



**Verified Carbon
Standard**

BOOMITRA GRASSLAND RESTORATION IN NORTHERN MEXICO



Document Prepared by ConserWater Technologies Inc. DBA Boomitra

Project Title	Boomitra Grassland Restoration in Northern Mexico
Version	1.2
Date of Issue	1 st March 2022
Prepared By	ConserWater Technologies Inc
Contact	173 Bel Air Ct Mountain View, CA 94043 USA +16502825671 info@boomitra.com https://boomitra.com/

CONTENTS

1	PROJECT DETAILS	4
1.1	Summary Description of the Project.....	4
1.2	Sectoral Scope and Project Type.....	5
1.3	Project Eligibility	5
1.4	Project Design	6
1.5	Project Proponent	12
1.6	Other Entities Involved in the Project	13
1.7	Ownership	13
1.8	Project Start Date	13
1.9	Project Crediting Period	14
1.10	Project Scale and Estimated GHG Emission Reductions or Removals	14
1.11	Description of the Project Activity	15
1.12	Project Location	23
1.13	Conditions Prior to Project Initiation	25
1.14	Compliance with Laws, Statutes and Other Regulatory Frameworks.....	31
1.15	Participation under Other GHG Programs	33
1.16	Other Forms of Credit.....	34
1.17	Additional Information Relevant to the Project.....	34
2	SAFEGUARDS	34
2.1	No Net Harm	34
2.2	Local Stakeholder Consultation	35
2.3	Environmental Impact	35
2.4	Public Comments	35
2.5	AFOLU-Specific Safeguards	35
3	APPLICATION OF METHODOLOGY	35
3.1	Title and Reference of Methodology.....	35
3.2	Applicability of Methodology	35
3.3	Project Boundary	37

3.4	Baseline Scenario	39
3.5	Additionality	49
3.6	Methodology Deviations	51
4	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS.....	52
4.1	Baseline Emissions	52
4.2	Project Emissions	52
4.3	Leakage	52
4.4	Net GHG Emission Reductions and Removals	52
5	MONITORING.....	52
5.1	Data and Parameters Available at Validation.....	52
5.2	Data and Parameters Monitored	52
5.3	Monitoring Plan.....	52

1 PROJECT DETAILS

1.1 Summary Description of the Project

This project works with the ranchers of northern Mexico who raise livestock on individually owned or community-owned grasslands and enables those ranchers to adopt Improved Grassland Management (IGM). Ranchers in this region have traditionally followed practices such as continuous grazing, without any sustainable grazing or water management plans in place. This has resulted in overgrazing, leading to severe soil degradation, loss of vegetative cover and even desertification. When ranchers then become unable to sustain their livelihoods on their degraded ranches, they are sometimes forced to sell their land to farmers who convert the grasslands into croplands, resulting in further CO₂ emissions and loss of natural flora and fauna. Through this project, ranchers are adopting new management practices, which include rotational grazing and a variety of water conservation measures. In rotational grazing, livestock are rotated between different sections of a pasture over the course of days, weeks, or months, while other sections of the pasture are allowed to rest. These sections are known as “paddocks”. This practice allows plants to recover and grow in the paddocks that are allowed to rest, and thus allows them to sequester carbon, gradually regenerating the land. In addition, for arid regions like northern Mexico, water conservation measures help increase the availability of water (which would otherwise be lost) for the growth of the biomass, contributing to the regeneration. The livelihoods of the communities utilizing these ranches are improved directly through the carbon credit payments, which provide an additional source of income, and indirectly through the increased productivity of their lands. The regenerated lands also become much less likely to undergo land use change, because the ranchers are better able to sustain their livelihoods. This in turn ensures that crucial habitats for the flora and fauna of the region are protected.

This project is located in northern Mexico, which is covered by vast arid regions and has two major deserts – the Chihuahuan Desert and the Sonoran Desert. The Chihuahuan Desert spans 647,500 km² and the Sonoran Desert spans 260,000 km² across Northern Mexico and the Southwestern United States of America. The Chihuahuan Desert is the largest desert in North America, covering the states of Chihuahua, Coahuila, Durango, Zacatecas, Nuevo León, and San Luis Potosí in Mexico and Arizona, New Mexico, and Texas in the United States of America. The Sonoran Desert is primarily located in the states of Sonora, Baja California and Baja California Sur in Mexico, and Arizona and California in the USA. These deserts have vast areas of grasslands that have very high levels of biodiversity, including many endemic species.

In addition to increasing Soil Organic Carbon (SOC) in grasslands, this project is expected to generate several community and biodiversity benefits. The project contributes to the following UN Sustainable Developmental Goals (SDG):

1. SDG Goal 2: Zero Hunger
2. SDG Goal 6: Clean water and sanitation
3. SDG Goal 8: Decent work and economic growth

4. SDG Goal 13: Climate Action

5. SDG Goal 15: Life on Land

This project quantifies only GHG removals from new project activities (rotational grazing) through the use of VM0042 methodology. We estimate an initial yearly GHG removal of approximately 950,000 tons of CO_{2e} from this project, and the number of ranchers participating in the program is also projected to grow over the course of the crediting period.

1.2 Sectoral Scope and Project Type

Sectoral Scope: 14. Agriculture, Forestry and Other Land Use (AFOLU)

AFOLU Project Category: Agriculture Land Management (ALM)

Project Type: This is a large project and a grouped project.

Activity Type: Improved Grassland Management (IGM): This category includes practices that demonstrably reduce net GHG emissions of grassland ecosystems by increasing soil carbon stocks, reducing N₂O emissions and/or reducing CH₄ emissions.

1.3 Project Eligibility

The proposed project meets all of the requirements set forth in the VCS Standard, VCS program and VCS methodology VM0042 “Methodology for Improved Agricultural Land Management”, Version 2.0, dated 21 December 2021, which is under development¹.

This is a voluntary project with the objective of promoting improved grassland management in the project area. Furthermore, to describe and justify how the project is eligible under the scope of the VCS Program, we use the criteria listed in section 2.1.1 of the VCS standard, V4.1, outlined in detail in the table below:

Criterion	Fulfilled (Yes/No)	Justification
The six Kyoto Protocol greenhouse gases.	Yes	The project results in GHG removals through soil carbon sequestration, removing CO ₂ from the atmosphere and storing it as soil carbon. Transitioning to rotational grazing is a proven way to achieve soil carbon sequestration in grasslands.
Project activities supported by a methodology approved under	Yes	The project activity is supported by the VCS methodology

¹ https://verra.org/wp-content/uploads/2021/12/VM0042_v2.0_FinalDraft_PublicComment.pdf. This methodology is under development and is open for public comment from 23 December 2021 until 5 February 2022.

Criterion	Fulfilled (Yes/No)	Justification
the VCS Program through the methodology approval process.		VM0042: Methodology for Improved Agricultural Land Management (version 2.0) which is under development under the VCS Program through the methodology approval process.
Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of Verra approval.	Yes	The proposed project activity does not belong to any project categories that are excluded by VCS from being part of the VCS program.
Jurisdictional REDD+ programs and nested REDD+ projects as set out in the VCS Program document Jurisdictional and Nested REDD+ (JNR) Requirements.	Not Applicable	This is not a Jurisdictional REDD+ program, hence this eligibility criterion is not applicable.
Ozone-depleting substances.	Not Applicable	The proposed project activity does not involve any Ozone depleting substances

1.4 Project Design

This is a grouped project and will have multiple project instances. All the new instances will be verified as per the applicable guidelines.

1.4.1 Eligibility Criteria

Inclusion Criteria for new project activity instances

The following table describes the minimum general eligibility criteria to be satisfied by new instances and evidence for how every criterion is fulfilled as per paragraph 3.5.15 and 3.5.16 of VCS Standard V4.2.

SL No.	Eligibility Criterion	Description / Required condition	Means of Verification / Supporting evidence for inclusion
1	Meet the applicability conditions set out in the methodology applied to the project.	As per VM0042 version 2.0, each new project activity instance must demonstrate compliance with the applicability conditions set out in the methodology.	Section 3.2 of the PDD must have all the details pertaining to applicability conditions.
2	Use the technologies or measures specified in the project description.	All the new project activities shall implement one of the activities mentioned in the project activity description in Section 1.11 of the PDD	Each instance must select one of the project activities listed in section 1.11 of the registered PDD.
3	Apply the technologies or measures in the same manner as specified in the project description.	Each project activity instance shall adhere to the technology specifications (mentioned in methodology / standard) employed by project activity.	Each instance must select one of the project activities listed in section 1.11 of the registered PDD and explain in detail how criteria have been met with respect to technology specifications, standard sizes, etc.
4	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	Each new Project Activity Instance must demonstrate that the baseline scenarios comprise one or more of unsustainable grazing practices such as but not limited to, no clear paddock demarcation with fencing, lack of water conservation activities, continuous grazing, etc.	Each instance should clearly define the baseline scenarios comprising of unsustainable grazing practices and related information in the PDD.
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic	Each new Project Activity Instance must demonstrate additionality, as per methodology requirements and standard requirements.	VM0042 uses a project method for the demonstration of additionality, which include: 1. Regulatory surplus analysis

SL No.	Eligibility Criterion	Description / Required condition	Means of Verification / Supporting evidence for inclusion
	area. For example, the new project activity instances have financial, technical and/or other parameters (such as the size/scale of the instances) consistent with the initial instances, or face the same investment, technological and/or other barriers as the initial instances.		2. A barrier analysis to justify why adoption of the proposed project activities would not occur in the absence of the project and An adoption rate analysis to justify that the proposed project activities are not common practice
6	Where grouped projects include multiple baseline scenarios or demonstrations of additionality, such projects will require at least one set of eligibility criteria for each combination of baseline scenario and demonstration of additionality specified in the project description.	Each new Project Activity Instance must demonstrate which of the baseline scenarios listed in the methodology will be applicable.	At least one of the baseline scenarios must be utilized in the project activity instance, which must further demonstrate compliance with all the set of eligibility criteria for the inclusion of new project activities instances as outlined in this document.
7	Geographical boundaries: all new project activity instances must be	Each project activity instance included must be within the boundaries of the United Mexican States	Details of the grasslands with geocoordinates and KML files will be part of the evidence

SL No.	Eligibility Criterion	Description / Required condition	Means of Verification / Supporting evidence for inclusion
	located within the boundary of the United Mexican States		
8	Comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.	New Project Activity Instances must comply with the full set of eligibility criteria for the inclusion of new project activity instances in this section.	New project instances shall provide all the relevant information with justifications in the relevant sections of the PDD.
9	Be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation / verification body (VVB).	Each new Project Activity Instances must have monitoring plans that define technical, financial, geographic and other relevant information, which enable VVBs to do a third-party audit.	Section 5 and other relevant sections of the PDD shall describe all relevant monitoring plans that define technical, financial, geographic and other relevant information with respect to the project activity instance.
10	Be validated at the time of verification against the applicable set of eligibility criteria.	Each new project activity Instance must be validated at the time of verification against the applicable set of eligibility criteria as listed in this section	A new project activity must be explained with all relevant evidence in the relevant section of the PDD.
11	Have evidence of project ownership, for each project activity	New project activity instances must demonstrate ownership by the	Evidence may include, but is not limited to, the following documents:

SL No.	Eligibility Criterion	Description / Required condition	Means of Verification / Supporting evidence for inclusion
	instance, held by the project proponent from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions).	project participant, from the start date of the project activity instance.	1. Board resolution / Governing body decision / CEO / Director decision copy that has details on project requirements 2. Minutes of meetings or stakeholder consultations 3. Purchase details of equipment or materials required for project implementation. 4. Contracts with the ranchers 5. Rancher Outreach events' recordings, pictures, invitations etc. 6. Periodic (quarterly, annual etc) published organizational reports of activities
12	Have a start date that is the same as or later than the grouped project start date: 1st July 2017	All the new project instances must provide evidence that the activities started after the group project start date.	Evidence may include, but is not limited to, the following documents: 1. Board resolution/ Governing body decision / CEO / Director decision copy which has details on the project requirement

SL No.	Eligibility Criterion	Description / Required condition	Means of Verification / Supporting evidence for inclusion
			2. Minutes of meetings or stakeholder consultations 3. Purchase details of equipment or materials required from project implementation 4. Rancher Outreach events' recordings, pictures, invitations etc. 5. Rancher activity attestations 6. Periodic (quarterly, annual etc) published organizational reports of activities
13	Be eligible for crediting from the start date of the instance through to the end of the project crediting period (only).	All the new Project Activity Instances must be eligible for crediting from the start date of the instance through to the end of the project crediting period (only).	Evidence may include, but is not limited to, the following documents: 1. Board resolution / Governing body decision / CEO / Director decision copy which has details on the project requirement 2. Minutes of meeting or stakeholder consultations 3. Purchase details of equipment or materials required from project implementation.

SL No.	Eligibility Criterion	Description / Required condition	Means of Verification / Supporting evidence for inclusion
			4. Rancher Outreach events' recordings, pictures, invitations etc. 5. Rancher activity attestations 6. Periodic (quarterly, annual etc) published organizational reports of activities All the activities implemented under this project qualify as per methodological requirements.
14	Where inclusion of a new project activity instance necessitates the addition of a new project proponent to the project, such instances shall be included in the grouped project within two years of the project activity instance start date	The addition of a new project proponent to Project Activity Instances shall be included in the grouped project within two years of the project activity instance start date.	Boomitra will be the project proponent of this project. However, this project may have multiple implementation partners. Contract documents, MoU documents or board meeting documents will be evidence.

