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Geoparks Going Green 2

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UNESCO Global Geoparks and Sustainable Development Goals **From theory to action**

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Useful information related to UNESCO Global Geoparks can be found on the following websites:
http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/unesco-global-geoparks

http://www.globalgeoparksnetwork.org

www.visitgeoparks.org

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Geoparks Going Green 2

UNESCO Global Geoparks and Sustainable Development Goals – from theory to action

For 20 years now and all over the world, UNESCO Global Geoparks have campaigned for a holistic understanding of our planet and its evolution. With their initiatives, environmental education and awareness programmes and projects, they place a special emphasis on conveying these natural interrelationships and the impact Man has on these.

Their international network is an opportunity for exchanging ideas with partners around the world. In accordance with their potentials, UNESCO Global Geoparks have been actively pursuing the Global Agenda 2030 with the 17 SDGs for a number of years.

Their bottom-up approach with community participation and capacity building, their sustainable regional development activities as well as their networking from regional to international level make the UNESCO Global Geoparks ideal places to understand the relevance of the SDGs and also the responsibilityof their implementation.

Thus the UNESCO Global Geoparks provide ideal model territories for implementing the Agenda 2030. They form the decisive interface between international declarations of intent and concrete on-the-spot activities – which means the transformation from strategy to action.

The GGN with the support of the GGN Working Group on SDG's are presenting the publication "Geoparks Going Green II – UNESCO Global Geoparks & SDGs – from theory to action" that includes a collection of best practice SDGs examples from different Geoparks!

229 UNESCO Global Geoparks from 50 countries in Africa, Asia and the Pacific, Europe, Latin America and the Caribbean and North America engage in significant initiatives and actions, such as:

- Converting Geoparks' facilities to energy efficient buildings.
- Implementing pioneer activities for energy production and managing issues concerned with noise pollution, air quality, water resources, marine litter, and land and landscape planning.
- Developing circular economies.
- Presenting new models for the consumption and reduction of waste by reusing, repairing, and recycling materials.
- Introducing the use of alternative materials for plastic and fossil fuel.
- Organising educational programmes, lectures, interactive exhibitions, festivals, tours, and activities for raising awareness about climate change and biodiversity to local communities and visitors
- Using indigenous knowledge, also new digital tools to develop new strategies in response to the climate and biodiversity crises.
- Networking and exchanging best practices and examples of projects with successful outcomes.

The Global Geoparks Network, working always in collaboration with the UNESCO Earth Sciences and Geoparks Section invites you to explore these best practices and, to join with members of the UNESCO Global Geoparks, to collaborate in implementing actions supporting the global effort for the Agenda 2030 and the 17 SDG's

Geoparks Going Green 2

GLOBAL GEOPARKS NETWORK

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Adamello Brenta UNESCO Global Geopark, Italy

“Sustainable Mobility: a challenge for our territories.”

A carpark in Adamello Brenta UGGp.

Mobility, meaning any kind of movement of people and goods for tourism, urban or rural, and industrial purposes, represents a crucial issue for the Alpine regions, with significant environmental implications. The territory of the Alpine areas is particularly fragile. The proliferation of the traffic infrastructure risks altering natural landscapes and interfering with cultural landscapes, in addition to causing a loss of tourism attractiveness, not to mention the negative contribution to climate change through emissions. Regarding mobility in a protected area, the logic is to promote access and visits, while reducing the environmental impact created by traffic flow, thus contributing to SDG 13 (Climate Action). Mobility within parks is linked directly to tourism. The risk is that transferring the chaotic model of the city to holiday destinations is detrimental, where people desire exposure to an authentic experience and a closer connection with nature. Since 2003, the introduction of the sustainable mobility project by the Geopark, aims to ensure a tourism approach more respectful to the extraordinary natural environment, with benefits that affect the features present in the territory. This initiative also aims to discourage the use of private cars, promoting an experience with greater awareness and attention to environmental and cultural values. The project is promoted using all the Geopark’s institutional communication channels and, at the same time, using adequate marketing strategies. Additionally, services must be easily accessible, remotely consultable, and available on any device. In the 20 years, from 2003 to 2023, 11,408,774 vehicles have entered the Geopark’s valleys where sustainable mobility was organised., and 3,205,421 people have been ferried via public transport. Currently the Geopark has activated the sustainable mobility project in five valleys.

Sustainable transport in Adamello Brenta UGGp.

Sustainable transport in Adamello Brenta UGGp

Matteo Viviani, director of the Adamello Brenta UNESCO Global Geopark - matteoviviani@pnab.it

Aspiring UNESCO Global Geopark, Algarvensis, Portugal

Sustainable Development Goals & UNESCO Global Geoparks: From Theory to Action

Children exploring a river in the Fonte Benémola, Querença – Loulé.

Observation point with a panoramic view in the Pico Alto, São Bartolomeu de Messines – Silves.

The aspiring UNESCO Global Geopark (aUGGp) Algarvensis is a territorial area with well-defined boundaries, and with a geological heritage of significant national and international importance. It combines a geoconservation strategy and a set of environmental education and awareness policies, involving the community and contributes to the appreciation and promotion of local products. The aUGGp Algarvensis is a territory of identity, inspiration, transformation, and belonging, which invites people to visit, settle and invest, consciously and in harmony with the territory’s natural and cultural values. It is a way of living and experiencing the territory, bequeathing it to future generations, which fits perfectly with the the UN’s Sustainable Development Goals SDG 4(Quality Education), SDG 8 (Decent Work And Economic Growth), SDG 13 (Climate Action), SDG 15 (Life On Land) and SDG 16(Peace, Justice And Strong Institutions).

The ODSlocal Platform is an initiative that aims to mobilize municipalities and other entities to achieve, at the local level, the SDGs proposed by the United Nations 2030 Agenda, through a partnership between the National Council for the Environment and Sustainable Development (CNADS), the OBSERVA (ICS-University of Lisbon), MARE (New University of Lisbon) and 2adapt, supported by the “la Caixa” Foundation.

Among other objectives, it aims to map and disseminate reference projects, as well as good municipal practices, and identify their respective impacts on the SDG goals. In this context, at the ODSlocal’23 Annual Conference, in Viana do Castelo (Portugal), the municipality of Loulé achieved recognition for the Aspirante Geoparque Algarvensis project, a partnership between the municipalities of Loulé, Silves Albufeira and the Algarve University to design a territorial dynamic conducive to climate action with a commitment to sustainable development.

With a multidisciplinary team, the aspiring Geopark Algarvensis focuses its work on the sustainable development of its territories, based on a green and socially balanced economy, as well as on environmental and heritage education. In achieving this, it involves a team composed by the Municipalities of Loulé, Silves and Albufeira and their corresponding representatives, the Scientific Director, coordinating team and technical team.

All available information about this project can be found in the following access https://geoparquealgarvensis.pt/en/

The Odelouca River Valley, close to Aldeia de Odelouca – Silves.

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Alxa Desert UNESCO Global Geopark, China

The investigation and research of the geological heritages gives strong support to a Geopark's scientific popularity and educational potential

The team investigating a site during the geological survey (2019.11)

The Quaternary cirque group newly discovered site in Helan Mountains (2022.07).

Alxa Desert Global Geopark is currently the only global geopark primarily with a desert geological heritage. The Geopark recognises the unique value of global desert research, landscape protection, development, and utilization.

Since 2021, Alxa Desert Geopark has successfully launched "The Three Years Action Plan Geological Heritages Survey, Investigation and Evaluation (2021-2023)". The project further investigates the types, causes, distribution, levels, protection status, scientific and aesthetic values of the geological heritage in the Geopark. The programme involving scientific and reasonable forward planning will promote development in the Alxa Desert Global Geopark including the expansion and high-quality development of the local tourism economy.

Over the past three years, Prof. TIAN Mingzhong from China University of Geosciences (Beijing) and his research team walked almost all of the 270,000 km2 of the Alxa Desert Geopark They identified about 391 sites with a significant geological heritage and investigated and recorded 107 cultural and other natural landscapes. The survey discovered, for the first time, more than 20 archaeological sites including the Helan Mountain Glacier Ruins, Taolai Basalt Arches, Yabulai Mountain Bayinshunbuer Ancient Human Activity Site, and Engerwusu Crater. These new sites were measured, mapped, relevant samples were collected, and the processes involved in their formation were explained scientifically and accurately. The survey provides a detailed and accurate scientific basis with new information for the scientific utilization and popular science education in the Geopark.

In the future, Alxa Desert Geopark Administration team will make the best use of the geological survey's achievements, transfer them from theory to practice and application, creating the sustainable development of the geological heritage and a geopark role model by contributing to SDG 4 (Quality Education) and life-long learning.

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The newly discovered Engerwusu Crater in Badain Jaran (2023.10).

Taolai Basalt Arches that newly discovered in Tengger (2022.08)

Apuan Alps UNESCO Global Geopark, Italy

The Apuan Alps Geopark (Italy) and Sustainable Development Goals: a long-standing commitment

Indoor activities at the Geopark Farm Museum in the framework of Educational Activities

Honey bee activities during the Summer Camps

Long before its first steps within the European Geoparks Network, the Apuan Alps UGGp has worked to consolidate its experience in the field of education for environmental sustainability.

All actions that have been set in motion contribute therefore to SDG 4 (Quality Education).

The most significant input concerns the Educational Offer for Students, a programme that has been going strong since 2010 and is meant to teach children how to take care of their world. Each year, around 1.500 students from primary and secondary schools are involved and several educational projects are designed according to a common theme, i.e. the title of the current International Year. Accordingly, the title chosen for the 2023-2024 Educational Offer is "Educating in science to mitigate climate change", following the UN resolution making 2024-2033 the International Decade of Sciences for Sustainable Development. The primary need for the enhancement and protection of natural environments and their resources, in order to achieve sustainable cultural and socio-economic development of local communities, will be addressed by experiencing the outcomes resulting from the scientific projects carried out by the Geopark (exhibitions, museums, and laboratories, equipped geotrails, visitor centres, an educational farm).

In addition to the Educational Offer, the Apuan Alps UNESCO Global Geopark organises every year weekly summer camps for children aged 8 to 16. These initiatives are a great opportunity for boys and girls to acquire a direct knowledge of the natural and cultural heritage of the Apuan Alps under the guidance of the Geopark guides, with particular attention to the promotion of environmental and human well-being.

Among the more recent, noteworthy actions was last year's Erasmus+ project in the field of environment and sustainability called "Approaching sustainable development through Geoparks". The aim was to contribute to the development of social and emotional skills in the visiting students from Portugal and Greece. This two-day programme allowed them to improve their STEM skills, and also their awareness about activities related to sustainable development, modelled on the good practices of the Geopark in preserving its geological, biological, cultural and historical heritage, as well as its impact on the local communities.

Moreover, with the support of national research institutes and regional associations, the Geopark organised several activities meant to foster the continuous education and training of the certified Geopark Guides. The themes ranged from more general concepts and knowledge of the territory and its governance concerning geohazards, and in particular to local aspects of risk prevention and mountain safety, using practical and theoretical activities.

The actions briefly described not only concern raising awareness about Earth processes and the environment's protection by contributing to SDG 4 (Quality Education)) but also by contributing to SDG 12 (Responsible Consumption And Production) SDG 13 (Climate Action) and last, but not least, SDG 17 (Partnerships For the Goals).

'Approaching sustainable development through Geoparks' Erasmus + project: the guided visit with foreign students

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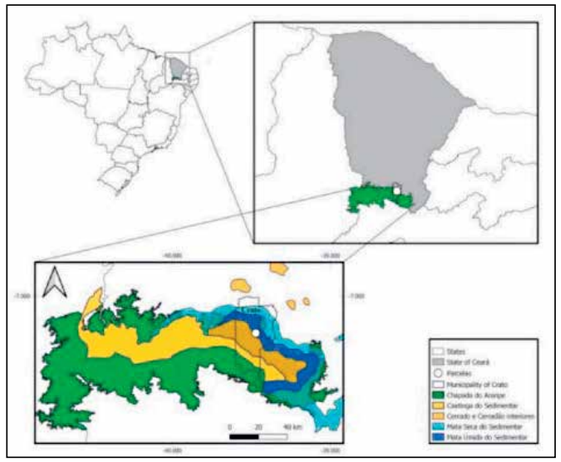
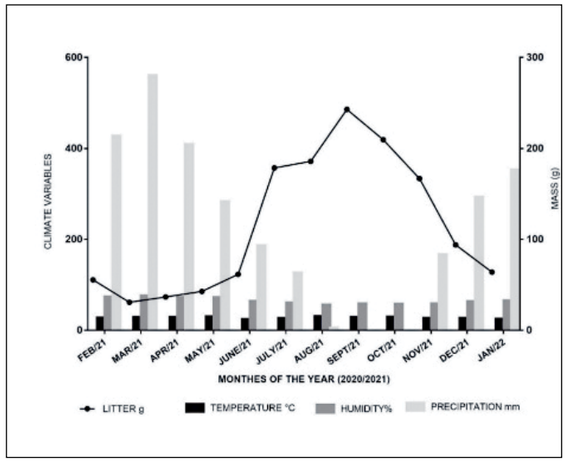
Araripe UNESCO Global Geopark, Brazil

Decarbonisation in forest areas of Araripe Geopark



Geographic location of the area of study. Sedimentary basin humid forest biome and forested savanna (Cerradão) in the Chapada do Araripe, Crato, Ceará, Northeastern Brazil.

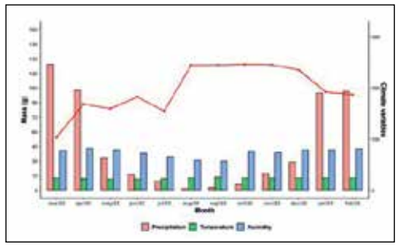


Relationship between senescent litter and climatic variables (temperature, humidity and precipitation) in the period from February 2021 to January 2022 in a humid forest biome in Chapada do Araripe, Crato, Ceará, Northeastern Brazil.

The emission of high concentrations of CO2 is today one of the main global problems. The growth of forest vegetation, with, the potential for a high carbon storage capacity in its biomass, is a fundamental factor in reducing these emissions. This study analysed the potential for CO2-eq (carbon dioxide equivalent) and removal in woody vegetation above ground, to support economic viability in the implementation of carbon credit projects in two areas with different phytophysiognomies in Chapada do Araripe, Crato, Ceará State (Araripe Geopark Territory, Brazilian semi-arid region); forested savanna (Cerradão) and humid forest. Litter collectors were installed to determine the carbon content in different components in order to relate this to climatic variables (relative humidity, temperature and rainfall). Carbon increment and stock/sequestration potential were obtained from information collected in continuous forest inventories (phytosociology) by permanent plots in two subsequent Years – 2021/2023) and conversion factors. Based on the average carbon content of each component and the volume of wood stored in the forest, it was observed that 27.14 and 11.28 t.ha-1 (ton/hectare) of carbon is stored in the living biomass for the humid forest and forested savanna, respectively, with an annual increase of 1.26 and 0.75 t.ha-1year-1 respectively. The annual average of the litter components was 5.47 (humid forest) and 16.92 t.ha-1year-1 (forested savanna), with an average component content of 50% (55.59 t.ha-1 – humid forest and 26.40 t.ha-1 - forested savanna) with an accumulated carbon mass of 2.73 t.ha-1 and 0.576 t.ha-1, respectively. Of the three compartments observed in the humid forest phytophysiognomy, only the "leaves" component showed a significant correlation with a climatic variable (precipitation), while in the forested savanna, all showed a significant correlation with at least one climatic variable. In the humid forest, the carbon sequestered annually totaled 3.99 t.ha−1 [carbon incorporated in the litter (2.73 t.ha−1) + average annual increment of carbon in the commercial volume (1.26 t.ha−1)] indicating that the area sequesters an average of 102.02 t.ha−1CO2e. The value of carbon sequestered/year in forested savana was 1.32 t.ha-1 [carbon incorporated in litter (0.75 t.ha-1) + average annual carbon increment in commercial volume (0.576 t.ha−1)] pointing to average sequestration of 40 t.ha−1 CO2eq. The results show the (still unexplored) carbon sink potential of the two forest phytophysiognomies in the Araripe Geopark territory, indicating the greater potential for the humid forest phytophysiognomy and suggesting its use for carbon credit projects at national and global level as an alternative to better land use and the mitigation of global climate change.

This study contributes significantly to SDG 11 (Sustainable Cities And Communities) through the possibility of local rural communities joining forest preservation projects; SDG 13 (Combating climate change) as forest conservation allows for greater carbon sequestration and storage) and SDG 15 (Life On Earth) by maintaining biodiversity through the conservation of forest areas in Araripe Geopark's territory.

Comparison between the production of senescent litter and climatic variables (temperature, humidity, and precipitation) between March 2022 and February 2023 in a Forested Savannah area (Cerradão), Chapada do Araripe, Crato, Ceará, northeastern Brazil. Values expressed in mean ± S.E.M. with non-linear regression of curves, analyzed by two-way ANOVA, following Tukey's test (p< 0.01).



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Arouca UNESCO Global Geopark, Portugal

The contribution of the "Arouca Agrícola" initiative for the Sustainable Development in Arouca Global Geopark

Community involvement in harvesting strawberries one of the products resulting from organic farming promoted by the "Arouca Agrícola" initiative.

Examples of local products integrated into local consumption patterns.

The Arouca UNESCO Global Geopark's "Arouca Agrícola" initiative serves as an exemplary illustration of sustainable development, effectively combining agricultural innovation, environmental preservation, and community involvement. Since its establishment in 2017, "Arouca Agrícola" has emerged as a leading advocate for local agricultural methods, effectively balancing the needs of the modern market while simultaneously driving economic, social, and environmental advancements within the region. With a network of 60 local farmers, the initiative promoted the sale of more than over 100 tons of fresh produce, embodying a commitment to short food supply chains and local sourcing. Through technical training and advocacy for eco-conscious methods, "Arouca Agrícola" promotes sustainable agriculture and organic farming, safeguarding environmental integrity while ensuring quality yields.

Beyond agricultural production, the initiative fosters community connections through educational programmes, cultural events, workshops, and collaborative partnerships with businesses and educational institutions. By integrating local products into daily consumption patterns and activities, "Arouca Agrícola" celebrates the region's agricultural heritage and promotes healthier lifestyles.

The multifaceted benefits of "Arouca Agrícola" extend beyond economic gains, encompassing environmental conservation and social well-being. By supporting new producers, creating innovative products, and encouraging settlement in rural areas, the initiative contributes to poverty alleviation and community resilience, aligning with SDG 1 (No Poverty). In addressing hunger and promoting sustainable agriculture (SDG 2), "Arouca Agrícola" establishes short marketing circuits to minimize food wastage and ensure food security.

"Arouca Agrícola" introduces locally sourced products into school canteens, fostering healthier eating habits among children.

By emphasising the nutritional value of locally sourced produce, the initiative promotes healthier diets and sustainable food systems. Aligned with the SDG 3 (Good Health And Well- Being), "Arouca Agrícola" introduces locally sourced products into school canteens, fostering healthier eating habits among children and adolescents. Additionally, by promoting organic farming methods, the initiative supports a healthier and more sustainable food system. As for SDG 4 (Quality Education)"Arouca Agrícola" organises awareness-raising actions and provides training on sustainable agricultural practices, enhancing education within the Arouca UNESCO Global Geopark.

Moreover, the initiative's efforts align with SDG 8 (Economic Growth), promoting inclusive economic growth, employment, and settlement in rural areas. It also contributes to SDG 11 (Sustainable Cities And Communities) by improving agricultural practices, raising awareness for sustainable food consumption, and combating land abandonment.

Under SDG 12 (Responsible Consumption And Production), "Arouca Agrícola" implements strategies for sustainable consumption and production patterns, promoting local products and organic farming. In combating climate change (SDG 13), the initiative implements organic farming strategies and combats land degradation.

Finally, to endorse SDG 15, "Arouca Agrícola" promotes the maintenance of natural landscapes, specifically through the preservation of the polyculture system typical of family farming, ensuring the sustainable management of forests and biodiversity conservation.

Considering the information provided above, this significant endeavor has been made feasible due to the active participation of four local entities within the Arouca UNESCO Global Geopark: AGA – Arouca Geopark Association, Municipality of Arouca, ADRIMAG and Arouca Group of Schools (SDG17 - Partnerships for development).

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Arxan UNESCO Global Geopark, China

Winter Study Travel + Ice and Snow Crossing Tourism - let Arxan UGGp winter tourism become popular

Learning how to use a chainsaw for for cutting logs.

Children enjoy ice and snow winter study in the Arxan Geopark.

An example of ice and snow sport in Arxan Geopark.

In-order-to allow the "cold" resources to leverage the "hot" industry, and the ice and snow economy to stimulate the winter tourism market, Arxan UNESCO Global Geopark has launched a series of activities of "Winter Study Travel and Ice and Snow Crossing Tourism".

Winter Study Travel

In November 2023, Arxan UGGp received the first batch of more than 40 winter study travel teams to enjoy an ice and snow, experience, ice and snow entertainment, and experience the scenery of Arxan UGGp.

Through the three-day study travel, activities such as bark painting, snowman building, a snow crawling competition, skiing, and a hot spring experience, the study travel team appreciated the magical charm of "ice and snow and hot springs" in Arxan UGGp, experienced forest culture, and inspired enthusiasm for ice and snow sports.

Li Jie, a child from the team, said: "Through the rich ice and snow study travel course, I learned about the formation of snow, and the teacher also taught us how to make ice lanterns, the process is particularly interesting, through the stumbling block, bark painting production and the experience of the characteristics of the forest culture."

Ice and Snow Crossing Tourism

On November 24, 2023, a self-driving team composed of self-driving enthusiasts from Guangzhou, Shandong, and Hebei arrived in Arshan, and more than 30 people in 20 vehicles went to the hot spring, port, and Haosengou geosites of Arxan UGGp for a self-driving tour, and stayed overnight at Lujiaowan Hot Spring Holiday Camp.

This self-driving crossing route is a winter tourism boutique route promoted and launched by Arxan UGGp.

With the continuous expansion of the scale of the Arxan ice and snow market, the supply of winter tourism products is becoming more and more abundant, and the demand for ice and snow tourism is also developing in the direction of diversification, specialization' and segmentation. Arxan UGGp's "Ice and Snow + Sports", "Ice and Snow + Study Travel", and "Ice and Snow and Self-driving Crossing" have become a new development model for Arxan's winter tourism market. These activities contribute to the UN's Sustainable Development Goals SDG 3 (Good Health And Wellbeing) and SDG 8 (Decent Work And Economic Growth) in Arxan UGGp.

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Vehicles involved in the self driving crossing.

On the self driving crossing trail.

Aso UNESCO Global Geopark, Japan

Raising awareness of Mental and Physical Difficulties on Returning to Work for Woman: A Means for Encouraging Women's Empowerment in Aso Geopark

A presentation in Aso UGGp.

Aso UGGp's team celebrates Christmas.

I started working for Aso Geopark Promotion Council in 2019, and I returned to work a year later after giving birth. By sharing the story of how I came back to work, I hope to promote mutual understanding between a child-raising-mother and those around them.

While raising my child, I sometimes felt isolated from society because I spent most of my time with my child and felt that I no longer belonged to any communities. I experienced an inability to communicate how I felt about getting back to work following my maternity leave to my co-workers even though they were trying to understand my situation. Maybe it is because in Japan we have an unconscious bias concerning the woman's role in raising children and as a mother. In addition, I had no time for myself and could only obtain limited information through the internet and other sources. So that it was difficult for me to rely on someone.

