2022 was an eventful year for Camp Altiplano

On top of meeting the goal of planting 10,000 trees, Camp saw new facilities, an agroforestry system, and impulses for monitoring and research. These accomplishments were accompanied by setbacks and rough periods including dry spells, wet spells, broken pumps, infected almond trees and clogged pee pipes.

Some highlights include the Holistic Course program (together with the Regeneration Academy), the Regenerative Culture Course, and obtaining support from the European Solidarity Corps Program for long term volunteers. The momentum from all of the activities and shifts in 2022, our collective resilience in the face of challenges, as well as the presence of more volunteers and staff leave us hopeful and excited for deepening regeneration efforts in 2023.

In this report you will find details on the ecological efforts, infrastructure changes and challenges, and information about the more administrative and social sides of Altiplano. It includes technical details and recipes and is meant to serve as a summary of Altiplano’s developments and a resource for campers.
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Camp Altiplano was established in 2017 as the first initiative of the Ecosystem Restoration Camps Foundation. The project is a 5-hectare parcel in the regenerative farm of La Junquera, Murcia (Spain). Located on the high steppe of south-eastern Spain, at 1,100 metres of elevation and with an average annual rainfall of 300 mm, this semi-arid ecosystem has been severely degraded by deforestation, industrial agriculture, overgrazing, water exploitation and climate change.

The project has established the foundation of an agroforestry system with almond trees intercropped with aromatic herbs, and a permanent groundcover in a non-irrigated environment. We’re aiming at a system that works without the intervention of machinery, and where all the agricultural inputs are self-produced. We are integrating natural areas with agricultural land: 5 artificial ponds harvest rainwater, replenish the aquifer and support local wildlife. Swales for water infiltration cross the land. Between October and April we focus our efforts on the reforestation actions of natural areas and hedges of fields of La Junquera, aiming every year at planting 10,000 native trees and bushes.

Camp Altiplano is now part of a growing network of organizations and individuals working towards the regeneration of degraded land in Murcia and Andalucia. The camp connects volunteers, farmers and landowners with the goal of catalyzing restoration on a large scale.
TREES

Our almond trees, planted in the beginning of 2019, are now 3 years old. In May, we saw the first ever fruits of Camp Altiplano’s almonds! The summer harvest was minimal (was quickly reduced into a few jars of camp pesto), but we have hope in the coming year’s harvest, considering the 4th year is usually the first productive one for almond trees. The late frost in spring also did not help, as it destroys most of the flowers, preventing them from turning into fruit.

Even if many of the almond trees at Altiplano continue to struggle and show signs of early ageing, we hope in the future the system will prove to be more resilient than conventional ones, providing a better production in difficult years (late frosts, droughts...).

The slow development of the trees seem to depend on the groundcover management implemented on the land since the trees were planted: the ground cover was left untouched for the first two years. These results showed us we needed to implement a different management.
General trees maintenance

We have two more little plots at Altiplano with different varieties of fruit trees: the area behind the kitchen, partially irrigated with grey water from the building; and the apple orchard, located near the ponds, in one of the most humid parts of the land. These trees are also pruned every winter, and fertilised. In spring, we fertilised the kitchen orchard and various reforestation trees on the swales with urine. Urine is high in nitrogen and we dilute it with water in a ratio of 1:10 to water. Urine fertilisation is great for the tree, but a pain for us - it stinks and it’s definitely not fun to walk around with cans of piss in your hand. We have therefore decided that making compost with urine is a better way to make use of it. You can find more information about this in the Composting section.

Pruning and grafting

Every winter, between January and March, we prune the almond trees at Altiplano to make sure they can reach their productive stage at their best. Most of the trees had grown very little, so they were pruned back to the start, or stage 0 (where the main trunk is left without any sprouts at all, to try to stimulate a good growth of the basic structure of the tree during the coming seasons). In general, when trees have a low early growth, keeping the branches can lead to low productivity and early decay.

Some trees did not make it, but are re-sprouting from the root stock. We are keeping these so we can use a branch and graft it again with the productive varieties of sweet almonds.

We are also running an experiment with directly sown bitter almonds (sown in January 2021). These are sturdier and harder than sweet varieties. As they are growing directly in the ground, they can develop a better root system from the beginning, compared to trees coming from a nursery pot. In the coming spring we can graft them with sweet almonds (or peaches!).

Bitter Almonds Direct Sowing

Bitter almonds are often used as rootstocks thanks to their hardness and resistance to disease and drought.

1. Soak the almonds in water. Drain them and keep them in a plastic bag for a few days to start the germination process.
2. In winter/early spring sow them directly in the ground with compost, a few almonds per tree hole (we sowed 3 in each hole).
3. Once they are a few months old, you can select the best individuals: the ones with the straightest and thickest stem.

In the spring of the following year you can graft them with different Prunus varieties (sweet almonds, peaches...).
Sickness and Treatment

Several trees showed signs of lepra (*Taphrina deformans*), a fungus and a causal agent of “peach leaf curl”, not uncommon in the area. Trees infected with *T. deformans* will experience leaf puckering and distortion, acquiring a characteristic downward and inward curl. Leaves will also undergo chlorosis, turning a pale green or yellow, and later show a red or purple tint. Fruit can either drop prematurely or show surface distortions. Severe infection can also produce lesions on the flowers. The host tree will experience defoliation if the leaves are badly diseased. If a seedling is severely infected, it may die. We decided to manually eliminate the affected parts from each tree to avoid spreading, and treated them with a copper solution and sulphur. This made us realise that in the coming months, we should implement the brewing and preparation of preventive solutions (compost teas, capsaicine based treatments, microorganisms solutions, lactic acid...) to improve the health of our crops so the system can become resilient to possible future attacks.
One of the likely causes of the stunted growth of the almond trees is competition with grasses for water and nutrients, especially in summer. For the first two years after planting the almond trees, the ground cover was not managed. In 2020 certain areas of Altiplano were grazed by cows, but not near the trees, as the animals would have damaged them. Comparing our almond trees with trees planted at the same time, from the same varieties, in a nearby plot of La Junquera farm, where a different management is implemented, we find ours mostly underdeveloped.

