with 3-5 lobes coarsely toothed, 6-12 cm long and longer than they are wide. The colour is shiny dark green on the upper side and white with dense hair on the lower side[7].

Laurus nobilis: 1'135 specimens

Also known as Sweet Bay or Bay Laurel, L. nobilis is native to the Mediterranean basin. Capable of becoming a branched evergreen up to 18 m tall (mostly 7-12) it is usually kept low if used for providing leaves for flavouring, its most common use. Leaves alternate, elliptic to oblong-lanceolate, 4-10 m long, 1.5-6 cm wide, obtuse or acute at the apex, cuneate to rounded at the base, pinnately veined, glabrous, entire or faintly undulate, very aromatic. Flowers are unisexual, small, yellowish or yellow-green, in axillary umbel-like inflorescences supported by small involucres while Fruits are black, ovoid-ellipsoid, 1-1.8 cm long, 0.8-1 cm wide[8][9].

[7] Caudullo, G., de Rigo, D., 2016. Populus alba in Europe: distribution, habitat, usage and threats. In: San-Miguel-Ayanz, J., de Rigo, D., Caudullo, G., Houston Durrant, T., Mauri, A. (Eds.), European Atlas of Forest Tree Species. Publ. Off. EU, Luxembourg, pp. e010368+

[8] Royal Botanic Gardens, Kew. http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:465049-1

[9] Ross I.A. (2001) Laurus nobilis. In: Medicinal Plants of the World. Humana Press, Totowa, NJ. https://doi.org/10.1007/978-1-59259-237-1_13

Figure 1 From top-left corner, clockwise, *P. halepensis, P. pinea, L. nobilis* and *P. alba*, planted by project activities

The seedlings were purchased on the 18th of January 2021, one day before the project starting date. The planting phase started on the 19th of January 2021 and accomplished on the 1st of March 2021, after 15 days of work, 9'302 trees put in the ground and 24 planting plots (project areas) established. The trees were all planted with the same non-invasive technique which implies reaching the planting site by car or on foot and digging holes by hand (easily feasible, thanks to the sandy nature of the soil in the project areas). Moreover, it has been studied, approved and planned for future instances, a direct seeding technique, which implies the planting of seeds instead of putting in the ground new-born seedlings.

The project planting activities were implemented by RAPA workers, together with the on the field supervision of CELIM employees and the technical consultancy of Carbonsink experts. Images and a list of the 24 project areas (Table 1), identified with codes, date of establishment, number of planted trees, surfaces and information about areas eligibility are provided below.

Project area code	Date of planting	Species	Number of planted trees	Surface [ha]	Eligibility
A1	19/01/2021	*P. pinea + P. halepensis*	400 + 400	0.433	No
A2	19/01/2021	*P. alba*	102	0.128	Yes
A3	21/01/2021	*P. alba*	591	0.418	Yes
A4	25/01/2021	*P. alba*	200	0.092	Yes
A5	25/01/2021	*P. pinea*	200	0.112	Yes
A6	25/01/2021	*P. alba*	200	0.239	No
A7	28/01/2021	*P. halepensis*	500	0.145	Yes
A8	29/01/2021	*P. pinea*	360	0.233	No
A9	03/02/2021	*L. nobilis*	120	0.169	Yes
A10	04/02/2021	*P. alba*	50	0.038	Yes
A11	04/02/2021	*P. pinea*	40	0.017	Yes
A12	04/02/2021	*P. halepensis*	500	0.177	Yes
A13	15/02/2021	*L. nobilis*	100	0.059	Yes
A14	18/02/2021	*P. halepensis*	1040	0.334	Yes
A15	19/02/2021	*L. nobilis*	600	0.114	Yes
A16	22/02/2021	*L. nobilis*	200	0.056	Yes
A17	24/02/2021	*P. halepensis*	1000	0.137	Yes
A18	24/02/2021	*P. pinea*	500	0.073	Yes
A19	25/02/2021	*L. nobilis*	115	0.008	No
A20	25/02/2021	*P. halepensis*	340	0.031	No
A21	26/02/2021	*P. halepensis*	350	0.08	No
A22	01/03/2021	*P. halepensis*	474	0.131	Yes
A23	01/03/2021	*P. pinea*	620	0.095	No
A24	19/02/2021	*P. pinea*	300	0.046	Yes

Total Area	3.37 ha
Eligible Area	2.25 ha

Table 1 - List of the 24 project areas, identified with codes, date of establishment and number of planted trees

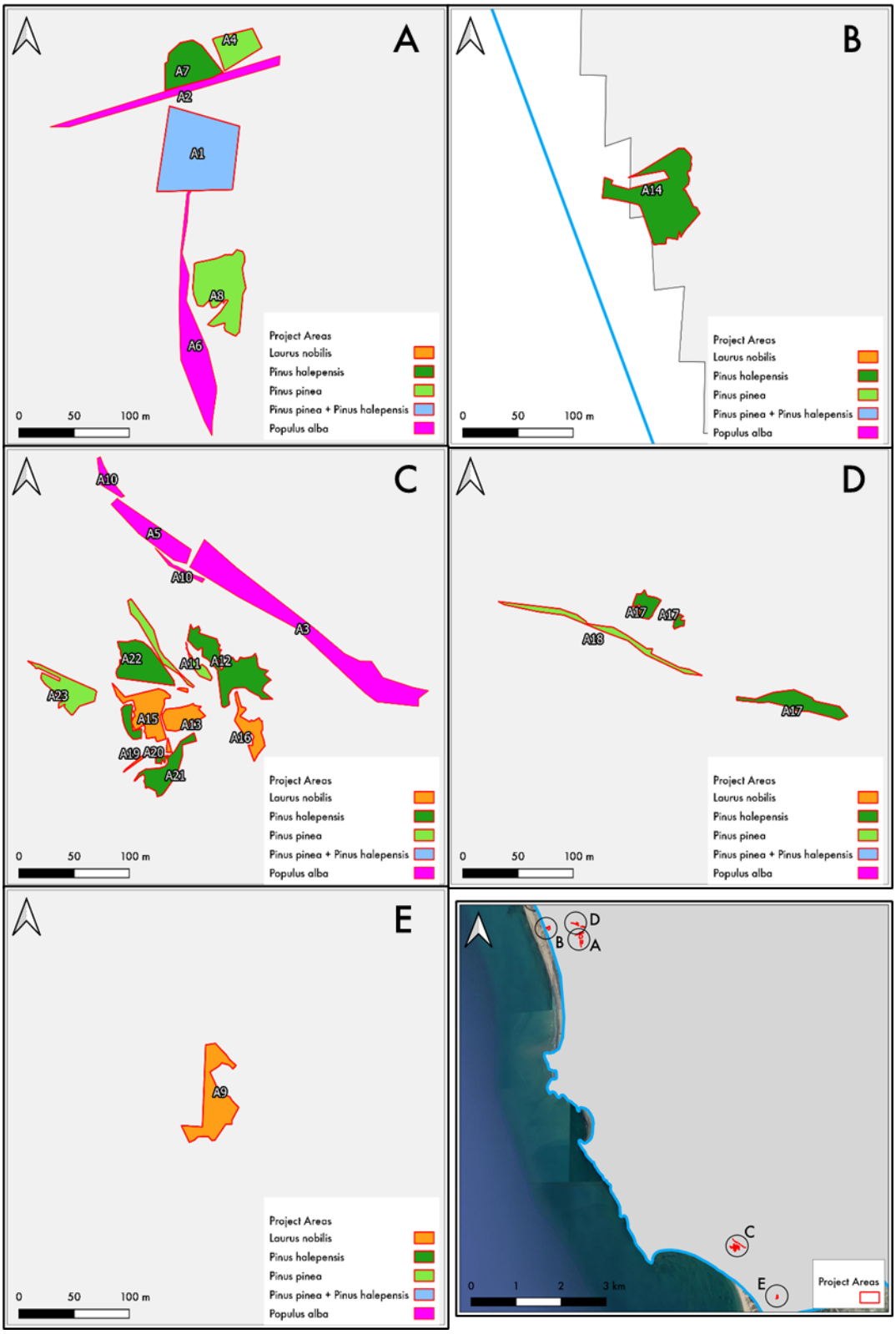

Figure 2 - Project areas by planted species

For these areas, RAPA and Celim planned an artificial irrigation from 3 to 6 times during summer, aiming at increasing the survival rate of the seedlings during the hot season.

The project is not located within a jurisdiction covered by a jurisdictional REDD+ program.

1.12 Project Location

The project takes place within the Protected Landscape of Vjosë-Nartë, an area situated in southwestern Albania that covers almost 200 square kilometres, with an altitude ranging from 0 to 246 meters above sea level. The whole area stands out for its biodiversity of habitats and richness of flora and fauna. Most of them are precious because of their local, national or international rarity. A range of typical habitats are observed in the area: Mediterranean bushes