1.5 Project Proponent

Organization name	ConserWater Technologies Inc
Contact person	Chethan T. R.
Title	Carbon Projects Development Lead

Address	173 Bel Air Ct, Mountain View, CA 94043 USA
Telephone	+16502825671
Email	info@boomitra.com

1.6 Other Entities Involved in the Project

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

1.7 Ownership

Land Ownership

In Mexico, land ownership consists of two forms. There are community-owned parcels of land known as “Ejidos”, modelled after traditional Amerindian models of land ownership. The rights to these lands exist with the respective communities, and any activities that leverage those rights are required to get the consent of the entire community, or at least the “Ejido Council” that governs the community. In some instances where the Ejidos have subdivided the rights associated with a certain domain or piece of land to a subset of the community, the consent of that subset of the community is required. All Ejidos are protected by Mexico’s La Ley Agraria (The Agrarian Law) and are recorded in the Registro Agrario Nacional² in Mexico City.

In addition to Ejidos, there are also direct private ownerships of land by individuals or organizations, who have land records to substantiate their claims to the land, and these are recorded in the Public Property Registry of each state in Mexico³.

Credit Ownership

The individuals or entities enrolling their lands irrevocably assign the right, title and interest to the Greenhouse Gas Reductions and Removals thus generated on their lands during the project to ConserWater Technologies Inc (doing business as Boomitra). The individuals or entities enrolling their lands disclaim all right, title and interest to any Carbon Credits that may arise from the Land. This is covered by legal agreements with the individuals and/or entities enrolling their lands.

1.8 Project Start Date

Project Start Date: 1st July 2017

² Gob.mx. 2022. *Registro Agrario Nacional*. [online] Available at: <<https://www.gob.mx/ran>> [Accessed 17 January 2022].

³ Lexology. 2022. *Real estate rights and registration in Mexico*. [online] Available at: <<https://www.lexology.com/library/detail.aspx?g=b45b0151-eaef-4a6a-bea7-f5718f144fb7>> [Accessed 17 January 2022].

The earliest ranchers participating in the project have incorporated improved grazing practices that have been gradually improving since mid 2017, so July 1, 2017 is taken as the start date. This is substantiated through signed attestations by the ranchers of their previous practices (or lack thereof), their gradual improvements in their practices from the start, and their transition timings.

1.9 Project Crediting Period

The duration of the VCS project crediting period is initially 20 years with a possibility for renewal four times. The present project crediting period starts on July 1, 2017 and ends on June 30, 2037. The project longevity is 100 years, in line with the requirements of the VCS AFOLU Non-Permanence Risk Tool, v4.0.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	✓

This is a **large scale** grouped project. The estimated greenhouse gas emission reductions for the first Project Activity Instance (Instance 01) are summarized in the following table

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 2018	950,000
Year 2019	950,000
Year 2020	950,000
Year 2021	950,000
Year 2022	950,000
Year 2023	950,000
Year 2024	950,000
Year 2025	950,000
Year 2026	950,000
Year 2027	950,000
Year 2028	950,000
Year 2029	950,000
Year 2030	950,000

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 2031	950,000
Year 2032	950,000
Year 2033	950,000
Year 2034	950,000
Year 2035	950,000
Year 2036	950,000
Year 2037	950,000
Total estimated ERs	19,000,000
Total number of crediting years	20
Average annual ERs	950,000

1.11 Description of the Project Activity

This is a grouped project. This project promotes sustainable grazing practices in Mexican grasslands. All new project activity instances of the grouped project follow the below mentioned project activities.

The principal project activity is the implementation of rotational grazing. We work with individual landowners or community owned Ejidos, educating and enabling their transition from conventional grazing to rotational grazing for their livestock (cattle, sheep, goats etc.). This is not just a discrete transition, as we continue to work with the ranchers throughout the lifetime of the project to help them continually improve their practices.

Here are the general principles or activities of rotational grazing, as implemented in this project.

- 1) The ranch is divided into organized paddocks roughly similar in livestock carrying capacity. (Having the same livestock carrying capacity is not always synonymous with having the same area. When there are significant differences in vegetation between different parts of a ranch, they can be very different.)
- 2) Livestock cycle between different paddocks and will spend anywhere from a single day to several months in a single paddock, to prevent overuse of any single paddock
- 3) Livestock will not return to the same paddock more than once or twice a year
- 4) Some paddocks may be rested for more than one year to allow recovery

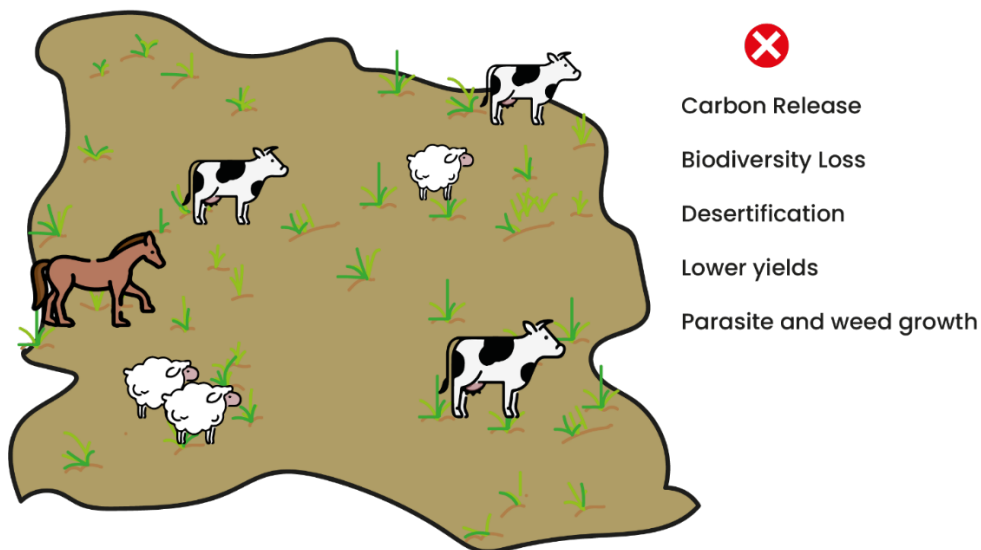
Some of the major advantages of rotational grazing are:

- ✓ Increased soil fertility
- ✓ Decreased wastage of forage
- ✓ Increased quality of forage production
- ✓ Increase water infiltration and soil water holding capacity

Rotational grazing of livestock provides time for the vegetation to regrow following a grazing event and for the vegetation itself to reproduce and propagate further. Herds of livestock inside a fixed paddock under rotational grazing are less selective in their foraging patterns than those operating in a continuous grazing scenario. Under continuous grazing, the livestock prioritize eating their preferred grasses and plants, often leaving undesirable invasive species and a variety of shrubs uneaten. This phenomenon has directly resulted in the conversion of most of these grasslands to shrublands over the past centuries. On the other hand, herds undergoing rotational grazing lead to a uniform impact of foraging across different plant species, reducing the chance of promoting potentially invasive plant species that increase in the presence of continuous grazing. Herds confined to a paddock also produce concentrated hoof impacts on the soils within the paddock, breaking up harmful surface crusts that promote sheet erosion and decrease rainfall infiltration. This enhances the soil structure and environment, making it more amenable to both plant growth and the storage of carbon. Altogether, the decomposition of the roots of the regenerated vegetation over time, combined with the return of carbon to the soil from livestock dung, lead to increases in soil carbon levels, effectively sequestering CO₂. The rotational grazing process, as contrasted with continuous grazing, is displayed below.

Continuous Grazing

Continuous grazing gives livestock ongoing access to the entire pasture and often leads to overgrazing.



Rotational Grazing

Under rotational grazing, only one portion of pasture is grazed at a time, allowing the rest of the pasture to 'rest'. To accomplish this, pastures are subdivided, and livestock are moved between paddocks according to changing conditions.

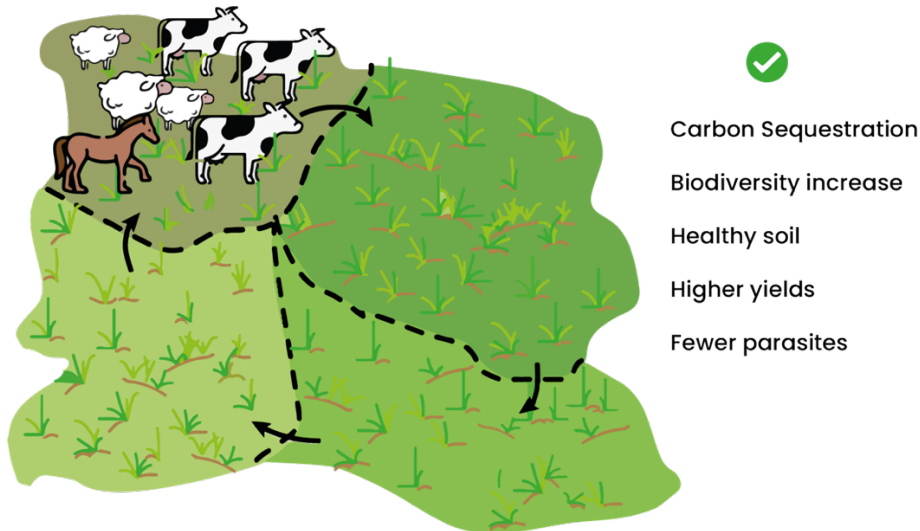


Figure 1: Baseline Scenario (Continuous Grazing) vs Project Scenario (Rotational Grazing)

On the other hand, continuous grazing has led to the loss of the upper soil, low regeneration of the plants/grass, promotion of invasive species, conversion of grasslands to shrublands or even barren lands, excess runoff of rainwater, inadequate forage for livestock, and more. Thus, the differences between ranches utilizing continuous grazing and rotational grazing are quite stark, as seen in Figure 2.



Figure 2: A ranch participating in the project (left) with healthy grass and a ranch not participating in the project (right) with observable overgrazing

Project Implementation Process

Field procedures will be developed as part of the project activity and will be made available during the verification. These procedures will be developed through exhaustive consultations with ranchers and are motivated by the latest research. Ranchers will be given training on how to use technical tools for data to be recorded. With the help of ground implementation staff, project managers will monitor all the activities to make sure data is captured correctly, which is then fed to the database. The number of cattle grazing in paddocks and the time for which the grazing has been done in given paddocks will be recorded. Regular training and awareness creation programs are necessary to improve grazing practices and bring behavior change among the ranchers.

Each private landowner or Ejido will implement their own rotational grazing schedule in collaboration with ground partners who will advise them on best practices and help architect custom practice packages for each ranch. An example of an implementation schedule used by one of the ranchers is given in Figure 3. A real comparison between a freshly grazed paddock and an actively grazed paddock in a ranch participating in the project is shown in Figure 4.

FÓRMULA DE PASTOREO
EJEMPLO

TAMAÑO DEL POTRERO 103 HAS DEL RANCHO 612 X PERIODO
DE DESBANDO 90 EN VERDE O 275 EN SECO
INICIO 3-JULIO - 2021

POTRERO DE LA ISLA 152 HAS 23 DIAS VERDE 70 DIAS SECO 19 AGO - AL	POTRERO DE LA CUEVA 174 HAS 25 DIAS VERDE 78 DIAS SECO 29 JULIO - 19 AGO - 210
POTRERO DEL RANCHO 103 HAS 15 DIA VERDE 46 DIAS SECO	POTRERO DE LOS CARMENES 178 HAS 26 DIAS VERDE 79 DIAS SECO DEL 3 AL 29 JULIO - 69 17 AL 29 JULIO - 129

Figure 3: The “formula” or management plan used by one of the project’s ranchers to manage their livestock, as implemented since July 3, 2021 – across 4 paddocks (“potreros”) of 157, 174, 103 and 178 hectares respectively. As seen in the image, the rancher uses each paddock for 15-25 days during the wet season (“verde”) and 50-80 days during the dry season (“seco”).



Figure 4: Cows entering a new, fresh paddock (left) that has just been opened to them after a year of rest, compared to a freshly eaten paddock (right) that the cows just left.

A significant amount of dung can be observed in the freshly eaten paddock – which ultimately contributes nutrients to the further growth of the grass. Furthermore, a uniform foraging impact across the freshly eaten paddock is visible.

Optionally, since this is an arid region, some ranchers also adopt various water conservation related measures that enhance biomass growth and thus increase soil carbon. The region is highly prone to flash floods – wherein a large amount of rainfall occurs in just a few hours and the water from the ensuing rainfall moves very fast across the land surface before reaching the endorheic seasonal lakes of the region. Very little water infiltration occurs in highly degraded lands with sparse vegetation, and thus most of the rainwater is lost and unavailable for regenerating the land. Water conservation practices are used to mitigate this loss and some examples of these interventions include:

1) Keylines



Figure 5: Keylines freshly drawn on a sloped terrain

Keylines are lines that are selectively ploughed by the rancher (either with tractors or livestock) that are parallel to the natural contours. These may be utilized in ranches that have noticeable elevation variations and enable infiltration to occur more effectively at the key line. This allows for biomass to grow better in and around the key line from the enhanced soil moisture and increases soil organic carbon.

2) Gabions



Figure 6: A gabion built on a seasonal stream of a ranch

Gabions are rock walls/dams that are set up in areas that have streams or other significant regions of sloped water flow. They hold back water, allowing for its accumulation and thus gradual infiltration increasing soil moisture, enhancing biomass growth and thus soil carbon. The gabions are constructed with rocks and stones sourced from the surroundings.