Farmers in the region till the land multiple times a year, to promote tree growth. This seems a barbaric activity, leaving the land naked and exposed to the harsh winds and strong sun. Our experiment however proved there’s a reasoning behind it, mainly connected to our dry climate. Our 350 mm of yearly rainfall makes it harder for trees and grasses to thrive at the same time. They compete for inputs, especially in summer. We have learned that to have productive almond trees, we need to intervene in some way, especially in the first few years of development. Since 2021, every spring (April - June) we clear an area of 1m diameter around each tree. The theory is that this will eliminate competition in summer, allowing the trees to absorb more water and nutrients and grow stronger. At the same time, we are benefitting from the advantages of a permanent ground cover on the rest of the land. The trees seem healthier and stronger. This year, we experimented with two different methods for ground cover management around the almond trees: a part of the plot was simply weeded by hand, without turning the soil. The other part was tilled superficially with a hoe. The goal of this experiment is to see whether competition with weeds is the only issue, or soil oxygenation as well.

In the map on the right: in red, the tree lines that were weeded; in green, the ones that were tilled superficially with a hoe.
NEW AGROFORESTRY SYSTEM

Altiplano has established the foundation of one agroforestry system: almond trees intercropped with aromatic herbs (rosemary, lavender, and thyme) in a non-irrigated environment. This year we created a new, more complex agricultural scheme. The new agroforestry system is on a half hectare of land that, until now, has only been cultivated with cover crops and grazed. The goal of this system is putting into practice the learnings harvested in the past years and improve the management on this plot.

In the picture, the dotted lines represent each one of the new tree lines in the plot. We marked the tree lines following the swales already on the land. The swales are on contour, and we created lines in between them that could be parallel to each other while not deviating too much from the initial contour design. This way we design a system that takes into account water flows and rainwater harvesting while facilitating the work of the machinery on the land at the same time.

We have selected the species based on the Altiplano climate and the most common crop grown in the surroundings, and are experimenting with a few species that have proved successful in other small scale trials. Here a list of the species included:

<table>
<thead>
<tr>
<th>TREE SPECIES</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almond trees (Laurane and Guara)</td>
<td>45</td>
</tr>
<tr>
<td>Fig trees</td>
<td>5</td>
</tr>
<tr>
<td>Walnut trees</td>
<td>6</td>
</tr>
<tr>
<td>Peach trees</td>
<td>8</td>
</tr>
<tr>
<td>Quince</td>
<td>5</td>
</tr>
<tr>
<td>Olive tree (Manzanilla cuquillo)</td>
<td>5</td>
</tr>
<tr>
<td>Loquat</td>
<td>5</td>
</tr>
</tbody>
</table>
In between the trees, we are planting native bushes, which are also productive species.

<table>
<thead>
<tr>
<th>BUSH SPECIES</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juniper</td>
<td>26</td>
</tr>
<tr>
<td>Rose hip</td>
<td>10</td>
</tr>
<tr>
<td>Elderberry</td>
<td>23</td>
</tr>
</tbody>
</table>

In between the tree lines we will plant aromatics (lavender, thyme, rosemary), which have proven to be successful crops in the region, giving high value production (high quality essential oils).

Preparation and Planting

In 2018, when Altiplano started working on this land, we covered the plot with compost and spread seeds for cover crops. Animals also served as extra preparation: cows grazed on the land in 2020 and this year we had horses grazing on part of the plot. The goal was to let the groundcover grow, break the soil compaction, and increase the organic matter content in the soil, creating healthier soils.

Before planting, we had machinery working the land to prepare the tree planting strips. The first step was using a disc plough to cut the leftover ground cover and reincorporate it in the soil, superficially tilling the first 10 cm. After using the disc plough, we passed over the land with a chisel plough, which breaks soil compaction up to a depth of 70cm. These two machines were used only along the line where trees will be planted, leaving the groundcover between the lines untouched. Finally, we planted with the support of a tractor, which dug a trench along the tree lines which made it easier to dig holes for the trees.

As one of our current goals is using our own inputs, we applied compost to the trees that came from the vermicomposting facility in La Junquera. We then covered it with wood chips and straw around the trees to reduce water losses and provide a source of biomass that will slowly degrade over time.
At the beginning of May we started preparing the vegetable garden. We are following no-till practices to build up the quality of the soil. To prepare the beds we: tilled superficially, spread compost (self-produced kitchen compost), sprayed microorganism solutions, mulched and mulched and mulched. We also got a wonderful broadfork (or grelinette) to loosen up the soil before planting and break compaction.

We planted the vegetables in the second week of May (according to the plan featured below). They enjoyed a full season of growth with watering every other day. Unfortunately, we stopped using water from the “charca” (pond) because the pump did not do well with the muddy and calcareous water. Instead, we used water we tanked from the farm village in La Junquera. We also had some difficulties with moles, losing part of the crops. Campers still enjoyed many tomatoes, peppers, basil, and chard.
Truffle Project

In a collaboration with the University of Murcia, we planted *Helianthemum violaceum*, a flowering bush, inoculated with desert truffles (*Terfezia clavery*) in March of 2018. The idea was to test if this symbiosis works, and if the truffles have potential to become an extra income source for farmers as a co-crop with almonds.