How we solved this situation? Looking back on my maternity leave, I did not lose my positive thought that I wanted to be a member of the Geopark programme and Aso UGGp's team. While taking maternity leave, I sent a video message to evaluators during the revalidation mission. Furthermore, my co-workers communicated with me concerning the developments in my former administrative role and I was always welcomed to come to the office with my child. I also accompanied the study tour from other UGGps. I found that my workplace was a community where I could feel fulfilled and ask for help even outside of work. I realised that a community where we can communicate on a regular basis is necessary to reduce physical difficulties involved with time and the surrounding environment, and to listen to what people want and need.

Teaching Japanese at Idea IT College, Aso.

As a result, I could easily return to work. Besides, I was assigned a project to teach Japanese to international students at a local vocational school with which the office works as part of its contribution to the community.

Through my own experience, it is true that there are invisible barriers on returning to a former role and there is a different awareness between females and males in senior positions. Though I still do not have a clear answer, the only thing I could say is that we need to have a dialogue in-order-to overcome unconscious bias.

I hope that everyone who works with "mothers" knows what is necessary for "mothers" through this account based-on a true story. The obstacles "mothers" experience are almost invisible as long as they fail to communicate them to others.

As a member of Aso UGGp, I want to try not to ignore mothers who are facing similar problems to mine and help them to sustain their careers. Through the Geopark network, I would like to know the good practices for promoting social engagement for people who face those invisible obstacles, and to further

The UNESCO Global Geoparks' contribution to SDG 5 (Gender Equality).
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Bakony–Balaton UNESCO Global Geopark, Hungary

Geotour-guides as local ambassadors of the Geopark

Educational field trip for geotour guides in the Tapolca Basin, the iconic landscape of the Geopark.

(photo by Barnabás Korbély).

Guided geotours are 'flagships' for geotourism provision in Bakony–Balaton UNESCO Global Geopark. Sixty-hour-long geotour-guide training courses, coordinated by the Balaton Uplands National Park Directorate, the management body of the Geopark, have been delivered since 2009. The courses aim to transfer as much 'localized' knowledge to the local participants as possible. To-date fourteen courses have been delivered in different areas of the Geopark and the entire territory was covered. However, there is still much for future geotour-guides to discover or for those who just simply would like to learn about and appreciate the territory's unique geological and cultural heritage.

Altogether 213 people, mostly dedicated locals, have participated in the programme, and some of them are already working in geotourism. Thanks to the enthusiastic participants who completed more than one course, a total of 385 certificates have been issued. Most of the courses were completed with the committed Geopark Partner NGOs, Bakonyalja Barátai Association and Pangea Association.

The curriculum for every training course reflects the holistic approach of UNESCO Global Geoparks. Thanks to lectures delivered by an experienced geologist, geographer, biologist, archaeologist and ethnographer, the sessions offer a unique opportunity to discover the Geopark's geological, geomorphological, hydrological, ecological, and cultural heritage. Of course, many field trips and outdoor exams at geosites are also important parts of the courses. We have received very positive feedback regarding the quality of the training, and the guides became members of a cohesive community. Besides providing participants with an interesting and joyful experience, the courses also offer a great opportunity to develop new geotourism services. In addition to geotour guides within the Geopark's staff, year by year, between 10–20 certificated guides have become official Geopark Partners. For a modest annual fee, they are allowed to use the official Bakony–Balaton Geopark Partner logo and their guided geotours are promoted by the Geopark. They can also take their geotour participants to some visitor centres and interpretive sites at a discounted entrance fee.

Some of the Geopark Partner guides also provide geotours in English and German. Veszprém, the largest city in the Geopark, and the Balaton Region with a fantastic geoheritage, was the European Capital of Culture in 2023, and we were happy to welcome many visitors from abroad as well. Our geotour guides are eager to present the geological wonderland of Bakony–Balaton UNESCO Global Geopark! You can read about them and their geotours at www.geopark.hu. The activities of the Geopark Partner guides contribute to the UN SDGs 3 (Good Health And Well-being) and 4 (Quality Education).

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Discovering the cultural heritage of the Geopark. Participants visit a church, built in the 11th century, near Öskü.

(photo by Barnabás Korbély).

Zsuzsanna Mácsány is also a spinal yoga instructor, so special stops are made during her geotours.

(photo by János Bozsó).

Batur UNESCO Global Geopark, Indonesia

Eco-Enzyme programme for Lake Batur

Lake Batur is on the east-southeast side of the Batur Caldera complex and has a unique shape resembling a crescent moon. It is 7.5 km long and 2.5 km wide and has a maximum depth of 84 metres.

Lake Batur is part of the geoheritage owned by the Batur UNESCO Global Geopark. Lake Batur is a volcanic lake which is believed to have formed during the first formation phase of Mount Batur Caldera, 29.3 thousand years ago. This lake is situated on the east-southeast side of the Batur Caldera complex and has a unique shape resembling a crescent moon. It is 7.5 km long and 2.5 km wide and has a maximum depth of 84 metres. As a volcanic lake that does not have an inlet or outlet, the main source of water to fill the lake comes from rainwater and magmatic water. Lake Batur has an important socio-ecological function because its position is in the central part of the island of Bali, which is believed to support groundwater resources on the island. Apart from that, this lake is a habitat for various freshwater fish and a food source for several bird species. As a social function, Lake Batur is a sacred lake for Hindus in Bali, especially Batur Village, because it is believed that Lake Batur is the abode of the Goddess Danu, who is the goddess of prosperity and fertility. Lake Batur, as a lake with a closed system, experiences several problems, such as shallowing due to sedimentation, pollution due to floating cage fishery feed waste, sulfur spray, and pollution due to household waste. So, with these conditions, Lake Batur cannot naturally improve itself, so collective efforts are needed to save and preserve the water in Lake Batur. One of these efforts is the eco-enzyme movement programme for Lake Batur. Eco-enzyme, also known as EM (Effective Microorganisms), is a liquid produced through the fermentation of a mixture of organic materials, such as fruit, vegetables, and sugar, by certain microorganisms. This fermentation process involves the collection of beneficial microorganisms, such as lactic acid bacteria, yeast, and other microbes. The eco-enzyme movement for Lake Batur was initiated by the Bangli Regency Government in collaboration with environmental activist communities, villages, and schools in the Bangli Regency area. From May 27, 2023 twenty tons of eco-enzyme liquid was poured into the lake on 11 occasions at six sites, namely Segara Temple in the middle of Lake Batur, around Toya Bungkah, Terunyan Village, Kedisan Pier, and around Hulun Danu Batur Songan Temple. Joint-collaboration between stakeholders in efforts to protect and preserve Lake Batur is an example of good practice. This collaboration contributes to the UN SDG goals 6 (Clean Water And Sanitation) and SDG 14 (Life Below Water) and SDG 17 (Partnerships For The Goals). The existence of the UNESCO Global Geopark provides awareness and knowledge of the importance of maintaining and preserving the Earth's heritage for a better life in the future.

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The community that cares for the preservation of Lake Batur gathered on the edge of the lake to pourin eco-enzymes made in each community and school into Lake Batur.

The process of pouring the eco-enzyme carried out by Mr. Sedana Artha, Regent of Bangli Regency in the middle of Lake Batur together with members of the Geoparks community.

Beaujolais UNESCO Global Geopark, France

The Conference on climate change and geology in Beaujolais Geopark

Gilles-Escarguel, Associate-Professor in macroecology at the Laboratory of the ecology of natural and anthropised hydrosystems, Lyon University.

Beaujolais_ Climate-conference held at Villefranche.

Situated 30 km north of Lyon and covering an area of some 1,550 Km², the Beaujolais owes its "Geopark" label to its incredible geological diversity. It is often said that there are more than 300 different varieties of rocks in the territory, from gneiss to golden stones, granite and bluestone. These different terroirs explain the great diversity of our world-famous wines, which are all made from the same grape variety: Gamay for the reds and Chardonnay for the whites.

Regarding climate change, when the Earth's average temperature rises by 1°C over 100 years, the Beaujolais region warms up by 2°C. It is therefore very important for the inhabitants to better understand the mechanisms involved in this change in our environment and how they can act to reduce their impact on our planet. As a Geopark, we have knowledge about the history of the Earth. Geology is a very useful science to understand the climatic conditions in previous periods, which sheds light on the challenges of current climate change.

The second topic of our action plan 2023 – 2026, which was approved by our decision-making body at the end of October, is entitled "supporting the region's adaptation to climate change". One of our key actions was the organisation of a conference about climate and geology. Actually, the same conference was delivered in three cities across the Geopark's territory to try to reach more people.

Beaujolais Geopark, the Climate conference_ booklet.

The speaker was Gilles Escarguel. A palaeontologist by training, he is Associate-Professor in macroecology at the Laboratory of the ecology of natural and anthropised hydrosystems, Lyon University.

After explaining the geological history of the Earth and how it relates to the movements of tectonic plates, he looked back at the history of life on Earth. Based on past geological history, he explained the link between climate changes and variations in biodiversity and, following this, the main causes of an extinction crisis. Based on this information, he analysed the current situation to understand where we stand, how we arrived here and what we can do in a very practical way.

Each time, the presentation led to some very interesting discussions on how to take- action, both individually and collectively. We received very good feedback from participants, who greatly appreciated the quality of the content presented and the ensuing discussions.

As a follow-up to this series of conferences, we have produced a booklet, which is available on our website, summarising the main points presented and offering some additional sources of information for those interested. The series of conferences together with the booklet promotes SDG 4 (Quality Education).

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Bergstrasse-Odenwald UNESCO Global Geopark, Germany

Leading the green movement by example in the Bergstrasse-Odenwald Geopark

One of the 8 stations on the Geopark-Trail "Climate change in the forest". High quality infographics were combined with a digital storytelling approach to specifically engage young people.

Soil columns in combination with information boards draw attention to the importance of soil.

Introduction:

The UN Agenda 2030 for sustainable development with the 17 Sustainable Development Goals (SDGs) are leading maxims for action in the Bergstrasse-Odenwald UNESCO Global Geopark. The following article will focus on our activities that contribute to the goals 4, 13 and 15. These goals play a special role in our day-to-day work.

SDG 4 (Quality education): In the area of Education for Sustainable Development (ESD), the Geopark offers a wide range of programmes for children, young people and adults and works closely with schools and kindergartens. The Geopark rangers invite you to discover nature and learn how important it is to treat it with care.

This year, we have educated new Geopark Rangers, participated in a joint ESD project with the German UNESCO Global Geoparks and were recognised with the "National Award - Education for Sustainable Development" for our large ESD programme. The award was presented by the Federal Ministry of Education and Research and the German Commission for UNESCO.

SDG 13 (Climate action): The area of the Geopark is covered by almost 50 percent with forests. It is therefore no surprise, that all issues concerning the condition of forests, the devasting effects of climate change and measures to plan for a more resilient "forest of the future" strike a key with the local citizens and member municipalities.

Therefore, we have developed the Geopark-Trail "Climate change in the forest", together with one of our member municipalities. As a visitor, you follow our digital protagonist Tanner, the young climate-detective, and her dog, solving, on site, the case of the dying monoculture forest.

Checklist of the SDG postcard in combination with SDG information panel

Eight interactive stations provide detailed information on the effects of climate change and what is done to create a more resilient, diverse forest culture in the future. Puzzles and tasks can be solved on the smartphone, and you can even plant your own "digital forest".

In a second project, which we call "Forest of the Future", we take citizens on to an excursion into their local forests, guided by foresters. This hands-on experience combined with the possibility of planting your own climate-resilient tree will eventually make for a lasting experience and strengthen the connection between people and their local forests.

SDG 15 (Life on land): Life on land is linked to the soil. Soil plays a key role in providing our nutrition, as a water reservoir, as a hotspot of biodiversity and as a carbon dioxide store.

To draw attention to the importance of soil, the Geopark is working with its members to erect soil profile columns. On the one hand, they show how important it is to treat our soil, which has formed over thousands of years, with care. On the other hand, they also provide an insight into the soil organisms that convert dead animal and plant material and convert it into nutrients for new life.

Communication: An entire range of the Geopark's communication tools are aimed at motivating people to act in line with the SDGs. We link each of our campaigns to the appropriate goal for example in our magazine and publish various media such as a flyer, an information panel or a postcard with individual sustainability checklist to raise awareness of the SDGs.

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Black Country UNESCO Global Geopark, UK

SDGs and the Black Country UGGp – Purple Horizons (SDG 13 & 15)

Top - Barr Beacon Geosite - Purple Horizons hillside bare earth habitat and bee bank creation for pollinators

(Photo courtesy of Aaron Bhamra University of Birmingham).

The Black Country UGGp, through its project work in a dense urban area, contributes to many of the UN SDGs. In this setting it plays a particularly important role in conserving heritage and greenspaces, nature recovery, biodiversity enhancement and climate action (SDG 13, SDG 15), supporting life-long learning for all and raising awareness about the local heritage (SDG 4, SDG 5, SDG 17). It also creates opportunities for local people and visitors to manage the landscape together (SDG 16) and enhance the visitor economy (SDG 8 and SDG 11), actively engaging in research and innovation projects (SDG 9) and take up more active and healthy lifestyles (SDG 3).

Many of the Geopark's projects deliver multiple outcomes across the SDGs. 'Purple Horizons', a project with a focus on expanding, reconnecting and enhancing lowland heathland is a good example. Its aim is to use a holistic, inclusive partnership approach to create a thriving nature recovery network that is resilient to climate change, with improved biodiversity, geodiversity and landscape value, enjoyed by people in a sustainable way.

This project was specifically designed to meet with both local priorities and policies and align with the SDGs. Its particular priorities are to:-

- Carry out works that will counter/reverse ongoing biodiversity and geodiversity loss.
- Carry out works that will establish a natural landscape that is more resilient to adverse climate change.
- Carry out works that foster better public knowledge about the landscape, that encourage more sensitive human interactions with the landscape and enhance appreciation of the local landscapes and enhance mental and physical wellbeing.

A queen Red-Tailed Bumble Bee exploring the new habitat shortly after its creation

(photo courtesy of Graham Worton)

This four-year (2021 – 2025) landscape-scale nature recovery project is designed to re-connect the natural habitats and communities fragmented by urban development. Its approach connects geodiversity, soils and biodiversity disciplines and operates through a partnership between local authorities, land managers, universities, communities and businesses. A key aspect is a focus on pollinator habitats on the urban/rural boundary and their role in pollination in the surrounding agricultural areas. The re-establishment of rock faces and soil banks to support burrowing bee and wasp communities is also being formally studied at the University of Birmingham in order to understand how to create ideal 'bee-banks' and 'bee-beaches' on abandoned quarry sites.

By 2024, this work has created four acres of new habitat and carried out green hay enhancement at eight sites in the area. Significant species recorded during surveying during the purple horizons work on the newly created habitats included three nationally notable species, including two new species seen for the first at the Barr Beacon Geosite. Further monitoring of geodiversity change and biodiversity are ongoing.

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ProGEO Geoconservation symposium visit to the Pinfold Lane Quarry part of the Geosite October 2023 as part of the International Geodiversity Day celebrations

(Photo courtesy of Colin Prosser Natural England).

Caçapava UNESCO Global Geopark, Brazil

Traditional knowledge and SDGs in quilombola communities

Women from quilombola community Picada das Vassouras collecting medicinal plants from their garden.

The integration of Sustainable Development Goals (SDGs) in the context of the quilombola communities of Picada das Vassouras and Quebra Canga, located in the Caçapava UNESCO Global Geopark in Rio Grande do Sul State, southernmost Brazil, is a vivid example of how traditional practices and knowledge can contribute to sustainable development and social justice. This quilombo represents a story of resistance and survival, where traditional knowledge, especially related to ethnobotany, stands out as a fundamental element of its identity.

The use of the Participatory Rural Diagnosis (DRP, in Portuguese) methodology associated with guided tours through family backyards, revealed not only the rich biodiversity of medicinal plants endemic to the Pampa biome, cultivated alongside ornamental plants but also the deep knowledge and appreciation of these plants in the community. This practice of growing and using medicinal plants, which includes the preparation of teas, ointments, and blessings, is an example of SDG 3, promoting health and well-being through the sustainable use of local natural resources, and SDG 15, by preserving terrestrial life and biodiversity.

The study testifies the need to strengthen the identity and belonging of the quilombola community, especially among young people, to ensure the transmission of this ancestral knowledge and avoid the loss of their rich and unique culture, addressing SDG 10 by reducing inequalities within and between communities. Furthermore, the initiative contributes to SDG 16 by promoting peaceful and inclusive communities for sustainable development, providing a platform for their voices to be heard and valued.

Cultivation of medicinal plants, traditional knowledge passed on to new generations.

The relationship between economic development (SDG 8) and the ethnobotanical practices of the quilombola community is also evident. The appreciation of traditional knowledge and the potential for developing natural products and ecological tourism based on this knowledge can offer new economic opportunities, promoting decent work and sustainable economic growth.

The eradication of poverty (SDG 1) and zero hunger (SDG 2) goals are equally impacted by these practices, as knowledge about medicinal plants contributes to food and nutritional security, and offers economic alternatives for communities. By valuing and preserving their traditional knowledge about medicinal plants, the community not only promotes health and well-being through the sustainable use of natural resources but also fosters a local economy based on valuing biodiversity and sustainable agriculture.

In conclusion, the experience of the quilombola communities of Picada das Vassouras and Quebra Canga is a testimony to the power of traditional knowledge and sustainable practices in achieving the sustainable development goals. By valuing and integrating this knowledge into development efforts, it is possible to promote a more just, healthy, and sustainable society, highlighting the importance of preserving and revitalizing ancestral cultures and wisdom for the benefit of future generations.

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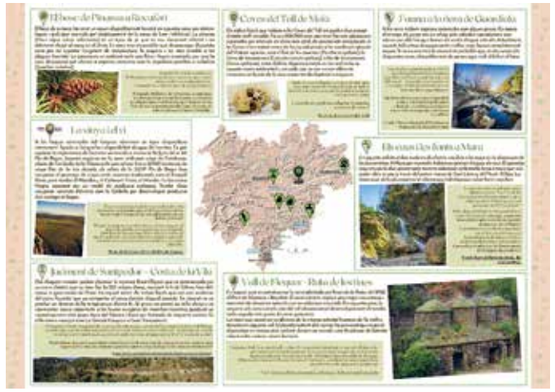
Catalunya Central UNESCO Global Geopark, Spain

Climate Change Impacts on Central Catalonia's Geopark



Didactic activity raising awareness about the effects of climate change within the Geopark.

The reduced flow and water level in the "Esparver" Gorge.

In the heart of Catalonia lies a landscape rich in geological and ecological diversity. However, the region's iconic landscapes, including its extensive pine forests and rivers, are facing unprecedented challenges due to climate change.

The pine forests of Central Catalonia's Geopark have long been a symbol of resilience, adapting to the region's varying climatic conditions. Yet, in recent years, the relentless combination of drought and soaring temperatures has pushed these resilient ecosystems to their limits. Prolonged periods of drought have weakened particularly the black pines, making them more susceptible to infestations and diseases. Consequently, maybe in a few years, these trees will disappear from the region, as well as some insects that rely on them.

The region's rivers, vital lifelines for countless species, are also experiencing the impacts of climate change. Reduced water levels due to prolonged drought create significant challenges for aquatic life, especially for species adapted to living in seasonal high-flow environments and in the upper courses of the streams. This reduction in water availability not only threatens the survival of these species but also jeopardizes the delicate balance of freshwater ecosystems.

Furthermore, the local viticulture industry, which relies heavily on rainfall to sustain vineyards, is facing a lot of pressure. A decrease in water availability has led to difficulties for vineyards, consequently, wine producers have to disband less resilient grape varieties.

The threat of wildfires looms over the Geopark, with climate change exacerbating the risk. The devastating fires of 2022 which burned over 1800 ha serve as a reminder of the region's vulnerability to extreme events,.

While in Earth history there have been several natural changes in climate like the Grande Coupure, associated with the Eocene-Oligocene global cooling event, the current trajectory of climate change is unparalleled. Unlike past changes, today's climate change is driven by human activities, unfolding at an alarming pace. The Geopark takes advantage of this fact from the geological record to enhance and make people more aware of the effects of climate change.

From the Geopark, we have developed an activity for the general public that invites them to reflect and to become aware of how they perceive climate change and its effects. From here, we propose that they explore the territory to identify for themselves those elements that are already being affected by climate change, and thus, invite them to be involved as active and resilient agents in combating climate change. This didactive activity introduces the participants to SDGs 14 and 15 and engages them in a partnership (SDG 17) for achieving the Sustainable Developent Goals and engaging in climate action (SDG 13).

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Costa de la Vila. The rock exposure where the climatic change during the Eocene - Oligocene transition is recorded.

Causses du Quercy UNESCO Global Geopark, France

A Geopark and its partners are mobilised by climate change

SDG Exhibition in the Varaire Village: What's on your list of the SDG global goals?

Climate change is a cross-cutting issue. It is integrated into many of the actions carried out by the Geopark and its partners.

The village of Varaire organised a one-month exhibition on the sustainable development goals. In partnership with the Causses du Quercy Geopark and the Lot Geological Nature Reserve, a series of conferences and events were organised. A number of themes were addressed: climate change in the Cenozoic Era, climate and sustainable development as seen from space, and the United Nations and its Global Goals. Other events included a "global goals" orienteering race for 8-15 year-olds and fossil discovery workshops at the Quercy phosphate caves geosites. These activities helped to raise awareness among local residents of the issues involved in sustainable development.

The Geopark also hosted the Assises Nationales de l'Environnement Karstique (National Conference on the Karst Environment). Organised by the French Speleology Federation, the theme of these meetings was "the impact of climate change on the management and protection of karstic geoheritage". To mark the occasion, the Geopark organised a conference on the challenges of water resources in the Causses du Quercy. A wide range of stakeholders in karstic environments took part, including the Geoparc des causses du Quercy, the Adour-Garonne water agency, the Lot Department, speleologists, tourist showcave managers, Occitanie regional archaeological services and academics. Various themes were discussed: the reduction of underground glaciers in mountain karstic caves, the evolution of underground biodiversity, the impact of global warming on the conservation of underground and palaeontological artefacts, and the management of karstic areas. The conference highlighted the need for all those involved in the field to work together, share and harmonise their data, and create dynamic monitoring tools to anticipate and manage future changes.

Flocks of sheep on a Natura 2000 site.

©Nathalie Baylat-Département du Lot

Conference about underground water at the National Conference on the Karst Environment.

©Jean-François Fabriol

The Geopark is also involved in agriculture and climate change. It supports farmers in adopting environmentally-friendly practices by deploying agricultural contracts known as "Mesures Agro-Environnementales et Climatiques" (climatic and agrienvironmental measures) on the Natura 2000 sites in its territory. These contracts are signed voluntarily by farmers for a period of 5 years. The farmer receives annual payments to compensate for the additional costs and loss of income resulting from the commitments made. In 2023, 33 farms and two groups of livestock farmers were committed to actions such as improving the management of grassland and pastureland through grazing, delaying mowing of meadows or opening up areas for grazing.

Climate change is everyone's business. The Geopark and its partners are helping to raise awareness of this issue and are committed to implementing the UN's Sustainable Development Goals. The activities described above highlight the Causses du Quercy Geopark's involvement in SDGs 3, 6, 8, 12, 13, 15, and 17.

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Chablais UNESCO Global Geopark, France

The Positive Results of the Educational Beehive, Chablais Geopark

Viewing Bees in the Educational Beehive during Geopark Partner Activities.

© A. Giroux

Bees of the Drunken Forest Geosite, Chablais UGGp.

© A. Giroux

The Chablais UNESCO Global Geopark (UGGp), France works daily to contribute to the many Sustainable Development Goals of the United Nations. One of these initiatives, the "Learning Beehive Project" combined several SDG's in a single action to contribute to SDG's 2, 4, 13, 15 and 17.

The Accueil and Partage Charity, Evian Preparing to send out the Geopark Honey.