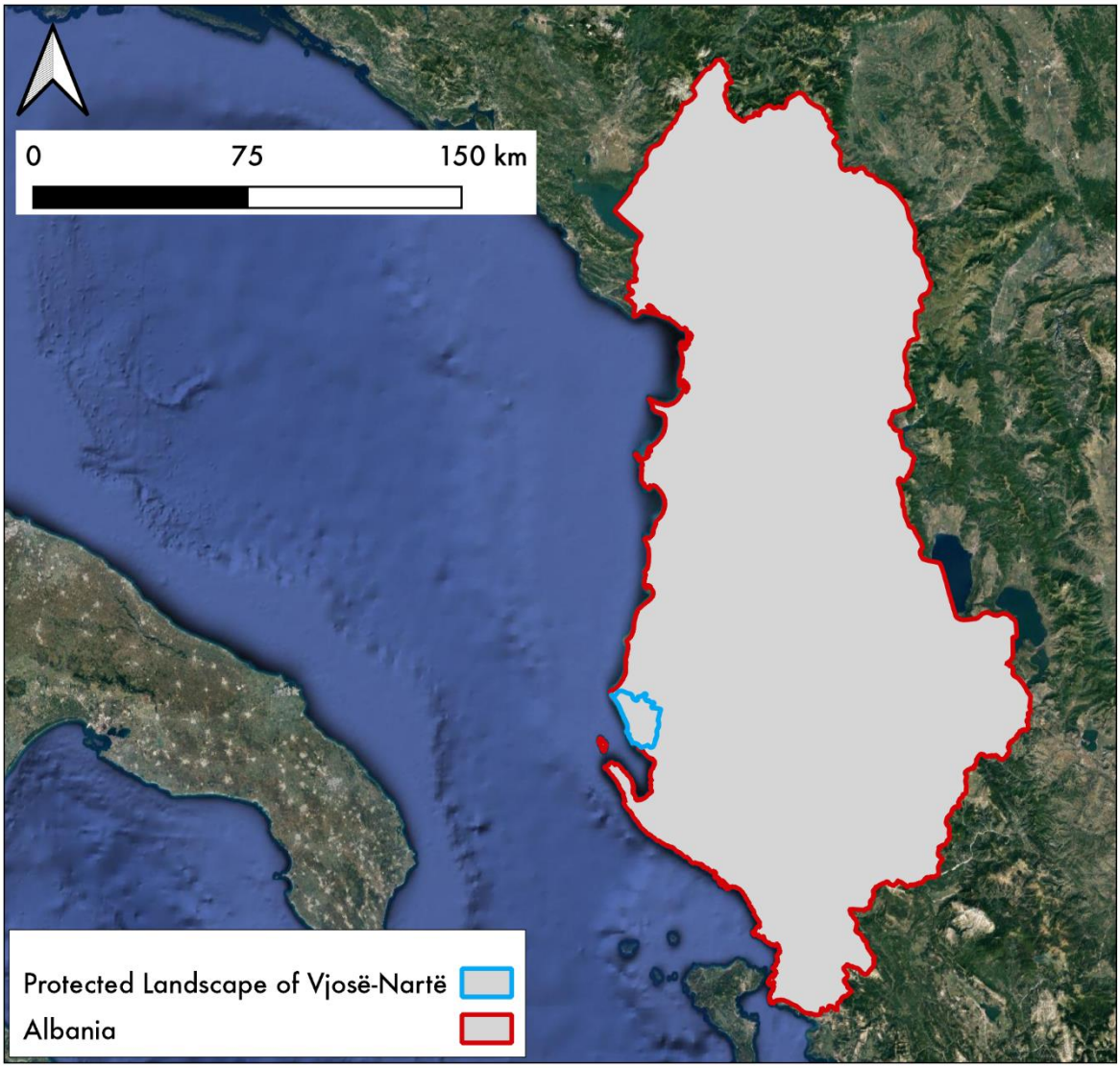

Figure 3 - Albania and the Protected Landscape of Vjosë-Nartë, where project areas are located

and mosses in the hilly area, alluvial forests of the Vjosë river, sweet water aquifers in Zvernec and Panaja hills, coastal lagoons of Nartë and Kallenge, salt marshes of Akernia[10].
The project areas, respecting the conditions of eligibility, are located in areas classified as non-forest from 10 years prior to the project initiation (Figure 4) and do not overlap wetlands areas, as categorized by Global Land Cover[11] (Copernicus Global Land Service). The images (Figure 2) in section 1.10 show the 24 project areas, identified with codes, date of establishment and number and species of planted trees. The coordinates of project areas are also provided separately as KML files. The areas that do not fall into the eligible area, even though trees have been planted there, are not taken into account in the ex-ante removals estimation. Compliance with eligibility criteria was checked through processing and elaboration of forestry cover, forest gain and loss data (Global Forest Change[12]) and Land cover data (Global Land Cover – Copernicus Global Land Service). Data elaboration was made in a GIS environment.

1.13 Conditions Prior to Project Initiation

The baseline scenario is the same as the conditions existing prior to the project initiation, in particular the project areas only present scattered vegetation, but they do not present any other forest cover. Within the selected project areas, there has not been forest cover during the last 10 years as shown by Figure 4, obtained analysing in a GIS environment the internationally recognized Global Forest Change and Global Land Cover (Copernicus Global Land Service) data and comparing forest cover in the last 10 years. Since the most recent available data are provided for the year 2019, a visual comparison can be done observing satellite images, relating to just before the project initiation, provided within the software Google Earth Pro. As shown by Figure 4, selected project areas were not cleared of native ecosystems to create GHG credits. Figure 4 also shows land cover change between 2010 and 2020. Only areas falling within Non-Forest class (brown) were considered for the ex-ante removals estimation. An exception was made for areas A3, A5 and A10, after on-the-field validation by NAPA forestry experts. In fact, the spatial resolution of the land cover change map (100m) does not reflect the real land cover in those areas (see Figure 5) and poplars were planted on the edge of the lagoon also to increase the soil resilience to erosion phenomena. Other exceptions were made for some more areas with only a small part falling within Forest class, after on-the-field validation by NAPA forestry experts, who ensured the misclassification due to the spatial resolution of the map. Areas falling within Forest

[10] Radford, E.A., Catullo, G. and Montmollin, B. de. (eds.) (2011). Important Plant Areas of the south and east Mediterranean region: priority sites for conservation. IUCN, Gland, Switzerland and Malaga, Spain. Gland, Switzerland and Malaga, Spain: IUCN. VIII + 108 p

[11] Buchhorn, M. ; Smets, B. ; Bertels, L. ; De Roo, B. ; Lesiv, M. ; Tsendbazar, N. - E. ; Herold, M. ; Fritz, S. Copernicus Global Land Service: Land Cover 100m: collection 3: epoch 2019: Globe 2020.DOI 10.5281/zenodo.3939050

[12] Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." Science 342 (15 November): 850–53. Data available on-line from: http://earthenginepartners.appspot.com/science-2013-global-forest.

(green) or Change class (Blue), namely A1, A6, A8, A19, A20, A21 and A23, were excluded from ex-ante removals estimation.

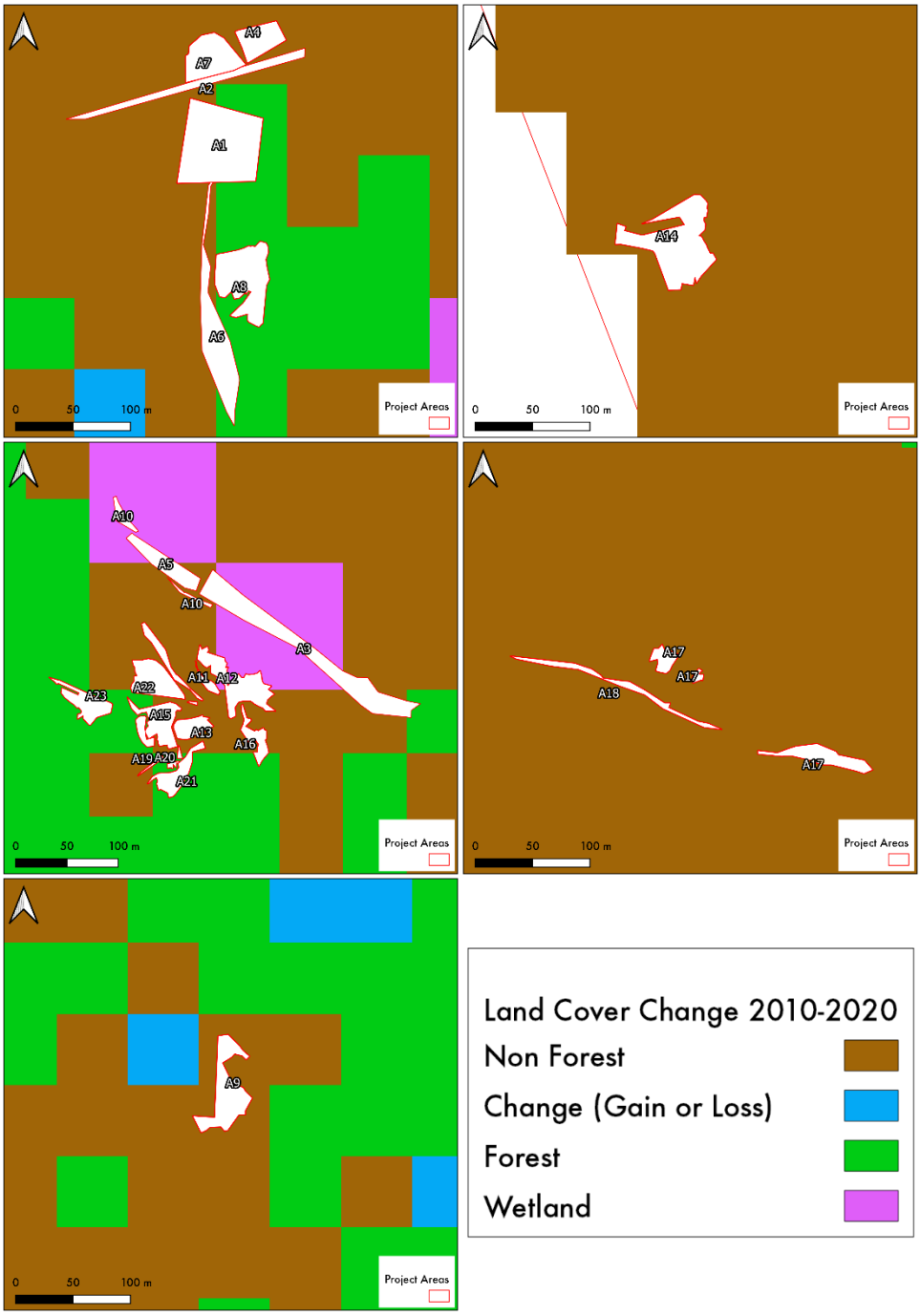

Figure 4 - Project areas on eligibility map. Areas A1, A6, A8, A19, A20, A21 and A23 were excluded from ex-ante removals estimation, due to their complete or partial overlapping with Forest class (green)

Figure 5 - Google Earth Pro image that demonstrates how areas A3, A5 and A10 do not fall within the lagoon. After on-the-field inspection, they were selected as project areas for the poplars capability to increase soil erosion resilience

Climate[13]

The climate of the area is warm and temperate, classified as hot-summer Mediterranean climate, with an average temperature of 16.9°C. The maximum annual temperature is 30.0°C in July/August and the lowest in January with 4.8°C. The winters are generally mild, with heavy rainfall while the summers hot and dry. Rainfall mainly falls in the form of rain. The rainfall is around 1079 mm per year, with July being the driest month (32 mm of precipitations) and November the one characterized by the heaviest precipitation (151 mm).