Typically, the first truffles appear 2 years after the planting, in spring. On our high plane, with a colder climate, they should appear at the end of April or during May. When there are truffles underground, cracks are visible in the soil near the plant, although it can be difficult to assess whether they are ready to be harvested. A plant has the potential to be harvested for 20 years.

The first camp truffle was found in 2020. This year we found another truffle, which weighed 8.8 grams. Our current plot is approximately 10 m², but if it proves successful in the future we will look into expanding it.

The truffle tastes like a mushroom, and we ate it thinly sliced, raw, with oil, lemon and salt. Opinions on this crop are mixed: some say delicious, some say tasteless.
COMPOSTING

Creating a continuous source of compost continues to be central to reforestation and garden activities and one of our main methods of quickly improving soil health and giving new seedlings an advantage in this harsh environment. This year saw many compost piles with different techniques including vermicompost for kitchen leftovers, fast compost using garden scraps, pee compost using the yields of our composting toilets, and camp's first vermicompost (worms!).

Urine Compost

We continue to create fast compost, based on the Berkeley method, and taking advantage of all the urine collected in our compost toilets. This compost is used during the reforestation activities.

After 4 days the pile is turned over and pee or water is added (depending on the temperature and moisture of the pile. If it’s too cold, more nitrogen is needed, in the form of pee or manure). After that, we keep turning the pile every 2 days. After 2 weeks, the compost should be ready.

URINE FAST COMPOST RECIPE

Developed by Tanja Lumme

- 60 l human urine
- 20 l leaf mould from underneath oak trees or compost as an inoculator/accelerator. (Alternatively, a beneficial microorganisms solution can be added to the mix)
- Straw
- Water

The ideal total size of the compost pile is at least 1 cubic meter.
Vermicompost

At the beginning of May, we jumped into vermicomposting! This practice has great potential to improve the health of our plants and soil. Vermicompost is an excellent source of nutrients, providing us with a high level end product while recycling all of our scraps. As part of the Holistic Course program, held between April and June, we built the first prototype of a vermicomposting bin at Altiplano.

For the average number of people staying at Camp, we estimated a good size of 1m³ for our worm bin. This would also make it an easily manageable size, as we learn to create the ideal environment for worm multiplication and correct transformation of organic matter into humus. We built the walls and floor with recycled pellets, and used a mesh and chicken wire to hold the substrate in place while maintaining an aerated environment.

We used the shape of a basic compost bin, a cube with a movable front piece (door) to facilitate both filling and harvesting once the process is complete.

For the first layer (bedding) we used straw and leaf litter. These are carbon rich materials that can soak up excess moisture and prevent compaction and lack of oxygen in the bottom. We added a second layer of about 70 cm of finished compost. This was the result of thermophilic composting Daniel (our vermicomposting expert) ran through the winter, with horse manure, straw and grape pomace. On top, a final layer of mulch (straw) for thermal insulation and light protection (most composting worms are highly photosensitive).

We got red worms from a local producer, and inoculated our bin. Two weeks later we fed them by adding a layer of vegetable food scraps to the pile, in order to maintain a high activity and promote rapid growth.

The bin was designed to keep a good air flow, actually causing the outer layers to dry out too quickly. At least once a week we were watering the drying edges. After 2-3 months, the whole content of the bin was completely transformed into vermicast (humus) and the population had at least doubled.
COMPOSTING TIPS

A healthy Worm Bin

Monitor your worm bin at least once a week or ten days.

- Temperature: between 12°C and 28°C.
- It smells similar to garden soil or has no odour at all.
- Castings, or worm poo, have accumulated (flattened surface).
- There is no exposed food.
- Some mould and mites are common.
- Moisture can be found throughout the bin, but not excessive amounts. Easiest way to check is to grab a handful and squeeze it. If it drips a bit, it’s optimal.
- The worm population is steady or increasing.

Feeding the worms

Collect vegetables and fruit scraps, tea bags (without the staple), and coffee grounds Do not include any animal by-products (fat, bone, dairy, meat, waste) or citruses.

Only add more food to the worm bin once the food you previously added has been consumed.

- Gently, dig a hole to put the scraps into.
- Cover ALL of the food scraps with dirt and moist paper, mulch, or the compost itself. Covered food scraps don’t attract other insects.
- Notice what the worms are eating and what not. Remove any scraps that your worms have not eaten for a while as they may not like it. Large chunks can be cut into smaller pieces.
- Put the lid back on the worm bin.

Troubleshooting Your Worm Bin

If your worm bin seems out of balance, it’s important to take action. Here are our tips for dealing with common worm bin issues:

- Odor: If your worm bin smells foul, try to pinpoint the food item that is causing the smell and remove it. If the entire bin is odorous, immediately remove all food that has not sufficiently broken down. Add additional bedding (the compost itself) throughout and on top of the food, leaving nothing exposed.
- Exposed food: Place a layer of bedding on top to cover all exposed food.
- Excess mites: Place a piece of bread in the bin, wait for mites to congregate on the bread, and then remove it.
- Lack/Excess moisture: Water as homogeneously and gently as possible. Remove all food that has not sufficiently broken down. Second, place dry bedding in areas of the bin where liquid has accumulated. Wait a day or two to add food. Do not overfeed the worms.
- Compact contents: Break up clumps of worms, food, and bedding and disperse it throughout the bin. Add bedding throughout to help aerate the bin.
LOOKING FORWARD: ALTIPLANO AGRICULTURAL MANAGEMENT

In this coming year we’re aiming at putting into practice all the learnings gathered since the beginning, improving the management of the agricultural side of Altiplano, producing most of our inputs, harvesting our products, and feeding the soil. At the same time we’ll continue to monitor the changes in the system to be able to identify the best techniques and practices.