© A. Giroux

The Learning Beehive Project was based around a major geoheritage site of the Chablais UNESCO Global Geopark. The site, protected for its great geodiversity and biodiversity, is in the middle of one of the region's most extensive landslide that covers more than 422 Ha. The National Forestry Office and the Mountain Restoration Service began engineering works and land management techniques in the area during the 1930's in-an attempt to safeguard villages and farmland. Today the forested area is characterised by crooked trees that have grown on the fine, constantly moving, glacial clay deposits and is known as the "Drunken Forest". Given its unique character, the site has become a haven for rare plants, insects, and animals. It was one of the first sites to be equipped with a discovery trail and information panels when the Chablais was granted UNESCO Global Geopark status in 2012.

As part of its educational programme the Chablais UGGp installed a learning beehive at the Drunken Forest site in 2020. The programme sought to explore local biodiversity, teach about pollinators, and explain the unique geology of the site using a hands-on approach. The project drew together many different partners such as the tourist office, technical experts such as the National forestry Office and local businesses. The special hive was adapted for teaching purposes with windows into the heart of the hive for observing bee activity and a tall access chimney which encouraged bees to fly high over the site so that observers were not in direct contact with the bees.

The beehive was developed for use by passing visitors, there was no need for a supervised visit. However, a-number of different actions were organised for Geopark partners, guides, school children and for the general public. Guided by official Geopark guides, free visits were offered during EGN week and the summer holidays to learn about the geosite, and also the hive with the beekeeper. A special educational project was developed with the local junior school that included a hands-on learning visit for pupils. The site was also used as a part of the Geopark partner programme to illustrate the Geopark's work.

The final element of the project was the sharing of the honey produced with families in need. The cost of living in the Chablais area is high and many turn to charities for support. More than 30Kg of honey was collected in 2022 and 2023 and put into around 120 jars. This was given to three local charities "Accueil et Partage", "La Passerelle", "CIAS" for distribution to help local families.

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Chelmos- Vouraikos UNESCO Global Geopark, Greece

A new educational tool for the Chelmos- Vouraikos Geopark

Each of the 30 cards contains information about a plant, an animal, or a rock of the Geopark.

According to the UN's 4th Sustainable Development Goal (SDG 4), to help children understand the world around them, access to basic education is crucial. Through participation in non-formal educational activities, children acquire essential skills such as listening, critical thinking, and making informed decisions for their lives. For this reason, educational activities are deemed necessary for organisations operating at both international and local levels, such as a geopark.

Chelmos- Vouraikos UNESCO Global Geopark (Chelmos- Vouraikos UGGp), in adopting SDG 4, has created a new educational game entitled "Discovering the Flora, Fauna, and Rocks of the Chelmos-Vouraikos UGGp." The main objective of the game is to introduce participants to the basic species of flora, fauna, and rocks in the protected areas of the Geopark, emphasizing the importance of nature conservation and promoting an appreciation for the natural environment. Additional goals include: a) enhancing observation and identification skills of nature and its organisms, b) addressing challenges and issues, such as selecting the correct characteristics for species, and c) developing collaboration and communication skills as participants interact and exchange information.

One of the two versions of the game requires cards, fill-in sheets, and pencils.

The first trial of the game with people from the Laboratory of Palaeontology and Stratigraphy of the University of Patras.

The game is played using 30 educational cards that are linked to a website via a QR code on each card. Participants can scan it with their mobile devices to discover interesting information about different species in the Geopark. Depending on the age and number of players, there are two different versions of the game. A recent presentation was made to elementary and high school students, as well as adults, and the response was equally enthusiastic in both cases.

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Ciletuh-Palabuhanratu UNESCO Global Geopark, Indonesia

Reforestation of coastal areas in the Ciletuh-Palabuhanratu Geopark: conservation and disaster risk reduction

Planting trees in coastal forest area.

CiletuhPalabuhanratu Geopark is located-in the southern region of Sukabumi Regency, West Java. This Geopark has a coastal area with a length of almost 100km that directly faces the Indian Ocean in southern Java. The position of the coast which parallels the seismically active subduction zone in the south of Java Island creates the potential for a tsunami.

CIletuh-Palabuhanratu Geopark has been actively reforesting its coastal areas. This is a step to carry out conservation activities as an effort to implement disaster risk reduction, especially the potential for a tsunami related disaster. This reforestation activity includes planning, planting, and monitoring carried out by the government, academics, the private sector, and the community.

The results of mangrove planting at the mouth of the Cimarinjung River, Ciletuh Bay area

The Ciletuh Bay area is one of the areas in the Geopark that has a high level of tsunami vulnerability. Around this area is the centre of tourist activities and there are many inns and homestays involving 140 houses. The coastal area of Ciletuh Bay consists of open beach areas, mangrove forests and coastal forests. This mangrove and coastal forest area is the first natural wall to withstand waves if a tsunami occurs. Mangrove forests and coastal forests can reduce the distance of tsunami inundation. Based on the simulation results, the presence of mangrove forests can reduce the distance of inundation by about ±28% compared to open beaches or water bodies.

The series of reforestation activities include planning, planting, and monitoring. Planning activities for planting areas and plants suitable for planting in the area are carried out based on the results of academic research. Tree planting is achieved in collaboration with the government, private sector and visitors. Visitors can plant trees with a tree adoption system. Mangrove monitoring and maintenance activities are carried out regularly by the community.

Through this activity Ciletuh-Palabuhanratu UGGp aims to ensure the sustainability of coastal ecosystems, and contribute to disaster risk reduction in this region. Reforestation involving coastal and mangrove forests improves coastal biodiversity and contributes to SDGs 14 and 15.

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Dak Nong UNESCO Global Geopark, Vietnam

Dak Nong Geopark's Green Living Campaigns

Contribution/Contributions to Sustainable Development Goal(s): 3, 6, 11, 13, 17

Collecting used batteries in the "Green living campaign".

Hair bows for girls produced from old clothes.

To promote sustainable development as well as to promote the mindset of recycling and creating green living habits, Dak Nong UNESCO Global Geopark (DNUGGp) Management Board (MB) organised the "Green living campaign" in 2022 and 2023. The variety of interesting activities attracted a large number people to participate. The main activity of the campaign was "Exchange recycle waste for gifts". Five types of waste were collected, including: used clothes, used batteries, electronic equipment, milk box cartons, glass, and plastic bags. Local people could exchange these for goods such as soap, shampoo, toothpaste, hand sanitizer and bags.

After collecting, the garbage was delivered to recycling plants in Ho Chi Minh City for treatment as Dak Nong Province does not as-yet have any recycling factories. This activity aimed to encourage locals to sort garbage at home and reduce the amount of disposed garbage in the environment.

In addition, the campaign also promoted the green products of Dak Nong UGGp's partners via the "Green Products Booth". This booth introduced a variety of green products such as bamboo thermal bottles, ferns straws, herbal soaps, etc. as well as local environmentally friendly products.

Participants in the "Green living campaign" use local fruit to make a Kombucha drink which is helpful for digestion and health.

The "Zero waste - Secondhand Exchange" activity created a platform for people to exchange used items such as books, backpacks, etc. with the purpose to extend the products lifecycle.

In 2023, in addition to the 2022 series of activies during the Green Living Campaign, the Dak Nong UNESCO Global Geopark also organised workshops on waste recycling in collaboration with Gen Xanh Social Enterprise and Dak Nong Community College. This programme attracted 70 students from Dak Nong College and more than 30 volunteers of Dak Nong Geopark.

The waste from old clothes was transformed into different useful goods such as hair bows, bookmarks, and water bottle bags. In addition to renewing the product's life cycle, this activity contributes to reducing the quantity of trash released into the environment.

The workshop also encouraged the participants to utilize local fruit to make a Kombucha drink which is helpful for digestion and health.

After the success of the two first Green Living Campaigns, DNUGGp has signed the MOA with Gen Xanh - Environmental NGO to cooperate to hold this event annually for the period 2022 - 2025. Dak Nong Geopark's Green Living Campaigns contribute to SDG 12 (Responsible consumption and production and SDG 17 (Partnerships for the goals)

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De Hondsrug UNESCO Global Geopark, Netherlands

De Hondsrug Geopark on tour with electric van

Left to right: Jasper Tomesen (managing director Geopark), Sonja van der Meer (director Het Drentse Landschap) and Harrie Wolters (director of the Hunebed Centre) officially receive the car keys from Jisse Otter (Deputy of the Province of Drenthe).

On Thursday the 28th of March a brand new electric van was revealed during a festive occasion. Together with two of our partners, De Hondsrug UNESCO Global Geopark is now the proud shared owner of an electric van. This initiative meets several of the Sustainable Development Goals: Quality education (goal 4), Affordable and clean energy (goal 7), Climate action (goal 13) and Partnership for the goals (goal 17).

Educating and connecting people

The van will be used during public activities and events in the area to educate and inform local people as well as visitors, increase visibility and raise awareness concerning our geological heritage, climate change and sustainability. This sustainable mobile tool can easily be used to reach people in different parts of the Geopark. Moreover, it is intended as an eye-catcher that will arouse curiosity and draw people to the van, inviting them to explore and participate in conversations and activities. In this way we bring people together in a friendly and accessible way.

Joint effort

The electric van is a joint effort between our Geopark and two of our key partners: the Hunebed Centre, which specialises in Dutch Dolmens, and Het Drentse Landschap, which protects the area's nature and heritage. We have overlapping interests and by working together we not only have a broader reach but also stress the overall importance of current themes such as sustainability and climate change. Also, because of the cooperation with these partners, we can use each other's knowledge and expertise, provide different perspectives and in this way enhance the educational level.

Back of the van: referring to the ice age theme of the Geopark.

The purchase of the electric van was also made possible by the Province of Drenthe, the Municipality of Borger-Odoorn, Recreatieschap Drenthe and the Cultuurfonds.

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El Hierro UNESCO Global Geopark, Spain

El Hierro Geopark, a sustainable island

Field trip with the IES Garoé.

In the Geopark of El Hierro we are aware that environmental education is necessary and essential to create a sustainable island. For this reason, in contributing to the Sustainable Development Goal (SDG) 3, we support outdoor activities to promote healthy lifestyles. We work with students from different schools on the island, with whom we carry out various outdoor excursions in which they learn how to orient themselves, what are latitude and longitude, what is a map and how the three dimensions (real world) are represented in two dimensions (map), what are the heights, and how to interpret contour lines. Along the way, they learn details of the Tagoro Volcano, a volcano created by an underwater eruption during 2011, which students do not remember because they were too young when this underwater volcano erupted. The visit ends at La Lonja (fishing auction), where they can learn details about sustainable artisanal fishing and the concept of a blue and circular economy.

Every summer, we collaborate with the camps of the three municipalities of the island, ensuring quality education, lifelong learning and awareness of Earth processes and the environment, in accordance with SDG 4. Different activities are carried out, such as a treasure hunt, collective activities to temporarily organise "the origin of the Earth",

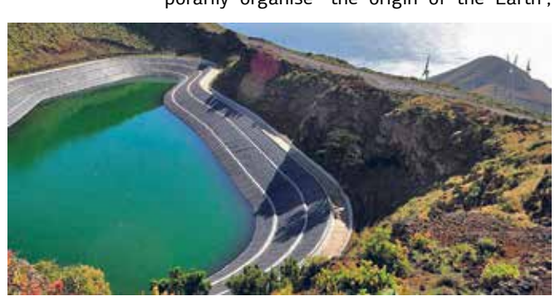
Workshop with summer camp in the municipality of El Pinar.

coastal clean-ups and a recycling workshop with everything collected.

Two of the main objectives of our Geopark are to increase environmental awareness and encourage global action to protect the environment. To meet these objectives and contribute to SDG 7, activities are designed to promote the use of renewable energy and energy saving. From our Geopark, we work with environmental education throughout the year in programmes in which we also collaborate with other initiatives such as Gorona del Viento, a worldwide innovative system that has transformed El Hierro into an example for the development of renewable energy and respect for the environment. Consequently the use of diesel and CO2 emissions are reduced thanks to the high percentage of electricity generated using clean resources.

We carried out different collaborative activities, including a visit to the hydro-wind power plant, followed by a presentation of the values that make El Hierro a UNESCO World Geopark and a coastal clean-up that led us to learn the meaning of the 3 R's (reduce, reuse, and recycle) and the introduction to a recycling workshop.

Visit to the Gorona del Viento reservoir.



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Estrela UNESCO Global Geopark, Portugal

"TRILHAR" - Sustainability Paths contribute to Sustainable Development Goals 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17 in Estrela Geopark

Hike through the Saint Lawrence woods in Estrela UGGp.

A hike along the many trails of Estrela is much more than a test of physical endurance and mental strength. It means to be prepared to assimilate the beauty of the unique landscapes, leaving egos behind so that one can truly feel a part of nature. As with a hiking trail, when walking the path to sustainability, we should seek to reduce our footprint, in this case, our ecological footprint.

As a territory classified as a UNESCO Global Geopark (UGGp) since 2020, the Estrela UGGp has an increased responsibility in helping to reduce the ecological footprint, promoting sustainable development strategies focused on geoconservation, the preservation of natural and cultural heritage, education and tourism. Its everyday work should seek to deliver the Sustainable Development Goals (SDGs), an action plan created by the United Nations (UN), with a target date of 2030, representing humanity's commitment to achieve peace, justice, the well-being of all and the protection of the environment.

With this in-mind, the Estrela UGGp, in partnership with its municipalities, has created the project "TRILHAR" - Sustainability Paths, which is based on a cycle of walks whose main theme is the SDGs. These walks take advantage of the existing trails in the territory, using nature as an amphitheatre to strengthen relations with the local communities, thus allowing everyone to be part of the change.

Tasting local products in Estrela UGGp.

Presentations by Helena Freitas from the University of Coimbra and Carlos Fonseca representing CoLAB ForestWISE.

Furthermore, with the aim bringing increased knowledge for the fulfilment of the SDGs, the project counts on the involvement of the Portuguese institutions for higher education, each with established contributions in different areas of expertise.

A good example of one of these initiatives was the hike along the Beech trees route, one of the best-known trails in the Estrela UGGp area, particularly during the autumn. This hike focused on two of the SDGs, SGD13 - Climate action and SDG15 - Life on land, with the participation of two scientists working on these subjects, Professor Helena Freitas, a specialist in Biodiversity and Ecology from the University of Coimbra, and Professor Carlos Fonseca, CTO of the collaborative laboratory for forest and fire management CoLAB ForestWISE. It was truly an opportunity to learn more about the territory's natural heritage, to understand the effects of climate change, to debate mitigation and adaptation measures and to think about new strategies for the future.

In conclusion, although this project is still in its early phases, the initiatives that have already taken place were very fruitful and have made it possible to discuss issues related to the sustainable development of communities in an informal and accessible way, allowing them to be involved in their own development process.

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Famenne-Ardenne UNESCO Global Geopark, Belgium

Famenne-Ardenne Geopark, an open book on climate

Spectacular Cave formations in the Caves of Han-sur-Lesse a natural complex of caves.

© Famenne-Ardenne Geopark

In mid-July 2021, the Famenne-Ardenne Geopark experienced historic and exceptional flooding. Nearly 5,000 families, hundreds of homes and infrastructure were partially or totally destroyed. A month earlier, the area had been hit by a tornado. The region's solidarity has enabled it to recover from these terrible ordeals. The Earth is full of information about the climate. That's why scientists are carrying out research to raise global awareness of the geosciences and warn of the dangers of climate change.

The Geopark has produced and distributed an educational film on climate change: 'Geopark https://www.youtube.com/watch?v=tYdwBrwqz58, and an open book on climate'. The book deals with SDGs 4 Quality education, and 13 Climate change.

The atmosphere is the element associated with freedom, communication and movement.

However, in the wake of global warming, the atmosphere is also the natural element that has impacted part of the Geopark's territory, creating a tornado in the commune of Beauraing. The atmosphere plays a crucial role in the formation of tornadoes, by transporting the moisture and energy they need to develop. Geology and tornadoes are linked in many ways, and it is important to understand how the geology of a region can affect the formation and impact of tornadoes.

Yves Quinif, a geologist involved in the study of the Caves of Han-sur-Lesse.

© Famenne-Ardenne Geopark

Water is essential to our survival and plays a vital role in our bodies and our environment. In July 2021, the Geopark was hit by catastrophic flooding. Torrential rain caused the Lomme and Lesse rivers to overflow their banks. The flood submerged streets and homes, causing extensive damage to infrastructure and housing. Scientists have attributed the flooding to climate change, which has led to an increase in the intensity and frequency of extreme weather events, such as torrential rains. Recurrent flooding in the Geopark area has highlighted the need for a better understanding of the water cycle and the factors that can affect flood levels. To answer this question, scientists have carried out in-depth hydrological studies in the caves based on borehole data and water flow measurements collected over the years. This has led to a better understanding of how water flows through the subsoil and how it is influenced by the geological features of the region.

The limestone cliff in Han-sur-Lesse.

© Famenne-Ardenne Geopark

The fight against climate change remains a major challenge for the various players who live or work in the Geopark area. Together, they are taking steps to protect the community from the dangers and safeguard our planet for future generations. Everyone is invited to act responsibly to preserve the natural balance of our world.

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GeoMôn UNESCO Global Geopark, Wales, UK

Sharing the diverse heritage of a unique island in GeoMôn Geopark

Local people carry specially designed lights to the copper mine and an illuminated traditional sailing vessel leaves the port from which copper was exported (which is also the site of the GeoMôn Visitor Centre).

Photos by Guy Singleton.

In addition to exhibitions at its Visitor Centre, GeoMôn offers monthly activities for local communities and visitors to the island, drawing attention to its rich natural and cultural heritage. These accessible activities are designed to appeal to a broad range of people and are targeted at several SDGs: examples of SD3, SD4 and SD5 events are:

SDG 3 (Good health and well-being)

GeoMôn contributed to the 'Green Space Dark Skies' national community project. This is a project that aims to increase the engagement of local communities with their natural and cultural heritage, and to promote well-being and good health. It was a mass participation event with more than 400 participants who created extraordinary artwork on the landscape of the historic Parys Mountain Copper Mine using specially designed lights and drones. GeoMôn staff explained the geological setting of the mine which was once the largest copper producer in the world. The event illuminated the relationships between the copper mine, industrial activities in the 19th century, the importance of copper for modern semi-conductors and microchips, and the profound impact of the mine on local history and culture. The event was filmed and broadcast by the BBC.

SDG 4 (Quality education)

Dr Rob Crossley of GeoMôn regularly leads field excursions for visiting groups who are keen to explore the iconic rocks of the Geopark. GeoMôn staff are leading experts on the regional geology and they provide field courses for a broad range of participants, from schools to research institutes. The photo shows a group of students from the Camborne School of Mines (Cornwall, SW England) being shown the Precambrian rocks of Llanddwyn Island which is a UNESCO World Heritage Site on the west coast of the Geopark. The rocks include pillow lavas from a spreading centre and a mélange from a deep-sea trench.

Students explore the unique Precambrian rocks, including pillow lavas, of Llanddwyn Island, a UNESCO World Heritage Site.

SDG 5 (Gender equality)

Professor Cynthia Burek of GeoMôn gives a monthly talk to visitors to the region on the contribution of a pioneer female geologist to the geology of the Geopark. She was Annie Greenly who worked with her husband Edward to produce the definitive geological map of the island of Anglesey – which provides the foundation for the GeoMôn Global Geopark. The map was published in 1919. At that time there were few female scientists and even fewer female geologists. It was Annie Greenly who developed the memorable colour scheme of the map. GeoMôn also provides field excursions that illustrate her important contributions. The photo shows a group from the Geological Society of London being shown Annie's grave which is within the Geopark.

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A group from the Geological Society of London are shown the grave of Annie Greenly during an excursion to iconic sites identified by Edward and Annie Greenly. Insets show Annie and the famous Greenly map.

Harz. Braunschweiger Land. Ostfalen UNESCO Global Geopark, Germany

ESD programme around food production and consumption in Harz. Braunschweiger Land. Ostfalen Geopark

The children choose emotion cards to describe their feelings.

Different foods are assigned to the corresponding countries.

In 2021, the Forum of UNESCO Global Geoparks in Germany, in cooperation with the Alfred Toepfer Academy and the German UNESCO Commission, successfully submitted a project to the Deutsche Bundesstiftung Umwelt (German Environmental Foundation). It was part of a call for proposals on the topics of sustainability dilemmas and dealing with uncertainties: Promoting Cooperation and Collaboration in Education for Sustainable Development (ESD). As part of the project "ESD for 2030: Integrating ESD into the educational programmes of German UNESCO Geoparks", a handout for new ESD concepts was developed, which can be passed on to tour guides, cooperation partners and other interested persons following the end of the project. An ESD module was offered to the geoguides of the geoparks for further training. In addition, each geopark has developed a new ESD programme.

The Geopark Harz. Braunschweiger Land.Ostfalen Geopark has been working intensively on Sustainable Development Goal 12 for sustainable consumption and production, resulting in the ESD programme "I'm packing my lunch box...". The offer is aimed at children aged 9 to 11. It can be taken up within the school framework of the specified subject areas "Goods from around the world: production, trade and consumption" and "Agriculture and nutrition" in courses in geography, politics/political education, history and natural sciences. The topic of "nutrition/food" is part of children's everyday lives. It affects them directly because they are confronted with the topic every day. It is not an abstract topic for them and is therefore more tangible.

Using toy foods and a world map, the origins of foods that are typically found as snacks in lunch boxes are explored. Together they discover why certain foods are produced on other continents and how they arrive in the supermarket. Aspects such as CO^2 emissions due to long transportation routes, different climate and soil conditions as well as economic factors are discovered and examined in more detail. Changes in transportation, climate and availability are highlighted by the "lunch box of yesterday". In the "lunch box of tomorrow", the children can put their knowledge into practice and pack a "sustainable lunch box". Other forms of food production are also discussed. For this purpose, typical Geopark minerals and the food obtained from them are brought along. The correlation between them makes it clear that raw materials have to be extracted for certain foods. The sustainability dilemma of resource extraction is presented in a child-friendly way. Other methods such as the use of emotion cards create a familiar and relaxed atmosphere. It is recommended that the topic be revisited at a later date. This can be achieved by planning a sustainable breakfast together.

The aim of this activity is for children of primary school age to be able to differentiate between regional and non-regional, seasonal and non-seasonal foods, to gain an insight into the agriculture of our Geopark area and to be sensitized to the availability, resources and appreciation of food. Various methods are used for this, in which the children work out results themselves in order to promote creativity, independent decision-making processes and positive group dynamics.

Food and ingredients in minerals typical of the Geopark.

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Hațeg Country UNESCO Global Geopark, Romania

Sustainability at work! Research and community driven action for sustainable development in the Hațeg Country UGGp

Testing the water samples.

© Hațeg Country UNESCO Global Geopark.

Training in the geopark's schools.

© Hațeg Country UNESCO Global Geopark.

A new project managed by the University of Bucharest, which bridges the gap between academia and local communities, started this year in the Hațeg Country UNESCO Global Geopark territory.

"Sustainability at work! Research and community driven action for sustainable development in the Hațeg Country UGGp" is the title of the project conducted by the UNESCO Bureau in Venice and financed by the abrdn Charitable Foundation (aCF).

The project focuses on citizen science, involving students from six schools. They are trained to collect and analyse water samples and then upload the data in an on-line platform. Working together, the professors and researchers from two top universities in Romania, University of Bucharest and Babeș Bolyai University in Cluj Napoca, and the teachers from the Geopark's schools will develop new educational materials regarding water and climate change. A water footprint assessment will be calculated for the youth volunteer group and for two partner NGOs, together with a sustainability strategy.