3) Ponds & Microbasins



Figure 7: A microbasin (left) and a pond (right) dug a few years ago. Part of the ridge surrounding the edges of the pond can be seen near the rancher in the top-right portion of the image

These features also lead to water accumulation and aid in gradual infiltration of water into the soil. The improved soil moisture allows grass to grow better in these areas than in others. These features are usually made using tractors or livestock. Sometimes the ponds and microbasins are also seeded by collecting seeds from grasses in the surroundings.

Training and awareness creation programs

As a part of the capacity building programs, training and awareness creation programs are planned for the ranchers. The content of the training will depend on participatory evaluation of the project's key stakeholders, ranchers. These trainings and capacity building programs help ranchers in adopting new techniques by developing the skills required. There are several such programs that have already been conducted.



Figure 8: Workshop awareness creation materials



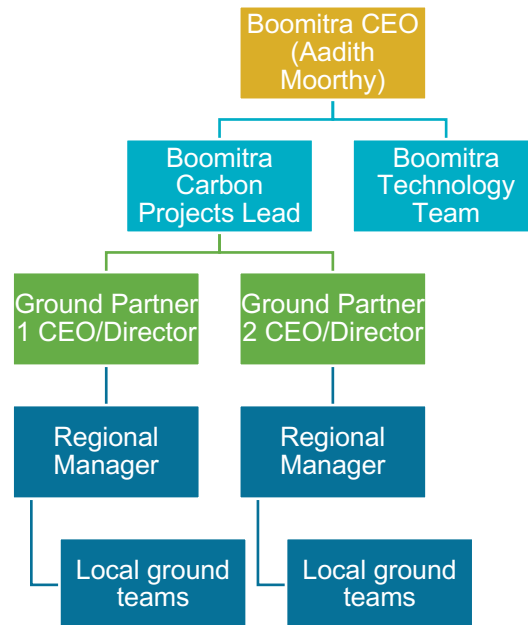
Figure 9: Workshop on regenerative workshop and farming models



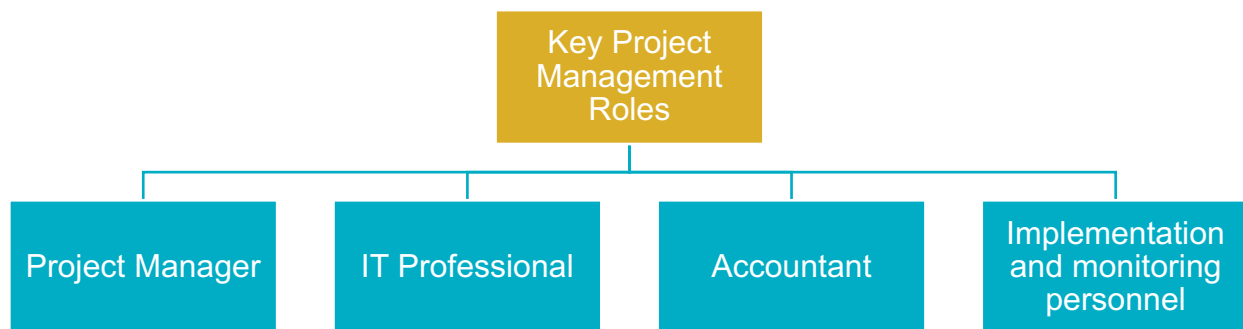
Figure 10: Sharing experiences on rotational grazing

1.11.1 Project organizational setup

The project will operate under the guidance of the Boomitra carbon projects team and technology team, along with our partners. All technical support will be provided by Boomitra and all project activities will be executed by our partners. Agreements have been made between Boomitra and local partners clearly explaining the roles and responsibilities of both Boomitra and local partners. The following organizational setup has been planned for this project's implementation and monitoring.



Our local ground partners have been working with ranchers for many years to promote sustainable grassland management to improve soil health and create carbon sequestration. Boomitra has developed the key technology components required for the project, including the measurement of soil carbon to 30 cm depth and the tools and interfaces for farmer enrollment, implementation, and MRV activities



1.11.2 Jurisdictional REDD+ Programs

This project activity and location are not covered by any jurisdictional REDD+ program.

1.12 Project Location

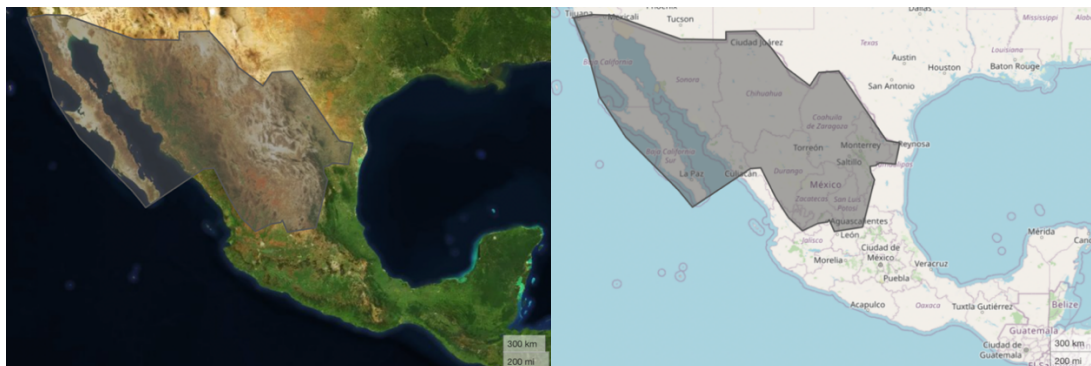
Country: Mexico

States: Aguascalientes, Baja California, Baja California Sur, Chihuahua, Coahuila, Durango, Guanajuato, Nuevo Leon, San Luis Potosi, Sinaloa, Sonora, Tamaulipas, Zacatecas.

State	Longitude (W)	Latitude (N)
Aguascalientes	102° 52' 26.40" W 101° 50' 06.00" W,	21° 37' 20.28" N 22° 27' 34.56" N
Baja California	118° 21' 54.00" W 112° 17' 49.20" W	28° 00' 00.00" N 32° 43' 07.32" N
Baja California Sur	115° 13' 26.40" W 109° 24' 46.80" W,	22° 52' 19.20" N 28° 00' 00.00" N
Chihuahua	109° 04' 30.00" W 103° 18' 25.20" W	25° 33' 31.68" N 31° 47' 04.20" N
Coahuila	103° 57' 36.00" W 99° 50' 35.16" W,	24° 32' 33.72" N 29° 52' 48.00" N
Durango	107° 12' 36.00" W 102° 28' 22.80" W,	22° 20' 42.36" N 26° 50' 41.64" N
Guanajuato	102° 05' 49.20" W 99° 40' 16.68" W,	19° 54' 46.08" N 21° 50' 21.84" N
Nuevo Leon	101° 12' 25.20" W 98° 25' 17.76" W,	23° 09' 45.72" N 27° 47' 56.76" N
San Luis Potosi	102° 17' 45.60" W 98° 19' 33.60" W,	21° 09' 36.72" N 24° 29' 29.40" N
Sinaloa	109° 26' 52.80" W 105° 23' 31.20" W,	22° 28' 01.56" N 27° 02' 32.28" N

State	Longitude (W)	Latitude (N)
Sonora	115°03'10.80" W 108°25'26.40" W,	26°17'49.20" N 32°29'38.04" N
Tamaulipas	100°08'42.00" W 97°08'39.12" W,	22°12'25.20" N 27°40'44.76" N
Zacatecas	104°21'14.40" W 100°44'31.20" W,	21°02'30.84" N 25°07'30.72" N

Table 1: Geocoordinates of the states⁴

Figure 11: Political Map of Mexico⁵

Figure 12: The Northern Mexico region covered by this project. Map data sources: Mapbox⁶, OpenStreetMap⁷

⁴ INEGI. 2020. *México en cifras*. [online] Available at: <<http://en.www.inegi.org.mx/app/areasgeograficas/default.aspx>> [Accessed 19 January 2022].

⁵ Embamex.sre.gob.mx. 2016. *Maps of Mexico*. [online] Available at: <<https://embamex.sre.gob.mx/nigeria/index.php/en/information-about-mexico/maps-of-mexico>> [Accessed 19 January 2022].

⁶ Mapbox. 2021. Retrieved from <https://www.mapbox.com/>

⁷ OpenStreetMap contributors. 2015. Planet dump. Retrieved from <https://planet.openstreetmap.org>

A GeoJSON with a more detailed set of coordinates is available separately.

1.13 Conditions Prior to Project Initiation

The project areas include vast lands of the Chihuahuan and the Sonoran deserts. These deserts have very rich and diversified ecosystems. The Chihuahuan Desert is considered the most diverse desert in the Western Hemisphere and one of the most diverse arid regions in the world. At the same time, due to the prevailing land management conditions, it is also one of the most endangered regions of the world.

Climate

The project location is characterized primarily by the Köppen classification BWh (hot desert), with significant areas of BWk (Cold desert), BSh (Hot semi-arid) and BSk (Cold semi-arid). Being a desert region, the project location receives very low rainfall for most of the year, with the exception of the summer months from July to September. The climate consists of hot summers and cool to cold, dry winters.

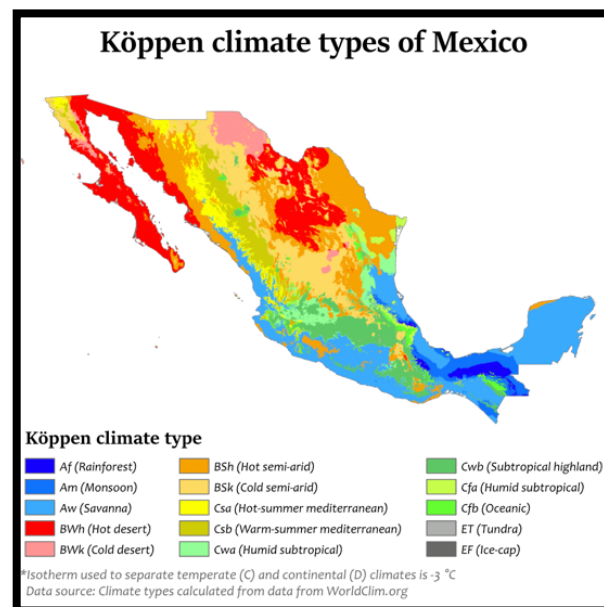


Figure 13: Köppen Climate zones of Mexico⁸

Hydrology

Northern Mexico has several endorheic basins, where playas form and fill during the summer rainy season⁹. Beyond the rains of the summer months, the region is arid and as a result, there are few permanent streams or rivers, with the vast majority being seasonal. A few notable seasonal rivers are the Nazas River and the Aguanaval River, which both drain into the Comarca Laguna region of the Chihuahua

⁸ Fick, S.E. and R.J. Hijmans, 2017. WorldClim 2: new 1km spatial resolution climate surfaces for global land areas. *International Journal of Climatology* 37 (12): 4302-4315.

⁹ Nps.gov. 2018. *Chihuahuan Desert Ecoregion*. [online] Available at: <<https://www.nps.gov/im/chdn/ecoregion.htm>> [Accessed 19 January 2022].

desert, an endorheic basin. The mouth of the Colorado River is in the very northern portion of the region near the border of Baja California with the state of California in the USA – however, due to prolonged droughts in the Western US and overextraction of river water for human use in the US, the river often does not reach its mouth and does not contribute meaningfully to the hydrology of the region¹⁰. The region is bounded in the northwest by the watershed of the permanent Rio Grande River (known as the Rio Bravo del Norte in Mexico), including the Rio Conchos, its largest tributary and the largest river in the state of Chihuahua. These hydrological features are shown in the watershed and basin maps below.



Figure 14: Major Watersheds of Mexico¹¹

¹⁰ Runyon, L., 2019. *Five Years Later, Effects of Colorado River Pulse Flow Still Linger*. [online] News.azpm.org. Available at: <<https://news.azpm.org/p/news-topical-sci/2019/4/9/149304-five-years-later-effects-of-colorado-river-pulse-flow-linger/>> [Accessed 19 January 2022].

¹¹ Paulo Petry and Leonardo Sotomayor. 2009. Mapping Freshwater Ecological Systems with Nested Watersheds in South America. The Nature Conservancy. Available at: <<https://databasin.org/datasets/5637f67d31d94a1cb165cdbddb8c4257/>> [Accessed 19 January 2022].