[13] https://en.climate-data.org/europe/

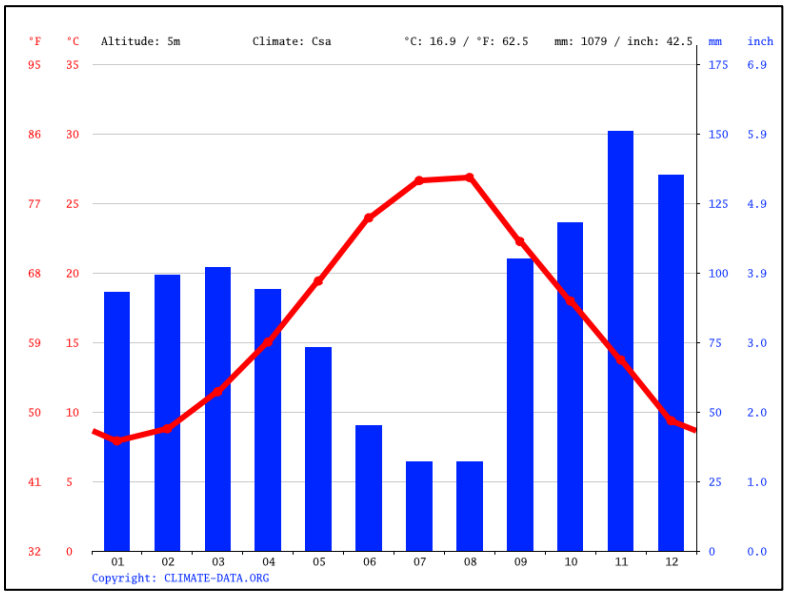

Figure 6 – Vlorë monthly temperature (red) and precipitation (blue)

Hydrology[14]

The complex is generally poor in groundwater. These waters accumulate in shallow sandy deposits; are of low quality and volume. Groundwater depth varies from 1 to 10 m. The main groundwater stream is westward to the Adriatic Sea. For what concerns surface water, the main drainage area is the Vjosë River which flows into the Adriatic Sea and the Shushica River which is a tributary of the Vjosë River. The low hills east of the complex are linked to the northernmost extension of the Kurvelesh mountains. Moreover, the area counts three hydrostations and several free-flowing canals. During heavy rains, large tracts of agricultural land are flooded for weeks. Finally, in the area there are two permanent marshes, namely the Nartë and Kallinge lagoons.

Geology, Geomorphology and Soil

Vjosë-Nartë Wetland Complex is located within Ionian and Sazani zones. The coastal portion from Vlora to Poro consists of quaternary marine sands and gravels of tertiary molasses headlands. The molasses were deposited in the Peri-Adriatic Depressions, which overlies older carbonate sediments. Molasses also constitute the central hilly portion of the area. Molasses are composed by sandstones, siltstones, shales and marls. Gypsum crops out near Narta where a small abandoned quarry is located. Quaternary marshy deposits of clayey silts and sand are found at the northern end of Narta lagoon. Quaternary and recent alluvium is also found in Vjosa rivers. These sediments consist mainly of coarse sand and limestone pebbles. The western part of Vlora and the plain area bordering the Adriatic Sea are part of the Narta syncline. The hilly area to the east is a part of the Trevllazeri anticline. The Narta syncline is made up of Neogene and

[14] PROTECTED LANDSCAPE "VJOSA-NARTA". https://www.diha.al/fileadmin/user_upload/PDF-Unterlagen/Marktpublikationen/EN_-_VJOSE_NARTE_PROTECTED_PANORAMA.pdf

quaternary deposits. In general, the Neogene deposits consist in clay, clay stone, sandstone, predominant in this area, and conglomerate. Moreover, The Protected Landscape of Vjosë-Nartë is famous for its coastal sand dunes with some of them reaching 6-8 meters. The sand dunes and the sandy belt along the coastline are bare of vegetation to a length sometimes extending up to 30 m[15].

Forest

These forests occupy around 1,200 ha, a considerable part of the Narta area, extending parallel with dune systems of this area. They have been planted some 30-40 years ago in order to stabilize the shoreline. The physiognomy of this formation is presented by Pine species such as, *Pinus pinea* and *P. pinaster*. The shrub layer is represented by typical Mediterranean species such as *Pistacia lentiscus*, *Erica manipuliflora*, *Myrtus communis* etc, characteristic species of the Class *Quercetea ilicis* (covering 40-50% of total area, shrub<2 m). Between these plant communities (sandy dunes vegetation and Mediterranean Pine forests), there are some cultivated belts, dominated by the introduced species of *Acacia saligna* (a large part of 48 this belt was burned last year, near of Vjosa delta river), *Agave americana* (about 200 m at Zverneci beach)[16].

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The proposed project is in compliance with directions set in the Law nr. 57/2020, "On forestry", as it introduces the implementation of reforestation activities in lands within which natural regeneration processes struggle to occur. Moreover, the activities are also aligned with Law nr. 10006, dated 23.10.2008, "On the protection and conservation of wild fauna". In particular, the first aim of Law nr. 10006, is to preserve or restore in favorable condition the natural habitats and species of wild fauna. Habitats and species in this area are considered to be of key importance and this status was recognized with the Decision of Council of Ministries nr. 680, dated 22.10.2004, "On the Declaration of The Vjosë-Nartë Ligatinal System a Protected Aquatic / terrestrial Landscape", since it labels the Vjosë -Narte ecosystem as a 5th Category Protected landscape, according to IUCN classification.

[15] Management Plan, Vjosë -Narta Landscape Protected Area, June 2005

[16] See footnote 11

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The current project's not seeking registration under any other GHG program.

1.15.2 Projects Rejected by Other GHG Programs

The current project has not required any registration to other GHG program.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

This project will only generate net GHG emission reductions/removals on an additional and voluntary basis.

1.16.2 Other Forms of Environmental Credit

The current project's not aiming to generate any other kind of Environmental Credit.

1.17 Additional Information Relevant to the Project

Leakage Management

In the project areas, agriculture, as well as livestock breeding, are prohibited, therefore leakage displacements were accounted as 0.

Commercially Sensitive Information

There is no commercially sensitive information excluded from the PD.

Sustainable Development

With its Intended Nationally Determined Contribution (INDC)[17], Albania aims at reducing CO_2 emissions by 11,5% between 2016 and 2030. This reduction means 708 kT carbon-dioxide emission reduction in 2030. Albania emissions come mainly from two sectors, corresponding with the sectors for which GHG inventory was carried out and they are, namely, (i) energy and (ii) industrial processes sectors. The measures the country intends to implement aim at (i) maintaining the low greenhouse gas emissions of the electricity generation and (ii) decoupling

[17] Intended Nationally Determined Contribution (INDC) of the Republic of Albania following decision 1/CP.19 and decision 1/CP.20. http://extwprlegs1.fao.org/docs/pdf/alb190658.pdf

growth from increase of greenhouse gas emissions in other sectors. To contribute to cost-effective implementation, Albania intends to sell carbon credits during the period until 2030 of the low emission development pathways through participation in international market mechanism.

In the terms of SDGs, the main contribution of this project activity benefits SDGs number 13 (Climate Action) and 15 (Life on Land), showing a good alignment with Albania national priorities, as illustrated in Figure 7.

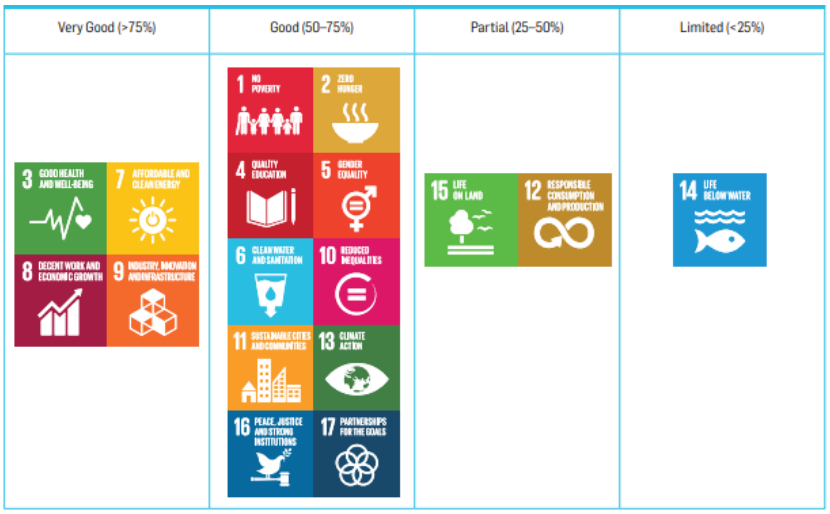

Figure 7 - Alignment of SDG targets with Albania national priorities

Summarizing:

SDG 13 – Climate Action

The activities of the project involve the planting of 9'302 indigenous trees which will sequestrate CO_2 from the atmosphere and stock carbon in their biomass while growing and hence contributing on mitigating the climate change. This contribution will be measured via the quantity of CO_2 absorbed by the trees in line with the applied CDM methodology.

SDG 15 – Life on Land

The activities of the project aim to promote the development of a forestry ecosystem on land that had previously been characterised by sparse vegetation. The new plantations will favour, through a sustainable use, the restoration of degraded soils, the reduction of the erosion rate and the increase of biodiversity. The contribution will be measured and reported following the objectives and framework already contained in the Narta Vjosa Management Plan. In particular, Chapter 3.5, which describes the operational objectives for the area, states how several indicators related to biodiversity are being and will be monitored, namely, biological diversity,

nesting waterbirds, Globally Endangered Species present in the area, as well as environmental variables and, more broadly, other indicators of ecosystem health.

Further Information

There is no further information.

2 SAFEGUARDS

2.1 No Net Harm

There is no potential negative environmental or socio-economic impact due to the project. On the contrary, starting from a land where natural regrowth struggles to happen, project activities can only issue environmental and socio-economic benefits.

2.2 Local Stakeholder Consultation

Relevant local stakeholders were identified by Celim who has a well-established presence and knowhow on working on the intended project area. Relevant authorities, included the Mayor and the Prefect of Valona, policy makers involved in the province management, focal bodies responsible for the project (NAPA and Celim members), local and international non-governmental organisations (NGOs), were all invited to the meeting. A screening of the entrepreneurial activities within the protected area, the only initiatives present, was carried out in order to identify local people potentially impacted by the project; among them four restaurant owners, working within the protected area, were identified and invited, even though their activities do not overlap project areas.

Considering the government mandated COVID 19 restrictions, the stakeholder consultation meetings have been organized to avoid gatherings of people.

A first virtual meeting with national/local authorities, (inter)national NGOs and all the people who were able to connect to the virtual meeting was carried out on the 15th of December 2020, while a second meeting with the four restaurant owners identified, the only ones having their own business in the protected area, was carried out on the 17th of December 2020.

The stakeholders were contacted via email and telephone calls and officially invited to the meetings on the 8th of December. A reminder invitation was sent in order to ensure the presence of more stakeholders.

The overall objective was to inform about the foreseen project and to receive feedback on its potential environmental and social impacts, in order to improve the project design and to increase the local awareness and involvement in the project.

The meetings were attended by 22 people (18 people in the first meeting, 4 in the second meeting), with representation from different stakeholder categories (representative of authorities, NGOs, local people). In total 7 women were present.

Summary of the meetings

The first meeting was virtual and coordinated by Viola Stefanizzi, Climate Project Officer at Carbonsink. The translation from Italian to Albanese was made by Gerta Mehmeti, that also asked the permission for recording the meeting.

The second meeting was carried out directly on the field and coordinated by Manuel Castelletti, Project Manager at Celim.

The agenda below was followed:

1. Opening of the meeting
2. Explanation of the project
3. Questions for clarifications
4. Discussion on continuous input mechanism
5. Closure of meeting

1. Opening of the meeting

The meetings started with the welcoming of participants, followed by the explanation of the general objective of the meeting and an introduction round to get to know the participants and their background.