The project focuses on SDG 4, 6, 12, 13, 15, 16 and 17, as follows:

- SDG 4 (Quality education) Having a consortium of universities training, researching, and working hands-on with the schools and teachers ensures a level of high-quality education.
- SDG 6 (Clean water and sanitation) The students from local schools and young Geopark volunteers are trained to collect water samples and analyse their quality (water from the rivers and the fountains), making them aware of the need to have clean waters and thus be healthy, which may contribute also to SDG 3 „good health and wellbeing".
- SDG 12 (Responsible consumption and production) relates to developing new assessments of the water footprint, also to make the present tourism facilities more sustainable.
- SDG 13 (Climate action) is also a focus of the project, as the students will interpret water quality data, comparing it to paleoenvironmental data, while understanding the parameters that influence the climate.
- For SDG 15 (Life on land) students and young volunteers find out the status of the sources of water around them which influences life on land and biodiversity.
- SDG 16 (Peace justice and strong institutions) and 17 (Partnerships for the goals) are achieved because the problem of water safety is an important international issue, which may cause conflict. Responsible use and clean water research and education will contribute to peace-keeping and collaboration between territories.

Cooperation between academia, research institutions and the local community sets an example of good practices for the other geoparks and institutions in the National UNESCO Geoparks Forum of Romania.

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Training for the youth volunteers in the geopark's office.

© Hațeg Country UNESCO Global Geopark.

Haute-Provence UNESCO Global Geopark, France

Documenting and understanding climate change in the Alps.

Gilles Fastenaekens taking a photograph in Haute-Provence UGGp.

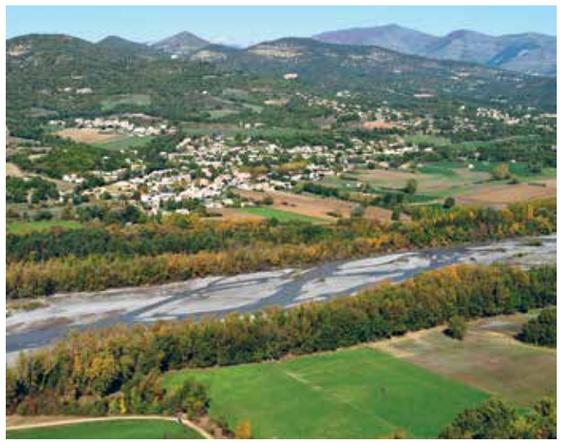
View of the River Bléone near Mallemoisson in 1997.

The various climate change scenarios proposed by the International Panel on Climate Change all show that these changes will be amplified in mountainous areas. The Haute Provence Global Geopark (France) is located in a particularly vulnerable area of mountains that is subject to Mediterranean influences. It currently boasts a wide variety of biotopes, many of which have been recognized as being of Community interest (Natura 2000 protected areas network). It is also characterized by a large artificially re-forested area created to combat erosion in the 19th and 20th centuries. These forests will be particularly sensitive to rising temperatures and recurring droughts.

To document the evolution of these environments and raise public awareness of the increase in natural risks, the Haute Provence UGGp is initiating a Photographic Landscape Observatory in 2024.

This tool provides an opportunity to record the territory's memory of its evolution environmental components, development, and agricultural and forestry activities, while at the same time emphasising the value of the landscapes in all their diversity. It will reveal the issues at risk in the context of rapid global change (global warming, natural hazards, artificialization of soils, etc).

View of the River Bléone near Mallemoisson in in 2019.



The project is inspired by and complements the work undertaken since 1996 in the Duyes Valley which represents a fraction of the Geopark's territory.

The aim is to illustrate some sixty representative sites over the long term, photographing them every 4 years or so to monitor the natural and artificial evolution of the landscape. The sites are chosen in consultation with the various stakeholders involved in the project: Parc Naturel Régional du Verdon, Office national des Forêts, land-use planners, etc.

Each recorded site is precisely referenced: geographical location, access, shooting azimuth, time of year, with illustrated themes to enable the finest possible comparisons.

The themes that the sites will illustrate are:

Natural environments

Rivers: observation of hydro-morphological profile, evolution of riparian vegetation and flow;

Lakes: drawdown of artificial reservoirs, erosion and/or silting, evolution of riparian vegetation;

Forest: forest dynamics (advance, retreat, dieback, exploitation, fires);

Alpine pastures: erosion, forest advance, evolution of herbaceous stratum, snow conditions;

Human activities

Agriculture: changes in land use, surface area and practices:

Urban dynamics: sprawl, densification, urban spread;

Developments: ZAE, photovoltaic parks, roads;

Street lighting: black grid;

Tourist facilities: societal evolution.

Site, accessibility is also an important criterion to enable an easily reproducible photographic campaign.

The Geopark's Photographic Landscape observatory project together with the cooperation of its stakeholders contributes to SDG 13 (Climate action) and SDG 17 (Partnership in the goals).

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Hexigten UNESCO Global Geopark, China

Guarding Nature – a visual narrative of the Hexigten Geopark

The junior guide of Hexigten Global Geopark

Hexigten Global Geopark was initiated in 2005. Its unique location, makes it a comprehensive global geopark that has a diverse geological heritage, including Quaternary glacial remains, granite,volcanoes, suture lines, deserts, highland lakes, rivers, grassland, thermal springs etc. .It is a geological encyclopedia and natural museum to explore the changes in the geological environment on the Inner Mongolian Plateau and human development in northern China. In the past years, Hexigten Geopark has always adhered to the three development concepts of heritage protection, scientific popularization, and promoting the local economy. It has also actively promoted green and sustainable development by continuously strengthening basic scientific research, popularizing the diversity of the geological heritage, raising public awareness of the relationship between climate change and human culture and development through various means such as infrastructure improvement projects, lectures, volunteer works, and books.

In order to create a better and understandable Geopark, raise the awareness of protection and conservation, enhance the general knowledge of "green development", Hexigten Geopark has spent approximately two years to produce a series of popularization videos for the general public, which are posted on the Geopark's official website. The hosts in the videos are all ordinary people, either

To Guard the Nature - Hexigten Geopark Poster

To Guard the Nature Field recording scenes

youths that have been trained by the Geopark, or English teachers from local schools, and the student volunteers from China University of Geosciences (Beijing). The videos provide an in-depth and interesting virtual guided tour in Hexigten Geopark, integrating elements such as geological heritages, cultural landscapes, and Mongolian customs. They vividly present the rich and diverse geological landforms and landscape resources of the Hexigten Global Geopark, fully showcasing the unique cultural charm and urban image of the Geopark.

Moreover, Hexigten Geopark participated in filming the science popularization documentary To Guard the Nature - Hexigten Global Geopark. Through the dissemination of scientific knowledge about the Geopark and its development progress, reverence of nature, respecting nature, believing in nature, protecting nature, and building a beautiful home for the Earth is emphasized. The documentary has been launched and broadcast overseas on five major core streaming media, covering more than 200 countries and regions worldwide. In 2023, it won the "Best Documentary Award" at the GOLDEN STATUETTE INTENATIONAL FILM FESTIVAL U.S.A and the "Excellent Work Award" at the International Communication Unit of the 10th Asian Microfilm Art Festival.

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Imbabura UNESCO Global Geopark, Ecuador

Strengthening of the Rural Tourism Secure Trail Imbabura Volcanic Complex

Ascending the Imbabura volcanic complex.

Information panel showing the safe path for ascending the Imbabura volcanic complex.

Imbabura, as a UNESCO Global Geopark, implemented on International Tourism Day the "Safe Path in the Imbabura Volcanic Complex" in interinstitutional coordination with the police officers of the Special Operations Group (GOE), Ministry of Tourism and the Provincial Government of Imbabura. The project also involved coordinating with local stakeholders in the parish of La Esperanza and Angochagua, to attract domestic and foreign tourists to visit the volcano at a height of 4621 metres above sea level. The project contributes to addressing climate change and engages with the UN's Sustainable Development Goals (SDGs).

The Sendero Seguro programme, involving climbing to the top of the Imbabura Volcano is very popular for ecological tourism, especially during the holiday season. Most tourists seek trails to reach the top of the volcano during the month of August . Consequently, a project was undertaken to certify 30 local guides and create informative signage for the delivery of tourist services to visitors who climb the "Imbabura Volcanic Complex". The visitors are taught about safety rules, recycling, care of the environment, reducing the burning and logging of forests and avoiding mishaps such as getting lost when ascending or descending the trails. The condition of the access roads and signage on the volcano,are constanly monitored.

This coordinated work, based on training and safety recommendations and keeping a record and control of people climbing the volcano, has been very important for the empowerment of the organisors, local guides, shelters, and enterprises. This work has also generated a socio-economic revival of the communities in the sector of the parishes of La Esperanza and Angochagua of the Canton Ibarra.

The geoparks contribution to the Sustainable Development Goals adopted by all United Nations member states are highlighted in the following table.

SUSTAINABLE DEVELOPMENT GOALS		
Objective 8	**Decent work and economic growth**	**- Creation of jobs and local culture. - Implementation of information panels. - Implementation of enterprises and socioeconomic development of the communities.**
Objective13	**Climate Action**	**- Improve education through training and sensitization of local stakeholders on climate change, SDGs, first aid, recycling, forest burning and logging. -Green spaces to receive national and international tourists. - Mingas and care of the Safe Path.**
Objective 17	**Partnership for the goals**	**-The implementation of the Imbabura Volcanic Complex Safe Path. Interinstitutional articulation between local stakeholders, the Special Operations Group - GOE, Ministry of Tourism, and the Provincial Government of Imbabura. - The creation of Local Guides for the parishes of Esperanza and Angochagua.**

Ascending the safe path on the Imbabura volcanic complex.

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Itoigawa UNESCO Global Geopark, Japan

Artwork and Games to Promote the UN's Sustainable Development Goals in Itoigawa, Geopark

Local Artist Leeanne Splatt poses with her creations.

Students at Tazawa Elementary School play a card game to learn about Sustainable Development.

In Itoigawa UNESCO Global Geopark, located in central Japan along the coast of the Sea of Japan, a variety of programmes have been introduced to promote sustainable practices in line with the UN's Sustainable Development Goals.

With over 50 km of shoreline along the Sea of Japan, Itoigawa's beaches are popular not only for their wide variety of rocks and minerals, including jade, but also for swimming and other beach activities in the hot summer months. Unfortunately, during the stormy winter months, large amounts of debris, mostly plastic, washes ashore, needing to be cleared away each year.

In 2022, Itoigawa Geopark teamed up with local artist Leeanne Splatt who uses the plastic debris she collects along the beaches to make colorful artwork. For a special exhibition at the Geopark's Fossa Magna Museum, Leeanne created renditions of each of the Sustainable Development Goal icons using plastic debris. This exhibition was used to promote sustainable practices in Itoigawa UNESCO Global Geopark, especially with regards to SDG 12 (Responsible consumption and production), Goal 14(Life below water), Goal 15 (Life on land) and Goal 17 (Partnership for the goals).

In 2023, Itoigawa Geopark continued these activities by facilitating special workshops in local schools and community centres. These workshops focused on a card game created by the organisation "Imacocollabo" called "2030 SDGs," which is designed to teach young people about the challenges that need to be overcome in order to create a balanced, sustainable society.

Participants are given cards and tokens representing resources, capital, and time. As participants play the game, turning in action cards in exchange for various resources, the facilitator records how their actions affect the global economy, natural environment, and social equality.

As play continues, students learn that individual groups often do not have the resources needed to create a balanced, sustainable approach, but through cooperation and creative thinking, surprising levels of progress can be made without destroying the natural environment or creating social inequalities.

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Itoigawa Geopark Academic Staff explains the effects player's actions have had on the world.

Izu Peninsula UNESCO Global Geopark, Japan

Making Izu Geopark fit for cycling

E-bike tour of the wasabi fields.

Blue arrows indicating cycling routes.

To promote sustainable tourism, the Izu Peninsula UNESCO Global Geopark in Japan provides visitors with an opportunity to take a bike ride across the territory. On the ride, one can enjoy sightseeing and witness the legacy of geological formations like the peninsula which is a product of volcanic activities on land and in the deep sea. The Geopark also has many heritage sites of ecological, historical, and cultural significance.

Our Geopark activities work in collaboration with local stakeholders, contributing to SDG 17 (Partnerships for the goals), to conduct a tour of geological heritage sites in different parts of the region. For example, an e-bike tour of wasabi or Japanese horseradish fields was conducted in the centre of the peninsula, as the crop is a local specialty that is linked to the climate and geology of the area. Visitors cycled approximately 18 km to the fields and were able to receive an explanation directly from the farmers about its traditional management. Such well-planned tours create a good balance between visitors and farmers, as it avoids crowding people on nature-rich farmlands. Another example is an e-bike tour of geosites on the western coast that was developed in association with a local bicycle shop.

We hope to promote geotours of a similar kind to increase knowledge and understanding of the Geopark's territory.

The Izu Peninsula is becoming more and more friendly for cycling activities. Blue arrows are drawn on the road to indicate cycling routes. As of 2020, there were 36 recommended routes, 188 bicycle stands, and 32 rent-a-bicycle shops in the region. Local public transport also contributes. People can choose to rent a bicycle in Izu or bring their bikes using cycle trains, cycle busses, and ferries. E-bikes are available to enjoy a comfortable ride in mountainous areas.

Not only does the promotion of cycling activities contribute to SDG 3 (Good health and well-being), but also helps in tackling climate change. The wasabi tour is a good example, which won the Sustainable Inbound Tourism Award from the Ministry of Land, Infrastructure, Transport, and Tourism in Japan. This honor was attributed to the zero-emission and community-based conservation category within the programme.

One of the motivations behind increasing cycling is to promote the use of public transport as well as to assist visitors in travelling to multiple destinations from a station. Bicycles serve as alternative modes of transport committing to reduced greenhouse gas emissions. We also consider that making Izu Geopark fit for cycling helps people perceive the region at a finer resolution and enjoy a slow sequential change of scenery.

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賞状

The wasabi tour winning a national award.

Karawanken-Karavanke UNESCO Global Geopark, Austria & Slovenia – Europe

Sustainable development of resilient & green cross-border destination

Contribution to Sustainable Development Goals: 3, 4, 5, 6, 7, 8, 10, 11, 13, 15, 16 and 17

Green and sustainable tourism programmes – guided interpretative hike with certified Geopark Guide, Petzen/Peca Mountain

Photo by: Urosh Grabner

The cross-border Geopark Karawanken-Karavanke which covers an area of 14 municipalities, has now been established for 11 years, and has been an UNESCO Global Geopark for 9 years. Since the beginning it has been addresing objectives such as: (a) conserve the geological and natural resources as well as the culture and cultural heritage of its members' region; (b) raise awareness of, inform and educate people about the Geopark and promote it as a Geopark; (c) make the best economic use of the Geopark, including through sustainable tourism; and (d) in general, promote cross-border cooperation and development, coordinate local policies and ensure that the interests of the entire region are represented so as to establish a sustainable regional policy.

Through various activities, Karawanken-Karavanke UNESCO Global Geopark follows the goal of becoming a geo-tourist destination that preserves geodiversity and living nature with sustainable development, and develops new green and sustainable tourism programmes and products through innovative interpretation approaches. One of such activity is the Geoparks annual school topic, which has been running since 2011. In the school year 2024/25 the topic, which is also dedicated to 10th anniversary of UNESCO Global Geoparks,

Workshop „greencare system" – introducing the digital Management Tool „Contwise" for management of hiking trails and nature experience infrastructures

Photo by: Urosh Grabner

Implementation of the Geopark annual school topic in Visitor centre Geo.Dom, one of the Geo. Hub Centre for resilient visitor management

Photo by: Urosh Grabner

is "UNESCO Geopark - Green classroom" and will include the implementation of educational module for teaching staff and Geopark guides. Another activity is so-called GEOfestival 2024, which will take place in May and June 2024 as part of the European Geoparks Week, and will be carried out under the slogan "So green and smart is Karawanken-Karavanke UNESCO Global Geopark". The aim of Geopark annual school topic and GEOfestival is to increase the awareness on area's outstanding geological-, natural-, and cultural heritage, as well as on its smart and sustainable development.

The above mentioned objective is also addressed within the Geoparks national and international projects. In the framework of newly approved Interreg Slovenia-Austria project „Cross-border sustainable development of resilient, green tourism products and bilateral management of public tourism infrastructure and visitor flows" (GreenTour) the Geopark aims to establish a sustainable and responsible management of tourism development in the cross-border region on the basis of its specific natural and cultural values. Project is based on following three pillars: Establishment of a cross-border resilient management system called "greencare"; development of resilient green tourism offers, products and further development of the Geopark Partners network with the aim of creating new quality in the offer structure, which contributes significantly to the active conservation of nature and cultural heritage, and cross-border green management of visitor flows based on visitor monitoring and the carrying capacity of the pilot areas together with the development of action plan, sustainable tourism based on preserved nature, an educational module, and activities to raise awareness and manage visitor flows.

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Kefalonia Ithaca UNESCO Global Geopark, Greece

Activities for sustainability in Kefalonia Ithaca Geopark

The Geopark Team together with the exchange group from Germany hiking on Mount Ainos.

The hiking tour organised during the Stay Active Event

Hiking tours, museums, presentations, events... The work in the Geopark is diverse and directed to achieving numerous Sustainable Development Goals. (SDG's).

SDG 4 (Quality education) plays a major role in our tasks. It is really important for us to transfer our rich geological and cultural heritage to the younger generations. We organise many excursions with local schools and tourists around the island. Furthermore we attend student classes and teach them about our work and the geo- and biodiversity of the island. We also educate teachers how to include these topics in their lessons.

In addition we are also open to the public. Our museums and geosites on Kefalonia and Ithaca provide an insight into the diversity of both islands. Additionally we arrange open tours on Mount Ainos and to our Dark Sky Park.

The Geopark Team giving a presentation about the Geopark and Geosites to a school class.

For researchers, scientists and local volunteers we hold talks, workshops and presentations about monitoring the wildlife, geology or the geopark itself.

A special event that we helped to establish is the annual September Stay Active Weekend. This provides different activities for the public and supports SDG 3 (Good health and wellbeing). We were the leaders in a hiking tour on Mount Ainos and the Ainos Marathon.

With local students we cleaned the beach around the Minia coast in Argostoli to Protecting life below water (SDG 15) and contributed to the well being of Sustainable cities and communities. (SDG 11)

Since the Cephalonian fir, *Abies cephalonica* is semi endemic and the Cephalonian violet, Viola cephalonica, is endemic to Kefalonia, we made a great effort to protect them, contributing in part to SDG 15 (Life on land) and reducing biodiversity loss. *Viola cephalonica* grows in a fenced area and is protected from hikers and wildlife. In addition we fight against illegal agriculture to protect the fir forests. Furthermore we made great efforts to reduce the light pollution on and around Mount Ainos, which qualifies as a Dark Sky Park.

We wouldn't be so successful with all of our projects, without contributions from several partners which involves SDG 17 (Partnership for the goals) For protecting the wildlife under water, especially the turtles, we work together with the local organisation „Wildlife Sense". For events like Stay Active we cooperate with local authorities and the tourist department. Another partner is the Agency Aloniwerk, which helped us to address our goals to an international audience, through exchange programmes with students from Germany. A frequently used and valuable partnership involves cooperation with the University of Patras. Recently the university added a new exhibition about fossils to our museum and held a presentation in the local library.

Through the cooperation with UNESCO we can host two volunteers from Germany

All in all the UN's SDGs help us to focus our work in the Geopark.

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Khorat UNESCO Global Geopark, Thailand

The local gastronomy promotes geotourism activities in Tha Chang communities in Khorat Geopark

The Tha Chang food combination consists of: (1) the Pha Khao Kham Chang set; and (2) a poster promoting the main dish. This consists of Som Tum (papaya salad), Larm Kai Tha Chang (spicy chicken cooked in bamboo), Pla Nga Chang (grilled fish skewered with lemongrass), and a bamboo shoot curry; (3) a set of desserts, a Chang Tok Man, and an elephant-powering herbal juice; (4) an elephant model in coconut milk (Chang Tok Man); (5) making herbal drinks from roselle; and (6) a Miang Kham Chang set.

Khorat UGGp's partneship with Nakhon Ratchasima Rajabhat University which promotes local gastronomy for geotourism in Tha Chang communities contributes to SDG 8 (Decent work and economic growth) and SDG 17 (Partnerships for the goals). This initiative, part of a broader development project in the Mekong Basin region, aims to boost creative and sustainable tourism, and enhance the creative economy in higher education institutions. The partnership focused on Tha Chang communities in Chaloem Phra Kiat District, known for their connection with the Mun River and to rich local resources, including fossils of ancient elephants. The community's resourcefulness contributes to the initiatives aimed to improve their gastronomy to attract tourists, generate revenue, and support rural communities.

The community's involvement in deciding the direction of local development will enhance their ability to develop sustainable tourism by utilizing locally available raw materials contributes to SDG 12 (Responsible consumption and production). The food, made with locally and seasonally available ingredients is appealing, has a connection to fossil resources like prehistoric elephants, and the design is charming.

The dish set is named "Pha Khao Kham Chang." This compound word derived from the terms Pha Khao, Kham, and Chang. "Pha Khao" refers to the rice-eating traditions of the Thai people. "Kham" indicates one bite of rice, while "Chang" denotes elephant and refers to the area's ten genera of fossil elephants . The food platter is huge, like an elephant, and satisfies a person's hunger with just one serving.. There is an appetizer, a main dish, a dessert, and a beverage.

"Miang Kham," or"Miang Kham Chang", a bite sized appetizer, consists of various ingredients wrapped in wild piper leaves (*Piper sarmentosum*) . With its variety of textures and a taste profile that includes sweetness, saltiness, sourness, bitterness, umami, piquancy, sharpness, and spice, the Miang takes the guest's taste buds on a fascinating sensory trip that leaves them wanting more. The main menu will include liquid and dry menus prepared with traditional techniques such as steaming, boiling, currying, grilling, laab (spicy minced meat salad), and food cooked in bamboo. The menu consists mostly of fish, chicken, and vegetables that are easily accessible in the Mun River and its environs. The dessert menu named "Chang Tok Man" is made from various kinds of seasonal yams commonly found along the Mun River. Meals of yam powder shaped like an elephant are topped with coconut milk. The word "tok" means falls into, and "man" in Thai has two meanings: it has fat or oil (from the coconut milk) and yam tubers. In addition, the "Chang Tok Man" word also refers to the elephant's behavior during must For the drink menu made from local herbs such as Bengal currant (*Carissa carandas*), butterfly pea (*Clitoria ternatea*), rosella (*Hibiscus sabdariffa*), etc. The beverage is named "Elephant-Powering Herbal Juice." Drink it, and you will be refreshed and invigorated.

By organising activities, the community worked together and learned how to arrange beautiful dishes, set the right price, include storytelling that connects with the local resource base, and provides an impressive welcome. After the activity, the community experimented with serving tourists and will create new menus based on the knowledge that has been gained.

A group of local chefs comes together to cook and prepare dishes for visitors at Sai Ngam. Jaroon Duangkrayom 1,2,*, Wilailuck Naksi 1,2, Natthaporn Kamjit 3, Natthinee

Apart from the fossil sites in Tha Chang, visitors should also visit the following significant locations: (1) Sai Ngam (banyan tree) Tha Chang, which is more than 200 years old; (2) the bag processing group at "Tha Chang Lamphan"; (3) the elephant pattern mat weaving group "Tha Chang Ensis"; (4) the Petrified Wood Memorial Monument; and (5) Kochanari Herbal Products Group. Duangkrayom 1,2,*, Wilailuck Naksi 1,2, Natthaporn Kamjit 3, Natthinee

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Kütralkura UNESCO Global Geopark, Chile

Innovation and Technological Transfer in the Survey of Geoheritage, natural and cultural heritage in Kütralkura Geopark

Planning a route for trekking using gps data.