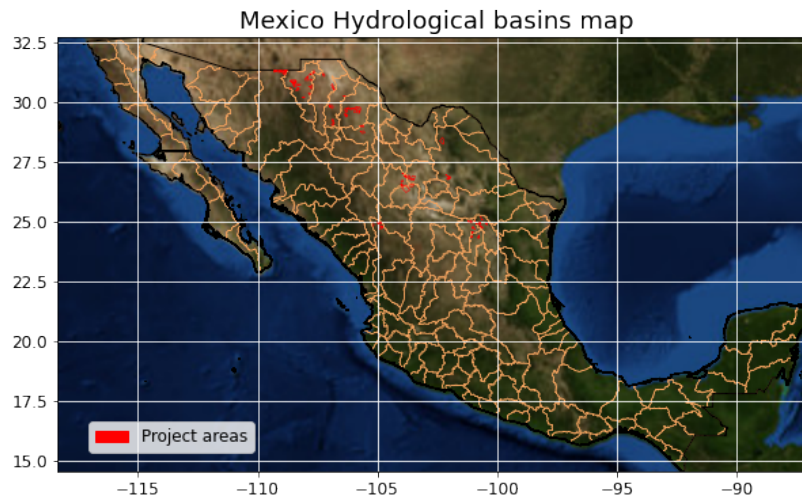


Figure 15: Mexico Hydrological Basin Map

Topography

The Northern Mexico region consists of broad desert valleys (basins) bordered by terraces, mesas, and mountains (ranges)⁹. The two main ranges are the Sierra Madre Occidental in the western portion and the Sierra Madre Oriental in the eastern portion. These are part of the North American Cordillera. The higher elevations tend to produce “sky islands” with wetter climates and coniferous forests different from the desert landscape of the surrounding region, but the sky islands are not a target implementation area for the project activity. The remaining region is largely part of the so-called Altiplanicie Mexicana or Central Mexican Plateau. It is a region with an average elevation of 1,825 m above sea level.

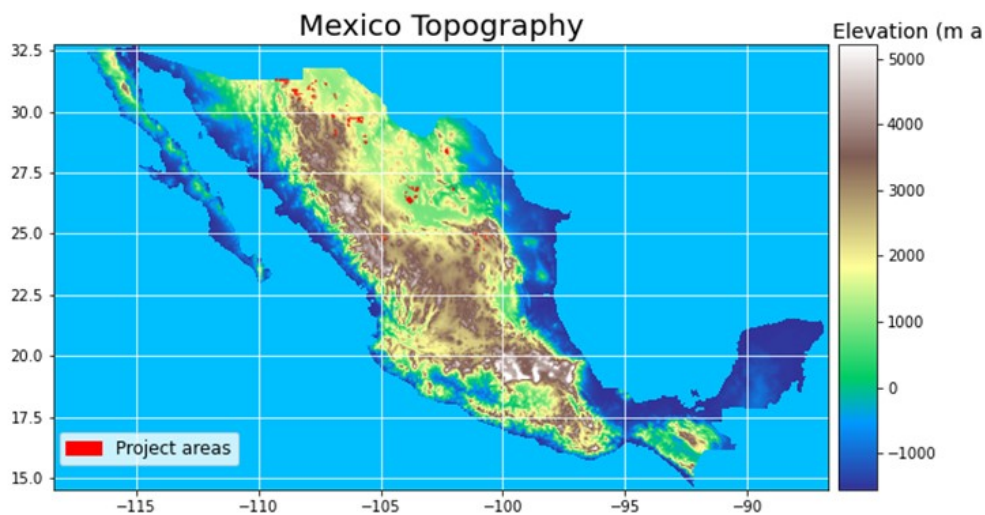


Figure 16: Mexico Topography Map

Historical Conditions

Please refer to Section 3.4 Baseline Scenario for the historical conditions of how the land has been managed prior to the project activity being implemented. Due to the maintenance of this baseline scenario and the knowledge barriers noted in the Additionality checks (Section 3.5), it is clear that GHG emissions were not purposefully generated for their subsequent reduction / removal / destruction.

Centuries prior to the establishment of the baseline scenario of Section 3.4 (before the Spanish Conquest), the region was dominated by nomadic tribes. Livestock grazing was unknown in the region, as there were no cattle, goats, sheep or horses in the Americas. Furthermore, prior to the Conquest, herds of bison would move in migratory groups throughout the “Great Bison Belt” ranging from Canada to Northern Mexico¹². As the bison migrated, they would naturally move from pasture to pasture, without causing any given section of land to become degraded. The threat of predation by wolves caused the bison to graze in tight herds, resulting in localized grazing similar to a managed paddock. The project activity of rotational grazing effectively mimics the kinds of conditions that existed before the arrival of land ownership structures and livestock rearing businesses as we know today.

Soils

The largest soil groups in the northern regions of Mexico in the project location are Cambisols, Calcisols and Leptosols. Calcisols are characterized by a strong accumulation of lime – leading to very fertile soils with high potential for natural biomass generation. Cambisols are characterized by low profile differentiation but are considered highly productive agricultural soils, which may be part of the reason for the ongoing expansion of farmland in the region. Leptosols are characterized by a gravelly or stony texture and can be low in fertility and can be representative of significant erosion taking place. This erosion may be related to the existence of overgrazing in the region leading to land degradation.

¹² Isenberg, Andrew C. *The Destruction of the Bison: An Environmental History, 1750-1920*. New York: Cambridge University Press, 2000.

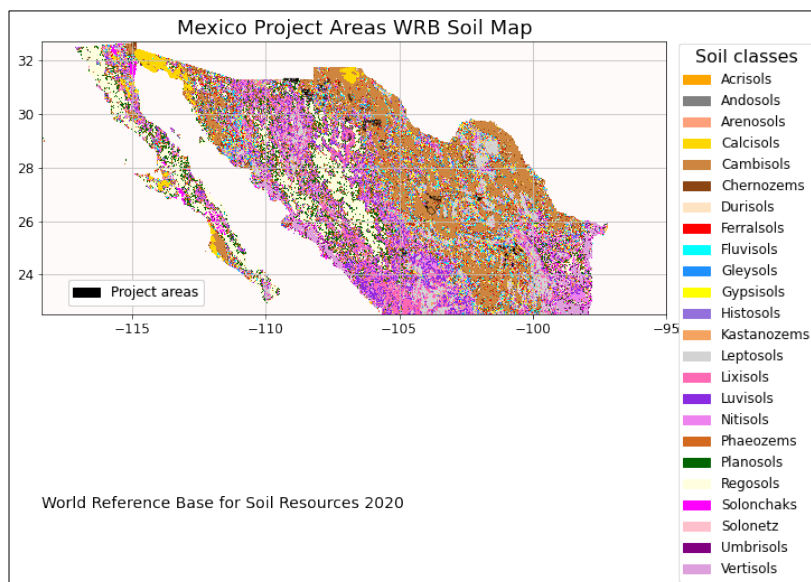


Figure 17: Detailed Soil Map of Mexico

Rainfall

Over recent years, droughts have intensified over the entire Northern Mexico region. In 2020 the region experienced a severe drought, which even led to riots¹³. These kinds of severe weather events will only become more common with climate change. A recent report on drought conditions in Mexico forecasts a period of water scarcity, with supplies unable to keep up with growth in agricultural and residential water use¹⁴.

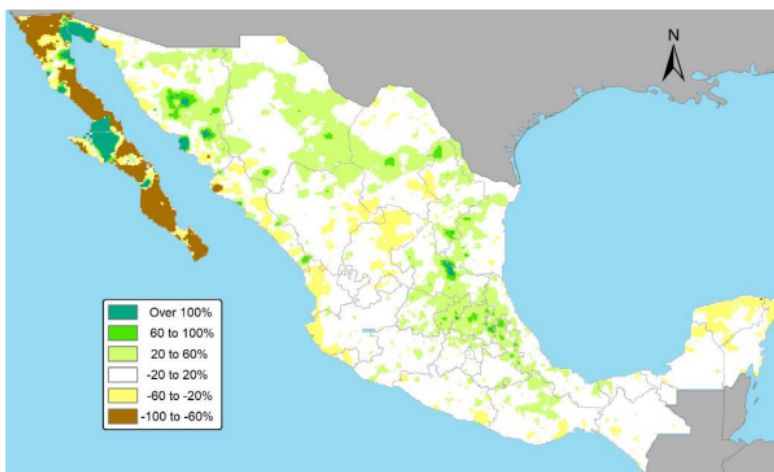


Figure 18: Deviations in rainfall from 30yr averages, for June 2021. Source: INIFAP

¹³ Agren, D., 2020. *Mexican farmers revolt over sending water to US during drought*. [online] The Guardian. Available at: <<https://www.theguardian.com/world/2020/sep/25/mexico-water-debts-us-farmers>> [Accessed 19 January 2022].

¹⁴ Chavez, L., 2021. *Drought Conditions in Mexico and Its Effect on Agriculture*. [online] Available at: <https://reliefweb.int/sites/reliefweb.int/files/resources/Drought%20Conditions%20in%20Mexico%20and%20Its%20Effect%20on%20Agriculture_Monterrey%20ATO_Mexico_06-02-2021.pdf> [Accessed 19 January 2022].

Ecosystem and Flora & Fauna

Northern Mexico is considered among the world's most biodiverse arid regions, with a significant presence of unique flora and fauna. For example, the Chihuahuan desert has one fourth of the world's cactus species, 170+ reptile and amphibian species, 130+ mammal species and 400+ bird species. These lands also fall in the migratory paths of many North American migratory birds who prefer to spend the winter months in these regions. Nearly 1000 plant species can be found in this area. Some distinctive habitat types in the Chihuahuan Desert include yucca woodlands, playas, gypsum dunes, and a diverse array of freshwater habitats. Vast desert grasslands and a wide variety of yuccas and agaves, including many endemic species, also make this desert extremely unique⁹.

The general vegetation cover is dominated by grasses, complemented by cacti, mesquite, agave and other local species¹⁵. However, in degraded areas, there may be very few grasses and mostly shrubs dominating the landscape, along with reduced biodiversity.

The biodiversity coexists along with the livestock that are owned by the ranchers – primarily cattle, goats, sheep and horses.



Figure 19: Some of the vibrant fauna observed on the ranches participating in the program. Clockwise from top-left: a Rattlesnake, a Chihuahua Desert Horned Lizard, a Mexican Prairie Dog and a Bolson Tortoise (or Mexican Giant Tortoise). The latter three are endemic.

¹⁵ Williams, C., Olson, D., Valero, A. and Allnut, T., n.d. *Southern North America: Northern Mexico into southwestern United States*. [online] World Wildlife Fund. Available at: <<https://www.worldwildlife.org/ecoregions/na1303>> [Accessed 19 January 2022].

Land Use Land Cover (LULC) Scenario

Detailed analysis has been done to see the changes in the land use scenarios since 2005. LULC maps are included in Section 3.4, and they outline the differences observed over time. As per methodological requirements, land remained as grasslands before the project implementation (10 years before). The project area has not been cleared of native ecosystems within the 10-year period prior to the project activity.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

Project activities are intended to follow all applicable legal and regulatory requirements of local, state and national policies. There are no laws today in Mexico that prevent the implementation of the proposed project activity. The proposed project activity adheres to the following laws:

1. Article 4 of the Political Constitution of the United Mexican States, which says that any person has the right to a healthy environment for their development and well-being. Environmental damage and deterioration will generate a liability for whoever provokes them in terms of the provisions by the law¹⁶.
2. General Law on Climate Change (2012): This law stipulates aligning activities on mitigation and adaptation between the different government entities. It sets certain emission reduction goals for the future to generate at least 35% of power with clean technologies by 2024 and to reduce emissions by 30% by 2020, and 50% by 2050 compared to 2000¹⁷. This law also emphasizes adaptation measures to strengthen the resilience of natural and human systems. These measures aim to reduce social and environmental vulnerability.
3. The General Law of Ecological Balance and Environmental Protection (Ley General del Equilibrio Ecológico y Protección al Ambiente) (Ecology Law); the General Wildlife Law (Ley General de Vida Silvestre); and the Fisheries Law (Ley de Pesca) and the Regulation to the Fisheries Law (Reglamento de la Ley de Pesca). Recently Mexico repealed the Official Mexican Standard (Norma Oficial Mexicana (NOM)) NOM-059-ECOL-1994, and issued NOM-059-ECOL-2001. These laws and standards require that wild flora and fauna be broadly protected¹⁸.
4. General Law for Sustainable Forest Development: this law promotes sustainable forest management to increase forest carbon stocks through active participation of vulnerable communities¹⁹. The project activities in this project do not involve forest carbon, but many of the general principles promoted by this law are also pertinent to running a grassland project with positive communal and environmental benefits.
5. Development of projects on social property: Since the proposed AFOLU project involves the use of social lands (Ejidos), all the contracts and agreements are based on the provisions of the

¹⁶ Universidad Nacional Autónoma de México. 2015. *Constitución reordenada y consolidada*. [online] Available at: <<https://www2.juridicas.unam.mx/constitucion-reordenada-consolidada/en/vigente>> [Accessed 19 January 2022].

¹⁷ IEA. 2012. *General Law of Climate Change (Mexico)*. [online] Available at: <<https://www.iea.org/policies/8683-general-law-of-climate-change-mexico>> [Accessed 19 January 2022].

¹⁸ Commission for Environmental Cooperation. 2022. *Summary of Environmental Law in Mexico*. [online] Available at: <<https://moose.cec.org/moose/lawdatabase/mxdoc.cfm?varlan=english&topic=17>> [Accessed 19 January 2022].

¹⁹ Secretaría de Medio Ambiente y Recursos Naturales, Gobierno de México. 2018. *Ley General de Desarrollo Forestal Sustentable*. [online] Available at: <<https://www.gob.mx/semarnat/acciones-y-programas/ley-de-desarrollo-forestal-sustentable>> [Accessed 19 January 2022].

Political Constitution of the United Mexican States, as well as the Agrarian Law and its regulations. Article 9 of the Agrarian Law states that ejidos own all real property granted to them as well as any property that they may have acquired title to by any other means. The same themes are also present in Section VII of Article 27 of the Constitution, which states that Ejidos “shall have legal capacity to enjoy common possession of the lands, forests, and waters belonging to them or which have been or may be restored to them”²⁰.