2. Explanation of the project

The explanation of the project was organized into:

- an introduction to both organizations, Celim and Carbonsink.
- the explanation of the reforestation project « ACAP Project Community Actions of Protected Areas » that foresees to plant more than 9'000 native plants in the Protected Landscape of Vjosë-Nartë in Albania.
- the aims of the reforestation intervention, i.e. (i) to remove GHG emissions from atmosphere by planting more than 9'000 native trees which will sequestrate CO_2 in their biomass while growing and contributing thus on mitigating the Climate Change, (ii) to contribute to the local biodiversity increase and conservation through the planting of native species on land that had previously been disturbed and to the restoration of degraded soils and the reduction of the erosion rate.
- explanation of the Carbon Market, generation of carbon credits, certification Standard, certification process focused on ACAP project activities.

It was specified that the goal of the certification process is to ensure the reduction of carbon dioxide; as a certified project, carbon credits will be generated after verification by a third party and then sold on the carbon market. The ownership of the carbon credit generated by ACAP project belongs to the National Agency for the Protected Areas (NAPA) and the revenues from the

sale of carbon credits will be used for reinvesting in the activities within ACAP framework and in monitoring the reforestation project.

3. Questions for clarifications

The main questions raised by participants were noted and clarifications were given by Carbonsink, Celim and RAPA. Most of the discussion and comments given by the participants were positive and the project was appreciated and very welcomed by institutions and civil society.

In general, all the questions aimed at better exploring:

- the carbon market and the typologies of projects that can be explored in Albania (renewable energy and reforestation/conservation projects).
- the number of carbon credits generated by ACAP project and the actual market price.
- the estimation of emission reductions related to the plant species selected and the parameters considered in the calculation.
- the timeline of the project activities within the carbon certification scheme.

However, there were some critical points related to the origin of the plant species selected and their lack of revenues in terms of plant production compared to other species. These issues were discussed and the reason of the selection was clarified. It was specified that all the plants selected are native (no one is non-native) and that the project aim is reforestation, that is why the selection was made in this sense and not aimed to plant production.

It was also pointed out that the presence of these new plants will positively impact the tourism in the project area.

4. Discussion on continuous input mechanism

The participants were encouraged to provide continuous inputs throughout the whole duration of the project. Emails contacts and telephone numbers of Carbonsink, Celim and Rapa representatives along with the office addresses of Celim and Rapa in Albania were provided in order to receive feedbacks or to manage grievances from stakeholders. Via email, telephone and poster posted in the offices, Carbonsink will communicate to stakeholders the process of VCS program validation and verification, the results of monitoring the risks, costs and benefits the project may bring to local stakeholders and all the relevant laws and regulations covering.

5. Closure of meeting

To conclude the meeting, the participants were thanked for their presence and were encouraged to fill the evaluation forms. A total of 6 evaluation forms were received; all the comments reflect exactly what is specified at the meeting agenda point 3. Questions for Clarification. According to the received comments and the evaluation forms, no needs for further modifications on the project design were identified.

2.3 Environmental Impact

Not applicable. According to Albanian legislation, forestry related environmental impact assessments are mandatory only in case of new forestation, but not for reforestation projects[18]. Before projects activities, there was an artificial wild pine forest.

2.4 Public Comments

This project was open for public comment from 30/08/2021 to 29/09/2021. No comments have been received.

2.5 AFOLU-Specific Safeguards

As stated in Section 2.2, a local stakeholder consultation was carried out and no conflicts were underlined. Moreover, no agricultural or any other kind of activities were carried out in the project area and hence, no impacts on local stakeholder are foreseen.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

This is an AFOLU A/R project that aims to reforest abandoned and degraded lands, which are expected to remain degraded or to continue degraded in the absence of the project. The project is a grouped project. Title of the methodology: AR-ACM0003. Afforestation and reforestation of lands except wetlands. Version 2.0.

The following documents are indispensable for the application of this methodology[19]:

(a) Clean development mechanism project standards.

(b) A/R methodological tools:

a) Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (Version 01)

b) Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/RCDM project activities (Version 04.2)

[18] Law nr. 10440-2011, Appendix 2

[19] These documents are available online at:

https://cdm.unfccc.int/methodologies/DB/C9QS5G3CS8FW04MYYXDFOQDPXWM4OE

c) Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity (Version 04.0.0)

3.2 Applicability of Methodology

AR-ACM0003 methodology applicability conditions

a) The land subject to the project activity does not fall in wetland category.

The condition a) is respected, as demonstrated in Figure 4 (LULC map), the selected project areas does not fall in wetland category.

b) Soil disturbance attributable to the project activity does not cover more than 10 per cent of area in each of the following types of land, when these lands are included within the project boundary:

i. Land containing organic soils

ii. Land which, in the baseline, is subjected to land-use and management practices and receives inputs listed in appendices 1 and 2 to this methodology

The condition b) is respected since the land i) does not contain organic soil, as described in Section 1.13, and ii) is neither cropland nor grassland and does not receive any of the inputs listed in appendices 1 and 2, as described in the Management Plan of Vjosë -Narta Landscape Protected Area (cap 2.2 and 2.3),

Applied tools applicability conditions

a) Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (Version 01)

i. Forestation of the land within the proposed project boundary performed with or without being registered as the A/R CDM project activity shall not lead to violation of any applicable law even if the law is not enforced.

The forestation activity is not violating any applicable law as described in Section 1.13 of this PDD.

ii. This tool is not applicable to small - scale afforestation and reforestation project activities.

The project activity is applying the AR-ACM0003 “A/R Large-scale Methodology: Afforestation

b) Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” (Version 04.2)

This tool has no internal applicability conditions.

c) Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity (Version 04.0.0)

i. The tool is applicable to all occurrence of fire within the project boundary.

Project lifetime will not consider activities such as burning of harvest residue and use of fire to prepare the land.

The applicability of the tool will be justified separately for each year in case fire has occurred within the project boundary.

ii. Non-CO2 GHG emissions resulting from any occurrence of fire within the project boundary shall be accounted for each incidence of fire which affects an area greater than the minimum threshold area reported by the host Party for the purpose of defining forest, provided that the accumulated area affected by such fires in a given year is ≥5% of the project area.

The applicability of the tool will be justified separately for each year in case fire has occurred within the project boundary.

iii. Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity (Version 02.0)

This tool is not applicable if the displacement of agricultural activities is expected to cause, directly or indirectly, any drainage of wetlands or peat lands.

The project activity is not expected to cause, directly or indirectly, any drainage of wetlands or peatland. In fact, the project area is currently abandoned (as described in Section 1.10) and thus there is no displacement of any agricultural activities.

iv. Calculation of the number of sample plots for measurements within A/R CDM project activities (Version 02.1.0)

This tool has no internal applicability conditions.

3.3 Project Boundary

For this project activity the project area consists of 24 separate land areas located within *the Protected Landscape of Vjosë-Nartë*. All the areas included in the project activity are georeferenced, as described in section 1.11, and available as KML file (Figure 8).

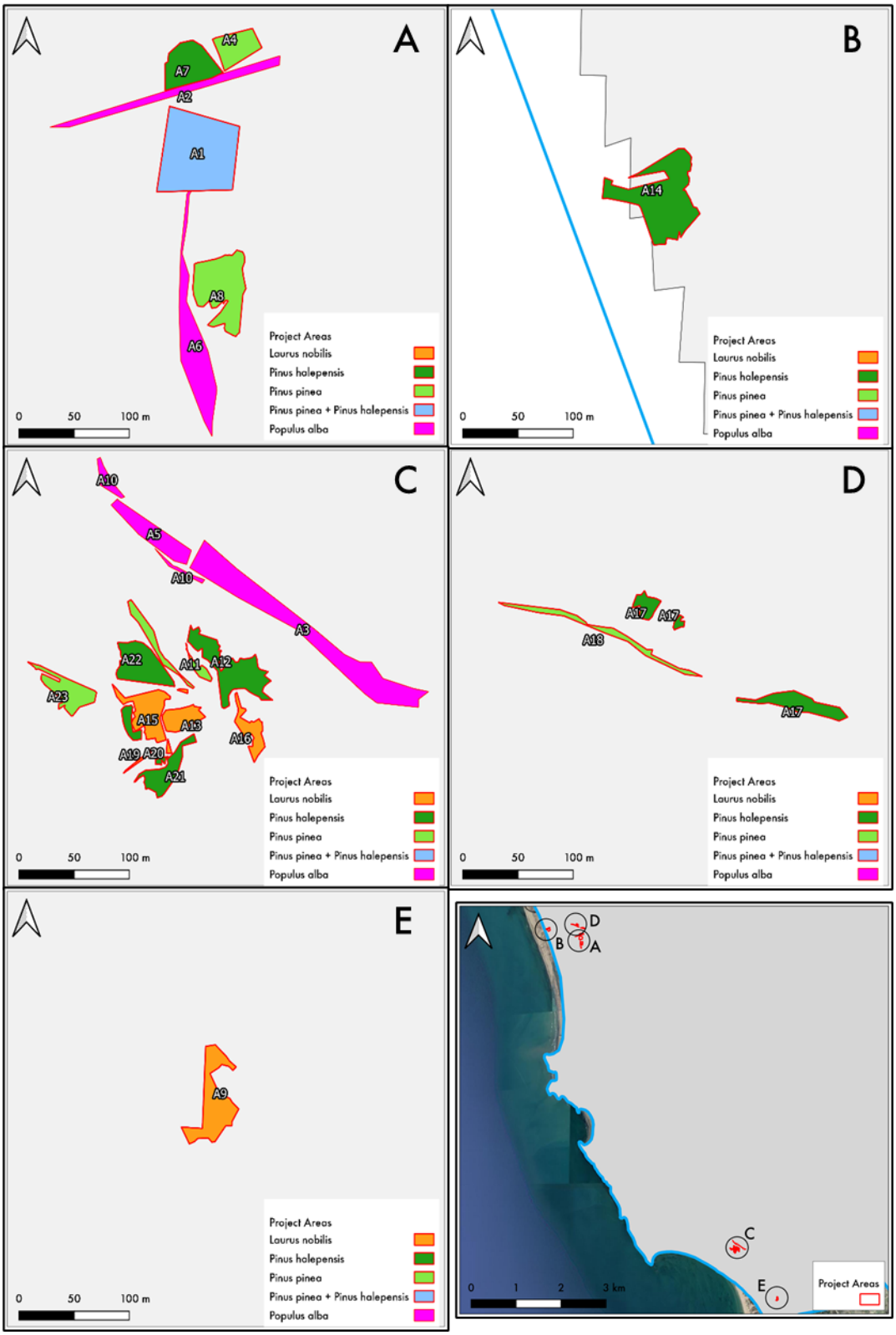

Figure 8 - Project areas locations

GHG sources, sinks and reservoirs

The relevant GHG sources, sinks and reservoirs for the project and baseline scenarios are presented below.