Starting from the almond trees, we have learnt that if a tree does not respond to pruning, it is better to remove it. This means that camp staff and volunteers are undertaking a selection of trees that are worth keeping and ones that will be removed and replaced. This first generation of almond trees has taught us that almonds in this region struggle with groundcover and that they need more support. With the new generation, we will continue experimenting with different types of groundcover management (superficial tilling and weeding), while providing the land with more and better inputs (compost and compost teas), and protecting the trees with foliar application of microorganisms. We will also be grafting sweet almonds to the bitter almond sprouts that are thriving in Spring as another attempt to create robust almonds for regenerative farming.

We are striving to make 2023 the year of compost at Altiplano. The beginning of this is a new composting area at camp, which is currently under construction. The goal is to cover all of our compost needs to feed the trees, the vegetable garden, and the reforestation areas. We will use both vermicompost and fast compost techniques.

Another crop and potential project at camp are the aromatics. In the coming months, we aim to use the wisdom of local herb growers and La Junquera to create products from our herbs and potentially create an income stream for Altiplano.

The vegetable garden will be planted again this year and is currently resting under a layer of compost and has been sowed with a mix of grasses and legumes so that the soil can regenerate over the winter. We will likely be changing the beds this year so that they are more narrow and better sheltered.

And finally, we’ll put in the ground a few larger trees in strategic spots. These trees will give more shelter to their surroundings, providing windbreak and shade to protect the land, and of course, the campers staying in their midst.
This year started by planting the remaining 5000 trees and bushes we received through the collaboration with Life Terra. January’s weather (occasional drizzles with slightly above average temperatures during the day) collaborated with our efforts, making for a fresh and energetic start. February was less friendly; we had to retrace our steps because of the lack of rain, visiting each plant and watering it before the critical timespan of 10-15 days after planting was exceeded.

The struggle to keep the newly planted trees alive ended at the beginning of March - rains came! In a couple of weeks we received over 120L of rainfall, which is great for the trees, so we are expecting a good survival rate. But this led to another obstacle: nonstop showers and muddy terrain. By the end of the month, accumulated rainfall was close to 400L (almost 100L more than the whole annual average for the region).

Alongside planting saplings, we kept sowing Quercus ilex and Quercus coccifera acorns in the natural areas, in order to keep boosting the growth and the progression of the ecological succession towards intermediate and climax communities.

By the 16th of May, 10,000 trees and shrubs were in the ground! In the map below the areas planted in the period January - May 2022 and the number of plants per area.
Below the list of species and units used in the reforestation. Our selection is based on the native species we can encounter in well preserved natural areas in the surroundings. Some of them are specifically selected for dry and rough areas, while some are more of wetland species (such as *Rosa canina* or *Sambucus nigra*), so we also pay attention to their natural habitats before finding the right planting areas.

<table>
<thead>
<tr>
<th>Species</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Arbutus unedo</em></td>
<td>231</td>
</tr>
<tr>
<td><em>Crataegus monogyna</em></td>
<td>249</td>
</tr>
<tr>
<td><em>Juniperus phoenicea</em></td>
<td>450</td>
</tr>
<tr>
<td><em>Juniperus thurifera</em></td>
<td>230</td>
</tr>
<tr>
<td><em>Olea europaea</em></td>
<td>299</td>
</tr>
<tr>
<td><em>Pinus halepensis</em></td>
<td>493</td>
</tr>
<tr>
<td><em>Pistacia lentiscus</em></td>
<td>520</td>
</tr>
<tr>
<td><em>Pistacia therebintus</em></td>
<td>560</td>
</tr>
<tr>
<td><em>Quercus coccifera</em></td>
<td>320</td>
</tr>
<tr>
<td><em>Quercus ilex</em></td>
<td>465</td>
</tr>
<tr>
<td><em>Retama sphaerocarpa</em></td>
<td>581</td>
</tr>
<tr>
<td><em>Rhamnus lycioides</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Rosa canina</em></td>
<td>387</td>
</tr>
<tr>
<td><em>Sambucus nigra</em></td>
<td>25</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>5010</strong></td>
</tr>
</tbody>
</table>

In September, we once again confirmed our collaboration with LifeTerra, and were granted support for 10,000 more trees for the 2022-23 season. We planted the first 200 trees during the Regenerative Culture Course in September. These trees will not only help our reforestation efforts, but also serve the purpose of teaching participants about rewilding. But it wasn't until mid-October that we entered the planting season fully. The first half of the 2022 - 23 planting season was one of the driest so far. There was no rain until December - which made for slow going as we watered by hand on quite hilly and hard to access terrains. Planting the trees for the 2022-23 season is still in progress. In the map below the progress of this season’s plantings.
Throughout the years we have developed techniques (and acquired tools) to reach higher success rates with the plantation. In our rough climate, with low rainfall, extreme temperatures, and strong winds, we need to take extra care during the planting stage to make sure the plants will survive.

In natural areas we first dig the tree holes with an excavator. The holes should be 40 cm deep, and the soil loosened up by the machinery. Best is having the holes dug before the planting season starts, so they oxygenate and collect rainfall. When planting, we add compost (usually the urine compost we produce) and plant the tree in the deepest part of the hole, making sure the potting soil is fully covered. Optimal situation is that the base of the plant is about 10 cm below ground level. This way it will be protected by extreme winds, sun, and will collect moisture and rainfall. Once the plant is in the ground we add mulch (straw or any dry material we find around) and big stones. The stones are a perfect protection for the tree, and they also provide a gentle watering, as they collect night humidity on their surface, slowly releasing it into the ground.
Like every year, we supplemented the seedlings we planted with direct seeding of locally harvested acorns from *Quercus ilex* and *Quercus cocifera*. The harvest season is between October and November.