6. Convention on International Trade in Endangered Species of wild fauna and flora (CITES), 1973. Mexico is one of the parties that has signed this convention²¹.
7. Convention on Biological Diversity (CBD), 1992: The CBD’s aims are the conservation of biodiversity, sustainable use of biological resources and equitable sharing of benefits arising from their sustainable use. The project complies with this convention by promoting sustainable management of grasslands, conservation of grasslands and their resources, and improving the livelihood of dependent communities. Mexico also ratified this convention in 1992²².
8. Stockholm Declaration of the United Nations Conference in Human Environment (1972): Mexico is also one of the parties of this convention²³. The Stockholm Declaration stipulates a person’s right to freedom, adequate condition of life and responsibilities towards the environment and sustainable future of the planet. The proposed AFOLU project provides a framework whereby the Project Proponent, local communities and other relevant stakeholders can protect and restore grasslands and sustainably manage the resources available therein, leading to an improvement in the socio-economic conditions of the community.
9. Human Rights: Mexico has ratified all international human rights treaties²⁴.
10. United Nations Declaration on the Rights of Indigenous Peoples: Mexico has voted in favor of this convention²⁵. Currently, none of the lands are held by groups that are considered to be indigenous people today in Mexico – however, if any such lands are added in the future, the rights of the indigenous people will be prioritized.
11. There are 81 International Labor Organization (ILO) conventions ratified by Mexico, out of which 68 are in force²⁶. The project activity does not involve production, trade or other commercial activity requiring a large labor force. The project activity does not deal with setting up a factory and recruiting employees, and hence is not complicit in restricting these freedoms and rights. Mexico has ratified ILO convention 29 and 105 on elimination of forced and compulsory labor.

²⁰ Constitution of Mexico. [online] Available at: <https://web.oas.org/mla/en/Countries_Intro/en_mex-int-text-const.pdf> [Accessed 19 January 2022].

²¹ Convention on International Trade in Endangered Species of Wild Fauna and Flora. 2022. *List of Contracting Parties*. [online] Available at: <<https://cites.org/eng/disc/parties/chronolo.php>> [Accessed 19 January 2022].

²² Convention on Biological Diversity. 2022. *List of Parties*. [online] Available at: <<https://www.cbd.int/information/parties.shtml>> [Accessed 19 January 2022].

²³ Undocs.org. 1972. *United Nations Conference on the Human Environment: List of Participants*. [online] Available at: <<https://undocs.org/en/A/CONF.48/INF.5/rev.1>> [Accessed 20 January 2022].

²⁴ UN Treaty Body Database. n.d. *Ratification Status for Mexico*. [online] Available at: <https://tbinternet.ohchr.org/_layouts/15/TreatyBodyExternal/Treaty.aspx?CountryID=112&Lang=EN> [Accessed 19 January 2022].

²⁵ Un.org. 2007. *GENERAL ASSEMBLY ADOPTS DECLARATION ON RIGHTS OF INDIGENOUS PEOPLES; ‘MAJOR STEP FORWARD’ TOWARDS HUMAN RIGHTS FOR ALL, SAYS PRESIDENT* | Meetings Coverage and Press Releases. [online] Available at: <<https://www.un.org/press/en/2007/ga10612.doc.htm>> [Accessed 20 January 2022].

²⁶ International Labor Organization. 2022. *Ratifications of ILO conventions: Ratifications for Mexico*. [online] Available at: <https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:102764> [Accessed 19 January 2022].

The project does not involve and is not complicit in any form of discrimination based on gender, race, ethnicity, class, caste, language, religion, age, disability, nationality, sexual orientation or any other basis (ILO 100 and ILO 111).

12. In addition, in Mexico, la Ley General de Consulta de los Pueblos y Comunidades y Afromexicanas²⁷ mandates that local stakeholders from indigenous communities be provided a very clear and communicative consultation for them to properly understand how any project impacts their communities. However, most of the inhabitants of this region and all of the participating ranches are not considered indigenous communities today. Regardless, this requirement is met by the full Local Stakeholder Consultation (Section 2.2) being conducted.

Mexico has submitted its Nationally Determined Contributions (NDC) to the UNFCCC, in which it has committed to reduce 22% of greenhouse gas emissions (GHG) and 51% of black carbon emissions by 2030 as compared to the baseline business-as-usual scenario (BAU). Additionally, it has committed a reduction of up to 36% of GHG emissions and 70% of black carbon emissions by 2030 compared to the BAU scenario. Economic activities included in the NDC include Transport, Power Generation., Residential and Commercial buildings, oil and gas, industry Agriculture and livestock, waste, Land use, land use change and forestry²⁸. To achieve committed goals, Mexico has planned to improve and adapt energy efficient solutions across the sectors. Promoting sustainable agriculture, agroforestry, and other conservation practices are some of the important actions foreseen by the government. REDD+ is another important activity where the government wants to strengthen its policies and strategies to have zero deforestation rate.

The proposed project does not overlap with any of the Nationally Determined Commitments and the project has a robust mechanism to identify each and every parcel of land associated with the project to avoid any double counting project carbon credits.

1.15 Participation under Other GHG Programs

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

This is a grouped project. This grouped project is neither registered in any other GHG program nor going to register or participate in any other GHG Programs other than VCS. All new project instances to be added to this grouped project are required to demonstrate whether the project was part of any other GHG program.

Instance 01: This project instance is neither registered in any other GHG program nor going to register or participate in any other GHG Programs other than VCS.

²⁷ CECIG. 2021. *Ley General de Consulta de los Pueblos y Comunidades Indígenas y Afromexicanas*. [online] Available at: <http://cecig.org.mx/wp-content/uploads/2021/04/Minuta_Pueblos_Indigenas_Afromexicanas_Senado_22042021.pdf> [Accessed 19 January 2022].

²⁸ UNFCCC. 2020. *Nationally Determined Contributions*. [online] Available at: <<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Mexico%20First/NDC-Eng-Dec30.pdf>> [Accessed 19 January 2022].

1.15.2 Projects Rejected by Other GHG Programs

The project has not been submitted to any other GHG Programs and has not been rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The project does not intend to reduce or remove, nor has reduced or removed, GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading, for the GHG emission reductions or removals claimed under the VCS Program.

1.16.2 Other Forms of Environmental Credit

The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

1.17 Additional Information Relevant to the Project

1.17.1 Leakage Management

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

1.17.2 Commercially Sensitive Information

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

1.17.3 Sustainable Development

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

1.17.4 Further Information

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

2 SAFEGUARDS

2.1 No Net Harm

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

2.2 Local Stakeholder Consultation

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

2.3 Environmental Impact

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

2.4 Public Comments

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

2.5 AFOLU-Specific Safeguards

This section has been omitted intentionally as per the section 3.1.3 VCS registration and issuance process V4.1.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The details of the methodology and tools applied for the grouped project are given below:

Title	Improved Agricultural Land Management
Version	2.0 (under development ¹)
Reference	Approved VCS Methodology VM0042
Version date	21 December 2021
Sectoral Scope	14
Tools Applied	AFOLU Non-Permanence Risk Tool to estimate buffer credits as per VCS standard requirement.

Table 2: Details of the methodology and tools applied

3.2 Applicability of Methodology

Grouped Project

All new activities must meet applicability conditions listed in the below Table 3 and demonstrate with justification in the project document

Instance 01

The following table provides details of how project Instance 01 is eligible under Section 4 of the VM0042 methodology:

Applicability Condition	Justification
Projects must introduce or implement one or more new changes to pre-existing agricultural management practices.	The project activities are new activities implemented by the landowners relative to the baseline scenario. The current baseline scenario is continuous unsustainable grazing on community-owned or privately-owned grasslands. The proposed project activity introduces and expands new sustainable improved grassland management practices such as rotational grazing on subdivisions of ranches known as paddocks.
Project activities must be implemented on land that is either cropland or grassland at the project start date and remains cropland or grassland throughout the project crediting period.	The project is implemented on grasslands. The land has remained a grassland prior to the project and after the start of the project. This is the natural state of the land which is verified by satellite images over the past 10 years. As per the methodology, land use change is allowed under certain scenarios. However, this project does not promote or allow any land use change during the crediting period.
The project area must not have been cleared of native ecosystems within the 10-year period prior to the project start date.	The ranches have not been cleared of native ecosystems – native ecosystems still exist, and this is verified by satellite images over the past 10 years. Analysis of these satellite images confirms that these lands have remained grasslands and are not converted or cleared of any native ecosystems.
The project activity is not expected to result in a sustained reduction of greater than 5% in productivity, as demonstrated by peer-reviewed	Literature on rotational grazing has been developed for several decades and does not suggest any significant changes to productivity. Extensive studies conducted in nearby Texas in

Applicability Condition	Justification
and/or published studies on the activity in the region or a comparable region.	the US suggest no statistically significant effects on harvest efficiency from the livestock ²⁹ .
The project activity cannot occur on a wetland. Note that this condition does not exclude crops subject to artificial flooding where it can be demonstrated that crop cultivation does not impact the hydrology of any nearby wetlands.	The project area is not a wetland. The project is implemented on grasslands. The land has remained a grassland prior to the project and will remain the same after the start of the project. It is an arid land as noted in Section 1.13
The project activity cannot include application of biochar as a soil amendment.	This is not applicable for this project since no project activity promotes biochar as a soil amendment.
Use of any model in estimating stock change/emissions	The project does not use empirical or process-based models to estimate stock change/emissions, so the stock change/emissions estimation model's applicability conditions are not required

Table 3: Applicability Criteria

3.3 Project Boundary

Grouped Project

The Grouped Project and each new project instance will define their project boundaries as per the VM0042 V2.0 methodology.

The carbon pool included in the Grouped Project and in Instance 01 is outlined in the following table.

²⁹ Heitschmidt, R., Dowhower, S. and Walker, J., 1987. 14- vs. 42-Paddock Rotational Grazing: Aboveground Biomass Dynamics, Forage Production, and Harvest Efficiency. *Journal of Range Management*, 40(3), p.216.

Carbon Pool	Included?	Justification/ Explanation of Choice
Aboveground tree biomass	No	The project does not involve any activity that contributes to aboveground tree biomass.
Aboveground non-tree biomass	No	As per VCS rules this has been excluded. (VM0042, table 2)
Belowground biomass	No	Project does not involve any activity which contributes to belowground tree biomass and there is no provision set aside to monitor this parameter
Dead wood	No	As per VCS rules this has been excluded. (VM0042, table 2)
Litter	No	As per VCS rules this has been excluded. (VM0042, table 2)
Soil Organic Carbon	Yes	Included as per VCS AFOLU Requirements as the landcover under the baseline scenario is comprised of grasslands. The proposed project activity increases this pool in the project scenario.
Wood Products	No	As per VCS rules this has been excluded. (VM0042, table 2)

Table 4: Carbon Included in this project

The project boundary of the Grouped Project and Instance 01 is outlined in the following table.

Source		Gas	Included?	Justification/Explanation
Baseline	Soil Organic Carbon	CO ₂	Yes	Primary stock changing due to rotational grazing and other project activities
Project	Soil Organic Carbon	CO ₂	Yes	Primary stock changing due to rotational grazing and other project activities.

Table 5: Project Boundary

Project activities are taking place throughout the project area, and primarily affect soil organic carbon. All other stock or pool changes are deemed de minimis relative to the total net anthropogenic GHG reductions and removals. Insignificant emission sources are excluded according to the VCS rules.

There is no statistically significant leakage because livestock numbers are not decreasing in a statistically significant manner, at least as seen for the initial crediting period – as measured through continuous

farmer-attested livestock counts, which will be presented in the monitoring report. Furthermore, the methodology explicitly requires that decreases in livestock emissions due to a reduction in livestock numbers not be accounted for credit. Hence, livestock-associated enteric emission changes are not included, as they are also considered de minimis.

Spatial Boundaries

The spatial boundaries of the project area consist of the grasslands located in the Mexican states of Aguascalientes, Baja California, Baja California Sur, Chihuahua, Coahuila, Durango, Guanajuato, Nuevo Leon, San Luis Potosi, Sinaloa, Sonora, Tamaulipas and Zacatecas. The geo-fenced boundaries of individual project areas will be clearly demarked as per Section 5 of the methodology and will be available at any point when new areas are added. The digital files of individual ranchers will be submitted in Keyhole Markup Language (KML) file format as required by the VCS Standard.

At the current time, 800,000 acres are covered by this project, out of the 647,500 km² total area of the Chihuahua Desert and 260,000 km² total area of the Sonora Desert, which will serve as areas for future project instances to expand into.

Details of the complete project areas will be provided as KML files for validation and verification.

3.4 Baseline Scenario

As per the methodology, “For each sample unit, a schedule of activities in the baseline scenario will be determined by assessment of practices implemented during the period prior to the project start date. The interval over which practices are assessed, x years, must be a minimum of 3 years and include at least one complete crop rotation, where applicable. Where a crop rotation is not implemented in the baseline, x= 3 years”.

The baseline scenario is identified as unsustainable grazing practices that have led to grassland degradation to a large extent. In the absence of this project activity, ranchers will continue unsustainable grazing, which further degrades grasslands.