Source		Gas	Included?	Justification/Explanation
Baseline	Above-ground biomass	CO_2	Yes	Required. Largest pool affected by project activity.
		CH_4	No	Not required by the methodology
		N_2O	No	Not required by the methodology
		Other	N/A	Not required by the methodology
	Below-ground biomass	CO_2	Yes	Required. Expected to increase due to project activity.
		CH_4	No	Not required by the methodology
		N_2O	No	Not required by the methodology
		Other	N/A	Not required by the methodology
	Deadwood, Litter and Soil organic carbon	CO_2	No	Optional. Carbon stock in these pools may not increase due to implementation of the project activity.
		CH_4	No	Not required by the methodology
		N_2O	No	Not required by the methodology
		Other	N/A	Not required by the methodology
Project	Above-ground biomass	CO_2	Yes	Carbon stock in this pool is expected to increase due to the implementation of the project activity
		CH_4	No	Not required by the methodology
		N_2O	No	Not required by the methodology
		Other	N/A	Not required by the methodology
	Below-ground biomass	CO_2	Yes	Carbon stock in this pool is expected to increase due to the implementation of the project activity
		CH_4	No	Not required by the methodology
		N_2O	No	Not required by the methodology
		Other	N/A	Not required by the methodology
	Deadwood, Litter and Soil	CO_2	No	Optional. Carbon stock in these pools may not increase due to implementation of the project activity.
		CH_4	No	Not required by the methodology

Source		Gas	Included?	Justification/Explanation
	organic carbon	N_2O	No	Not required by the methodology
		Other	N/A	Not required by the methodology

3.4 Baseline Scenario

Identification of the baseline scenario

In line with the applied methodology, the baseline scenario has been identified by using the "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities (Version 01)" as described in Section 3.5

Selected baseline scenario

The lands within the project boundary are part of the Protected Landscape of Vjosë-Nartë and the baseline scenario is the continuation of the pre-project land use. In the baseline, the project areas have only scattered shrubs and some isolated trees, but they do not present any other forest cover or other activities. Outside of the project areas several plant species are thriving, but inside them new seedlings struggle to flourish after past natural phenomena happened. In these areas, due to the lack of forest cover, soil is vulnerable to rain and wind erosion, especially along wet areas, and consequent nutrient leaching.

3.5 Additionality

The demonstration and assessment of the additionality of the project is made in accordance with the applied AR-ACM0003 methodology following the steps of the "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" (Version 01).

Step 0: Preliminary screening based on the starting date of the A/R project activity

The proposed project activity has its starting date after 31 December 1999 but before the date of project's registration. The evidence for the starting date of the project activity being the 19th of January 2021, as descripted in chapter 1.8, one day after the date of the purchasing of the seedlings planned by project activities and it is provided to VVB.

The incentive from the planned sale of carbon credits was seriously considered in the decision to proceed with the project activity. In fact, the project has received technical assistance for evaluating the feasibility of the project carbon certification before the project's starting date and the foreseen carbon credit revenues were considered before proceeding with starting the project activity. The project, as developed and included in the business plan provided to the VVB, is part of a framework that takes into consideration the possibility for the Albanian Government to sell

the future credits generated by the project in order to use these financial resources for the realisation of new instances/projects to be implemented.

STEP 1: Identification of alternative scenarios to the proposed A/R project activity

Sub-step 1a: Identify credible alternative land use scenarios to the proposed project activity

Alternative 1. Continuation of the pre-project land use

As described in Section 1.10, the project areas were characterised by bare soil land cover and without activities in the baseline situation, with nearby trees struggling to naturally reproduce. The continuation of the pre-project land use i.e., the abandoned state is a realistic and credible alternative scenario.

Alternative 2. Forestation of the land within the project boundary performed without being registered as the Verified Carbon Standard project activity

In this scenario the tree planting activities would be performed without the foreseen carbon credit revenues (i.e., income from selling of carbon credits). Since the project areas are within the borders of a Protected Landscape, namely the Protected Landscape of Vjosë-Nartë, the option that the project areas would have been planted with trees without being certificated for carbon credit generation will be further studied and evaluated as an alternative scenario.

Alternative 3. Forestation of at least a part of the land within the project boundary of the proposed A/R project at a rate resulting from 1) Legal requirements; or 2) Extrapolation of observed forestation activities in the geographical area with similar, socio-economic and ecological conditions to the proposed A/R project activity occurring in a period since 31 December 1989 as selected by the PPs.

In this scenario the forestation activities would be performed resulting from 1) Legal requirements or from 2) Extrapolation of observed forestation activities. This scenario is not a realistic alternative scenario as there is either no legal requirements for forest establishment (See section 1.13) nor observed forestation activities in nearby areas which could be extrapolated to cover the lands or the parts of the lands within the project boundary (See Step 4 “Common practice analysis).

Outcome of Sub-step 1a: Scenario 1 and Scenario 2 are the identified as credible alternative land use scenarios.

Sub-step 1b. Consistency of credible alternative land use scenarios with enforced mandatory applicable laws and regulations

The alternative scenarios to the project activity presented above as the outcome of Sub-step 1a are all in compliance with mandatory legislation and regulations taking into the account the enforcement in the region or country and Board decisions on national and/or sectoral policies and regulations. The legal and regulatory requirements are identified in section 1.13.

Outcome of Sub-step 1b: Scenario 1 and Scenario 2 are plausible alternative land use scenarios.

STEP 2: Barrier analysis

Sub-step 2a: Identification of barriers that would prevent the implementation of at least one alternative land use scenarios

Below is presented a list of barriers that may prevent alternative scenarios to occur.

a) Investment barriers, other than insufficient financial returns: lack of access to credit where the project activity is to be implemented in order to support high cost of project activity launch and maintenance. In general, funds for the management of the protected area are limited to cover: regular maintenance, investigating illegal activity, fire prevention, wildlife census activities. The Vjosë-Nartë A/R project is part of the broader ACAP project, funded by AICS (Agenzia Italiana per la Cooperazione e lo Sviluppo - Italian Agency for Development and Cooperation). In this context, one of the goals is to reduce by 5% the carbon footprint of the whole project area. In order to reach this objective, some funds were allocated to develop a carbon project, expected to be scaled up in the near future. The revenue provided by the selling of carbon credits are necessary to develop new instances of this project. As reported in Narta Vjosa Management Plan, section 2.1.3.3 Responsibilities and personnel; "… personnel is limited in number […] and not well trained and qualified to conduct conservation management activities. They are trying just to protect the area from any damages caused to forest, but not able to execute other jobs, such as research and monitoring, data collection and information management…"

b) Institutional barriers: lack of enforcement of legislation relating to forest or land-use where the project activity is to be implemented. As wrote in Narta Vjosa Management Plan, section 2.1.3.1 Legal and institutional frameworks: In fact, up to now, there is an absence of integrated management and lack of cooperation between different institutions.", and 2.1.3.2 Management structures: "As mentioned before, actually there is no proper management structure over the project site of Narta. […] As stated above, there is no proper communication among different sector resulting in lack of integrated management."

c) Technological barriers: lack of access to planting materials and infrastructure for the project activity implementation; lack of skilled and proper staff dedicated to project activity. As mentioned in Narta Vjosa Management Plan, section 2.1.3.5, a.Roads: "[road network] quality isn't very good.", b.Water Supplies: "Despite the high water resources, […] the defficiency is due to ammortisation of the water distribution network, misuse, electric power deficiency, etc…", c.Irrigation: " The factic irrigated land is much less than the station capacitites. That difference is caused by the partial destruction and ammortisation of the irrigating system.", d.Drainage: " During the last 15 years the investments in the drainage sector have been very low […] As a result the drainage capacity has been largely reduced." Sub-step 2b: Elimination of land use scenarios that are prevented by the identified barriers

The alternative scenario "Scenario 2" is prevented by the barriers listed in Sub-step 2a, and thus Scenario 2 is eliminated from further consideration.

Outcome of Step 2b: The only alternative scenario not prevented by any barrier is the Scenario 1 "Continuation of the pre-project land use".

Sub-step 2c: Determination of baseline scenario

In accordance with the decision tree of the used tool, the Scenario 1 "Continuation of the pre-project land use" is the baseline scenario and the additionality demonstration need to be continued with Step 4 "Common practice test".

STEP 3: Investment analysis
This step is used to determine which of the remaining land use scenarios identified in the "Sub-step 2b" is the most economically or financially attractive.

In this case the only alternative scenario identified is the Scenario 1 "Continuation of the pre-project land use". Therefore, step 3 is not applicable.

STEP 4. Common practice analysis

Based on public and accessible information provided by NAPA, in addition to the proposed project one project[20] was carried out in 2009 in the Albanian hinterland, but areas were different from the areas covered by this project. Moreover the project was implemented under the CDM framework, hence following different requirements, So there are no significant similar reforestation projects to remark.

In general, funds do not cover actions similar to the project activities and have never been foreseen for the protected area.

Therefore, the proposed project is not a common practice and the proposed forestation activity is not the baseline scenario.

Outcome of Step 4: The proposed project activity is not the baseline scenario and, hence, it is additional.

3.6 Methodology Deviations

There are no methodology deviations.

[20] PROJECT DESIGN DOCUMENT FORM FOR AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES (CDM-AR-PDD) - Version 04 - Assisted Natural Regeneration of Degraded Lands in Albania

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Procedures to be used for calculation of ex-ante baseline net GHG removals by sinks are detailed in the AR-ACM0003 methodology (Version 02.0) under the section 5.4 "Baseline net GHG removals by sinks".

According to the methodology baseline net GHG removals by sinks are calculated with the following equation:

$$\Delta C_{BSL,t} = \Delta C_{TREE\_BSL,t} + \Delta C_{SHRUB\_BSL,t} + \Delta C_{DW\_BSL,t} + \Delta C_{LI\_BSL,t} \quad \text{Equation (1)}$$

Where:

$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks in year t; t_{CO2-e}

$\Delta C_{TREE\_BSL,t}$ = Change in carbon stock in baseline tree biomass within the project boundary in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t_{CO2-e}

$\Delta C_{SHRUB\_BSL,t}$ = Change in carbon stock in baseline shrub biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t_{CO2-e}

$\Delta C_{DW\_BSL,t}$ = Change in carbon stock in baseline dead wood biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t_{CO2-e}

$\Delta C_{LI\_BSL,t}$ = Change in carbon stock in baseline litter biomass within the project boundary, in year t , as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t_{CO2-e}

Carbon stock in trees

The pre-project trees have not been harvested, but the plantations grow around them. These trees have not been damaged by the project activities and, given their large size, do not suffer from competition with the new implanted trees. In addition, they are not inventoried along with

the project trees in monitoring of carbon stocks, but their continued existence will be monitored throughout the crediting period of the project activity.