### ACORNS PREPARATION FOR DIRECT SEEDING

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Find oaks producing good amounts of acorns (check the ground!)</td>
</tr>
</tbody>
</table>
| 2)   | Look for healthy acorns. Use the following criteria:  
|      | a) Colour: we’re looking for a shiny sunburst-tanned colour, if they are too pale or matte, it might be a sign of old age. If the tip of the acorn is slightly green, it’s ok to pick.  
|      | b) Hardness: if the acorn feels soft or hollow when you press it with the tip of your fingers, it’s likely that larvae have chewed their way into the acorn, decreasing its seed viability. |
| 3)   | Soak them in water with 5% bleach. Discard any floating seeds from the batch (floating acorns have air inside, and are not viable). Bleach kills any residual larvae, so that the seeds can be stored during the whole season safely. |
| 4)   | Let them dry in thin layers in the shade, better on a sieve so that moisture doesn’t accumulate. Once dry, they can be stored in a cotton bag, in a dry and dark place. |
| 5)   | 24 hours prior to seeding, soak them in unchlorinated water to help them germinate. |
MAINTENANCE AND MONITORING

During the hot months, we continued our work by weeding around the still-establishing plants, watering them at least once in order to help them survive the summer season. During this period, we also continued monitoring the reforested areas. The first results seem promising, with a survival rate spanning between 70% and 85%.

To improve the reforestation strategy and get even better results, a team of Altiplano’s volunteers and staff started a specialised working group which involves PhD students, researchers, and passionate campers. The work aims at gathering detailed information on the reference ecosystem (the natural areas in the hills nearby) and on the factors that determine the success or failure of the reforestation efforts. This wonderful team is currently writing a proposal that will be presented to universities and research institutes, so that we can gather funds to implement these actions.

LOOKING FORWARD: REFORESTATION

Reforestation efforts are continuing into 2023. Our collaboration with Life Terra is planned to continue for the next 2 years, meaning we will be planting 10,000 seedlings every season (October till April). We are in the process of planting buffer zones around fields of La Junquera that will remain in production. The intention is to provide a windbreak and create green corridors throughout the whole farm. There are also many trees and bushes waiting to become a forest near the farm village, in a previously cereal plot.

The dry weather is definitely not helping our reforestation actions, so in the coming year we’ll be busy with much maintenance work on the reforestation areas.

As mentioned in the Maintenance and Monitoring section, a group of past and current campers is meeting to approach monitoring and research of reforestation at Altiplano. This group will continue through the next months and is aiming to write a research proposal to apply for funding opportunities.
The Ecosystem Restoration Communities (ERC) Foundation has created a Monitoring and Evaluation framework to assess both environmental and social impacts of our practices.

Camp Altiplano has implemented different monitoring tests since its beginnings, in 2018, and came to select the ones that are most effective to indicate the changes on our land.

To implement the framework, we have defined different ‘Management areas’: these are sections of our land which differ from each other due to their soil type and management. Every year we implement the tests on each one of the areas, so that comparing the results can give us a detailed picture of the impact of our work.

<table>
<thead>
<tr>
<th>AREA</th>
<th>DESCRIPTION</th>
<th>AMENDMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 0</td>
<td>Control area. Cereal field</td>
<td>Pig slurry</td>
</tr>
<tr>
<td>Area 1</td>
<td>Control area. Natural vegetation</td>
<td>None since Camp started (2017)</td>
</tr>
<tr>
<td>Area 3</td>
<td>Mixed fruit trees watered with kitchen wastewater</td>
<td>Compost teas and urine (2020-22), Cattle grazed (2020)</td>
</tr>
<tr>
<td>Area 4</td>
<td>Gully, no trees.</td>
<td>Cattle grazed (2020)</td>
</tr>
<tr>
<td>Area 5</td>
<td>Almond trees. Shallow soils, less clay, more exposed.</td>
<td>Compost (2018), Compost teas and urine (2020-22)</td>
</tr>
<tr>
<td>Area 6</td>
<td>Almond trees. Deeper soils, higher clay content.</td>
<td>Compost (2018), Compost teas and urine (2020-22)</td>
</tr>
<tr>
<td>Area 10</td>
<td>Wetland. Natural vegetation and reforestation species.</td>
<td>None</td>
</tr>
</tbody>
</table>
Flora monitoring

This is one of our favourite tools to analyse the changes over time at Camp Altiplano. Every spring we implement it, and we can see changes in the ground cover vegetation. It’s also an amazing educational tool to learn about plant species at Camp Altiplano. In each area we randomly select three locations, where we mark an area of 1 square metre. In each square metre we identify all the plant species, using a local flora handbook (*Flora básica de la región de Murcia*), plant identification apps, and identifications from previous years. We are creating a wonderful database with all plant species growing on the land, with more than 100 species, which if analysed can also tell us about the state of the soil. In addition we are checking the percentage of bare soil on the land, the percentage of grasses versus other species, and any interesting sight we notice on the plots, creating a qualitative narrative of the state of the land.