The current “baseline” practice is continuous or otherwise unsustainable grazing, whereby animals repeatedly graze throughout a ranch in small groups, simply as a consequence of the most convenient and least time and energy demanding deployment of livestock. Such types of grazing have been maintained for at least 3 years prior to the farmers’ starting their current improved management practices. However, in almost all cases, it has been maintained for much longer – with many decades of continuous grazing occurring. This is substantiated by the lack of significant local knowledge on rotational grazing prior to its introduction by ground partners, and the general history of the land use over the past few centuries. Overgrazing over the course of this period of time has changed the grassland composition in the project area – resulting in the promotion of invasive species at the expense of native perennial

grasses that are preferably eaten by livestock. The populations of nearly 20 vertebrate species have been detrimentally affected and the land's capacity to support livestock has decreased³⁰.

Mexican grassland grazing history dates back to the 16th century, soon after the Spanish Conquest. It was the Spanish who brought cattle, sheep, goats, donkeys and horses to Mexico, as they were not endemic to the New World. The conquest of Northern Mexico occurred several decades after the establishment of New Spain – and a major allure for Spanish settlers around the end of the 16th Century was the existence of vibrant grasslands. The grasslands were exceptionally vibrant to the point where even wild cattle that escaped from ranches in southern and central Mexico and formed their own herds would make their way to the north to feed on the grass. The settlers in the region (who were often nobility of New Spain, missionaries or other wealthy individuals) quickly established massive haciendas (the imperial Spanish term for an estate), with over 150,000 cattle per a hacienda, which itself could be larger than 65,000 km². The pastures were, in the words of contemporary observers, “inundated with cattle”, suggesting that the quantity of livestock was already in extreme excess. This trend of large haciendas with even larger amounts of cattle continued through the end of the colonial period and even past Mexican independence in 1821, all the way up to the early 20th Century. Notably, the largest landowner in North America at the time was Luis Terrazas of Chihuahua, who owned 6,740,000 acres and raised as many as 140,000 calves a year. Many of the ranches participating in the project today from the state of Chihuahua were originally part of Terrazas’ ranch³¹.

Then came the Mexican Revolution in 1910 – which was largely fomented by rural unrest due to this significant level of inequality. One of the key measures that came out of the revolution was the codification in the new Mexican Constitution that every ranch could only have as much land as needed to raise 500 cattle, or equivalents for other kinds of livestock³². Thus, in pursuit of land reform, the federal government began confiscating large ranches and either selling smaller pieces of land to private individuals or assigning them to “Ejidos”. An Ejido (from the Latin word exitus or way-out) means a field outside human settlements or towns that is used for livestock or orchards. Today, in Mexico, it refers to communal lands granted to rural communities unconditionally by the government in the aftermath of the Mexican Revolution to reduce rural inequality and the rural unrest that led to the Revolution. In Mexico, there are about 53,000 ejidos with approximately 3,000,000 ejidatarios (2.6% of the total population) that occupy about 82,420,000 hectares, representing 42% of the total area of the country³³.

Northern Mexico is covered by vast arid regions and 2 major deserts – the Chihuahuan Desert and the Sonoran Desert. The Chihuahuan Desert spans 647,500 km² across Northern Mexico and the Southwestern United States of America. It is the largest desert in North America, covering the states of Chihuahua, Coahuila, Durango, Zacatecas, Nuevo León, and San Luis Potosí in Mexico and Arizona, New

³⁰ Eric Mellink, Mónica E. Riojas-López; Livestock and grassland interrelationship along five centuries of ranching the semiarid grasslands on the southern highlands of the Mexican Plateau. *Elementa: Science of the Anthropocene* 1 January 2020; 8 20.

³¹ Brand, D., 1961. The Early History of the Range Cattle Industry in Northern Mexico. *Agricultural History*, [online] 35(3), pp.132-139. Available at: <<https://www.jstor.org/stable/3740624>> [Accessed 19 January 2022].

³² Constitute Project. 2015. *Mexico's Constitution of 1917 with Amendments through 2015*. [online] Available at: <https://www.constituteproject.org/constitution/Mexico_2015.pdf?lang=en> [Accessed 19 January 2022].

³³ Data Basin. 2017. *Ejidos of Mexico*. [online] Available at: <<https://databasin.org/datasets/a5e789aa10fb4efbbd8b7b5a1cf8d423/>> [Accessed 19 January 2022].

Mexico and Texas in the United States of America. Furthermore, the Chihuahua Desert holds a unique position among deserts in the Americas from other perspectives: it receives much more rain, a necessity for building biomass and enabling carbon sequestration, than nearby deserts such as the Sonoran and Mojave deserts. Another side-effect of this increased precipitation is enhanced biodiversity. The Chihuahua desert is considered among the world's most biodiverse arid regions, with a significant presence of unique flora and fauna, including one-fourth of the world's cactus species, 170+ reptile and amphibian species, 130+ mammal species and 400+ bird species⁹.

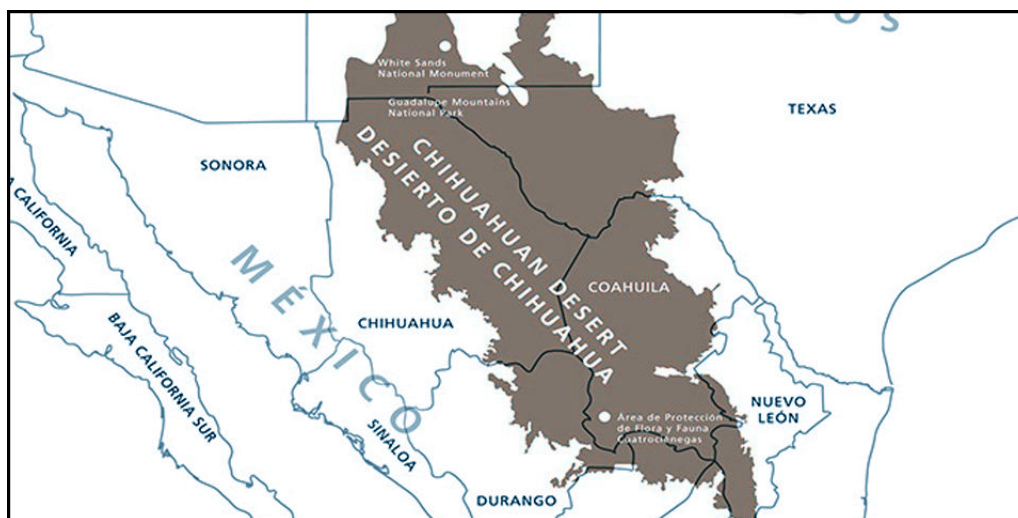


Figure 20: The Chihuahua Desert⁹

The Sonoran Desert spans 260,000 km² across Northern Mexico and the Southwestern United States of America, and is primarily located in the states of Sonora, Baja California and Baja California Sur in Mexico, and Arizona and California in the USA. This desert also has some very unique endemic flora and fauna, including the famous Saguaro Cactus, and 350 bird species, 20 amphibian species, and more³⁴.

These arid regions of Northern Mexico are now under threat from a variety of anthropogenic causes, particularly overgrazing. Overgrazing occurs when plants are subject to heavily intensive grazing from livestock, leading to severe loss of vegetation. Unsustainable ranch management by pastoralists throughout the region has led to severe land degradation, desertification and loss of soil carbon, resulting in CO₂ emissions – lands that were formerly vibrant grasslands have been converted into barren surfaces with loosely scattered shrub vegetation. And when they become unable to sustain their livelihoods on their degraded ranches, ranchers are sometimes forced to sell their land to farmers who convert the grasslands into croplands, resulting in further CO₂ emissions. In addition, it represents a significant loss of habitat for the fauna of the region, coupled with the replacement of the natural flora with crops. According to researchers at Cornell University, if the current trends in cropland conversion are sustained,

³⁴ Malone, M., n.d. *Birds of the Sonoran Desert*. [online] Available at: <<https://animals.mom.com/birds-sonoran-desert-3312.html>> [Accessed 19 January 2022].

the grasslands of the Chihuahua desert will completely disappear by 2025^{35,36}. Furthermore, Boomitra's soil carbon estimates show that the region has collectively released around 2 tons of CO₂ per acre into the atmosphere through soil carbon loss over just the past 5 years – which corresponds to over 400M tons of net CO₂ emission into the atmosphere, as much as the entire country of Mexico accounts as its yearly Greenhouse Gas emissions³⁷.



Figure 21: Ejidos of Mexico³³

Since the land reforms of the 20th century, there has been a mixture of livestock grazing on these lands including sheep, goats, horses and donkeys, with the vast majority being cattle. Paradoxically, the division of the huge landholdings into smaller private ranches and Ejidos has led to further overgrazing and loss of grass due to poor management. Particularly in Ejidos, a tragedy of the commons has developed, leading to significant grassland loss³⁸. This trend of subdivision coupled with loss of grass cover has also led to further devastating consequences for the biodiversity – not only are native flora under heightened

³⁵ Briggs, Mark & Lozano-Cavazos, E. & Poulos, Helen & Ochoa-Espinoza, Javier & Rodriguez-Pineda, Jose. (2019). The Chihuahuan Desert: A Binational Conservation Response to Protect a Global Treasure. 10.1016/B978-0-12-409548-9.11966-9.

³⁶ State of North America's Birds 2016. 2016. *Grasslands*. [online] Available at: <<https://www.stateofthebirds.org/2016/habitats/grasslands/>> [Accessed 19 January 2022].

³⁷ Hannah Ritchie and Max Roser (2020) - "CO₂ and Greenhouse Gas Emissions". *Published online at OurWorldInData.org*. Retrieved from: '<https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>' [Online Resource]

³⁸ Morett-Sánchez, J. and Cosío-Ruiz, C., 2017. Panorama de los ejidos y comunidades agrarias en México. *Agricultura Sociedad y Desarrollo*, 14(1), p.125.

pressure from invasive plants, but even major fauna, such as the American Bison, went extinct in this region over the past century³⁹.

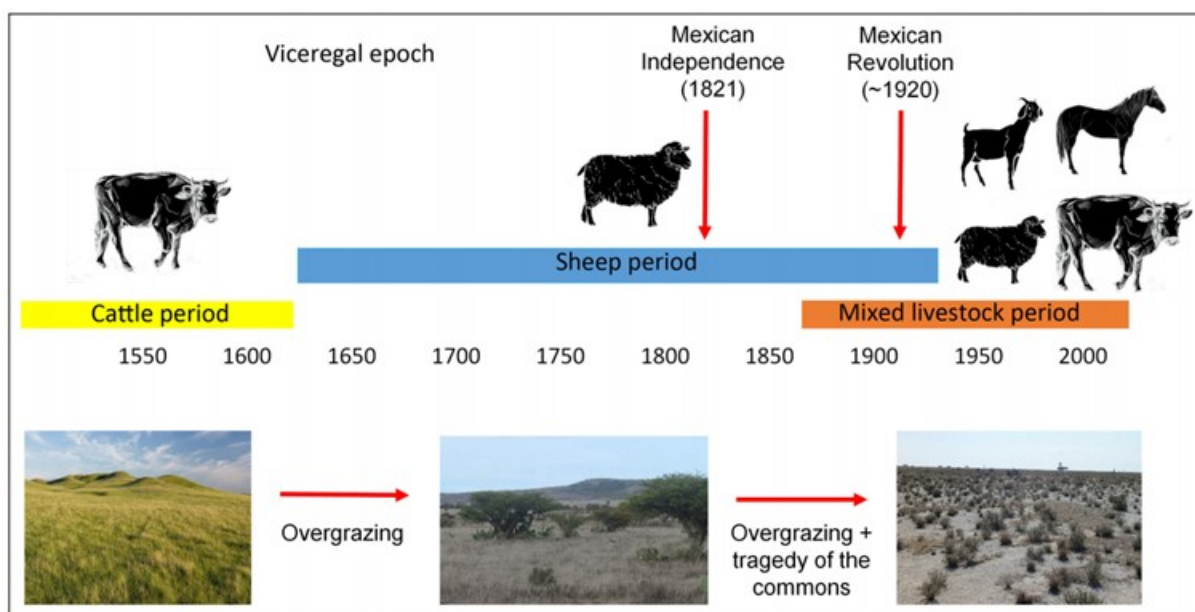


Figure 22: Livestock ranching on grasslands in the southern part of the Mexican Plateau³⁰

The above image shows the consequences of unsustainable grazing practices that have led to land and soil degradation.

Our baseline study shows that there is no use of any synthetic fertilizers, pesticides, herbicides, fungicides, or other agrochemicals on the lands at present. The ranches will also not use any of these in the project scenario as no component of the project activity requires them. However, livestock were fed with Ivermectin to protect them from potential infections earlier (during the baseline scenario). After the project initiation, ranchers are encouraged to stop the use of Ivermectin. This action is taken to promote the health of important insects like dung beetles, which are crucial to breaking up livestock dung and thereby facilitating soil carbon increases.

The baseline analysis of soil carbon has been done using remote sensing technology using satellites throughout the entire electromagnetic spectrum in a proprietary data fusion and machine learning system. This satellite mix allows us to directly probe the soil at depths around ~30cm. (Details of this technology usage will be provided to the VVB during validation and verification). Further information on baseline procedures is also in Section 4.1.

Each ranch is operated independently from the others. Hence, the minimum baseline specifications for each ranch as outlined in VM0042 Table 4 has been collected or is being collected from every rancher along with their attestation. Primarily, these include the “Animal Type” and “Animal Stocking Rate” for

³⁹ Maldonado, C., 2021. *México reintroduce el bison americano 100 años después de su desaparición*. [online] El Pais. Available at: <<https://elpais.com/mexico/2021-01-07/mexico-reintroduce-el-bisonte-americano-100-anos-despues-de-su-desaparicion.html>> [Accessed 19 January 2022].

these ranches. Since these are open rangelands, crops are not grown on these lands, and there is no irrigation, tillage or any kind of nitrogen application used (these practices are unheard of for rangelands in Mexico).