On this basis, according to the Section 5 of tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities", the carbon stock and change in carbon stock in trees in the baseline can be accounted as zero.

Carbon stock in shrubs

According to point 12 of the conditions under which carbon stock and change in carbon stock may be estimated as zero, the tool establishes that trees and shrubs in the baseline may be accounted as zero if conditions (a), (b) and (c) under paragraph 11 are satisfied (see above). On this basis, the carbon stock and change in carbon stock in shrubs in the baseline can be accounted as zero. According to point 13, for the purpose of ex ante estimations of carbon stock and change in carbon stock in the project scenario, change in carbon stock of shrubs would be estimated as zero.

Carbon stocks in dead wood and litter

The carbon stock in dead wood and litter are not selected (See table in Section 3.3) and thus in accordance with the applied methodology these pools are set to zero.

4.2 Project Emissions

Procedure to be used for calculation of ex-ante actual net GHG removals by sinks are detailed in the AR-ACM0003 methodology (Version 02.0) under the section 5.5 "Actual net GHG removals by sinks". GHG emissions resulting from removal of herbaceous vegetation, combustion of fossil fuel, fertilizer application, use of wood, decomposition of litter and fine roots of N-fixing trees, construction of access roads within the project boundary, and transportation attributable to the project activity shall be considered insignificant and therefore accounted as zero.

The actual net GHG removals by sinks is calculated as follows:

$$\Delta C_{\mathrm{ACTUAL},t} = \Delta C_{\mathrm{P},t} - \mathrm{GHG}_{\mathrm{E,t}} \qquad \text{Equation (2)}$$

Where:

$\Delta C_{\mathrm{ACTUAL},t}$ = Actual net GHG removals by sinks, in year t; t $CO_{2\text{-e}}$

$\Delta C_{\mathrm{P},t}$ = Change in the carbon stocks in project, occurring in the selected carbon pools, in year t; $t_{CO2\text{-e}}$

$\mathrm{GHG}_{\mathrm{E,t}}$ = Increase in non- CO_2 GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year t, as

estimated in the tool "Estimation of non- CO_2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity[20]"; t_{CO2-e}

Change in the carbon stocks in project, occurring in the selected carbon pools in year t is calculated as follows:

$$\Delta C_{P,t} = \Delta C_{TREE\_PROJ,t} + \Delta C_{SHRUB\_PROJ,t} + \Delta C_{DW\_PROJ,t} + \Delta C_{LI\_PROJ,t} + \Delta SOC_{AL,t} \quad \text{Equation (3)}$$

Where:

$\Delta C_{P,t}$ = Change in the carbon stocks in project, occurring in the selected carbon pools, in year t; t_{CO2-e}

$\Delta C_{TREE\_PROJ,t}$ = Change in carbon stock in tree biomass in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t_{CO2-e}

$\Delta C_{SHRUB\_PROJ,t}$ = Change in carbon stock in shrub biomass in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t_{CO2-e}

$\Delta C_{DW\_PROJ,t}$ = Change in carbon stock in dead wood biomass in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of dead wood and litter in A/R CDM project activities"; t_{CO2-e}

$\Delta C_{LI\_PROJ,t}$ = Change in carbon stock in litter biomass in project in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of dead wood and litter in A/R CDM project activities"; t_{CO2-e}

$\Delta SOC_{AL,t}$ = Change in carbon stock in SOC in project, in year t, in areas of land meeting the applicability conditions of the tool "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities", as estimated in the same tool; t_{CO2-e}

For conservativeness, only change in carbon stock in trees biomass of project will be considered. Therefore, change in carbon stock in shrubs, dead wood, litter biomass and SOC are accounted as zero.

Change in carbon stock in trees biomass in project

Change in carbon stock in trees in a year is estimated as follows:

$$\Delta C_{TREE\_PROJ,t} = \frac{C_{TREE,t2} - C_{TREE,t1}}{T} \times 1 \text{ year} \quad \text{Equation (4)}$$

[20] EB 65, Annex 31. https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-08-v4.0.0.pdf

Where:

$\Delta C_{TREE,t}$	=	Change in carbon stock in trees within the project boundary in year t; t_{CO2-e}
$C_{TREE,t2}$	=	Carbon stock in trees within the project boundary at time t2; t_{CO2-e}
$C_{TREE,t1}$	=	Carbon stock in trees within the project boundary at time t1; t_{CO2-e}
T	=	Time elapsed between two successive estimations (T = t2 - t1); yr

Carbon stock in trees biomass in the project

According to the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (Version 04.2), carbon stock in trees at a point of time can be estimated by using one of the following four methods or a combination of them:

a) Estimation by measurement of sample plots

b) Estimation by modelling of tree growth and stand development

c) Estimation by proportionate crown cover

d) Updating the previous stock by independent measurement of change

In this project, method b) was used for the *ex-ante* estimation.

According to the Tool, under Method (b), existing data are used in combination with tree growth models to predict the growth of trees and the development of the tree stand over time, and ex-ante estimation (projection) of carbon stock in tree biomass is not subjected to uncertainty control. Stand parameters such as stocking (e.g., number of stems per hectare), age-class structure, and species composition are simulated from assumed (planned) tree planting and management practices (e.g., planting density, survival rate). Tree growth (e.g., volume increment, biomass expansion factor, wood density) is simulated by taking into account data from peer-reviewed scientific literature. In this project the average volume of trees in one hectare was estimated using a parameter called Mean Annual Increment (MAI). The MAI is expressed in m^3/ha/year and represents the vegetation volumetric gain in one hectare every year, due to the growth of the trees. For the *ex-ante* estimation, it was selected one value of MAI per genus[21] [22]

[21] Pinus pinea + Pinus halepensis: FAO (2003). Planted forests database (PFDB): structure and contents by M. Varmola and A. Del Lungo. Planted Forests and Trees Working Papers, Working Paper 25. Forest Resources Development Service, Forest Resources Division. FAO, Rome.

[22] Populus alba: K. Rédei, Z. Keserű and J. Rásó, "Practice-Oriented Yield Table for White Poplar Stands Growing under Sandy Soil Conditions in Hungary", South-east European forestry, vol.3, no. 1, pp. 33-40, 2012. [Online]. https://doi.org/10.15177/seefor.12-04

[23], according to the stratification.

The carbon stock in trees in the tree biomass estimation strata is estimated as follows:

$$V_{TREE\_j} = \sum_{i,j} MAI_j \times A_i / N_{i,j}$$

$$B_{TREE\_j} = V_{TREE\_j} \times D_j \times BEF_j \times \left(1 + R_j\right)$$

$$C_{TREE\_j} = \sum_{i,j} A_i \times N_{i,j} \times \frac{44}{12} \times CF_{TREE\_j} \times B_{TREE\_j}$$

Where:

$C_{TREE,t}$	=	carbon stock in trees of tree species *j* of strata *i*; t_{CO2-e}
A_i	=	Area of strata i; ha
$N_{i,j}$	=	Number of the tree species j of strata i; trees/ha
$CF_{TREE\_i,j}$	=	Carbon fraction of tree biomass for tree species j; t C/t d.m.
B_{TREE_j}	=	Biomass of one tree of tree species j; t d.m.
V_{TREE_j}	=	Stem volume of one tree of tree species j; t d.m.
$MAI_{\_j}$	=	vegetation volumetric growth of tree species j in one hectare in one year; m^3/ha/year
D_j	=	Density of tree species j; t d.m/m^3
BEF_j	=	Biomass expansion factor for conversion of tree stem biomass to above-ground tree biomass, for tree species j; dimensionless
R_j	=	Root-shoot ratio for tree species j; dimensionless

The four tree species adopted in the project, namely *Pinus halepensis*, *Pinus pinea*, *Populus alba* and *Laurus nobilis* are all native trees. For ex-ante estimation of the carbon stock change due to project activities implementation, the mean annual increment (MAI), available for the selected

[23] Laurus nobilis: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Annex 3A.1 - Biomass Default Tables for Section 3.2 Forest Land. TABLE 3A.1.5 AVERAGE ANNUAL INCREMENT IN ABOVEGROUND BIOMASS IN NATURAL REGENERATION BY BROAD CATEGORY (tonnes dry matter/ha/year + conversion to volumetric MAI with wood density

species in scientific literature, provided to the VVB, is used to estimate the volume of trees in the project areas.

4.3 Leakage

Leakage emission shall be estimated as follows:

$LK_t = LK_{AGRIC,t}$ Where:

$LK_{,t}$ = GHG emissions due to leakage, in year t; t_{CO2-e}

$LK_{AGRIC,t}$ = Leakage due to the displacement of agricultural activities in year t, as estimated in the tool "Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity"; t CO2-e

In the project area there is no agricultural or any other kind of activity implemented, hence, no leakage is foreseen. So as far as our project activities:

$LK_t=0$

4.4 Net GHG Emission Reductions and Removals

The net anthropogenic GHG removals by sinks shall be calculated as follows:

$$\Delta C_{AR,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - LK_t \quad \text{Equation (7)}$$

Where:

$\Delta C_{AR,t}$ = Net anthropogenic GHG removals by sinks, in yeart; t_{CO2-e}

$\Delta C_{ACTUAL,t}$ = Actual net GHG removals by sinks, in year t; t_{CO2-e}

$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks, in year t; t_{CO2-e}

$LK_{,t}$ = GHG emissions due to leakage, in year t; t_{CO2-e}

As stated in the previous sections, baseline emissions, as well as emissions due to leakage, are accounted as zero.

The table below summarizes the net anthropogenic GHG removals by sinks due to project activities implementation:

Year	Estimated baseline emissions or removals (t CO_2e)	Estimated project emissions or removals (tC CO_2e)	Estimated leakage emissions (t CO_2e)	Estimated net GHG emission reductions or removals (t CO_2e)
2021	0	25	0.0	25
2022	0	28	0.0	28
2023	0	27	0.0	27
2024	0	27	0.0	27
2025	0	27	0.0	27
2026	0	27	0.0	27
2027	0	27	0.0	27
2028	0	27	0.0	27
2029	0	27	0.0	27
2030	0	27	0.0	27
2031	0	27	0.0	27
2032	0	27	0.0	27
2033	0	27	0.0	27
2034	0	27	0.0	27
2035	0	27	0.0	27
2036	0	27	0.0	27
2037	0	27	0.0	27
2038	0	27	0.0	27
2039	0	27	0.0	27
2040	0	27	0.0	27
Total	**0**	531	**0**	531

About the buffer to be applied after compiling the Non-Permanence Risk Report, since the Non-Permanence Risk Tool contains an error, the calculations have been cross-checked by VVB, that

stated the overall risk to be equal to 10%, corresponding to 53 tCO_2eq, to be deposited in the AFOLU pooled buffer account.