Looking at results from 2021 and 2022 the percentage of bare soil in different areas of Altiplano is stable or slightly reducing, apart from a few areas where it’s actually increasing (Area 1, 3 and 7. Area 10, the wetland, seems to have increased but that might be due to the chosen location for the monitoring). The total number of species (non grasses) identified is between 12 and 22, depending on the areas. The diversity has lowered from the previous year, when between 21 and 35 species (non grasses) were identified. Grasses are slowly taking over in certain plots, and the strongest species are dominating the land over time. Good to keep this in mind: we might want to spread more diversity on the land in the future.
Good plant growth depends also on soil texture, the presence of micro and macro pores in the ground, and the texture of it. Measuring soil compaction tells us whether we are creating a healthier soil overall or not. We use a penetrometer to test compaction, a very easy and reliable tool. By pushing it into the ground we know how much pressure we are exerting, and in turn we know how compacted the soil is. Results from 2022 indicate that the least compacted areas at Altiplano are the wetland area (A10), followed by A2 and A5. Areas 3, 4 and 7 seem to be doing much worse. This can be very much connected to our activity on the land: areas where we often walk through show higher signs of compaction. These areas also show a thinner groundcover, which is probably both cause and consequence of soil compaction. This tells us which areas we should focus on the coming year, adding possibly more compost to improve soil structure, and reducing our impact on the land by defining paths to walk through.

Ph tests

Nutrients absorption by plants also depends on soil Ph. At the ideal Ph of 6/7 plants can absorb most nutrients. Ph changes can be influenced by organic matter content, soil geology, amendments and practices. We are using Ph strips to check the Ph on our land, taking small samples which we mix with water. We then soak the strips in water and get our results.

All areas at Altiplano range between 7 and 8, with an average Ph of 7.4. The first Ph tests in 2018, from a lab, indicated that the average value on the land was 8.1.
Soil organic matter content

This is the only test we implement which requires access to a lab. We do it every couple of years, as the organic matter content does not change so often. We take multiple soil samples from each area, following the guidelines we receive from the lab, mix them, and send it out. We have seen an increase in soil organic matter content at Altiplano, and being able to prove this through this test gives us confidence our practices are going in the right direction. The last results are from 2020. The coming year would be a good moment to repeat the tests and find out the results evolve over time.

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<tr>
<td>1.6%</td>
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<table>
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<td>1.9%</td>
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</tr>
<tr>
<td>2.0%</td>
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</table>

A wild boar visiting Altiplano. Picture taken with a wildlife camera trap, as part of the monitoring program organised in coordination by ERC Foundation and Restor.
Altiplano infrastructure has received many updates and repairs in 2022. Now there is more space for living, more resilience in the case of extreme weather, and even more plans (and needs) for future development. The Altiplano climate was not kind to our infrastructure. We had to deal with many complications, which ended up in: improving the electric system so that we’re now able to charge the batteries by connecting them to a generator (for grey days), general car and trailer fixes, broken irrigation pumps, constant tidying up and re-arrangement of shared spaces, fixing the cob walls of the roundhouse (a yearly task), painting wooden infrastructures with linseed oil to protect them from the sun (yearly task), fixing rainwater harvesting gutters and more!
ROUNDHOUSE

The ‘Roundhouse’ is the only building with foundations at Altiplano. Built over the ruins of a shepherd’s shelter, the building is made out of stones, straw and cob, with a wooden structure. It has two floors; the higher floor has been inhabited since 2020, while the lower floor was only completed this year, thanks to the caring hands of many volunteers who completely plastered the walls with a clay and limestone mix, washed the stones, and treated the ceramic floor tiles with linseed oil to protect them. The wood burning stove located in the upper floor was moved down, so when turned on it heats up both parts of the little house! Already a few guests have stayed in the roundhouse, and the next step will be insulating the floor between the two rooms to give a bit more privacy.

PLASTER FOR THE COB HOUSE

INGREDIENTS
Clay, limestone, and water.

METHODOLOGY
1) Mix clay and limestone 2:1 in a bucket (don’t use too much at a time, it dries very quickly)
2) Start adding water little by little while mixing with vigour until the mix has a homogeneous and sticky texture (if it is too liquidy, you can just wait until it dries a bit and gets thicker)
3) If the mix is supposed to cover and protect the wall, it is done. If the mix is aimed to fill holes, it needs structure and cohesion. Add some hay and small rocks.
The composting toilet building has been fully insulated this year. With OSB planks we blocked off the wind which otherwise would run through the beams of the wall, and it’s now slightly more pleasant to sit in there in the winter. We also perfected the humanure compartments under the toilets, which are now fully separated from each other. The first hole is now going through a decomposition process, which should last for a year, before we empty it and use the humanure to make new compost.

The next improvement concerned the pee drainage system. The old pipes were changed with flexible ones, to avoid blockages in the elbows.

In the early part of the year, we struggled with frost and ice in our water pipes. During the first week of January we had some frosty nights (reaching -9°C!). The pipes in both the shower and kitchen did not function in the morning! To solve this problem, we are working on insulating the system so that we don’t encounter exploded pipes every winter morning. We also installed a draining tap at the bottom of the shower room, so we can empty the pipes in case of frost. Another more positive development is that the bathroom got an outdoor sink - the perfect place to brush teeth under the stars!

We have recycled the bunkhouse canvas (when installing the metal roof, we cut off a big piece) to make a wind and sun protection in the kitchen porch, a space we use frequently when we receive big groups of people, like during the Regenerative Culture course. Small improvements constantly take place inside the kitchen, thanks to the carpentry skills of volunteers.
LOOKING FORWARD: ALTIPLANO INFRASTRUCTURE

Since Altiplano is expanding and becoming more active, the infrastructure will have to respond as well. At the beginning of 2023, we received a tiny house donated from BASECAMP, adding another private room for volunteers to stay in. Our goals for the coming years are: building more tiny houses to increase the number of people living at Camp while providing them with more privacy. At the same time we see the need to create a common space that would be suited for workshops and shared activities for larger groups of people. This space would likely have a kitchen, a woodstove and wifi - providing an area for research, great meals and cosy evenings. We’re now starting to design this building, so we’ll soon have a clearer idea and a budget, hoping to have it in place by 2024.