In 2021, the partnership responsible for managing Kütralkura UGGp including the the Association of Cordilleran Municipalities of La Araucanía, completed its revalidation process which included the expansion of the territory from 8,100 km² to 12,078 km². The expansion of the Geopark involved planning and the territorial structure provided by the Regional Government of La Araucanía (GORE) and its Regional Council (CORE).

Using "Kütralkura Capturer" mobile applicationt.

In 2020, the Geopark inventory was updated, addressing the main problem, namely the absence of a systematic inventory integrated into a single platform that would allow sharing and displaying the available information for the territory.

Navigating the route using gps data.

The updating of the inventory of natural and cultural heritage was accomplished by 12 local guides using a participatory methodology involving a mobile application for private use, designed exclusively for this purpose, called "Kütralkura Capturer". This allowed them to collect the relevant information on the inventoried sites including coordinates, description, photographs, access, state of conservation, etc. The information was stored in a centralized database using cloud storage, and following a technical validation process, was transferred to www.kutralkura.cl. This platform which contains the following information for all geosites and georoutes: the digital passport, offline alert, geo education, information on geodiversity, flora and fauna, virtual tours. The platform also provides statistical information about visits and also facilitates the permanent incorporation of new information.

This work allowed us to increase the number of relevant natural and cultural heritage sites from 42 to 120, to collect valuable information from the territory integrating local and ancestral knowledge with scientific knowledge during the COVID19 period.

This initiative has made it possible to include technological innovation and, in parallel, deliver a training process for local organizors who participate in the inventory (Integrated Territorial Heritage Diagnosis), supported by professional advisors.

The "Kütralkura Capturer" mobile application is an innovation product that is developed through public-private collaboration, since this project is financially supported by the Regional Government of La Araucanía and its Regional Council (CORE) and is implemented by one of the Universities of the Scientific Committee of the Geopark, through the Territorio Mayor Technological Centre of the Universidad Mayor in coordination with the Kütralkura Geopark.

As part of the principles of the Global Geoparks Network (GGN) and the UNESCO Geosciences and Geoparks Programme (PIGG), using of the "Kütralkura Capturer" mobile application provides a means for strengthening networks between Geoparks and UNESCO Programmes in Uruguay. Developing the "Kütralkura Capturer" mobile application exemplifies SDG 17 (Partnerships in the goals). The information concerning the fauna and flora will contribute to SDG 15 (Life on land).

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Land of Extinct Volcanoes UNESCO Global Geopark, Poland

Actions developing Sustainable Local Communities in the Land of Extinct Volcanoes Geopark

Students' artwork "STOP SMOG".

Poster exhibition "STOP SMOG" made by students from one of the schools in the Geopark.

According to the idea of deep ecology, each of us can save the world for future generations by taking our own small steps. In the Land of Extinct Volcanoes Geopark, we work to disseminate that idea among the local residents to protect the climate, biodiversity and build sustainable communities.

We have taken actions regarding the value of ecosystem services and the consequences of their loss. We conducted thematic field workshops, crafts and art classes for adults and children. An innovative action included the renovation of an old farm building, intended for use as the Geopark office, in a way that accommodated the synanthropic species of birds, insects, reptiles and bats living nearby. An instructional brochure was published together with "How to renovate rural buildings for the benefit of biodiversity in accordance with local tradition." This was a response to the use of new technologies by villagers in the renovation of buildings, which inhibits re-population by synanthropic species and leads to their decline. This activity supported the sustainable development of communities in the Geopark and contributes to SDG 11 (Sustainable cities and communities)

Preservation of the the old style wall of our Geoscience Centre in Dobków with an Airly sensor on the left and a bat house (on the right).

There is also a serious problem with air pollution in Poland, especially during winter time because of domestic coal burning. Everyone can observe it on the Airly (Air Quality) map. There is a big difference between our country and the rest of Europe. So, in August 2023, we launched the project "We reduce greenhouse gas emissions in the Land of Extinct Volcanoes Geopark", co-financed by the Polish Fund for Environmental Protection and Water Management and the Voivodeship Fund for Environmental Protection and Water Management in Wrocław.

Schools from the Geopark area were invited to implement the project. Each school, after conducting classes/workshops on greenhouse gas emissions and air pollution received a sensor to measure air quality. Measurements from sensors are available to everyone on the website https://looko2.com/heatmap.php which will make it possible to check the air condition on an ongoing basis. Students could also participate in distributing brochures with instructions for residents "How to burn coal in a central heating system in a way that reduces greenhouse gas emissions"

During the project, children as well as adults could take part in an on-line lecture on the impact of air pollution on human health. The lecture was delivered by Weronika Michalak, Poland's Director of HEAL (Health and Environment Alliance).

At the end of the project in each participating school we conduct workshops on climate, climate changes and air quality monitoring. Almost 900 students from 15 schools took part in this project. The project contributes significantly to SDG 3 (Good health and well-being) and SDG 13 (Climate action).

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Langkawi UNESCO Global Geopark, Malaysia

Langkawi Geopark Coastal Protection Project: Combatting Marine Debris and its impact on Island Communities

Initiated in 2019, the Idaman Geosite Clean Up (IGSC) is a cleaning programme locally known as 'gotong-royong' organised by Langkawi UNESCO Global Geopark every week to ensure that the cleanliness and physical maintenance of 38 geosites and beaches on the island remain well-looked after and preserved. This programme plays a crucial role in promoting multi-stakeholder partnerships which contributes directly to SDG 17 (Partnerships for the goals). By involving volunteers from all walks of life including from local communities, school students, universities, corporate companies, NGOs, volunteers, tourists and government agencies, the programme creates opportunities for networking, cooperation, experiential learning, knowledge sharing, and skill development between stakeholders. Geopark officers provide onsite guidance and educational sessions to volunteers, emphasising the importance of natural and geological preservation, sustainable practices, and the significance of UNESCO Global Geoparks. This networking component enhances environmental literacy, fosters a sense of responsibility, and empowers individuals to become active stewards of their natural heritage, aligning directly with the objectives of SDG 17. Most of the geosite-linked beaches within the boundary of the Geopark require active maintenance work and restoration as most of the infrastructure provided is exposed to the harsh tropical climate and every so often to littering by several carefree visitors. Apart from that, being an 'island Geopark', the threat of marine debris across the archipelago is a constant issue that needs addressing. Regular clean-up activities along the beaches of the island were also regularly conducted.


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1. Collecting beach litter in Langkawi UGGp.

2. An example of coastal marine debris. Fig. 3. The Geopark's enthusiastic volunteers.

The Geopark's enthusiastic volunteers.

Working closely with E-idaman Sdn. Bhd, a local waste management company, also a Geopark Partner who supported the programme since its beginning, the company provided the means to transport the collected plastic waste/marine debris to the recycling centre or landfill for recycling or to be incinerated responsibly. In recognition of this partnership, the programme is named after the company 'Idaman' which carries the meaning of hopes or dreams. To date, 2,326 participants have collected approximately 7,973 kilograms of plastic waste through this initiative.

Conducting geosite clean-up or beach clean-up activities could boost local economies as many coastal communities rely heavily on tourism for their livelihood (SDG 8 Decent work and economic growth). Tourists are more inclined to promote clean environments and in return, benefit the local economies.

Each clean-up activity that is organised by Langkawi UNESCO Global Geopark is designed to achieve all the related Sustainable Development Goals (working towards multiple SDGs in one programme: SDG 13 (Climate action, SDG 14 Life below water), SDG 15 (Life on land) and SDG 17(Partnership for the goals). Given that most of the sites are in forest reserves, islands, and beaches, protecting nature is crucial for climate action as forests and oceans help mitigate climate change by absorbing carbon dioxide. Thus, this also ensures the longevity of natural and marine ecosystems and populations reliant on the oceans/forests for their lives and livelihoods.

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Lauhanvuori - Hämeenkangas UNESCO Global Geopark, Finland

Saving water through extensive cooperation in Lauhanvuori – Hämeenkangas Geopark

A Geopark Ranger teaches how to use the water monitoring equipment during the Water Day in Isojoki, Lauhanvuori - Hämeenkangas UGGp, Finland.

Water is a key element for life. Extensive land use in the past has altered the quality of surface waters, and climate change also affects water quality and supply. To mitigate these effects, extensive cooperation is needed.

Schools play an important role in raising interest in taking care of nearby water features. In the educational project Naturenet, a model for Lauhanvuori - Hämeenkangas Geopark's elementary schools to monitor the quality of local water features and to upload the results on a common database. Equipment for monitoring is provided by the local Rotary clubs.

Life below water is studied in the Geo-education centre at the upper secondary school level. The students survey the amount of microplastics in fish, both inside and outside the Geopark. They have also filmed 360-degree videos about the river trout (*Salmo trutta fario*). In addition, they offer their help in restoration projects in the Geopark. The student surveys contribute to SDGs 4 (Quality education) and 14 (Life below water).

Two rivers in Lauhanvuori - Hämeenkangas Geopark are home to the endangered freshwater pearl mussel (*Margaritifera margaritifera*). During 2016–2022 the Freshabit LIFE project aimed to map, monitor, and improve the habitats of mussels and improve the living conditions of brown trout (*Salmo trutta*), which hosts the mussel larva during their first years of life. Removing barriers to migration was one of the aims of the project. Another important action involved breeding of mussels in the University of Jyväskylä's Konnevesi research station and their subsequent transplantation of freshly bred mussels to their original rivers. The LIFE Revives project (2023–2027) continues the work with the freshwater pearl mussel. This project also contributes to SDG 14 (Life below water).

In addition to pearl mussel habitats, improvements are also being made to other trout streams. Extensive cooperation is required between landowners, the Centre for Economic Development, Transport and the Environment, the Finnish Environment Institute, Jyväskylä University,The Water Protection Association of the River Kokemäenjoki, The Pyhäjärvi Institute, and local stakeholders, including the Geopark. Projects in the Geopark area include water treatment by added biomass, modifications of waterways and the removal of migration barriers. The level of cooperation in bringing these projects to fruition conforms to SDG 17(Partnerships for the goals)

Other water related projects in the Geopark area include rewetting old peat production areas by various stakeholders to create artificial wetlands, to improve water quality, to prevent greenhouse gas emissions, and create birdlife sanctuaries thus contributing to SDGs 13 (Climate action) and 15 (Life on land)

As various projects on improving water quality proceed, it becomes clear that coordination, cooperation, and persistence is critical for achieving results. Participation of students in restoration activities is also important in mitigating the effects of long-term climate change.

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Lesvos Island UNESCO Global Geopark, Greece

Innovative practices for adapting agroecosystems to the requirements of the circular economy and addressing climate change

Products of organic farming in Anemotia volcanic fields

The Cooperative "Anemotia Volcano" with the support of the Natural History Museum of the Lesvos Petrified Forest, the management body of the Lesvos Geopark is introducing a new pioneering project for Lesvos under the title"Innovative practices for adapting agroecosystems to the requirements of the circular economy and addressing climate change".The project is funded by the "Green Fund" of the Greek Ministry of the Environment

The collaboration among the project partners started a few years ago. The Copperative with the support of the Lesvos Geopark created the model organic vineyard in which all native grape varieties were collected and preserved.

The new project concerns the creation and management of a model productive agro-ecosystem of perennial crops (vineyard, fig tree, aromatic plants) resistant to climate change. (increase in average temperature, heat waves, drought, floods, etc.) and its impacts (reduction of organic matter in the soil, loss of biodiversity, reduced crop yield, insect infestations, etc.), by implementing innovative circular economy practices and utilizing agricultural and livestock by-products of Lesvos' productive sectors (viticulture, winemaking, livestock farming, olive production).

The farm will be designed to be accessible and host educational activities (for visitors, farmers, students, etc.) related to the environment, regenerative agriculture, the circular economy and sustainable development.

New crops of fig trees and aromatic plants will be planted. A rainwater collection system will be created for their use in the irrigation of crops. The production and application of soil conditioners (compost, biochar) and ground cover materials (sheep wool) will begin, utilizing the by-products of viticulture, winemaking, olive production and livestock farming, which would otherwise be discarded as waste.

In parallel with the implementation of the above, free experiential workshops will be held, in the stages of (a) the configuration of the farm, (b) the plantings, (c) the development of methods for the utilization of agricultural and livestock by-products. A central information day on climate change will also be organised at the Natural History Museum of the Petrified Forest of Lesvos.

The ultimate goal is to formulate and freely make available to the public a new "road map" and rules for the integrated and sustainable management of agricultural land and the by-products of the main productive sectors of Lesvos.

The project is implemented by the "Anemotia Volcano" Cooperative, in partnership with the Natural History Museum of the Petrified Forest of Lesvos and with the support of the Ionian University, Soil Science Laboratory, the Cultural Heritage Management Laboratory of the University of the Aegean, the Laboratory for the Geography of Work of the University of the Aegean, the North Aegean Region, Directorate of Agricultural Economy of Lesvos, the Winegrowers' Association of Anemotia of Lesvos "o Kampos", the Environmental Cultural Association of Skalochori of Lesvos "Drys" and the Environmental Association "Lesvos without Plastics".

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Planting of traditional local varieties of grapes by the "Anemotia Volcano" Cooperative.

The wineyard of "Anemotia Volcano" Cooperative

Lushan UNESCO Global Geopark, China

Gender Equality in Lushan Geopark Contribution to SDG Goal No.5 Gender equality

Adhering to the principle of serving the objectives of UNESCO Global Geoparks and women, Lushan UGGp integrates the Geopark's development with the protection of women's rights. By maximising the roles played by the female managers and staff in the economic and social development of the Geopark, Lushan UGGp contributes to SDG 5 (Gender equality).

Firstly, the Geopark's development involved the gradual transition of female staff to management and technical posts. The Geopark has 636 female staff members, including 9 officials at county-level and above, 85 officials at section chief-level and above, and 304 in management positions.

Secondly, grassroots organisations of Women's Federations have been established and enhanced in the Geopark, which facilitates the implementation of women's development and the protection of women's rights. There are 24 grassroots women's federations and 76 grassroots leaders in Lushan UGGp.

Thirdly, Lushan UGGp has established a career platform for women to achieve goals in their respective fields and to contribute to the Geopark's development. Female staff are encouraged to demonstrate their talents in tourism, cultural and industrial activities, scientific and technological research, cultural communication, and other fields.

Ms. HU Wei, Lushan Museum Curator led her team to construct a museum complex including a Geo-museum, Stone Inscription Museum, Religious Culture Museum and a Poetry Museum. The team won multiple prizes such as "Top Ten Excellent Works of the National Museum Exhibition",

and the title of "National First-level Museum".

Female employees of Lushan Botanical Garden of the Chinese Academy of Sciences served as team leaders of research groups. They presided over more than 10 projects at national level and published hundreds of high-level papers, which promoted sustainable development in the Geopark and eco-environment protection.

Dr. KONG Danyu of Lushan Botanical Garden of the Chinese Academy of Sciences led her research group, made contributions to promoting the development of the tomato industry in Jiangxi Province and supporting rural economy revitalization

The Chinese ink paintings of Ms. YANG Fan, vice president of Lushan Painting Institute, were included in the Peony International Art Festival exhibition in Germany co-hosted by Bergstrasse-Odenwald UGGp (Lushan's sister Geopark) and Lushan UGGp. As the first exhibition of Chinese folk artists' works overseas, it was a breakthrough in Geopark international cooperation.

During holidays (peak time for tourism), over 1,000 female interpreters, tour guides, tourism bus ticket inspectors provided a well received volunteer service to the visitors.

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The Chinese ink paintings by Ms. YANG Fan, Vice President of Lushan Painting Institute, were presented in the Peony International Art Festival exhibition in Germany co-hosted by Bergstrasse-Odenwald UGGp and Lushan UGGp.

Volunteers cater for vistors during holiday peak times for tourism.

Maiella UNESCO Global Geopark, Italy

Green innovation for bio and geodiversity in Maiella Geopark

There are many collaborative actions undertaken by Maiella Geopark for innovation involving local industries and economic activities that promote sustainable development and trigger a growing interest in the territory. Many actions concern the protection of natural and agronomic plant biodiversity, which are consequently linked to the protection of geodiversity and specifically with different habitats.

In the Maiella Geopark there are two botanical gardens, Michele Tenore Botanical Garden in Lama dei Peligni and Daniela Brescia in Sant'Eufemia a Maiella, the Centre for the Conservation of Plant Biodiversity for Abruzzo. In addition, the Geopark is the protagonist and leader of other protected areas within the Life FLORANET project and a partner of the Life SEEDFORCE project including all seed banks in Italy and international partners. This involves scientific investigation of issues related to germination processes, the organoleptic characterization of agronomic varieties, medicinal properties, flora, and vegetation.

The Majella Seed Bank, also contributes to the foundation of the Italian Network of Germplasm Banks for the Ex Situ conservation of Italian natural flora, which includes over 15 seed banks distributed throughout the country. This project strongly supports SDG 9 (Life on land)

The "Let's cultivate diversity" programme revitalized and expanded studies and processes for the recognition and enhancement of local varieties (sixty potatoes from the Pizzi Mountains, marzuolo wheat, and black celery from the coasts of Torricella Peligna, etc.). Inland rural areas, by accepting the new agronomic value, offer products that are increasingly in demand, and by partly avoiding the depopulation of inland areas contribute to SDG 8 (Decent work and economic growth).

There are many agreements signed with industries and economic pursuits. These include the Agreement with BioCantina Orsogna, for the integrated study of native yeasts, with the production of organic wines under a joint brand; Agreement with the Toro Distillery, to start liqueur production using medicinal herbs produced on site and/or harvested with controlled authorizations (gentian, juniper, etc.).

The #STREAMS hatchery for breeding Mediterranean trout.

The Park also invests in the architectural innovation of its infrastructures: the #STREAMS hatchery for Mediterranean trout breeding was recently inaugurated at the "D. Brescia" Botanical Garden in the Municipality of Sant'Eufemia a Maiella. The building is constructed entirely of wood, raised from the ground and has no environmental impact. The cladding, composed of 3,000 hand-shaped wooden components, imitates the scales of the Mediterranean trout. These projects are the result of in-depth scientific research that allows, thanks to the procurement of European and regional funds, to move from theory to action! Maiella Global Geopark is going green!

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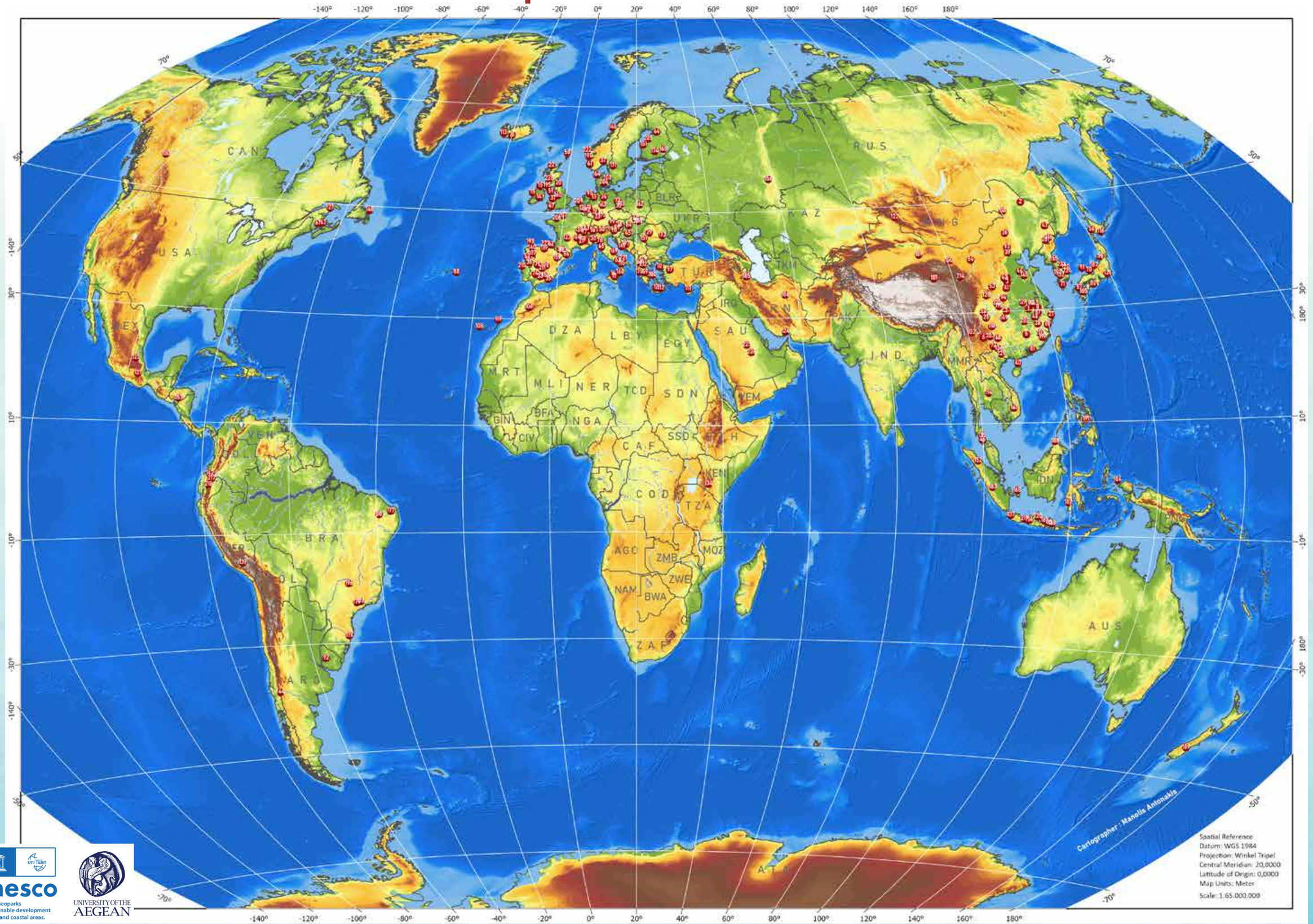
The Majella Seed Bank, also contributes to the foundation of the Italian Network of Germplasm Banks.

The interior of the Maiella seed Bank.

UNESCO Global Geoparks

229 Geoparks in 50 Countries



GLOBAL GEOPARKS NETWORK

unesco Global Geoparks

unesco Chair on Geoparks and sustainable development of insular and coastal areas.