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	Rj
Data unit	*dimensionless*
Description	*Root shoot ratio for tree species j*
Source of data	*Appendix 1 of the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"*
Value applied	*0.25*
Justification of choice of data or description of measurement methods and procedures applied	*According to the applied tool, a default value of 0.25 is used as there is no available transparent and verifiable information to justify a different value.*
Purpose of Data	*Calculation of project emissions*
Comments	*n/a*

Data / Parameter	CF_{TREE}
Data unit	*t C/t d.m.*
Description	*Carbon fraction of tree biomass*
Source of data	*Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"*
Value applied	*0.47*
Justification of choice of data or description of measurement methods and procedures applied	*According to the applied tool, a default value of 0.47 is used as there is not available transparent and verifiable information to justify a different value.*

Purpose of Data	*Calculation of project emissions*
Comments	*n/a*

Data / Parameter	Biomass expansion factor (BEF) for planted species
Data unit	*Dimensionless*
Description	*Factor for conversion of tree stem biomass to above-ground tree biomass*
Source of data	*P. halepensis + P. pinea:* *IPCC Good Practice Guidance for LULUCF – Table 3A.1.10* *P. alba:* *IPCC Good Practice Guidance for LULUCF – Table 3A.1.10* *L. nobilis:* *IPCC Good Practice Guidance for LULUCF – Table 3A.1.10*
Value applied	*P. halepensis + P. pinea:* *1.3* *P. alba:* *1.4* *L. nobilis:* *1.4*
Justification of choice of data or description of measurement methods and procedures applied	*P. halepensis + P. pinea:* *Pines value for temperate climatic zone* *P. alba:* *Broadleaves value for temperate climatic zone* *L. nobilis:* *Broadleaves value for temperate climatic zone*

Purpose of Data	*Calculation of project emissions*
Comments	*n/a*

Data / Parameter	*Wood density for planted species (D_j)*
Data unit	*t/m^3*
Description	*Wood density is the ratio of the mass of a tree species per unit of volume*
Source of data	*P. halepensis + P. pinea:* *Catalogo de àrboles y arboledas singulares - HUESCA. Pino Carrasco Parque del Isuel. Ayuntamiento de Huesca, Medio Ambiente* *P. alba:* *2006 IPCC Guidelines for National Greenhouse Gas Inventories - TABLE 4.14 BASIC WOOD DENSITY (D) OF SELECTED TEMPERATE AND BOREAL TREE TAXA* *L. nobilis:* *Pulgar, José & Muñoz, Guillermo. (2018). Inter-tree and intra-tree variation in the physical properties of wood of laurel (Laurus nobilis). European Journal of Forest Research. 137. 10.1007/s10342-018-1119-y.*
Value applied	*P. halepensis + P. pinea:* *0.54* *P. alba:* *0.35* *L. nobilis:* *0.57*
Justification of choice of data or description of measurement methods and procedures applied	*P. halepensis + P. pinea:* *P. halepensis value from Mediterranean basin based research* *P. alba:*

	Populus spp. default value *L. nobilis:* *L. nobilis value from Mediterranean basin based research*
Purpose of Data	*Calculation of project emissions*
Comments	*n/a*

Data / Parameter	*Mean annual increment for planted species (MAI)*
Data unit	*m^3/ha/yr*
Description	*The mean volume increment per hectare per year per species*
Source of data	*P. halepensis + P. pinea:* *FAO (2003). Planted forests database (PFDB): structure and contents by M. Varmola and A. Del Lungo. Planted Forests and Trees Working Papers, Working Paper 25. Forest Resources Development Service, Forest Resources Division. FAO, Rome.* *P. alba:* *K. Rédei, Z. Keserű and J. Rásó, "Practice-Oriented Yield Table for White Poplar Stands Growing under Sandy Soil Conditions in Hungary", South-east European forestry, vol.3, no. 1, pp. 33-40, 2012. [Online]. https://doi.org/10.15177/seefor.12-04* *L. nobilis:* *2006 IPCC Guidelines for National Greenhouse Gas Inventories Annex 3A.1 - Biomass Default Tables for Section 3.2 Forest Land. TABLE 3A.1.5 AVERAGE ANNUAL INCREMENT IN ABOVEGROUND BIOMASS IN NATURAL REGENERATION BY BROAD CATEGORY*
Value applied	*P. halepensis + P. pinea:* *10.0* *P. alba:* *8.6*

	L. nobilis: *6.2*
Justification of choice of data or description of measurement methods and procedures applied	*P. halepensis + P. pinea:* *Minimum value for pine species* *P. alba:* *Average of maximum values* *L. nobilis:* *The original data is a biomass increment (t/ha/yr). However, it was converted into a volumetric increment using wood density value for the selected species*
Purpose of Data	*Calculation of project emissions*
Comments	*n/a*

5.2 Data and Parameters Monitored

Data / Parameter	A_i
Data unit	*ha*
Description	*Area of stratum i*
Source of data	*Monitoring of strata and stand boundaries is done using a Geographical Information System (GIS) which allows for integrating data from different sources (including GPS coordinates and Remote Sensing data)*
Description of measurement methods and procedures to be applied	*Field measurement: the area shall be delineated either on the ground using GPS or from georeferenced remote sensing data*
Frequency of monitoring/recording	*Each time a verification is conducted*
Value applied	*Determined ex-post*

Monitoring equipment	*GPS coordinates and Remote Sensing data*
QA/QC procedures to be applied	*Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, are applied*
Purpose of data	*Calculation of project emissions*
Calculation method	*N/A*
Comments	*N/A*

Data / Parameter	$A_{BURN,i,t}$
Data unit	*ha*
Description	*Area burnt in stratum i in year t; ha*
Source of data	*Field measurement or remote sensing measurement*
Description of measurement methods and procedures to be applied	*The area shall be delineated either on the ground using GPS or from georeferenced remote sensing data*
Frequency of monitoring/recording	*This area is measured whenever forest fire has occurred*
Value applied	*Determined ex-post*
Monitoring equipment	*GPS*
QA/QC procedures to be applied	*Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory are applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, may be applied*

Purpose of data	*Calculation of project emissions*
Calculation method	*N/A*
Comments	*N/A*

Data / Parameter	T
Data unit	*Year*
Description	*Time period elapsed between two successive estimations of carbon stock in trees and shrubs*
Source of data	*Verification records*
Description of measurement methods and procedures to be applied	*n/a*
Frequency of monitoring/recording	*Every time a verification is conducted*
Value applied	*Determined ex-post*
Monitoring equipment	*n/a*
QA/QC procedures to be applied	*n/a*
Purpose of data	*Calculation of project emissions*
Calculation method	$T = t_2 - t_1$
Comments	*If the two successive estimations of carbon stock in trees are carried out at different points of time in year t_2 and t_1, (e.g. in the month of April in year t_1 and in the month of September in year t_2), then a fractional value is assigned to T.*

Data / Parameter	$A_{PLOT,i}$
Data unit	*Ha*
Description	*Total area of sample plots in stratum i*
Source of data	*The size of sample plots in each stratum will be assessed*
Description of measurement methods and procedures to be applied	*Standard operating procedures (SOPs) prescribed under national forest inventory will be applied. In absence of these, SOPs from published handbooks, or from the IPCC GPG LULUCF 2003, will be applied*
Frequency of monitoring/recording	*Every time a verification is conducted*
Value applied	*Determined ex-post*
Monitoring equipment	*GPS*
QA/QC procedures to be applied	*Quality control/quality assurance (QA/QC) procedures prescribed under national forest inventory will be applied. In the absence of these, QA/QC procedures from published handbooks, or from the IPCC GPG LULUCF 2003, will be applied*
Purpose of data	*Calculation of project emissions*
Calculation method	n/a
Comments	Sample plot location will be registered with a GPS and will be marked on the project map

Data / Parameter	n_i
Data unit	*Dimensionless*
Description	*Number of sample plots in each stratum*
Source of data	*Estimation*
Description of measurement methods and procedures to be applied	*It will be estimated according to the tool "Calculation of the number of sample plots for measurements within A/R CDM project activities" (version 02.1.0). This value will be estimated*

	based on a conservative standard deviation of 35% and a standard error of 10% of the ex-ante mean biomass stock.
Frequency of monitoring/recording	*Every time a monitoring is conducted, at least every five years*
Value applied	*Determined ex-post*
Monitoring equipment	*n/a*
QA/QC procedures to be applied	*n/a*
Purpose of data	*Calculation of project emissions*
Calculation method	The calculation method is described in the tool "Calculation of the number of sample plots for measurements within A/R CDM project activities" (version 02.1.0). $$n = \frac{N * t_{VAL}^{2} * \left(\sum_i w_i * s_i\right)^2}{N * E^2 + t_{VAL}^{2} * \sum_i w_i * s_i^2}$$
Comments	n/a

Data / Parameter	w_i
Data unit	*Dimensionless*
Description	Ratio of the area of stratum i to the sum of areas of biomass estimation strata
Source of data	*Calculated*
Description of measurement methods and procedures to be applied	*n/a*
Frequency of monitoring/recording	*Every time a monitoring is conducted, at least every five years*
Value applied	*Determined ex-post*
Monitoring equipment	*n/a*

QA/QC procedures to be applied	*n/a*
Purpose of data	*Calculation of project emissions*
Calculation method	w_i is equal to the area of the stratum i divided by the project area
Comments	n/a

Data / Parameter	DBH
Data unit	*cm*
Description	Individual trees' diameter at breast height
Source of data	*Measured in sample plots*
Description of measurement methods and procedures to be applied	*measure of all trees in sample plots resulting in project's activities*
Frequency of monitoring/recording	*Every time a monitoring is conducted, at least every five years*
Value applied	*Determined ex-post*
Monitoring equipment	*tape measure/tree caliper. Computer and database*
QA/QC procedures to be applied	*Workers involved in field measurement should be fully trained in field data collection. Field measurements shall be checked by qualified person to correct any technical errors.*
Purpose of data	*Calculation of project emissions*
Calculation method	*n/a*
Comments	n/a

5.3 Monitoring Plan

In accordance with the applied methodology the monitoring plan shall provide for collection of all relevant data necessary for:

a) Verification that the applicability conditions of the applied methodology have been met;

b) Verification of changes in carbon stocks in the pools selected; and

c) Verification of project emissions and leakage emissions.

The data collected shall be archived for a period of at least two years after the end of the last crediting period of the project activity.