Livestock Population

This project involves rancher communities in the project area. These rancher communities comprise both private individual ranchers, and community ranchers known as Ejidos. Cattle, horses, sheep, goats, and donkeys are grazed. The grazing area and livestock stocking rate varies from person to person and community to community. A complete list of ranchers with all baseline details will be provided separately in an excel sheet for the VVB.

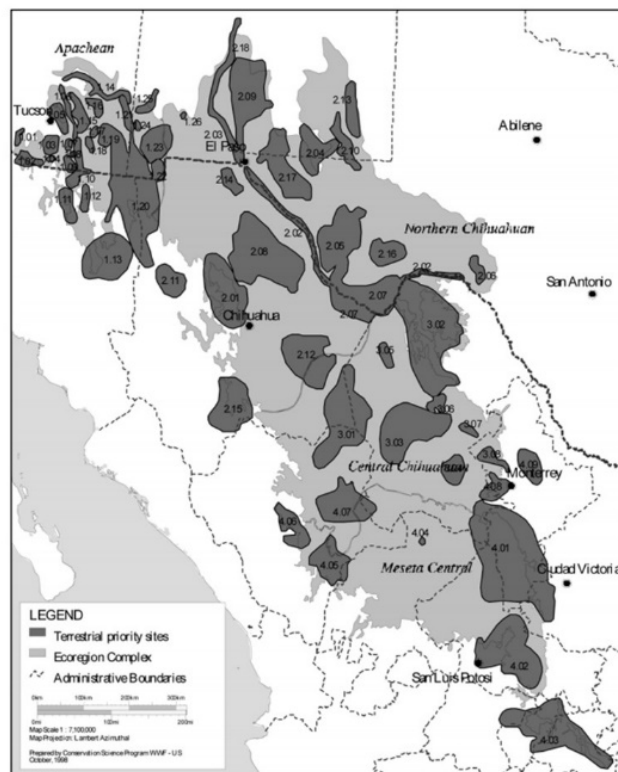


Figure 23: Priority sites for conservation in the Chihuahuan Desert identified by the World Wildlife Fund. These are also regions where Boomitra’s rancher recruitment efforts are focused.⁴⁰

In the absence of the project, there are no plans, and no anticipation of future interventions that would be sufficient to address the various factors that contribute to depletion of SOC due to unsustainable overgrazing.

Overgrazing is the main threat to the grasslands in the project area. Severe loss of vegetation and loss of biodiversity is the outcome of overgrazing. This has led to the degradation of the grasslands and desertification to a great extent. Eventually, overgrazing has resulted in a loss of overall soil health and

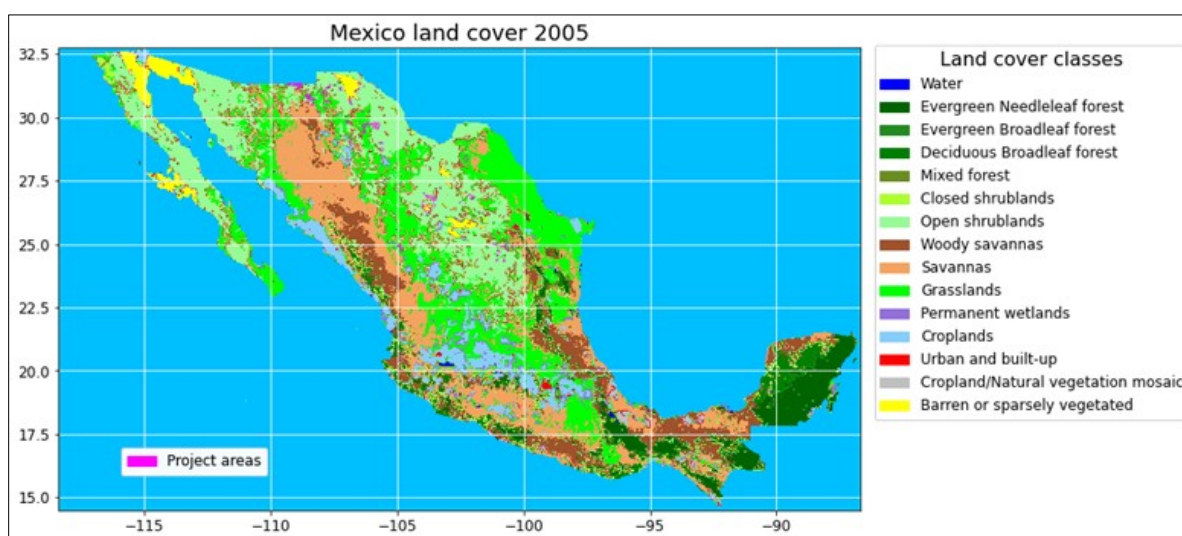
⁴⁰ Desmond, M. and Montoya, J., 2006. Status and Distribution of Chihuahuan Desert Grasslands in the United States and Mexico. *USDA Forest Service Proceedings*.

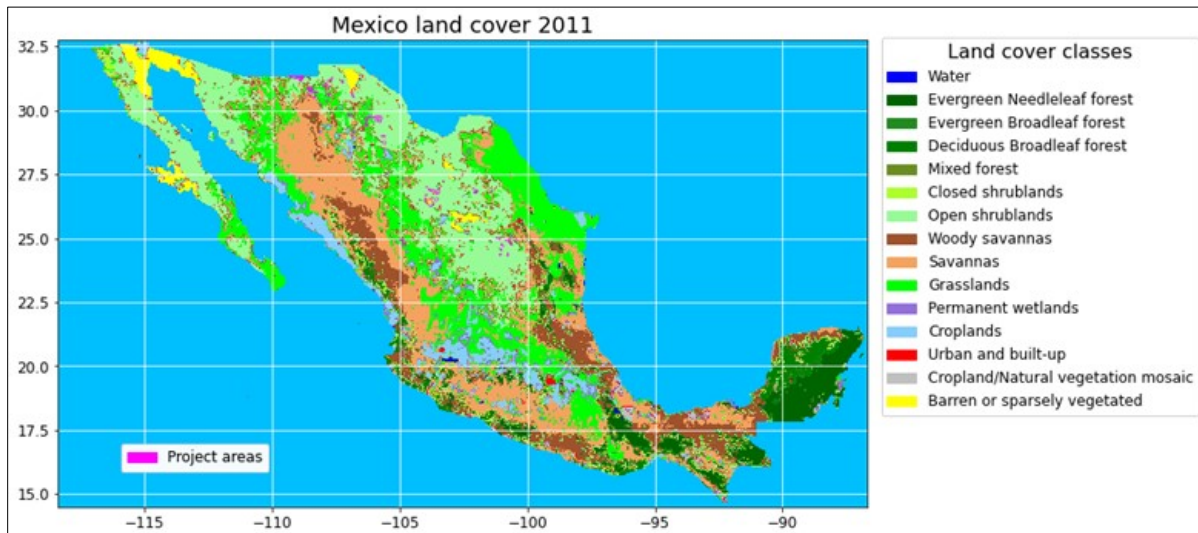
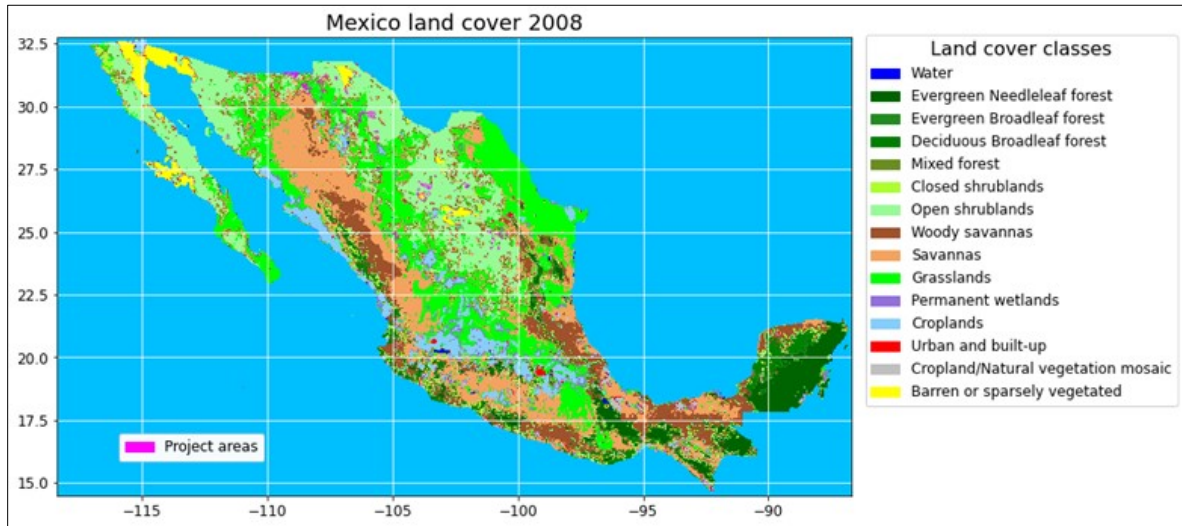
fertility. When perennial grasses are lost due to overgrazing, they are replaced by a sparse distribution of annuals and shrubs that do not meaningfully maintain soil organic carbon or the biodiversity. Additionally, without the project, the ranchers are incentivized to convert grasslands to croplands to continue to maintain their livelihoods. Flora, fauna and rancher livelihoods are at risk due to the trends and practices that prevail in the baseline scenario.

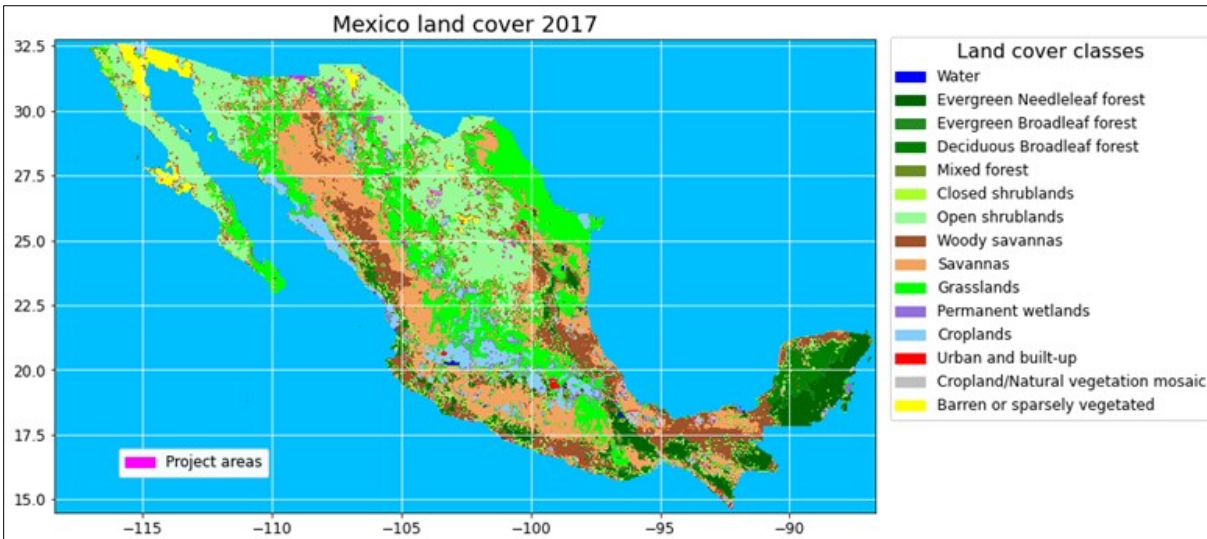
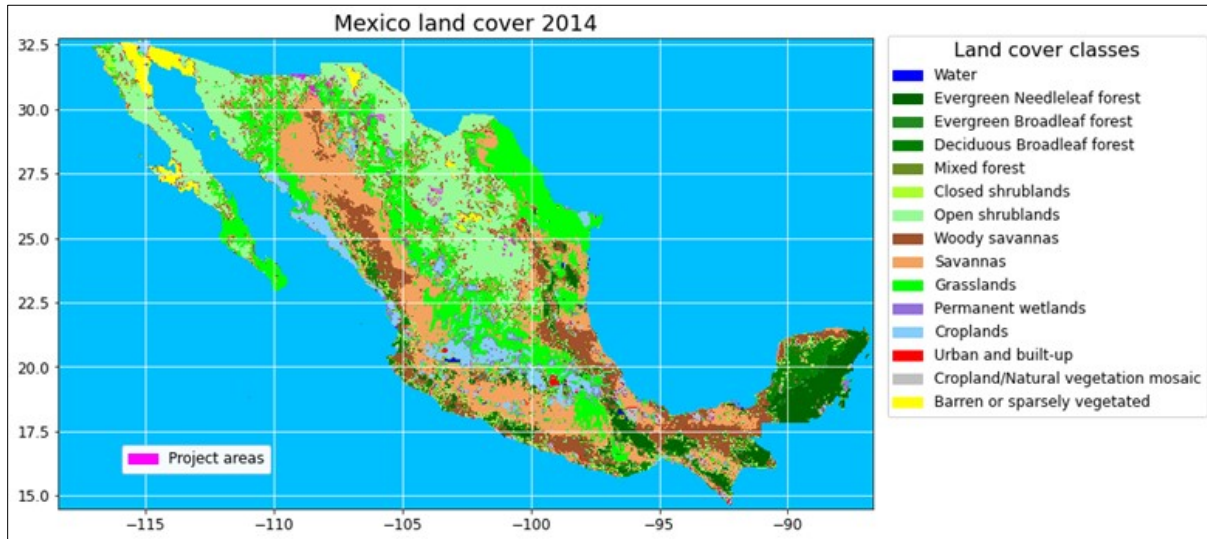
Baseline SOC stocks are directly measured in baseline control sites, selected based on the methodology guidelines and elaborated in further detail in separate documentation available to the VVB at validation.