UNIVERSITY OF THE AEGEAN

List of UNESCO Global Geoparks

229 Geoparks in 50 Countries

No.	Geopark name	Country	Year
1	Lushan	China	2004
2	Wudalianchi	China	2004
3	Songshan	China	2004
4	Yuntaishan	China	2004
5	Danxiashan	China	2004
6	Shilin	China	2004
7	Zhangjiajie	China	2004
8	Huangshan	China	2004
9	Haute-Provence	France	2004
10	Lesvos island	Greece	2004
11	Vulkaneifel	Germany	2004
12	Psiloritis	Greece	2004
13	Terra vita	Germany	2004
14	Copper Coast	Republic of Ireland	2004
15	Cuilcagh Lakelands	N. Ireland/Republic of Ireland	2004
16	Madonie	Italy	2004
17	Rocca Di Cerere	Italy	2004
18	Styrian Eisenwurzen	Austria	2004
19	Bergstrasse-Odenwald	Germany	2004
20	North Pennines	UK	2004
21	Luberon	France	2005
22	North West Highlands	UK	2005
23	Swabian Albs	Germany	2005
24	Harz Braunschweiger Land	Germany	2005
25	Xingwen	China	2005
26	Hexigten	China	2005
27	Yandangshan	China	2005
28	Taining	China	2005
29	Hateg Country	Romania	2005
30	Beigua	Italy	2005
31	Fforest Fawr	UK	2005
32	Bohemian Paradise	Czech Republic	2005
33	Sierras Subeticas	Spain	2006
34	Sobrarbe-Pirineos	Spain	2006
35	Cabo de Gata	Spain	2006
36	Naturtejo	Portugal	2006
37	Gea-Norvegica	Norway	2006
38	Araripe	Brazil	2006
39	Fangshan	China	2006
40	Leiqiong	China	2006
41	Funiushan	China	2006
42	Wangwushan-Daimeishan	China	2006
43	Jingpohu	China	2006
44	Taishan	China	2006
45	Papuk	Croatia	2007
46	Langkawi	Malaysia	2007
47	English Riviera	UK	2007
48	Longhushan	China	2007
49	Zigong	China	2008
50	Adamello Brenta	Italy	2008
51	Geo Mon	UK	2009
52	Arouca	Portugal	2009
53	Qinling Zhongnanshan	China	2009
54	Alxa	China	2009
55	Itoigawa	Japan	2009
56	Toya Usu	Japan	2009
57	Unzen Volcanic Area	Japan	2009
58	Shetland	UK	2009
59	Chelmos-Vouraikos	Greece	2009
60	Novohrad-Nograd	Hungary/Slovakia	2010
61	Magma	Norway	2010
62	Basque Coast	Spain	2010
63	Cilento, Vallo di Diano e Alburni	Italy	2010
64	Rokua	Finland	2010
65	Tuscan Mining Park	Italy	2010
66	Vikos-Aoos	Greece	2010
67	Stonehammer	Canada	2010
68	Leye Fengshan	China	2010
69	Ningde	China	2010
70	San'in Kaigan	Japan	2010
71	Jeju island	Republic of Korea	2010
72	Dong Van Karst Plateau	Viet Nam	2010
73	Muskau Arch	Germany/Poland	2011
74	Sierra Norte de Sevilla	Spain	2011
75	Burren and Cliffs of Moher	Republic of Ireland	2011
76	Katla	Iceland	2011
77	Massif des Bauges	France	2011
78	Alpi Apuani	Italy	2011
79	Villuercas Ibores Jara	Spain	2011
80	Muroto	Japan	2011
81	Hong Kong	China	2011
82	Tianzhushan	China	2011
83	Chablais	France	2012
84	Bakony-Balaton	Hungary	2012
85	Batur	Indonesia	2012
86	Central Catalonia	Spain	2012
87	Sanqingshan	China	2012
88	Azores	Portugal	2013
89	Karavanke/Karawanken	Slovenia/Austria	2013
90	Idrija	Slovenia	2013
91	Oki islands	Japan	2013
92	Grutas del Palacio	Uruguay	2013
93	Yanqing	China	2013
94	Shennongjia	China	2013
95	De Hondsrug	Netherlands	2013
96	Sesia-Val Grande	Italy	2013
97	Kula-Salihli	Turkey	2013
98	Molina and Alto Tajo	Spain	2014
99	Ore of the Alps	Austria	2014
100	Tumbler Ridge	Canada	2014
101	Mount Kunlun	China	2014
102	Dali Mount Cangshan	China	2014
103	Odsherred	Denmark	2014
104	Monts d'Ardeche	France	2014
105	Aso	Japan	2014
106	M'Goun	Morocco	2014
107	Terras de Cavaleiros	Portugal	2014
108	El Hierro Global	Spain	2014
109	Dunhuang	China	2015
110	Zhijindong	China	2015
111	Troodos	Cyprus	2015
112	Sitia	Greece	2015
113	Reykjanes	Iceland	2015
114	Gunung Sewu	Indonesia	2015
115	Pollino	Italy	2015
116	Mount Apoi	Japan	2015
117	Lanzarote and Chinijo Islands	Spain	2015
118	Arxan	China	2017
119	Las Loras	Spain	2017
120	Cheongsong	Republic of Korea	2017
121	Mixteca Alta	Mexico	2017
122	Keketuohai	China	2017
123	Causses du Quercy	France	2017
124	Qeshm Island	Iran	2017
125	Comarca Minera, Hidalgo	Mexico	2017
126	Famenne-Ardenne	Belgium	2018
127	Perce	Canada	2018
128	Guangwushan-Nuoshuihe	China	2018
129	Huanggang Dabieshan	China	2018
130	Beaujolais	France	2018
131	Izu Peninsula	Japan	2018
132	Mudeungsan Area	Republic of Korea	2018
133	Origens	Spain	2018
134	Ngorongoro Lengai	Tanzania	2018
135	Satun	Thailand	2018
136	Non nuoc Cao Bang	Viet Nam	2018
137	Ciletuh-Palabuhanratu	Indonesia	2018
138	Rinjani Lombok	Indonesia	2018
139	Colca y Volcanes de Andagua	Peru	2019
140	Courel Mountain	Spain	2019
141	Vis Archipelago	Croatia	2019
142	Imbabura	Ecuador	2019
143	Jiuhuashan	China	2019
144	Kutralkura	Chile	2019
145	Yimengshan	China	2019
146	Trollfjell	Norway	2019
147	Cliffs of Fundy	Canada	2020
148	Discovery	Canada	2020
149	Xiangxi	China	2020
150	Zhangye	China	2020
151	Lauhanvuori-Hameenkangas	Finland	2020
152	Toba Caldera	Indonesia	2020
153	Rio Coco	Nicaragua	2020
154	Estrela	Portugal	2020
155	Hantangang river	Republic of Korea	2020
156	Yangan-Tau	Russian Federation	2020
157	Djerdap	Serbia	2020
158	Granada	Spain	2020
159	Maestrazgo	Spain	2004
160	Black Country	UK	2020
161	Dak Nong	Viet Nam	2020
162	Holy Cross Mountains	Poland	2021
163	Thuringia Inselberg-Drei Gleichen	Germany	2021
164	Vestjylland	Denmark	2021
165	Saimaa	Finland	2021
166	Aspromonte	Italy	2021
167	Grevena-Kozani	Greece	2021
168	Belitong	Indonesia	2021
169	Majella	Italy	2021
170	Ries	Germany	2022
171	Platåbergen	Sweden	2022
172	Mëllerdall	Luxembourg	2022
173	Buzău Land	Romania	2022
174	Salpausselkä	Finland	2022
175	Kefalonia-Ithaca	Greece	2022
176	Southern Canyons Pathways	Brazil	2022
177	Serido	Brazil	2022
178	Caçapava	Brazil	2023
179	Quarta Colônia	Brazil	2023
180	Lavreotiki	Greece	2023
181	Ijen	Indonesia	2023
182	Maros Pangkep	Indonesia	2023
183	Merangin Jambi	Indonesia	2023
184	Raja Ampat	Indonesia	2023
185	Aras	Iran	2023
186	Tabas	Iran	2023
187	Hakusan Tedorigawa	Japan	2023
188	Kinabalu	Malaysia	2023
189	Waitaki Whitestone	New Zealand	2023
190	Sunnhordland	Norway	2023
191	Bohol Island	Phillipines	2023
192	Jeonbuk West Coast	Republic of Korea	2023
193	Cabo Ortegal	Spain	2023
194	Khorat	Thailand	2023
195	Mourne Gullion Strangford	UK	2023
196	Uberaba	Brazil	2024
197	Biokovo-Imotski Lakes	Croatia	2024
198	Enshi Grand Canyon-Tenglongdong Cave	China	2024
199	Linxia	China	2024
200	Longyan	China	2024
201	Mount Changbaishan	China	2024
202	Wugongshan	China	2024
203	Xingy	China	2024
204	The South Fyn Archipelago	Denmark	2024
205	Impact Crater Lake	Finland	2024
206	Armorique	France	2024
207	Normandie-Maine	France	2024
208	Bükk Region	Hungary	2024
209	Schelde Delta	Belgium/Netherlands	2024
210	Oeste	Portugal	2024
211	Volcanes de Calatrava	Spain	2024
212	Meteora-Pyli	Greece	2024
213	Kanbula	China	2025
214	Land of Extinct Volcanoes	Poland	2024
215	Yunyang	China	2025
216	Napo Sumaco	Ecuador	2025
217	Mt Paektu	Democratic People's Republic of Korea	2025
218	Tungurahua Volcano	Ecuador	2025
219	Kebumen	Indonesia	2025
220	Meratus	Indonesia	2025
221	MurGeopark	Italy	2025
222	Fjord Coast Regional and Geopark	Norway	2025
223	Danyang	Republic of Korea	2025
224	Gyeongbuk Donghaean	Republic of Korea	2025
225	North Riyadh	Saudi Arabia	2025
226	Salma	Saudi Arabia	2025
227	Costa Quebrada	Spain	2025
228	Arran	UK	2025
229	Lang Son	Viet nam	2025

What is a UNESCO Global Geopark?

UNESCO Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development.

A UNESCO Global Geopark uses its geological heritage, in connection with all other aspects of the area's natural and cultural heritage, to enhance awareness and understanding of key issues facing society, such as using our earth's resources sustainably, mitigating the effects of climate change and reducing natural disasters-related risks.

By raising awareness of the importance of the area's geological heritage in history and society today, UNESCO Global Geoparks give local people a sense of pride in their region and strengthen their identification with the area.

The creation of innovative local enterprises, new jobs and high quality training courses is stimulated as new sources of revenue are generated through geotourism, while the geological resources of the area are protected.

At present, there are 195 UNESCO Global Geoparks in 48 countries.

All the UNESCO Global Geoparks are institutional members of the Global Geoparks Network.

Global Geoparks Network

The Global Geoparks Network (GGN) is a non-profit and a non-governmental organisation. It was initially founded in 2004 as an international partnership developed under the umbrella of UNESCO, and was officially registered as an association in 2014 subjecting to French law. The Global Geoparks Network is the official partner of UNESCO for the operation of the UNESCO Global Geoparks.

Networking and collaboration among Global Geoparks is an important component of the Global Geoparks Network.

The four GGN Regional Geoparks Networks are the Asia Pacific Geoparks Network (APGN), the European Geoparks Network (EGN), the Latin America and Caribbean Geoparks Network (GeoLAC) and the African UNESCO Global Geoparks Network (AUGGN).

www.globalgeoparksnetwork.org
www.visitgeoparks.org

Massif des Bauges UNESCO Global Geopark, France

Get out on the Bauges side of the mountains

The mountain discovery, summer session.

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Orienteering exercise in the "Sors en montagne, versant Bauges" scheme.

© PNRMB

By contributing to SDG 3 (Good health and well being) and SDG 4 (Quality education) the Massif des Bauges UNESCO Global Geopark has set itself the goal of giving young people from the region and the gateway towns, who are cut off from mountain culture, the opportunity to experience the mountains through the "Sors en montagne, versant Bauges" scheme. As part of this scheme, the Geopark is helping youth groups (social centres, local missions, children's centres, etc.) to organise mountain breaks that include roaming, meetings with local players, heritage discovery and at least two overnight stays. The aim of these trips is to show young people that the mountains do not have to be hard and expensive. The aim is not to offer holidays that are full of sporting activities. The sole aim is to create memories for young people through simple actions (bivouacking, fire, taking part in milking in the mountain pastures, etc.) and thus to set them on the road to citizenship!

To encourage educators to offer their young people mountain holidays, the "Sors en montagnes, Savoie" (Get out in the mountains, Savoie) collective, connects the Chartreuse, Vanoise and Massif des Bauges parks, the Educ'Alpes and Savoie Mont Blanc Juniors networks, Mountain Riders and State administration for young people and sport. The project offers immersive mountain training courses for social centre leaders (e.g. Dare to roam with your group of young people, Dare to spend the night in an igloo with your group of young people, etc.). To remove a final obstacle to participating, the Geopark provides bivouac equipment (sleeping bag, ground sheet, tents, rucksack) free of charge to the centres.

The mountain discovery, winter session.

© PNRMB

To be eligible for Geopark support, projects must meet a number of criteria: the children's group camp must be located in a municipality that is a member of the Park or in an urban area outside the Park; the young people concerned must have little or no exposure to mountain culture; the project must take place in the Massif des Bauges UGGp; the project must include at least two overnight stays; the project must include an itinerary (hiking, cycling or another activity); the project must be developed in partnership with at least one local tourist, artistic or cultural provider.

Each year, the Geopark supports the organisation of 10 trips. Funding is provided by the Auvergne Rhône Alpes region, the Départements and the Snowleader foundation. The bivouac equipment was purchased thanks to funding from a local bank, Crédit Agricole des Savoie.

An educator commented: "The activities on offer, the skills they develop and their usefulness are all part of a drive to develop young people. Carrying out a variety of activities encourages them to surpass themselves and helps to unite the group. They provide a shared experience that can be used as a lever in the future support pathways of young people".

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Mixteca Alta UNESCO Global Geopark, Mexico

From education to action: engaging the local communities into sustainable strategies in Mixteca Alta Geopark (SDGs 2, 4, 11, 12, 15 & 17)

1

2

1. "Earth Colours" project contributes to education in geodiversity.

2. The Zero Waste Programme focused on reuse, recycling, and environmental education on waste management.

Currently, there are a number-of alarming environmental issues and circumstances that require highly necessary mitigation. For example, in Latin America and the Caribbean (LAC) region, the poverty and extreme poverty rates between 2002 and 2020, only decreased by less than 1%. Another important indicator concerns extreme weather events which, between 1990 and 2020, increased from 37 to 70 events per year.

Likewise, greenhouse gas emissions in the region produced by the energy, industrial and waste sectors doubled or more than doubled between 1990 and 2020. The production of solid waste is increasing, and will reach 1.6 kg per day per capita by 2025 in the LAC region. This exceeds the estimated global average of 1.4 kg per day per capita. Another fact is the excessive and constant use of fertilizers and pesticides and, at the same time constant deforestation coincides with an increase in agricultural areas.

Concerning the above, it is important to highlight that UGGps can be territories that help mitigate these problems, especially those related to the sustainable environmental management of territories through specific strategies and actions. In this sense, the Mixteca Alta UNESCO Global Geopark has made a commitment and has therefore developed various environmental education activities and strategies, by considering its contribution to different SDG goals and targets.

Some of these environmental management actions contribute, for example, to SDGs 2, 4, 11, 12, 15 and 17, and we can highlight the following initiatives:

- SDG 4 (Quality education). The "Earth Colors" project contributes to education in geodiversity by producing paintings with natural soil and rock colours.
- SDG 12 (Responisible consumption and production). The Zero Waste Programme focused on reuse, recycling, and environmental education on waste management.
- SDC 2 (Zero hunger). Native seed banks and traditional agricultural activities for sustainable agriculture, including rural tourism itineraries.
- "Tequio" programmes = Community volunteering for cleaning, reforestation, environmental surveillance, among others.
- SDG 15 (Life on land) Workshops on plants and their medicinal properties, and traditional gastronomy;
- SDG 11 (Sustainable cities and communities. Creation of areas destined for community and voluntary conservation and protection;
- Training programmes and action plans to mitigate and combat forest fires;
- Tourist and educational programmes on various topics for environmental management and conservation;
- (SDG 4). Pedestrian routes for environmental interpretation with various themes such as climate change, biodiversity management, the value of geodiversity, among others.

Taking this into consideration, it is also important to highlight that many of these initiatives are promoted and managed by local young people, who play a fundamental role in the environmental protection and conservation of the Mixteca Alta UGGp. Their activities are a vital component of SDG 17 (Partnerships for the goals). These actions and examples mentioned refer to the contribution to different SDG goals and particular targets of the 2030 Agenda that serve as a basis for the local regulations and the specific actions in the management plan of the Mixteca Alta UGGp.

A display of native seed products in the Mixteca Alta UGGp.

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Molina-Alto Tajo UNESCO Global Geopark, Spain

Creating awareness in the Molina-Alto Tajo Geopark

Talk for training of businesspeople and entrepreneurs in the ANiDA Coworking Space.

The ANiDA Coworking Space is a project supported by the Molina de Aragón Municipality to promote sustainable employment in the territory of Molina Alto Tajo UGGp, developed with the financial support of the Ministry of Economy, Business and Employment through the General Directorate of Self-Employed, Labor and Social Economic of the Regional Government of Castilla La Mancha. It was created with the aim of energizing entrepreneurship and companies, promoting sustainable development in areas with low population and, where it is necessary, to promote population settlement, such as in the territory of Molina Alto Tajo UGGp. In order to achieve this, facilities are made available to companies and entrepreneurs in which they can obtain the technical equipment necessary to develop economic activities, as well as support for the use of innovative technologies. Users of this space can find the necessary office equipment, as well as individual work sites, in-person and online meeting rooms, and a catering, auditorium, among others. This is achieved in a communal space in which ideas are shared by establishing contacts that encourage creativity by developing synergies. The team dedicated to this initiative offers its support in its own facilities or by travelling to the locations where its services are required. In this way, in addition to providing a physical work space, the use of new technologies and social networks is supported for the design and promotion of projects and products. This project supports both new and established entrepreneurs with special attention devoted to traditional, innovative and/or social value initiatives. In addition to the services described above, the ANiDA Coworking Space carries out multiple activities to support companies, such as workshops in which they work on useful aspects such as style manuals, branding, place identity, brochure design, brain storming, networking, among others. The project also organises presentations on products and company certification, and markets and fairs to promote products. We highlight the San Miguel Livestock Fair which, in addition to being a showcase for the quality of the region's products, involves the recovery of an important historical tradition. The ANiDA Coworking Space is part of a regional network that includes workplaces in other locations in the Castilla La Mancha region such as Riopar in Albacete, Almadén in Ciudad Real, Quintanar del Rey in Cuenca and Belvis de la Jara in Toledo. The activities of the AniDA Coworking Space contributes to SDG 8 (Decent work and economic growth0, SDG 9 (industry innovation and infrastructure and SDG 11 (Sustainable cities and communities).

Street market of local products and services organized by the ANiDA Coworking Space.

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Mourne Gullion Strangford Geopark, Northern Ireland, UK

Advancing Marine Conservation: Seagrass Restoration Pilot in Mourne Gullion Strangford Geopark

Mourne Gullion Strangford Geopark spearheads a pioneering initiative to restore seagrass habitats through an innovative pilot scheme utilizing advanced mooring systems on the island of Ireland. Recognized as a blue carbon habitat, seagrass exhibits an unparalleled ability to absorb and store carbon, surpassing that of trees.

The primary goal of the trial mooring scheme in Strangford Lough is to preserve the surface integrity above the water while promoting regenerative growth below. This entails exploring inventive strategies to prevent traditional mooring systems from causing damage to the seabed and vital seagrass habitats.

Traditional mooring systems, characterized by swinging chains, pose a threat to the seabed and the invaluable seagrass, a carbon capture plant generating considerable excitement. A successful trial holds the potential to extend the benefits of the new mooring system to numerous locations across the Geopark's expansive marine environment.

Divers, integral to the annual inspection team, share their insights, highlighting the rich biodiversity beneath the surface within the Geopark. The ongoing trial, set to span several years, aims to invigorate seagrass growth, actively contributing to the conservation and protection of blue carbon within the Geopark.

This pioneering project harmonises with the Sustainable Development Goals, specifically:

SDG 13: Climate action, mitigating the impact of traditional mooring systems on seagrass habitats.

SDG 14: Life below water, fostering the enhancement of marine biodiversity and habitat conservation.

By mitigating potential damage from traditional mooring systems, the pilot scheme aspires to cultivate a sustainable future for marine life in the Geopark. This holistic endeavour underscores our commitment to trial innovative practices, with the overarching objective of ensuring a resilient and flourishing environment for our boating communities. The project's dedication to environmental preservation and carbon capture exemplifies the Geopark's steadfast commitment to a sustainable and ecologically balanced future.

Installing the advanced mooring system.

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Brent geese in Strangford Lough Courtesy of Tourism Northern Ireland.

Photo by Brian Morrison.

Mt. Apoi UNESCO Global Geopark, Japan

Teaching Indigenous Ainu Culture at Local Schools

Introducing the Samani Folk Culture Preservation Society to the students.

The Mt. Apoi Geopark holds an annual Ainu cultural experience at the elementary school within the Geopark boundaries to teach students about the culture of the indigenous Ainu people of Japan.

The Ainu people passed down their culture orally as, in the past, they did not have a written language. Their culture continues to flourish in Mt. Apoi Geopark. Many place and river names, for example, are derived from the Ainu language, and local cuisine that utilizes the bounty of nature is loved by many of the townspeople. The Samani Folk Culture Preservation Society is actively working to pass this culture on to the next generations.

This cultural experience for the elementary school was developed by the Preservation Society. First, the Preservation Society members performed a traditional Ainu dance for the students. This dance was recognised as an intangible cultural heritage by UNESCO. Then the elementary fourth graders donned happi coats embroidered with traditional Ainu patterns and danced the "Amatsubame (Pacific Swift) Dance" and "Ring Dance" together.

The students enjoyed the dances and learning about the local Ainu culture.

Mt. Apoi Geopark plans to continue its activities to allow more people to understand the indigenous Ainu culture. The Mt Apois Geopark's annual Ainu cultural experience subscribes to SDG 4 (Quality education). By highlighting the value of different cultures the Geopark also contributes to SDG 10 (Reduced inequalities).

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The Preservation Society members perform a traditional Ainu dance.

The students participate in the Ring Dance while wearing happi coats decorated with Ainu patterns

Mudeungsan UNESCO Global Geopark, Republic of Korea

The Mudeungsan Geopark Promotes Citizen's Health Activities

In October 2023, the 2nd Geo-Marathon was held in the Mudeungsan UGGp in South Korea. Following the first event in 2019, it was suspended due to COVID-19 and resumed after four years, with the third event scheduled to be held this year. The "Geo" in Geo-Marathon refers to the geological park located at Mt. Mudeungsan. The primary goal of hosting the Geo-Marathon at the Mudeungsan UGGp is to promote the Geopark and encourage citizens to lead healthier lives by participating in the marathon. The distinctive feature of the Geo-Marathon is the inclusion of geological and historical cultural sites within the UGGp as part of the marathon course, providing participants with an enriched experience of the Geopark. The Geo-Marathon, co-organised with South Korea's MBC broadcaster, was broadcast nationwide, introducing Mudeungsan UGGp to the entire nation by showcasing its prominent attractions during the live coverage.

The Geo-Marathon holds a profound significance as the only marathon event hosted within the family of UNESCO Global Geoparks. During the 1st event, officials from UNESCO and Global Geopark participated in this special event. Additionally, this event introduced a new 5.18 km course, with a total of 1,187 participants. Both numbers, 5.18 and 1,187, carry significant meaning. The former symbolizes the pivotal history of the 5.18 Democratization Movement in Gwangju, the latter represents the height of the Mudeungsan, towering at 1,187 m.

In addition, the Mudeungsan UGGp is actively engaged in various activities for the health and well-being of civilians. 'The Mudeungsan Love Hiking Event' which has encouraged many citizens to engage in hiking is a prime example The event, which celebrated its 17th occurrence in 2023, has been an ongoing event since its inception in 2004, except for the years 2020 to 2022 due to COVID-19. Additionally, access to the summit of the Mudeungsan was prohibited to civilians due to the presence of military units. However, through cooperation between the Mudeungsan UGGp, relevant local governments, and military units, access to the summit has now been made available to the public at all times. As a result, efforts have been made to restore and preserve the ecosystem that was previously damaged by military installations located on the summit.

Through these activities, the Mudeungsan UGGp contributes to SDG 3, by promoting the good health and well-being of the local- residents by coexisting harmoniously with the Mudeungsan, and fostering shared experiences. During the Mudeungsan Love Hiking Event, participants collaborated with a 40-year-old NGO dedicated to the Mudeungsan conservation to clean up trash along the hiking route. With the goal of supporting healthy lifestyles in the local-residents, preserving the ecological environment of the Mudeungsan UGGp, and encouraging robust community engagement, the Mudeungsan UGGp plans to continue organising events such as the Geo-Maarthon and Mudeungsan Love Hiking Event.