As the situation regarding the surface of the project area is currently changing due to the possibility of implementing areas with other related projects, monitoring operations will be identified and coordinated in spite of the total number of hectares that will fall under this phase. Moreover, information shall be provided, and recorded in the project design document (PDD), to establish that the commonly accepted principles and practices of forest inventory and forest management in the host country are implemented. If such principles and practices are not known or available, standard operating procedures (SOPs) and quality control/quality assurance (QA/QC) procedures for inventory operations, including field data collection and data management, shall be identified, recorded and applied. Use or adaptation of SOPs available from published handbooks, or from the "IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry 2003", is recommended.

a) Verification that the applicability conditions of the applied methodology have been met

The verification of the applicability conditions is done through the project boundary monitoring and through forest establishment monitoring.

Monitoring of project boundary will be conducted with field surveys concerning the project boundary within which the project activity has occurred, site by site, measuring geographical positions using GPS and checking that the afforested/reforested areas are in coherence with the eligibility criteria. Project boundaries, as well as any stratification inside the boundary, of all the discrete areas forming each project instance will be defined at every verification. Geographic coordinates of the measurements will be recorded in a database and archived.

The periodically monitoring of the boundary is done to demonstrate that the actual area afforested conforms to the afforestation area outlined in the project plan. If the forest area changes during the crediting period, for instance, because deforestation occurs on the project area, the specific location and area of the deforested land will be identified. Similarly, if the planting on certain lands within the project boundary fails these lands will be documented. Personnel involved in the monitoring will be trained to identify the changes in the boundary and to record changes in the project database for reporting of project verification.

Monitoring of forest establishment and forest management will be done to ensure that it is compliant with this VCS-PD during the complete establishment period, including all major activities that can affect carbon stocks or generate GHG emissions. The inventory operations, including field data collection and data management, will be done following standard operating

procedures (SOPs) and quality control/quality assurance (QA/QC) procedures. Established stands will be also monitored with respect to the species and strata pre-defined in the VCS-PD. Any deviation from the planned forest establishment will be documented and justified.

b) Verification of changes in carbon stocks in the pools selected

Forest management activities (e.g., planting, re-planting, etc.) as well as unexpected natural disturbances occurring during the crediting period (e.g., due to fire, pests or disease outbreaks) will be monitored to guarantee that the correct practices are applied in accordance with the management plan and to ensure the health of the stands. In case of wildfires the area subjected to the fire will be monitored, in accordance with the best practices available.

The growth of individual trees on sample plots will be measured at each monitoring event for the estimation of above-ground tree biomass using allometric equations to be identified. The below ground biomass will be extrapolated from above-ground biomass. In the monitoring plots, parameters required by allometric equations will be measured for each tree.

Plots establishment and trees measurements will be done with the following equipment:

- diametric tape or caliper;
- GPS;
- compass;
- measuring tape;
- PVC rods.

Carbon stock changes in living planted trees can be estimated through biomass expansion factors or allometric equations. The carbon content in dead wood, litter and soil attributable to project activities, will not be monitored.

c) Verification of project emissions and leakage emissions

According to the applied methodology and to what has been stated in previous sections, no GHG emissions nor leakege are expected to happen within the project boundaries. Hence, GHG emissions as well as leakage will not be monitored. However, while monitoring forest management activities, evidence will be provided that the assumptions made in the *ex-ante* assessment still hold in the *ex-post* situation. If needed, for example in case of wild fires occurring in the project area, monitoring and estimation of GHG emissions will be done in accordance with the latest version of the tool "Estimation of non- CO_2GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity[24]".

Stratification

If biomass distribution over the project area is not homogeneous, stratification should be carried out to improve the precision of biomass estimation. Different stratifications may be appropriate for the baseline and project scenarios to achieve optimal precision of estimation of net GHG removals by sinks. In particular:

[24] EB 65, Annex 31. http://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-08-v4.0.0.pdf

a. For baseline net GHG removals by sinks, it is usually sufficient to stratify the area according to major vegetation types and their crown cover and/or land use types

b. For actual net GHG removals by sinks the stratification for *ex ante* estimations is based on the project planting/management plan and the stratification for *ex post* estimations is based on the actual implementation of the project planting/management plan. If natural or anthropogenic impacts (e.g., local fires) or other factors (e.g., soil type) significantly alter the pattern of biomass distribution in the project area, then the *ex-post* stratification is revised accordingly.

The changes in the biomass within the project area during the crediting period of the project will be monitored through the sampling designed based on the number and extension of strata. Each stratum will consist of the set of blocks in the project area based on the planting date and species. Any filling gaps will also be included within each block.

The *ex-post* stratification will be updated periodically because the following events might have impact on the strata:

- Unexpected disturbances occurring during the crediting period (e.g., due to fire, pests or disease outbreaks), affecting differing impacts on various parts of an originally homogenous stratum;

- Two or more different strata may be similar enough to allow their merging into one stratum.

Monitoring of strata and stand boundaries will be done using a Geographic Information System (GIS), which allows data from different sources to be integrated (including field data, GPS coordinates and possible remote sensing data).

Sampling framework

Permanent sampling plots will be used for sampling over time to measure and monitor changes in carbon stocks. Permanent plots will be installed prior to the first verification. Each plot will be installed prior to the first verification.

The total number of permanent sampling plots is estimated in line with the tool “Calculation of the number of sample plots for measurements within A/R CDM project activities” (version 02.1.0). Sample plots will be located randomly inside each stratum and measured at least every five years, for verification purposes. Permanent sample plots will be located using random function of a GIS system). In particular the point found with the random function will be permanently marked on field, being the center of each plot, considering a circular area of 100m^2. This area will be realized with the support of the measuring tape, walking from the middle of the plot to any direction for a distance of 5.64 metres as the radius of the circle and walking around to outline the circumference of the sample plot.

The coordinates will be used as a reference for the starting point of each individual permanent sample plot. The plot centers will also be marked on the field with metal boards or poles by the technicians.

Measuring of trees

Technical team members in charge of measurement, data collection and recording activities will be adequately trained before the start of monitoring operations. The technicians will use the instrumentation provided to collect the data. once the sampled area has been reached, identify which individuals fall within the test area. If some of these individuals are on the edge of the study area, they will only be included if the stem centre falls within the boundary, otherwise they should be considered excluded.

The diameter is measured using a dendrometric caliper, placed at a height of 1.3 metres, technically referred to as the "diameter at breast height" (DBH).
If discrepancies are revealed during data analysis, the responsible person will verify the measurement first in the office, and if will be a negative check, the measurement will be repeated on the field.
The data collected will first be recorded by the technicians on a table directly in the field and then transferred to a digital database in the office.

Monitoring frequency

Although the verification and certification will be carried out every five years after the first verification until the end of the crediting period, the monitoring interval can be less than five years so that enough information can be collected for management purposes. However, it is possible that only the data to be used for verification will be recorded in the database structure used for verifications.

Organizational structure for monitoring

The grouped project is based on the relationship between the Project Proponent (NAPA), who had overall control of the project, RAPA Vlore, responsible for the implementation of the activities on-the-field, supported by Celim, and Carbonsink, in charge of the carbon certification process. The generic project implementation structure can be seen in Figure 8.

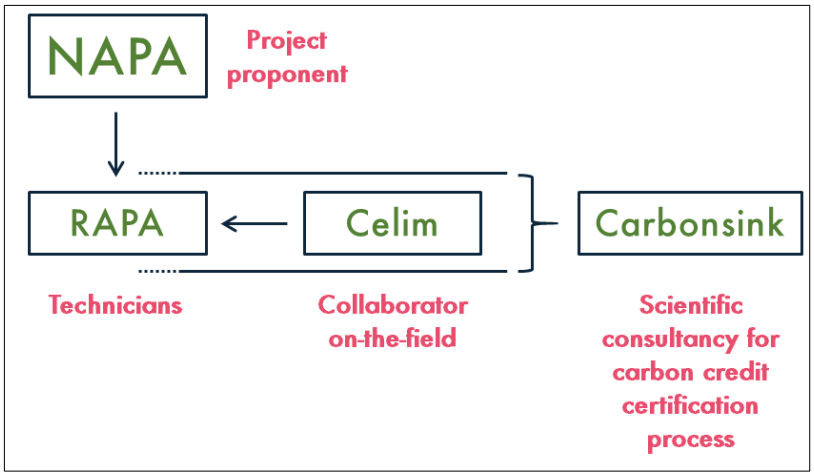

Figure 9 - Generic project implementation structure

NAPA, the project proponent, has the overall control of the project. RAPA Vlore is responsible for the implementation of the on-the-field activities, supported by Celim. Moreover, RAPA and Celim are responsible for monitoring activities. They will work closely with Carbonsink in order to follow VERRA's guidelines and requirements. They will take care of the part concerning the SOP, training for field measurements and verifies the collected data in the first phase (each end of the monitoring day) as well as in the last one (before sending the measurement data to Carbonsink). The technicians of RAPA Vlore will take direct measurements while Carbonsink officers will work closely with Celim and RAPA Vlore teams, to support and achieve validation and verification under VCS.

Quality assurance

A quality assurance/quality control (QA/QC) plan will be implemented to ensure the net anthropogenic GHG removals by sinks are measured and monitored precisely, credibly, verifiably and transparently. QA/QC control includes steps to control the errors in project boundary, stratification, sampling, measurement, data entry, data analysis, and data maintenance and archiving. This plan will be implemented in two phases, (i) a training on how to understand, analyze, calibrate and manage the measuring tools and on forest management practices, and (ii) the put into practice of all the theoretical knowledge acquired in the first phase.

Quality control

Monitoring will be done by trained RAPA project technicians, who understand the importance of accurate data collecting. This technical team will receive trainings about field measurements, both theorical and practical, before every new wave of measurement. Every member of each measurement group will be evaluated to identify errors, verify measurements processes and correct any problems before they carry out the measurements. At the end of each monitoring day a meeting will be held to explain which plots have been measured, any gap filling and/or dead

trees and any difficulties or anomalies found. In the event that the consultant cannot remove the doubts that have arisen from that particular measurement, then he will go to the field together with the measurement team to resolve the anomalies found. This quality control activity will be conducted with the same frequency as that of the measurements.

Conservative approach and uncertainties

Project proponents will also apply all relevant equations for the *ex-ante* calculation of net anthropogenic GHG removals by sinks with care and provide transparent estimations for the parameters that are monitored during the project crediting period. These estimates must be based on measured or existing published data where possible and project proponents should retain a conservative approach; that is, if different values for a parameter are equally plausible, a value that does not lead to over-estimation of net anthropogenic GHG removals by sinks must be selected. An uncertainty analysis is required for all estimates from monitoring related to change in area, change in carbon stocks and emissions in the project activities. In particular monitoring results will be subjected to a statistical analysis in order to assess their significance.

Record system

A database will include all information related to the monitoring of project activities: identification codes and coordinates for each sampling plot, dates when sampling has been made, persons involved in the sampling and the sampling results. The database ensures that all afforested and/or reforested areas within a specific project instance are uniquely defined and are included exclusively in one project, thereby avoiding double accounting of emission removals. Also, all the eventual hard copies of the field measurement results will be scanned and saved.