Other updates for improving camp conditions are on the way, including planting a few larger trees (as mentioned in Altiplano Land Management) for shade, guiding vines to grow around the greenhouse structure to provide some protected outdoor living area near the bunkhouse, and creating a Camp Library in the kitchen.
During these years on the Altiplano we have gathered knowhow and learnings on ecosystem restoration in semi-arid conditions as well as lessons on running a camp and regeneration in a broader sense. An essential part of our work is sharing these lessons with the broader public in a variety of formats, so that everyone can find their way through it: courses, experiences, volunteering activities, online events and general outreach. In 2022, we were able to create opportunities to pass on these teachings and gain momentum in education. These experiences are also the chance we have to generate our own income and sustain the project.

**COURSES AND EDUCATION**

During 2022 Camp Altiplano hosted two one-week courses co-organised with different experts. In March, we successfully hosted the Ecosystem Restoration course, together with Kris Deveria and Jurre Zwart. We received 12 participants who enthusiastically joined tree planting, compost making workshops, and natural areas management.

In September, we hosted the second Regenerative Culture course together with Lian Kasper. The course is a mix between ecological techniques and teaching and exploring the cultural and social side of regeneration. Participants work through and share their thoughts and feelings on our connection to nature to move towards action.

We also collaborated with the Crash Course organised by the Regeneration Academy, hosting one day visits to Camp Altiplano as part of a weeklong course where participants learn about land management, soil and regenerative business.
Holistic Course

This course deserves a section on its own. This year we hosted the first Holistic Course program in collaboration with the Regeneration Academy. The course aims at training young people from the region on regenerative agriculture, ecosystem restoration, and circular business, giving them insights on everyday activities and life on La Junquera farm. Thanks to funding from Fundación La Caixa, three young and unemployed people got the chance to come and live at Altiplano for two months, learn through practice and live off grid. We see this project as a step towards creating stronger ties in the region, and look forward to repeating the course in 2023!

OUTREACH AND COLLABORATIONS

In the past months we have put the word out there, sharing our story both online and in person. The most fun event was definitely the Boom Festival (Portugal), where Camp Altiplano featured in the Cultural and Knowledge Hub, together with Ecosystem Restoration Communities colleagues.

We participated in a Soil Food Web School webinar, and shared our learnings in an online class organised by the Eberswalde University for Sustainable Development (Germany).

In October we hosted organisers and friends of the Badlands bike race for a weekend of tree planting. Check this video for a Badlands View of Altiplano.

Since September 2022 we have been involved in the restoration of a limestone quarry in La Puebla de Don Fadrique, a few kilometres away from us. Areniscas Rosal is the limestone extraction company who currently owns the extraction rights on the land. We have been advising them on the reforestation process, the species selection, and the biodiversity monitoring of the area.
COMMUNITY

Camp Altiplano is not an isolated piece of land in the middle of nowhere, although it might look like it. We are part of the 1,100 ha regenerative farm of La Junquera, and of a larger network of projects and local businesses with whom we exchange knowledge and resources. During the past year, together with the volunteers, we have participated in a variety of activities on the farm, learning and creating together.

Wine making
With La Junquera resident and winemaker, Julie Casado (La del Terreno), during the harvest season

Cider making
From apples of our regenerative orchard to juice and more

Vineyard maintenance
Planting and pruning the young vines

Holistic grazing
Moving and often rescuing La Junquera cows

Fig jam
Bucketets and buckets of figs from the natural area at Altiplano turned into jam with various additives (rosemary and lemon)

Soap making
Recycling used oil and turning it into soap

Our community also extends outside of the farm limits, and reaches other local organisations involved in alternative education in the area. Together we have created a solid network that dreams about a different educational system and works towards it. The Regenerative Education Alliance (Alianza para una Educación Regenerativa). Throughout 2022, we have worked to develop a common vision and land it into a regenerative curriculum that we will integrate in our activities and into the educational system.

Finally, our community is made of all the people that pass through Camp and support us; people who come back, people that help from a distance, people we can reach out to in the moment of need.
LOOKING FORWARD: EDUCATION AND COMMUNITY

The opportunities for courses and outreach are the side of Altiplano that is the most active driver for change, but that also needs a more solid core team.

In the coming year we’re aiming at reaching a more diverse and stable team of both hired people and volunteers. These include support from the European Solidarity Corps (ESC), which will fund 3 long-term volunteers for 6-month periods starting in January 2023. Through the ongoing funding for the coordinator role from Fund de Roeper and the ESC volunteers, there will be a solid core team that can advance all the other projects at Altiplano. Accompanying this change, we have decided to only take volunteers on the first Monday of every month, giving us more time to disseminate knowledge and build teams. Likely, this increased commitment at camp will bring in more opportunities for revenue streams and offers.

With this energy, we hope to solidify our course curriculum in 2023. This includes working with the ‘Alianza para una Educación Regenerativa’, a solid network of local organisations in a collaboration for regenerative education. This process gives us regional support and a vision to dream of, both of which are energising. It is also an opportunity to summarise and evaluate the current course offerings and learnings of Altiplano.

We are planning to continue many of the courses from 2022 including the Holistic Course and the Regenerative Culture course. In addition, we are planning an introductory course to permaculture in June and a tree planting Boot Camp in October.