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Participants prepare to run before the start of the Geo-Marathon.

Explanation of attractions of the Mudeungsan UGGp during live coverage of the Geo-Marathon.

The Marathon commences and the participants begin running.

Muroto UNESCO Global Geopark, Japan

Combating Invasive Plants in Muroto Geopark

Cutting Opuntia cacti along the roadside.

The Muroto UNESCO Global Geopark (Muroto UGGp) prioritizes the responsible management of its terrestrial ecosystems. A significant challenge in recent years has been created by the introduction of the Opuntia cactus, a non-native species that disrupts the ecological balance of Cape Muroto.

The Opuntia cactus, also known as prickly pear, thrives in Muroto's semi-tropical climate despite its South American origins. Its rapid spread displaces native vegetation, threatening the local ecosystem's delicate balance.

The Muroto Geopark Conservation Team, a group dedicated to preserving and protecting the Geopark area, has been instrumental in addressing the challenge created by the spread of the Opuntia cactus. These volunteers carefully remove Opuntia cacti, ensuring the preservation of native flora and fauna.

However, the Muroto UGGp's approach goes beyond eradication. Recognising the potential for innovation, we have implemented a multifaceted strategy for managing the Opuntia cactus.

Through collaboration with Muroto High School students, the Geopark explores alternative and sustainable uses for the invasive cactus. Student research and experimentation delve into culinary applications, exploring the potential of using Opuntia as an ingredient in various dishes, ranging from Japanese curry to smoothies. These efforts not only provide valuable insights in the problem but also spark community interest in the issue.

Furthermore, the Geopark collaborates with an external company to create "Muroto Shiokaze Cactus," a product addressing both invasive species management and sustainable livelihoods. This product repurposes Opuntia cactus as food for reptiles, mitigating the environmental impact while creating economic opportunities within the community.

Public education and community engagement are crucial aspects of the Geopark's strategy. Outreach programmes, workshops, and guided tours raise awareness about the importance of biodiversity, conservation, and sustainable land management. Empowering residents and visitors promotes a sense of ownership and collective responsibility in safeguarding the Geopark's natural heritage.

The fight against invasive species remains a top priority for the Muroto UGGp as we pursue sustainable development. With community and partner support, we remain committed to preserving Muroto's natural heritage for future generations.

In conclusion, the Muroto UNESCO Global Geopark's response to the invasive Opuntia cactus exemplifies our dedication to Sustainable Development Goal 15 (Life on land). Through a combination of conservation, innovation, and community and partner collaboration and support, SDG 17 (Partnerships for the goals), the Geopark strives to create a future where its terrestrial ecosystems flourish in harmony with nature.

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Cooking the cacti using various methods.

Cleaning up walking trails.

Ngorongoro-Lengai UNESCO Global Geopark, Tanzania

Ngorongoro-Lengai Global Geopark: recent progress and future prospects

The Maasai people of Ngorongoro-Lengai Geopark.

Olduvai Gorge Museum is one of the educational facilities used to convey information and the history of humanity in East Africa.

The Ngorongoro-Lengai region in Tanzania covers an area of 13,800 km2 and is home to a population of 250,000 individuals. The local community comprises the Hadzabe hunter-gatherers, Datoga, Iraqw and Maasai. Prior to the establishment of the Ngorongoro-Lengai Global Geopark (NLGGp), these communities, while living in a tourist area, were marginalized, and had no chances to participate in tourism-related activities.

The Global Geopark programme has provided local communities with opportunities to celebrate their natural, geological, and cultural heritage, while engaging in various socio-economic activities, such as tourism. An important initiative employed is the inclusion of local residents in the governing body, where they actively participate in the management of geological, ecological, and cultural assets. The NLGGp emphasizes the significance of education in promoting public awareness and understanding of the Geopark programme and the opportunities it offers. The Geopark has established educational facilities, such as a museum at Olduvai Gorge, together with visitors and community centres, to convey the geological history, types of landscapes, and the importance of the region's geodiversity. The facilities also provide information on the evolutionary history of humanity, past habitats, and the current history of the local inhabitants and contribute to SDG 4 (Quality education).

To facilitate the involvement of the local community, individuals, and businesses in the tourism industry, NLGGp advocates the promotion of local products, provides business training, and encourages women's groups to actively participate. Through these activities, the Geopark promotes SDG 5 (Gender equality), and SDG 8 (Decent work and economic growth). Additionally, the Geopark promotes the application of indigenous knowledge and skills, such as ironworking and bead making techniques within the Datoga and Maasai communities, to stimulate economic development. The Geopark actively engages in the recruitment, training, and provision of short-term employment for young individuals as local guides. These community engagement activities have fostered a sense of ownership and guarantee that benefits from tourism are shared locally. In addition, the NLGGp emphasises the importance of ongoing activities to safeguard the varied geological and cultural heritage of the region, in cooperation with environmental organizations, scientific institutes, and local communities.

The current initiative, which is supported by China, focuses on the geodiversity of the region, and includes a comprehensive evaluation of geological sites. Essential elements of this project involve establishing visitor-friendly facilities and structures, such as a geo-museum, and placing signage and interpretive panels at various locations to enhance visibility and promote awareness of the Geopark. Furthermore, the active volcanic Lengai Mountain and other dangers associated with climate change have been highlighted as possible geohazards. Efforts are underway to create monitoring and mitigation strategies for these hazards. The purpose of these activities is to promote the safety and resilience of local communities within the Geopark.

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Local products produced by women in Ngorongoro-Lengai Geopark.

Maasai women manufacturing bead Jewellery. Bead making is one of the economic activities conducted by local women in Ngorongoro-Lengai to sustain their livelihood.

Ningde UNESCO Global Geopark, China

Sustainable Development in Ningde - Boosting Targeted Poverty Alleviation

Local tourism products store in Zhouning County.

Ningde UNESCO Global Geopark is situated in Ningde City, northwest of Fujian Province, China. It integrates different types of landforms, such as miarolitic granitic cavities, volcanic landforms, features created by river erosion, coastal landforms, and water features. The Geopark is part of the the spectacular geographical and geological heritage of in the southeast costal area of China.

In recent years, Ningde UGGp has initiated and developed the concept of "Lucid waters and lush mountains as invaluable assets". This uses the beautiful eco-environment and diverse tourism resources of the Geopark for developing rural tourism, and actively promotes SDG 1 (No poverty) by encouraging the impoverished inhabitants to develop tourism and increase their income, and improve their living standards.

A large-number of indigenous people have begun to enrich themselves through hard work. By starting businesses and by increasing the family income they achieved remarkable results in poverty alleviation through tourism. Villagers who have reaped the tourism "dividend" have begun to nurture and promote the sustainable development of the landscape, realising the goal of "people promoting tourism and tourism enriching people". They are achieving remarkable results in promoting the sustainable development of the Geopark and realising targeted poverty alleviation. In 2022 the Geopark had a total of 3.73 million visitors and an income of 1.98 billion yuan.

Currently the Geopark has cultivated a number of tourism poverty alleviation projects such as Fuding Chixi Village, Fuan Hutou Village, Pingnan Jixia Village, and Fu'an Nanshan Village, which are known as the "first villages in China for poverty alleviation through tourism". The Geopark has also promoted the construction of multiple national key rural tourism villages, provincial-level all-in-one eco-tourism demonstration counties/cities, provincial level all-in-one eco-tourism towns, four-star leisure towns, four-star tourist villages, gold medal tourist villages, sightseeing factories, forest parks, and forest homesteads.

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Indigenous people handcrafting straw sandals in Chixi Village, one of the first poverty alleviation villages.

Dayangshan Forest Park in Fuding City.

Non nuoc Cao Bang UNESCO Global Geopark, Viet Nam

Traditional craft preservation and livelihood creation in Non nuoc Cao Bang Geopark

Learning experience in paper-making in Luong Son paper village, Hoa Binh Province.

Zo Project representative introduced some handmade souvenirs that can be made of Dia Tren paper.

The Dia Tren traditional paper-making village, which is a site in Non nuoc Cao Bang Geopark, is home to more than 260 Nung ethnic people. In Phuc Sen Commune, Quang Hoa District the village consists of 65 households who still practice the traditional paper-making craft. Their income mainly comes from agriculture and traditional paper-making.

Dia Tren women with paper fans made of traditional paper.

The traditional paper of the Nung An people is usually used for spiritual purposes by the ethnic minorities in Cao Bang. However, with the industrialisation and modernisation of paper production, their handy craft products have been losing their place in the market. Accordingly, their income from this craft is gradually decreasing. Many people, especially, young people have been looking for alternative livelihoods. Hence the preservation of this tradition is now at risk.

Since 2020, the Management Board of Non nuoc Cao Bang Geopark has worked closely with the paper-making households and local authorities on the preservation of the traditional craft and livelihood improvement in this craft village. For example, the Geopark Management Board conducted field surveys to evaluate the socio-economic conditions, actual state of craft preservation and potential for geo-tourism development in the village. Consequently training courses were organised to raise people's awareness about traditional craft preservation in association with geotourism and livelihood improvement and guided the paper-making households to diversify their paper products.

In 2023, the Geopark Management Board conducted field study tours on traditional craft preservation in association with sustainable tourism development for paper-making artisans and other Geopark partners in Hanoi and Hoa Binh Province. Particularly, in Hoa Binh Province, they visited Luong Son Poonah paper-making village where they learned about producing quality Poonah paper and the techniques for making large-size paper sheets. They also visited the Chieng Chau brocade weaving cooperative in Hoa Binh province, where they learned about the production of quality and aesthetic craft products that meet market demand and the development of cooperatives for craft villages.

The Geopark Management Board connected Zo Project company (a social enterprise focusing on the preservation and promotion of Poonah paper) to train Dia Tren villagers to improve the quality of their paper and create different products from traditional paper such as notebooks, fans, souvenirs, coloured paper, etc. Zo Project has also purchased new paper products from Dia Tren villagers. Recently, five paper-making households have been involved in a production group to make paper for the Zo Project under the guidance of Nong Thi Kinh, a Dia Tren villager. In addition, the number of visitors coming to Dia Tren to experience traditional crafts has been increasing. In future, the Geopark Management Board will persist in guiding the villagers in implementing tourism-service development and will continue contributing to SDG 8 (Decent work and economic growth.

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Ore of the Alps UNESCO Global Geopark, Austria

Living together in harmony

The Geopark is responsible for a significant part of the MINT holiday programme.

© Johanna Griesser.

The "Ecological Footprint Table" illustrates the ecological footprint of selected nations.

© Horst Ibetsberger

The region of the Ore of the Alps UGGp has been a transit landscape for several cultures since time immemorial. In the Bronze Age, the area was the centre of Central European copper mining, in Roman times one of the most important Alpine roads from Aquileia (Italy) to Juvavum (Salzburg) passed through the territory and today the Tauern motorway connects the people in the south and north of the Alps. This area has not always been a peaceful place, but that is precisely why the Geopark and its stakeholders should help to bring people from all countries together and share experiences that "Mother Earth" reveals to us, in a friendly and peaceful way.

The few selected SDGs should now briefly show you what our Geopark contributes to overcoming the current problems of humanity.

SDG 4 (Quality education). The Ore of the Alps UGGp works very closely with the newly established MINT Region Pongau. MINT stands for mathematics (M), computer science (I), natural sciences (N) and technology (T). It is precisely these disciplines that should inspire more young people in the future. The Geopark is responsible for the natural sciences. Experts from the Geopark visit schools and the schools come to the Geopark's Visitor Centre to learn more about "Mother Earth". Rocks, sediments, fossils as well as climatic changes over the course of the Earth's history and even interpreting aerial photos are the topics for discussion. Excursions and trips complete the programme, which is mainly intended for primary school pupils, but also for their teachers.

SDG 6 (Clean water and sanitation). The Ore of the Alps UGGp is located in the heart of the Alps and is characterised by its enormous water resources of the highest quality. Nevertheless, care must be taken to ensure that, for example, snow groomers should not contaminate the soil due to the leakage of oil and thus the groundwater. Some of the snow groomers already run on electricity, not least because there is also a large river power station in the Geopark.

SDG 13 (Climate action). The Ore of the Alps UGGp is implementing, and has already implemented, a number of campaigns to raise awareness of climate change. The "Fridays for my Future" project consisted of action days and excursions designed to make participants aware of where our climate is heading. In this context, the "Footprint Table" was created and a two-day excursion to the "covered mountain pasture" Geopark glacier was organised to study on site the effects of climatic changes in the glacier.

SDG 17 (Partnership for the goals). The Ore of the Alps UGGp is working closely with the Inselsberg / Drei Gleichen UGGp in Thuringia / Germany to prepare the SDGs for a multimedia presentation and, also to implement measures in the Geopark communities, such as the construction of wells for drinking water.

The Ore of the Alps UGGp is proud to contribute to the UN's Sustainable Development Goals.

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Excursion to the glacier "Übergossene Alm" (covered mountain pasture) in the Hochkönig mountain range.

© Georg Hofmann.

Papuk UNESCO Global Geopark, Croatia

Repopulation of common yew *(Taxus baccata)* in Papuk Geopark

A 'Croatian Forest' staff member acquaints volunteers with the tools and techniques of planting yew seedlings.

The common Yew (*Taxus baccata*) is one of the three native conifer species on Mt. Papuk (alongside fir and common juniper). The species is strictly protected in the Republic of Croatia and classified as vulnerable (VU) according to the IUCN.

Yew is a slow-growing species that can live up to 3000 years. Due to its exceptionally high-quality and valued wood, yew has been exploited since ancient times, leading to significant decreases in populations across Europe, including in Croatia. Today, on Mt. Papuk, we are aware of only one location where yew grows, and precisely because of this, that area is protected as a 'Natural Monument'.

In cooperation with the Croatian Lottery, a new project was launched in mid-2023, named 'Thousand Yews on Papuk,' aimed at restoring certain forest areas with yew trees. This contributes to SDG 15 (life on land). Although the initial idea of the project was to plant 1000 yew trees, due to the lack of a sufficient number of seedlings that met our criteria, 438 seedlings were procured. In collaboration with the Croatian Forests (state enterprise responsible for forest management) a suitable planting location was identified, logistically accessible for the transportation of materials, tools, and volunteers. The afforestation initiative which contributes to SDG 13 (Climate action), involved employees of the Croatian Lottery, Papuk Geopark, and students from the Elementary School in Voćin, with technical assistance from Croatian Forests staff. Approximately forty volunteers successfully completed the planting action in a single day. The teamwork consisting of equal numbers of women and men is an example of SDG 5 (Gender equality) and SDG 17 (Partnerships for the goals). After the work, we organised a lunch for all participants, followed by a guided tour of the Jankovac Forest Park led by employees of the Papuk Geopark.

The project also includes presenting the achieved results and educating the public. Therefore, during December 2023, the Croatian Lottery funded a media campaign entitled 'Planting a Thousand Yew Seedlings,' featuring daily one-minute reports from the planting activities.

Additionally, the project includes educational thematic workshops in local schools within the Papuk Geopark area, scheduled for January and February 2024. The workshops contribute to SDG 4 (Quality education).

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Volunteers in full swing

Mission accomplished! A snapshot of unity among volunteers after successfully planting yew seedlings.

Psiloritis UNESCO Global Geopark, Greece

An afternoon dedicated to vultures in Psiloritis Geopark

Locals attending the Eurasian griffon vulture release. Photo by A. Dafermos).

Locals discussing with scientists from the NHMC. Photo by by Psiloritis UGGp).

In the afternoon of June 1st 2023, a few days before World Environment Day, Psiloritis Geopark organised an event dedicated to vultures and birds of prey. It was held in the village of Axos, which hosts one of the vulture colonies that can be found in Psiloritis.

The afternoon began with the reintroduction of Eurasian griffon vultures in the wild, an action that took place thanks to the already-established cooperation between the Natural History Museum of Crete (NHMC), the Hellenic Wildlife Care Association- ANIMA and the shipping company ANEK lines (sponsor for the transfer of the animals to Crete). This key action which contributes to SDG 15 (Life on land) brought together many children and residents of the area, curious to see the impressive birds up close!

Poster of the event produced by by Psiloritis UGGp.

Afterwards, all the attendees walked to the village's school where there was a screening of the multi-awarded documentary "Nomads" (produced and kindly provided by the Hellenic Ornithological Society, along with respective informative material). The documentary is a short film based on interviews with pastoral nomads from northern Greece focussing on their everyday life as shepherds and their relationship with Egyptian vultures that are found in their territories. The documentary proved to be very interesting to the attendees, as the communities of mountainous Psiloritis are also comprised mainly of shepherds, who discovered many similarities and attributes shared with their northern- Greek colleagues.

After the screening, the Geopark staff gave a brief presentation on the geodiversity of the area and how the presence of gorges and crevices in Axos supports the colony of vultures and other birds of prey by providing nest sites. Finally, a discussion took place between all the attendees and the scientists of the NHMC, Dr. Stavros Xirouchakis and Mr. Spiros Liapakis. The discussion was quite lively and was concerned with how the birds of prey and human actions coexist in Crete, also about the superstitions surrounding different birds of prey on the island and the truth about how beneficial they are for the ecosystems! The screening, the range of issues, discussions and the involvement of Geopark staff and scientists shows how SDG 4 (Quality education) can be successfully delivered in a convivial and informal setting.

We would like to highlight the success of this activity, which is mainly attributed to the large number of members of the local community that were involved! The locals actively participated through the different stages of the activity's preparation and implementation, proving that the best way to get the local communities to engage in such initiatives is to involve them in the process! We, therefore, extend our gratitude to the Local Community of Axos-Livada, the Cultural Association of Axos-Livada and the teachers of the Kindergarten and Primary School of Axos for their immense help! Special thanks to our partner, the NHMC for their immediate positive response to our invitation to participate. This successful activity is an example of SDG 17 (Partnerships for the goals).

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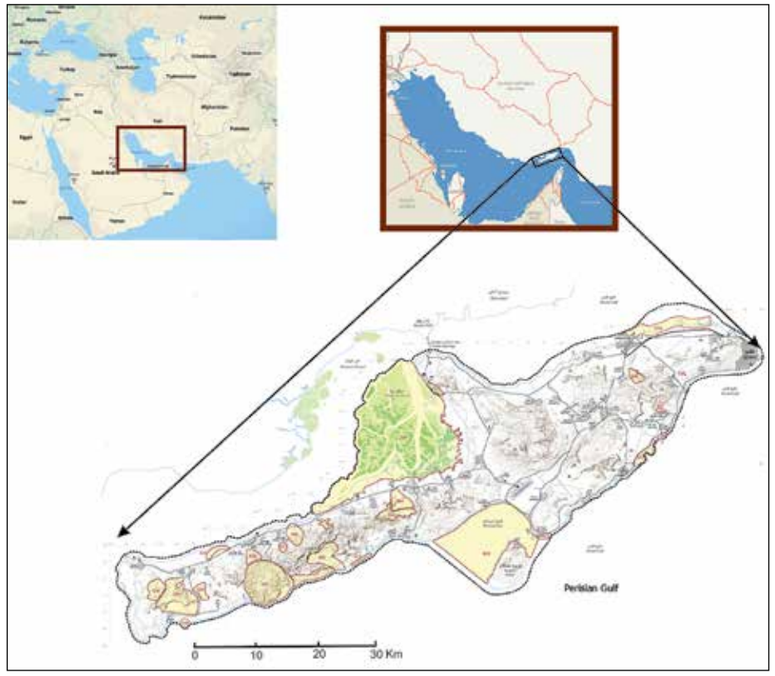
Qeshm Island UNESCO Global Geopark, Iran

Achieving sustainable and balanced development in Qeshm Island Geopark



Qeshm Island UGGp location of the geosites.

Qeshm, an elongated island with a length of 120 km and an average width of 11 km, is located in the Strait of Hormuz in the south of Iran. Situated on the trade route in the Persian Gulf within the free trade-industrial zone has made this island one of the commercial areas of Iran and one of the shopping destinations for Iranians. The cities of Qeshm and Darghan are located at the easternmost end of the island, and 60 villages and small towns are scattered along 120 kilometres of the coastline. Due to the existence of an urban infrastructure and proximity to the province's centre, the main commercial activities and job opportunities are limited to the eastern areas of the island. The western areas, which, are almost completely deprived of commercial opportunities, will lead to unequal development. Considering these issues, providing equal entrepreneurial opportunities, and achieving sustainable and balanced growth is a challenge for Qeshm Island UGGp. The Geopark's programme provides the opportunity to overcome this challenge. While the eastern parts of the island have a high capacity for commercial activities, the western parts also have a unique capacity for developing activities related to geotourism. A wide range of capabilities related to different aspects of geotourism, including geodiversity and biodiversity, along with the cultural features of Qeshm Island, have been studied and identified, and we in Qeshm Island UGGp use these features to create new business opportunities and growth in the local community. Qeshm Island is located on the marine trade route of the Persian Gulf towards Arab countries, India, and East Africa, and these relationships have led to the creation of the island's rich cultural diversity, which when combined with geodiversity and biodiversity, plays a vital role in creating new entrepreneurial opportunities. The 13 neighboring villages located in the mangrove forests on the island's northwest coast have used the opportunity to develop geotourism and geotourism activities with a focus on the mangrove forest geosite. Sandy and rocky beaches, along with their coral reef ecosystems, characterise the south coast of the island. Together with the geology, they play an important role in the economic development of the local communities in the villages on the south coast. Various geological forms resulting from wind and water erosion can also be seen in different parts of the island and are the important components of geotourism activities on the island. Qeshm Island UGGp tries to ensure the even distribution of tourists throughout the island in order to create suitable job opportunities, improve access to sustainable livelihoods in the local community and contribute to the balanced development of Queshm Island. The Geopark's efforts contributed significantly to the aims of the UN's SDG 8 (Decent work and economic growth), SDG 10 (Reduced inequalities) and SDG 11 (Sustainable cities and communities).

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Raja Ampat UNESCO Global Geopark, Indonesia

“Geo-mingle” with the Youth Forum to instill a sense of pride in being part of the “Children” of Raja Ampat

The 1st Geo-Mingle held in Waisai City, which was attended offline and online by the Raja Ampat Geopark Youth Forum.

(Left) Yusdi N Lamatenggo – General Manager of Raja Ampat UGGp Management Body gave a welcome and appreciation for the implementation of this activity. (Middle) Marcho Willyam - Chairman of the Indonesia Geopark Youth Forum giving a presentation about “Youth and Geoparks”. (Right) Participants who attended offline were the Children of Raja Ampat who were currently studying outside the boundary.

Geo-mingle or Geopark Mingle, an activity initiated by the Raja Ampat UNESCO Global Geopark (UGGp) Management Body, has succeeded in forming an initial step in raising awareness for the indigenous and local youth forum of Raja Ampat. Begun in 2024, this activity is an example for implementing the UN’s Sustainable Development Goal 4 (Quality education). Ensuring that all levels of society can have knowledge and information related to Earth processes and their local environment forms the basis for this activity.

Raja Ampat is an archipelago which is part of the Southwest Papua Province, Indonesia. It is the largest Geopark area in the world, in which more than 70% of the area is an ocean. The geography is almost certainly one of the causes of the knowledge and information gap that occurs in local communities. The large distance from big cities in Indonesia also influences the personality and sense of pride in the local people who feel that they exist far removed from big city modernity and have very simple lives.

We know that the strength of tradition in the Raja Ampat UGGp is a very valuable and that it must be passed down to future generations including the young members of the community. Based on the Indonesian law N0.40 of 2009, youth is an important period of growth and development in the 16–30-year-old age group. Young people who have strong networks, organise trend centres, have high mobility, and are critical. They are the pillars supporting the sustainability of the development of a Geopark area. To address the delivery of information and knowledge regarding the potential and special features of the Raja Ampat to this community, the Raja Ampat UGGp implements its strategies, one of which is “Geo-Mingle”.