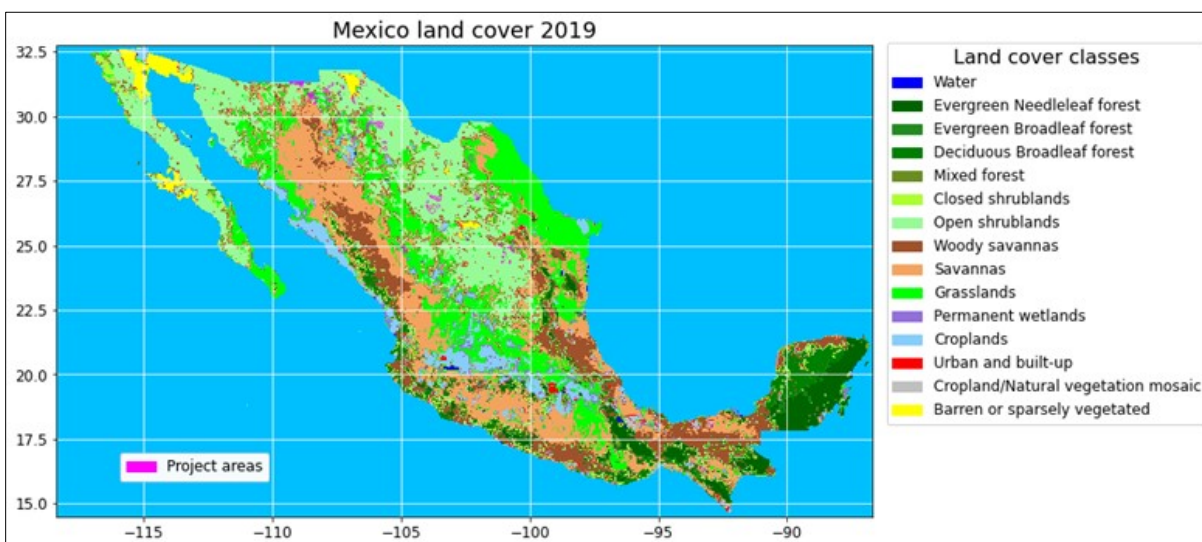
The baseline shall be updated every 10 years in accordance with Section 3.8 of the VCS Requirements on renewal of baselines. The procedure for updating the baseline shall be done with reference to Section 9.3 of the applied methodology. The baseline estimated for calculating carbon removals across the landscape will be re-evaluated at an interval of every 10 years from the project start date to reflect changing environmental, technological, and socio-economic scenarios. The baseline re-evaluation includes procedures available at the time of re-evaluation.

The below series of figures show land use and land changes of the project location before the project implementation:









An LULC analysis of Mexico revealed that the area covered by grasslands is decreasing, and open and shrublands are increasing over time.

Landcover Type	2005	2008	2011	2014	2017	2019
Water	0.77	0.78	0.77	0.77	0.76	0.77
Evergreen Needleleaf forest	0.05	0.06	0.06	0.06	0.08	0.07
Evergreen Broadleaf forest	7.81	7.76	7.41	7.56	7.31	7.34
Deciduous Broadleaf Forest	4.05	4.21	4.31	4.23	4.51	4.66
Mixed forest	0.32	0.37	0.34	0.39	0.44	0.41
Closed shrublands	0.30	0.31	0.32	0.33	0.31	0.34
Open shrublands	21.86	21.08	23.00	22.06	23.02	24.08
Woody savannas	10.72	10.99	10.75	11.01	10.97	11.65
Savannas	17.43	17.28	18.33	18.86	18.65	18.19
Grasslands	25.29	25.93	23.96	24.33	23.51	22.40
Permanent wetlands	0.32	0.34	0.36	0.38	0.40	0.40
Croplands	7.01	6.89	6.31	6.22	6.32	6.15
Urban and built-up	0.35	0.36	0.36	0.37	0.38	0.39
Cropland/Natural vegetation mosaic	0.77	0.78	0.81	0.89	0.89	0.75
Barren or sparsely vegetated	2.95	2.88	2.90	2.53	2.45	2.40

Table 6: % of total land (by year)

Though the project activity started in the year 2017, the grassland area has continued to decrease because the project does not currently work with every rancher in the region. The project aims to

eventually expand, aided by the carbon finance, to reach every rancher in the region and collectively restore the grasslands.

3.5 Additionality

As per the latest VCS methodology requirements v4.1, section 3.5.3 and methodology (VM0042) requirements, the additionality of this project is demonstrated below.

Regulatory Surplus

The proposed project is not mandated by any law, statute or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework. This project is a voluntary activity undertaken by Boomitra.

In addition to the demonstration of regulatory surplus, as per the VM0042 methodology, additionality is determined by a project method. We follow the 2-step process outlined in the methodology.

Step 1: Identify barriers that would prevent the implementation of a change in pre-existing agricultural management practices

There are several barriers that prevent implementation of the change in practices:

1. Ranchers in these regions have not implemented significant changes to their practices in the past several decades and uptake rates for any changes are exceedingly slow, especially in communal lands⁴¹. This is a combination of socioeconomic barriers and general resistance to change in the absence of incentives. As observed over a period of more than 10 years using satellite data, the lands have largely remained as grasslands, but the vegetative cover is either low or has been decreasing.
2. A large number of the rural rancher communities in the region have poor literacy^{42,43}. Literacy levels are low in many targeted ranch communities (particularly Ejidos) and their dependence on government financial support is high with very low access to social networks connecting them with higher levels of governance and decision-making. Their socioeconomic structure is very fragile and vulnerable³⁸. The ranches cannot independently adopt sustainable practices due to a lack of knowledge of techniques and their impacts on their grazing practices as well as their livelihoods. Many ranchers have been using the same practices their ancestors have been using for the past century.

⁴¹ GRÜNWALDT, J., CASTELLARO, G., FLORES, E., MORALES-NIETO, C., VALDEZ-CEPEDA, R., GUEVARA, J. and GRÜNWALDT, E., 2016. Pastoralismo en zonas áridas de Latinoamérica: Argentina, Chile, México y Perú. *Revue Scientifique et Technique de l'OIE*, 35(2), pp.543-560.

⁴² OECD. 2022. *Mexico Country Note*. [online] Available at: <https://www.oecd.org/skills/piaac/publications/countryspecificmaterial/PIAAC_Country_Note_Mexico.pdf> [Accessed 19 January 2022].

⁴³ Padilla Rodríguez, B., Armellini, A. and Traxler, J., 2021. The Forgotten Ones: How Rural Teachers in Mexico are Facing the COVID19 Pandemic. *Online Learning*, 25(1).

3. For the Ejidos specifically, any change in practice occurring on communal land requires the consent of all the members, or at least the Ejido Council, to work⁴⁴, and achieving such a universal consent to create change is a difficult and unlikely task, presenting a strong adoption barrier. In addition, many Ejidos have weak internal cooperation due to social networks primarily being organized around nuclear families. Due to severe poverty, families are primarily incentivized today to focus only on their own conditions and are not incentivized towards cooperation³⁸.
4. There are a few laws that restrict ranchers from easily converting their grasslands to croplands or to sell^{45,46} but there are no rules or laws in place that prevent them from adopting new sustainable grazing practices. Apart from getting community consent to adopt any changes in practices, there are no adoption barriers in the region. Conversely, there are also no rules or laws that prevent overgrazing in Mexico. Unlike countries like the USA, there are also no federal incentives for the adoption of sustainable practices.
5. Our ground partners conduct awareness creation and capacity building work for the ranches. Due to financial constraints and other resource constraints, our ground partners are unable to expand the area of work and expedite the adoption of sustainable grassland management at scale. Hence, the activities have previously been confined to a small area. Carbon finance is the only mechanism that exists to promote these activities today, with 20%+ of the carbon credit payments going to local partners to fund their capacity building efforts. This funding stream is by far the largest funding source for the ground partners, often by an order of magnitude. Without these funds, these organizations could not do work at the level required to execute this project at its intended scale.
6. Although there are various national developmental banks operating in the region, access to rural finance is relatively low and government data also indicates that fewer than 3 of every 10,000 rural poor households have credit access. Additionally, 60% of the rural population live under the poverty line and 21.5% live under extreme poverty as per the latest government indicators⁴⁷. Project activities and typical ranch management do not involve cropping, and as a result, no farming-related loans are available to the ranchers at this point of time.

Most of the ranches in the region are wholly dependent on the sale of livestock for meat production as their sole source of revenue. Thus, good quality and quantity of grass is paramount for their long-term sustainability in livestock production. Hence, we share 55%+ of the carbon revenue with ranchers and

⁴⁴ Creekmore, M., 2000. EJIDO LAND VS. PRIVATE PROPERTY – WHAT'S THE DIFFERENCE?. *Arizona Journal of Real Estate & Business*, [online] Available at: <<https://www.stewart.com/content/dam/stewart/Microsites/mexico/pdfs/ejidoarticle.pdf>> [Accessed 19 January 2022].

⁴⁵ Lexology. 2022. *In brief: agricultural land acquisition and use in Mexico*. [online] Available at: <<https://www.lexology.com/library/detail.aspx?g=568f5146-0f50-4ec5-b516-3ce5787d4732>> [Accessed 19 January 2022].

⁴⁶ Key, N., Munoz-Pina, C., de Janvry, A. and Sadoulet, E., 1998. *Social and Environmental Consequences of the Mexican Reforms: Common Pool Resources in the Ejido Sector*. [online] University of California, Berkeley. Available at: <<https://are.berkeley.edu/~esadoulet/papers/ejido.pdf>> [Accessed 19 January 2022].

⁴⁷ Torres Munguía JA, Martínez-Zarzoso I (2021) Examining gender inequalities in factors associated with income poverty in Mexican rural households. *PLoS ONE* 16(11): e0259187. <https://doi.org/10.1371/journal.pone.0259187>

landowners, so they can use the money to clearly demark the land as paddocks with proper fencing and take other interventions as necessary to continually improve their practices. Otherwise, the ranchers do not have the financial incentive to invest in these continued interventions. (The adoption of rotational grazing is not a binary process but rather falls on a continuum, with ample room for ranchers to continue to improve throughout the lifetime of the project and continue to restore their lands – as long as there is sufficient capital for continued investment).

In the long term, the Mexican agriculture sector (including livestock production) will be exposed to increasing climate change vulnerabilities and a degraded natural resource base. For example, droughts are expected to become more common in Northern Mexico due to an increase in severity of the El Niño⁴⁸. These conditions make it very difficult for the land to regenerate in the absence of good practices that are incentivized by carbon finance.

Step 2: Demonstrate that the adoption of the suite of proposed project activities is not common practice

Mexico is a country of grasslands. Nearly 55% of its total area is covered with fodder vegetation, with grazing occurring on the vast majority of those lands. Since the 16th century, grazing has been the common practice on these lands. The number of livestock has exponentially increased over time. There is a lack of new and improved sustainable grazing practices among the ranchers of this region. Hence, overgrazing has led to desertification of the grasslands in Mexico^{49,50}.

The primary project activity is rotational grazing, and this activity is relatively unknown in this region – no quantitative statewide or nationwide surveys exist, but our own ground surveys show that ranchers are most often unfamiliar of the practice prior to the learning interventions created by our ground partners. Thus, it is almost certain that the 20% adoption rate threshold is met, which is also qualitatively corroborated by academic literature describing the region⁴¹.

Without carbon finance, the ranchers would neither be incentivized to practice sustainable grazing, leaving their land in a degraded state, nor will they be able to receive scalable knowledge support to change their practices. Simply put, the project would not exist without carbon finance.

Hence this project meets all the requirements and is additional.

3.6 Methodology Deviations

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)

⁴⁸United Nations. n.d. *COMMENTS OF MEXICO ON CLIMATE CHANGE AND SECURITY*. [online] Available at: <https://www.un.org/esa/dsd/resources/res_pdfs/ga-64/cc-inputs/Mexico_CCIS.pdf> [Accessed 19 January 2022].

⁴⁹ Manzano, Mario & Návar, José & Pando-Moreno, Marisela & Martínez, A.. (2000). Overgrazing and Desertification in Northern Mexico: Highlights on Northeastern Region. *Annals of Arid Zone*. 39. 285-304.

⁵⁰ Teague, R. and Kreuter, U., 2020. Managing Grazing to Restore Soil Health, Ecosystem Function, and Ecosystem Services. *Frontiers in Sustainable Food Systems*, 4.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)

4.2 Project Emissions

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)

4.3 Leakage

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)

4.4 Net GHG Emission Reductions and Removals

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)

5 MONITORING

5.1 Data and Parameters Available at Validation

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)

5.2 Data and Parameters Monitored

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)

5.3 Monitoring Plan

Left blank intentionally as per Section 3.1.3 of the VCS Procedural Document; Registration and Issuance Process: (Version 4.0)