In general, the presence of more long-term campers will lead to expansion and change. Thanks to the new group dynamic we will be able to get more involved in more long term projects both on the farm and outside. We will create connections in the area and communicate our efforts to the broader public. In 2023 we are starting a camper run newsletter, which we hope will stay strong.
Camp Altiplano is steadying, expanding, and transitioning. It is steadying in that there are activities that have been constantly carried out over a few years now and remain part of Camp’s plans. There is also more constant funding and a steadier team. This steadiness has allowed us to expand existing projects and reach into new areas. Some of these expansions are leading to a phase of transition in which we are learning how to share responsibilities and visions for the years to come.

**STEADY**

Over the past 3 years of having a steady coordinator, Camp has found annual rhythms. Looking forward, we are aiming to keep these rhythms. They include the reforestation efforts of planting 10,000 trees a year with the support of Life Terra. This means that definitely for the next couple of years, fall, winter, and spring will see Camp Altiplano volunteers reforesting plots of La Junquera. The goal is to have a green corridor throughout the whole farm.

As seasons come and go, we will maintain the beautiful agricultural plot that has been created through the years, weeding, pruning, making compost, caring for the land. Steady will be the buildings we have at Altiplano: the kitchen, bunkhouse, roundhouse, toilet block. They will need maintenance and fixings, but are definitely there to stay.

Another expression of steadiness are Camp’s human resources. Since we have funding until the end of 2024 thanks to Fund De Roeper, Camp will have at least one employee making it possible for more people to join. For example, starting in 2023, there will also be a steady presence of 3 long-term volunteers at camp. We have also decided that volunteers will arrive only once per month so that the groups at camp will have time to get to know the project and become a more cohesive team, providing a form of steadiness on the short-term as well. Even the ecosystem around camp is mirroring this steadiness. The field has become a grassland that does not need outside input to thrive. There are also 2 ponds that have been consistently filled over the past few years.

We will continue to invest in the stability of reforestation efforts, course offerings, the camp team, and the ecosystem. This way, we will maintain the strong roots that are allowing the camp to expand its regeneration activities and projects.
EXPANDING

Stability is allowing us to expand on current branches of the project. Camp Altiplano team has expanded to include another staff member and 3 long-term volunteers through the European Solidarity Corps. The growth and steadiness of the core team will enable expansion of camp activities in 2023 and beyond.

The regeneration efforts of Camp Altiplano are also providing opportunities for expansion. While we expect the number of plants for the reforestation project to remain constant for the next few years, there is an interest in turning this branch of Altiplano’s work into a core one. The development of a research project focussed on our reforestation efforts (see ‘Reforestation’) aims at expanding this working area while supporting the rest of Camp’s activities.

The expansions to the camp team and camp activities will be accompanied by a parallel expansion to camp infrastructure. One goal is to increase the capacity of the camp to be able to host 30 people. This includes constructing more private space for long-term residents and a common space for larger groups. Other infrastructure expansions for 2023 and beyond include having chickens at camp, adding wind turbines, and the equipment for brewing compost teas.

These tangible expansions are accompanied by expansions to knowledge and outreach. We are in the process of establishing a camp library to help staff and volunteers share knowledge more effectively. Through our collaboration with the Alianza (see ‘Education and Community’) we are contributing to the vision of a regenerative education, expanding the educational side of camp beyond the courses we have offered so far.

The expansion at camp is far reaching; human resources, camp infrastructure, and the more academic side of education and research are all growing. 2023 will be a defining year selecting priorities and noticing which of these expansions are both feasible and advantageous in our context.
TRANSITIONING

All of the expansion of Altiplano has led to a phase of redefining decision making, communication, and distribution of responsibilities. In 2023 we will likely be a mixture of conscious transition through conversation and permaculture design and the spontaneity of volunteers and opportunities that present themselves. All of this while trying to secure our economic stability and exploring new ways of being self-sufficient. One thing is for sure: camp is changing quickly and 2023 will see both the beautiful moments and growing pains of a transitioning organisation.

2023 AND BEYOND

The challenge of 2023 is to manage the expansion and transition that started 2022 so that the experiment that is Camp Altiplano is successful. It is not easy to define at this moment what that success would mean. Some clear indicators of success are the technical/ecological ones that have been the focus of monitoring until now, including soil quality, biodiversity, and the survival rates of trees for the reforestation project. However, while these are important, we have noticed that the education and outreach side of Camp is the engine that fuels ecological change. It is also the aspect of Camp that will expand our impact beyond the 5 hectares that we are physically working on. As such, goals that are on our radar for the long term include improving camper experience, increasing ties with local communities, and financial independence.

While these goals are more on the horizon than right in front of us at this point in time, they will help steer the process of expansion and transition that we are in the thick of. In turn, the opportunities that come to fruition in 2023 will help form and inform more concrete versions of these goals. For now, it is exciting to be in the process of expansion and transition that is organisational (as well as ecological) succession.
Since its beginning, Camp Altiplano has been an organisation that is possible thanks to many. All of the highs and lows in 2022 were supported and lived by people who chose to give time, energy, and resources to Camp.

THANK YOU!

Thanks to Volunteers who gave their time to Camp

A special thanks to our main donor, Fund De Roeper, promoted by impact investor Corien Botman, who visited our project in 2021 and decided to fund Camp Altiplano for 3 years starting in 2022. This funding has given us the breathing space and capacity to dedicate more time to improving Altiplano.

Thanks to all the organisations that support and inspire us.
## EXPENSES

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<td>Restoration activities</td>
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## INCOME

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Feel free to contact us if you have any questions about our work at Camp Altiplano.

Camp manager: Silvia Quarta

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- Camp Altiplano
- camp.altiplano
- Ecosystem Restoration Camp Altiplano

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