

Ecological restoration based on natural succession and conservation education in a quarry in Mesa de Ocaña. LafargeHolcim, Spain

Description

This case study has been selected as an inspirational model of a private company's approach to natural capital. LafargeHolcim Group¹ has developed a biodiversity and ecosystem services valuation and accounting tool project associated with quarry restoration works in the Yepes-Ciruelos quarry², located in Toledo, Spain.



LafargeHolcim promoted biodiversity in this mining site through ecological restoration processes in order to create a 250-ha nature reserve to improve and increase structural and functional biodiversity of regional ecosystems. In addition, this project has allowed the establishment of ecological niches for regional fauna of invertebrates, amphibians, reptiles, birds, and mammals.

Specific actions have been applied for extraction operations and ecological restoration: restoration and revegetation of a series of oak

and kermes oak groves formations were carried out with native species and vegetation types such as Thyme, Esparto Grass, Retama Broom Brushes, Kermes Oaks and Holm Oaks in Castile-La Mancha; promotion of pollination (beehives were placed to favour the pollination of flora and support local European bee-eater populations); promotion of the cliff-nesting bird species through the installation of artificial nets (hacking method), among many others. To evaluate the evolution of the restoration processes, a monitoring system has been developed in

collaboration with WWF, a biodiversity index, and the IUCN Biodiversity Indicator and Reporting System tool (BIRS)³ - which guides the cement and aggregate sector in adopting a standardized system for monitoring the state of biodiversity.

The natural capital valuation conducted by LafargeHolcim assessed and measured the qualitative state and economic value of the natural capital and ecosystem services generated through ecological restoration. The economic value per hectare rehabilitated annually generated by the quarry's ecosystem services was estimated at 540 euros/ha. This value is derived from ecological restoration and rehabilitation processes developed according to biodiversity conservation objectives.

The restoration improved the ecosystems and promoted biodiversity, whilst fostering the public use of the restored quarry due to the increased attractiveness and versatility of the environment: for recreation, training and education activities and investigations. A series of educational and leisure activities to promote environmental awareness and knowledge about biodiversity have been designed and implemented. In addition, the project has allowed the identification of different actions and guidelines to be used as references for the mining sector's ecological restoration projects.

Methodology and tools

Natural assets or natural resources in the quarry and its surroundings were studied based on field samples using a floristic catalogue. Work was done on the identification and mapping of the different types of vegetation according to their biology and ecology alongside soil characterization (the study of the influence of soil on living beings and land use) of the area. As for the fauna, a study about the presence and distribution of birds and insects was carried out based on bibliographic resources and field censuses.

Once existing natural asset locations were identified, a qualitative and quantitative assessment on the status of biodiversity present in the restored area was developed based on the value of each habitat typology. In addition, specific strategies and action plans were drawn up and implemented to guarantee and increase biodiversity indicators over time.

To track and control restoration processes, the biodiversity index of butterflies, birds, insects, lichens, and plants developed in collaboration with WWF was used as a monitoring tool, together with the IUCN Biodiversity Indicator and Reporting System (BIRS) tool. The latter tool allows the evaluation of the state of biodiversity in mining operations and is applicable to any ecosystem at international level. BIRS is used to determine whether measures and actions implemented have led to an increase in the value of biodiversity over time.

Finally, an economic valuation of the ecosystem services generated through ecological restoration works was carried out. The valuation analysed the costs and benefits, in relation to the investment made by LafargeHolcim, of generating, maintaining and conserving natural assets and ecosystem services generated. This was done in order to identify how the restoration contributed to biodiversity conservation and the value of the ecosystem services generated in the restored quarry, to society. Public administrations are able to identify the added ecological and social value of the natural capital that restoration could ensure, for the benefit of human capital. This is to ensure private companies and the public sector change their restoration goals to cost effective actions focused on natural capital approaches.

Impacts achieved by the restoration actions

Restoration works were aimed at accelerating the natural plant succession to achieve a notable increase in the biodiversity of the quarry. Data was collected on whether plant communities had been restored; whether populations of birds and insects had increased; whether populations of flora species of conservation interest had increased and if soil diversity had increased. Rehabilitation also involved the creation of ecosystem services with potential benefit for 15,000 people, directly or indirectly, annually. This benefit derives from some rehabilitated areas where different activities related to the botanical path, the bird observatory, and the cycle route can be enjoyed. These recreational ecosystem services involved setting up areas for public (educational and leisure activities) and research (as an experimental field site for universities) use.



Lessons learned

Due to the active role⁴ this company had in creating public-private sector cooperation between experts on ecological restoration, conservation, and other professionals, LafargeHolcim was awarded by the European Business Awards for the Environment (EBAE)⁵ for this collaborative model of quarry restoration that improves biodiversity and natural capital. The collaboration with external stakeholders is contributing to awareness raising around the ecosystem function and the duty to increase biodiversity in every area that a company operates. This company's commitment is part of their strategy, incorporating biodiversity as an asset to their environmental accounting within natural capital politics⁶. This collective work was essential to identify how restoration that focused on conservation and biodiversity criteria could encourage the presence and resilience of rare or vulnerable species. The project also identified how value could be generated through cultural and regulating ecosystem services, by improving habitat conditions and restoring the habitats ecological and biological functions. The lessons learned through this project have served to make public authorities aware that other restoration models with a greater cost-benefit balance for private companies and for biodiversity, are possible.

“Our restoration model at the Yepes - Ciruelos quarry is aimed at increasing biodiversity and has shown that it is possible to make use of mining, in this case for the production of cement, while giving back to society a large area of land with high ecological value. It is a practical case that shows Nature-based solutions in mining is possible” (Pilar Gegúndez, Environmental and Sustainability Director; LafargeHolcim España).



Education activities related to ecological restoration, were developed in the “Mesa de Ocaña Nature Classroom”⁷. These activities contribute to an increase in the level of knowledge and awareness in society about ecosystem processes that create biodiversity. The public use of the restored land is a legacy of the mining activities of LafargeHolcim, with a very high social, cultural, and natural interest. The multidisciplinary collaboration allowed the creation of value for society, by embracing natural resources through the design of new restored areas and public-use activities.



¹ <https://www.lafargeholcim.com/>

² <https://view.genial.ly/57fbb37894fe1f6ad0b13f8d/interactive-content-recovery-of-the-ecological-values-of-the-mesa-de-ocana-lh>

³ <https://www.iucn.org/content/biodiversity-management-cement-and-aggregates-sector-biodiversity-indicator-and-reporting-system-birs>

⁴ <https://www.lafargeholcim.es/biodiversidad>

⁵ <https://ec.europa.eu/environment/awards/index.html>

⁶ https://www.lafargeholcim.com/sites/lafargeholcim.com/files/atoms/files/04062018_lafargeholcim-sustainability-report-integrated-profit-loss-2017.pdf

⁷ <https://www.lafargeholcim.es/lafarge-abre-las-puertas-de-su-cantera-en-una-nueva-edicion-del-programa-de-practicas-de>

The campaign is being led by the [Institute of Chartered Accountants in England and Wales](#) alongside the [World Business Council for Sustainable Development](#), [IUCN](#) and [Oppla](#).



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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821303

wevaluenature.eu

info@wevaluenature.eu

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