On March 23rd, 2024, the 1st Geomingle was held offline and online - for Raja Ampat children studying abroad, to stay connected and educated about their “homeland”. Carrying the theme “Sa Bangga jadi Anak Raja Ampat!” which means I am proud to be a Raja Ampat child, in Indonesian Papuan dialect. Raja Ampat UGGp wants to instill a sense of pride in the younger generation, through stories and explanations about Raja Ampat Geopark, including its toponymy and the scientific story of Raja Ampat.

“I am very impressed with this excellent activity. Apart from adding new and in-depth knowledge and insight for me, this Geopark activity for the Youth Forum can definitely help us, the Children of Raja Ampat to know and love, even protect our homeland.” said Frans Ronaldo Kbarek, from Boni - Ayau Island, who is currently studying in Sorong City - the capital of the province.

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Ana R Septiana from the Raja Ampat UGGp Management Body gave a general explanation about the Geopark and stories about Geo-Bio-Cultural Heritage of Raja Ampat.

Ries UNESCO Global Geopark, Germany

A role model for sustainability in Ries Global Geopark

Schwerin, Germany, November 2023: The UNESCO Global Geopark Ries is one of six German geoparks to be recognized for achievements in Education for Sustainable Development as part of the UNESCO ESD 2030 programme. Photo by: German UNESCO Commission / Angela Pfeiffer Photographer Hamburg.

Along the Kids’ Trails of the UNESCO Global Geopark Ries, mascots Suevie and Riesie (named for the impact rock Suevite and mineral Riesite) explain geological features and also how to protect the well-being of nature and visitors. Photo by Dietmar Denger.

In November 2023 the Ries UNESCO Global Geopark was honoured with the “National Award—Education for Sustainable Development” (ESD) by the German Federal Ministry of Education and Research and the German Commission for UNESCO.

Ries UGGp impressed the jury with its exemplary commitment to education for sustainable development and special dedication to the United Nations’ Sustainable Development Goals particularly SDG 4 (Quality education).

“The ESD approach of the Geopark Ries is reflected in offers for very different target group” says Heike Burkhardt, Managing Director of Ries UGGp. For example, certified Geopark tour guides have developed guided tours for all age groups and engage participants in an entertaining way with topics that are closely linked to sustainability and the protection of the geological and ecological heritage.

Since its founding in 2004, the Ries UGGp has prioritized education and participated in district and state continuing education for teachers. Collaboration with the professorship for Geography Education at the University of Augsburg resulted in teaching aids for individual Geotopes as well as an in-classroom learning module - “Networked Know-how about the Ries Event” - focusing on ESD through pupil-centred learning.

Ries UGGp extends its outreach to the next generations in a multitude of projects: Children’s Info-Points, Kids’ Trails with accompanying handbooks, seating in Geotopes for outdoor classroom activities, continuing-education programmes for teachers and even in-school programmes with 3D models of Ries Geopark Geotopes.

In 2019 the Geopark finalized its comprehensive concept for Geopark Ries Schools. The network of Geopark Ries Schools is growing in popularity and size and now includes three elementary schools, one secondary school for business education and three academically oriented secondary schools. The schools can develop their own ESD programmes together with Ries UGGp. All schools in the Geopark have the opportunity to use existing ESD teaching materials provided by Ries UGGp

As an educational partner, the Geopark Ries e.V. wants to bring the importance of the UNESCO Global Geopark to young people, especially regarding sustainability.

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Rinjani-Lombok UNESCO Global Geopark, Indonesia

Women empowerment & bamboo straws production

Bamboo straws for sale in the Geoshop

(Creative Hub of Rinjani-Lombok)

In 2023, Rinjani-Lombok UGGp focused on 4 programmes related to climate change namely Spices for Life, Sembalun Ecosystem (Beboka Nursery), Literacy School of Rinjani and Creative Hub to promote eco-friendly products from our partners. One of our products is bamboo straw from a Women's Group called Bambu Rinjani.

Bambu Rinjani was initiated by Mrs. Mahuni from Karang Sidemen Village in the Rinjani-Lombok Geopark Area. Karang Sidemen is located in the buffer zone of the Forest Area, an area with small-scale quarrying for sand and rocks. The main product produced by this women's group is made from non-timber products (bamboo). Several years ago, some women in this village were left by their husbands who worked abroad as Indonesian Migrant Workers (TKI). Unfortunately, many of them ended up getting divorced and had to bear the responsibility of raising their children as single parents. To meet their living needs, these women work, removed from their children, as stone breakers in a relatively high-risk job.

Starting with a few people, Bambu Rinjani has now empowered more than 40 women, the majority of whom are single parents. By working as bamboo craftsmen, these women have a safer job and can be closer to their children. Although the income may not be as high as when working as stone breakers, the job's risks are much lower, and these women have flexible working hours. They can work while taking care of their families.

These bamboo straws can be used as an alternative to single-use plastic straws, and when damaged, they do not contribute to waste as they are biodegradable. One bamboo straw can be used for a maximum of 6 months for individual use and a maximum of 3 months for use in cafes if properly sterilized. The use of bamboo straws strongly supports waste reduction efforts in Lombok Island, and in West Nusa Tenggara Province – Indonesia. Bambu Rinjani contributes to SDG Goal 13 (Climate action), SDG 5 (Gender equality), SDG 17 (Partnership for the goals) SDG 15 (Life on land), SDG 4 (Quality education) and support and SDG 1 (No poverty) Therefore, through the Creative Hub Programme of the Rinjani-Lombok Geopark UGGp, bamboo straws, along with the Bambu Rinjani group, have become one of the flagship products and main partners.

Product promotion is carried out through various activities, such as the use of bamboo straws in the Geo-shop Rinjani-Lombok UGGp, and by simultaneously educating customers. Bamboo straws (as well as other bamboo-based products) are also promoted as souvenirs, with continuous improvement in promotion and packaging to reach the international market. The higher the demand for bamboo straws, the more women can be empowered, and the more children can receive a good family education.

Processing the non-timber product into bamboo straws.

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Saimaa UNESCO Global Geopark, Finland

Climate Change and Sustainable Development Goal activities in Saimaa Geopark

A winter's scene in Saimaa UGGp.

Saimaa, Eastern Finland's treasure, is renowned for its beautiful landscapes, vibrant towns, and idyllic villages. The Saimaa UNESCO Global Geopark showcases its natural sites, charming hiking trails, and historic cultural sites, providing a unique perspective on the birth of Saimaa.

Saimaa Geopark's most important value is responsibility. Responsibility also includes preserving the values of the sites in our area and promoting their protection. Our values also include preserving the internationally valuable geological heritage, respecting the values of culture, and living nature, and vigorously supporting the activities of local communities.

Nurturing the region's unique geology, nature, culture, and sustainable tourism are top tasks for us. Through our own activities, we also take care of preserving the values of our Saimaa Geopark sites and promoting their protection. Saimaa Geopark operates in accordance with the principles of sustainable development and promotes the production and operation of sustainable development.

Sustainable development requires the preservation of biological diversity, the functioning of the ecosystem and the long-term adaptation of human activity to the sustainability of nature, where international cooperation is the key. In our operations, we always consider private land areas and try to minimize damage to the natural environment with our activities. At Saimaa Geopark sites, hikers are encouraged to pursue responsible activities, and the signage draws attention to hiking etiquette, among other issues.

Tourism should promote long lasting well-being in the economy, employment, environment, and socio-cultural sustainability. In tourism based on geology, consideration of sustainability is a basic starting point, because it is implemented in a territory that is sensitive to footfall. Therefore, tourists rely on the responsibility of the tourism services in providing information.

Saimaa Geopark has carried out a number of actions related to sustainable development and combating climate change. We inform our target groups actively about responsible camping and encourage trash-free camping. A camping etiquette has also been developed for our area, which imparts useful information about responsible camping. In the Saimaa Geopark area, it is possible to go on low-emission excursions, buy experiential intangible services and rent equipment. We have invested in bicycle tourism and especially commuting cycling.

The municipalities and provinces of the Saimaa region are committed to protecting Saimaa and keeping it clean and signed the relevant Charter in 2019. Wastewater from industry and communities is effectively cleaned in the Saimaa Geopark area, and emissions from agriculture and forestry are combated by e.g. protection zones. The natural environment of and especially the Saimaa ringed seals are particularly well protected in Saimaa Geopark. Special nature conservation areas have been established in the area for this purpose. The most recent action related to sustainable development was calculating our carbon footprint. Saimaa Geopark's activities contribute to SDG 6 (Clean water and sanitation) , SDG 13 (Climate action), SDG 14 (Life below water) and SDG 15 (Life on Land).

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San'in Kaigan UNESCO Global Geopark, Japan

Promoting an understanding of climate change through geotours in the Tottori Sand Dunes in San'in Kaigan UNESCO Global Geopark

The Tottori Sand Dunes are a famous geological heritage site that attracts many tourists from home and abroad. The effects of sea-level changes linked to recent climate change have been recorded in these coastal dunes facing the Sea of Japan. The dunes which are divided into old and new sand dunes, are bordered by volcanic ash (Daisen Kurayoshi Pumice) which accumulated about 50,000 years ago. The old and new dunes formed during the interglacial period, the volcanic ash layer formed when sea level was low during the glacial period. Tourists can observe the old and new dunes and the volcanic ash layers sandwiched between them at sites around the Tottori sand dunes and from specimens in nearby museums. In addition, the Tottori University Arid Land Research Centre, a research institute for studying dune greening, has been established in the vicinity of the Tottori sand dunes, where practical research is being conducted. Therefore, the San'in Kaigan UGGp in response to SDG4 (Quality education) and SDG 13 (Climate action) is working to help tourists and residents understand climate change and its countermeasures based on scientific information on the history of the Tottori Sand Dunes and research at Tottori University. This includes:

1. The establishment of a system for Geopark guides to guide visitors through the Arid Land Research Centre's exhibition facilities

The Tottori University Arid Land Research Centre is a research institute that has had a long history of engagement in the study of the world's arid lands and climate change. It used to be a research institution for the agricultural use of sand dune lands from approximately 1923. On the Centre's premises, there are exhibition facilities for the Centre's research, climate change, plants, agriculture, and lifestyles in the world's arid lands, which are open to the public. However, their use for education and tourism is limited because they are only open to the public on weekends, and there is a shortage of interpretation staff. Therefore, since 2018, the San'in Kaigan Geopark guides trained by the Centre have been able to guide visitors to the exhibition facilities on weekdays as well. As a result, the number of schools and tourists from within and outside the prefecture increased dramatically.

Special education programme for elementary school students at the Tottori University Arid Land Research Centre.

Tottori sand dune. The volcanic ash layer between the new and old dunes is an impermeable layer.

2. The Creation of a panel exhibit showing the relationship between Quaternary climate change and environmental changes in the Tottori Sand Dunes.

The growth of the Tottori Sand Dunes is closely related to the sea-level changes associated with the Quaternary glacial and interglacial cycles. In addition, archaeological sites have revealed that vegetation and people's lifestyles changed as the dunes moved inland and along the coast due to sea-level changes. However, there were no exhibits regarding the relationship between Quaternary climate change and the Tottori Sand Dunes at the Tottori Sand Dunes Visitor Centre or the Arid Land Research Centre. Therefore, a panel exhibit was created and installed at both exhibition facilities to help visitors deepen their understanding of past global-scale environmental changes and encourage them to think about the future global environment. Furthermore, the exhibit was incorporated into the training content for the guides at the Arid Land Research Centre to explain the relationship between the Tottori Sand Dunes and climate change.

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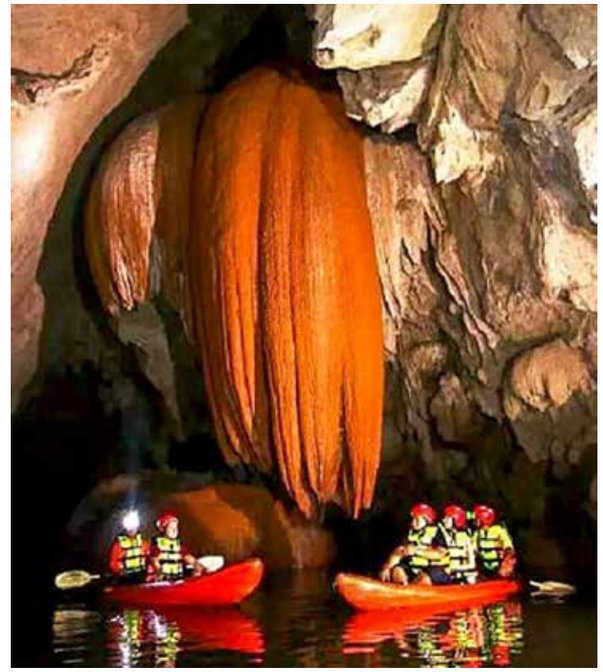
Satun UNESCO Global Geopark, Thailand

Unlocking the Hidden Treasures of Satun UNESCO Global Geopark: A Journey towards Sustainable Adventure and Community Empowerment



Satun UNESCO Global Geopark in southern Thailand boasts stunning landscapes and a rich geological heritage. Conservation efforts focus on preserving biodiversity, while sustainable tourism and community empowerment initiatives create economic opportunities. Recommendations include strengthening community involvement, expanding livelihood options, and promoting sustainable practices. Through these measures, Satun Geopark sets a model for global sustainable development and conservation efforts.

Activities involving sustainability, Local Community Development, Participation and Empowerment, and the Geopark contribute to SDG 8 (Decent work and Economic Growth).

Satun UNESCO Global Geopark, located in southern Thailand, showcases stunning natural landscapes and a rich geological heritage. Conservation efforts prioritise preserving biodiversity through habitat restoration and community-based monitoring programmes. Sustainable tourism initiatives aim to minimise environmental impact while empowering local communities economically. Recommendations for further enhancement include strengthening community participation, expanding livelihood opportunities beyond natural resource extraction, and implementing sustainable tourism practices. Additionally, promoting education and awareness about conservation and sustainable development is essential. By implementing these recommendations, Satun Geopark can continue as a beacon of sustainable development, conservation, and community empowerment, setting an example for similar initiatives worldwide.

Satun UNESCO Global Geopark showcases sustainable development, blending conservation, tourism, and community empowerment for a robust local economy. It demonstrates the benefits of sustainable practices for both the environment and community. Let us draw inspiration from Satun Geopark's success and collaborate to promote sustainability for future generations.

Satun UNESCO Global Geopark is known for its abundance of fossil species and sustainable tourism activities

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Serido UNESCO Global Geopark, Brazil

Efforts for the Sustainable Development Goal 4 implementing in the Seridó UNESCO Global Geopark: Geosciences and heritage education for all

Since 2020, we have been diligently measuring and monitoring our progress in implementing the UN 2030 Agenda in our region. Various annual surveys on the 17 Sustainable Development Goals (SDGs) have provided positive indicators, particularly in our efforts to enhance SDG 4 (Quality education). This success is strongly supported by our educational programme, "Cinco Sentidos do Geoparque Seridó".

In 2022, 37% of more than 230 diverse actions in the Geopark's agenda were executed, focusing specifically on SDG 4 within our educational planning. The initiative, conceived in 2017, revolves around stimulating the five human senses and integrating these with the five geoconservation concepts (geodiversity, geoheritage, geoconservation, geotourism, and geoparks).

The programme serves as the initial introduction for children and teenagers in public schools within the territory. The Cinco Sentidos Project adheres to a standardized operational plan, encompassing stages such as a presentation lecture on the Seridó UNESCO Global Geopark, field activities at geosites, workshops for creating models, music, poems, and handicrafts, and culminating in a thematic Geopark science fair.

During the COVID-19 pandemic, we initiated the development of educational materials to support the Cinco Sentidos Project through a partnership with the Federal University of Rio Grande do Norte, which was funded for extension projects. The first step in contributing to the educational project involved designing and using mascots The characters, Mariazinha and Zé, represent mineral deposits and cultural exploration, Pepeto narrates the geological history of pegmatite, and Juju personifies a basalt rock girl. Linked to biodiversity, we created Madu (a local cactus), Cauã (a bird of prey), and Calangu (the lizard of the Caatinga).

These concepts served as the foundation for creating comic books, three distinct educational booklets (for two levels in primary schools and another for high schools) - http://geoparqueseridо.com.br/?page_id=9305 -, puzzles, conceptual and illustrative maps, as well as organising live events, geo-days, and video productions. Alternative remote strategies, like the virtual route, proved effective in engaging the community during the lockdown periods. Following outbreaks of COVID -19 , we started to promote alternative local events such as the geological gymkhana and the International Day of Geodiversity. Recently, an album featuring theme songs related to Seridó Geopark was released (https://geoparqueserido.com.br/?page_id=9756), narrating stories about geosites and the cultural heritage of the territory and municipalities.

All these resources contribute significantly to teaching, providing autonomy and proficiency for teachers regarding local geodiversity and offering young students access to their natural spaces. Currently, the Cinco Sentidos Project enjoys support from local artisans, public managers, and private companies who contribute to SDG 17 (Partnerships for the goals) in Serido UGGp. In summary, we plan to initiate a comprehensive capacity-building project to empower education professionals to replicate this initiative widely.

The final-results of the Cinco Sentidos Project in a public school sciences fair – students receiving the Seridó UGGp Mascots HQ's.

The mascots of the Seridó UNESCO Global Geopark

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Shennongjia UNESCO Global Geopark, China

Shennongjia Geopark's Efforts towards eradicating poverty

Since 2018, the Administration of Shennongjia UNESCO Global Geopark (UGGp) has made significant efforts regarding the eradication of poverty in 26 villages associated with five townships in its territory, with a total investment of CNY 180.84 million. The per capita disposable income of the local residents has increased from CNY 9,300 to CNY 12,100, with an average annual increase of 30.1%.

Shennongjia UGGp actively implements the "three mechanisms" of eco-compensation for forest land, commercial insurance for farmers' loss caused by natural disasters and animal damage, and subsidies for using electricity instead of firewood. The Administration of Shennongjia Geopark (ASG) has invested a total of CNY 11.03 million in commercial insurance premiums for local households, for possible loss in horticulture and agriculture caused by wildlife damage and natural disasters. Apart from subsidies for pension insurance, the ASG has also provided subsidies of CNY 8.17 million to 480 relocated households, saving 8.43 million cubic metres of firewood and reducing the on average annual destruction of about 112,400m2 of forest land.

Poor households have been given priority to participate in resource conservation and management, a total of 3,140 local-residents have been employed as part-time rangers. The community residents have gradually been transformed from forest consumers to ecology guardians, and a positive interaction between the increase in farmers' incomes and resource conservation has been established.

The ASG established a "farmer + base + cooperative" model, to facilitate the transition from traditional crop planting to sowing more profitable crops. A total of CNY 37.54 million has been paid in prizes to encourage and support farmers to plant local herbal medicinal and rare plants. More than 330,000 seedlings of 39 rare plant species have been cultivated, and herbal medicine crops with a total area of 1.73km2 have been established, benefiting 576 households.

Herbal medicine cultivation.

The ASG has established the "Talent-supporting Award" for community residents. This allocated a total of CNY 827,000 to 210 local students entering college, and provided extensive skills training for community residents. By installing solar-powered streetlights and energy-saving stoves in villages and households, repairing 268 kilometres of country roads, and building nine bridges, the ASG shares with community residents the benefits of the Geopark's development.

A National Commendation Conference was held on February 25, 2021 in Beijing to mark the nation's accomplishments in poverty alleviation. The ASG won the "National Outstanding Collective for Poverty Eradication" award.

Shennongjia UGGp will continue to make efforts for rural revitalization and ecological conservation, paving the way for environment-friendly poverty eradication and sustainable development with clear water and lush mountains. The Geopark will continue contributing significantly in realizing the UN Sustainable Development Goals SDG 1 (No poverty), SDG 6 (Clean water), SDG 13 (Climate action), and SDG 15 (Life on land)

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Some of the Geopark's part-time rangers.

The award certificate of National Outstanding Collective for Poverty Eradication.

Shilin UNESCO Global Geopark, China

Shilin Global Geopark's Green Actions to Combat Climate Change

Shilin UNESCO Global Geopark (hereinafter referred to as Shilin UGGp), located in the southwest of China, has made unremitting efforts to combat climate change over the past two decades by contributing to the following:

Tree Planting

Trees and forests play an essential role in mitigating the impact of climate change. Every year Shilin UGGp organises tree planting activities to enhance the beauty of the Geopark and to promote carbon sequestration.

Science Education

Shilin UGGp carries out educational activities annually for the general-public to provide the necessary knowledge required to mitigate and adapt to the potential effects of climate change. Using interconnected publicity materials and interpretation panels, Shilin UGGp shows how climate change can affect our environment and its impact on the Geopark's territory. These activities about facing the severe consequences of global warming contribute significantly to SDG 4 (Quality education) and SDG 13 (Climate action) .

Green Infrastructure

In order to effectively reduce carbon dioxide emissions and improve air quality, Shilin UGGp has adapted approaches to utilizing renewable energy and employing green transportation: advocating the use of clean energy sightseeing vehicles inside the Geopark, providing several charging stations at the of the Geopark's Visitor Centre, upgrading tourism buses to be more energy- efficient, and controlling the number of vehicles inside the Geopark, etc.

Nature-caring Theme activities

To ensure that the concept of green life is widely disseminated, Shilin UGGp conducted various theme activities including litter picking, hiking, recycling, etc. These activities which were organised jointly with several other institutions such as the Bureau of Natural Resources of Shilin County, the Bureau of Forestry and Grassland of Shilin County, and others contribute significantly to SDG 15 (Life on land and SDG 17 (Partnerships for the goals).

Tree planting activities.

Photo by Li Kun

Garbage is a threat to the natural environment and wildlife. All the living things, from the smallest to the largest organism, are directly and indirectly affected by garbage. The Geopark's staff and volunteers regularly pick up beverage bottles, cigarette ends, plastic bags, etc. within and outside the Geopark. The action of picking up garbage gives the participants the possibility to learn about nature in combination with taking care of it.

Expecting that people can conserve energy by starting from the trivial things in their lives, therefore hiking is frequently arranged inside or near the Geopark. One participant once said " I embraced the nature and green life while hiking."

In the future, Shilin UGGp will continue to uphold the concept of a green and sustainable development and actively participate in all domestic and international cooperation activities that are conducive to combating climate change and "going green".

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Science education in Beidacun, Middle School of Shilin County.

Photo by Li Kun.

Clean energy vehicles inside_ the Shilin Global Geopark.

Photo by Wang Limei.

Sierras Subbéticas UNESCO Global Geopark, Spain

Geo-education available for everyone

The stratigraphic column shows the rock succession ordered in time. The layers have been arranged obliquely, as they are frequently in nature, and with a natural appearance, so that it is associated with the corresponding terrain.

The Geopark Classroom is a good place to understand the evolution and the history of the Sierras Subbéticas. On the floor is represented the old Tethys Sea with the marine fauna and on the walls the present landscape with some geological graphics.

Geoparks offer opportunities to provide education for children and adults of all ages. The geopark landscapes provide an excellent outdoor classroom for teaching a wide range of skills, acquiring and understanding important concepts in environmental science and developing the need for the conservation of the natural heritage.

At the Sierras Subbéticas Geopark, we have been working on geo-education for years, designing educational materials and developing projects and programmes for educational centres. For this reason, we have created a catalogue of educational resources and activities that specify all the equipment, educational materials, projects and activities that we make available to educational centres and environmental education companies for a better understanding of our territory. The materials have been designed by the Geopark and can be used both in the classroom and in the field.

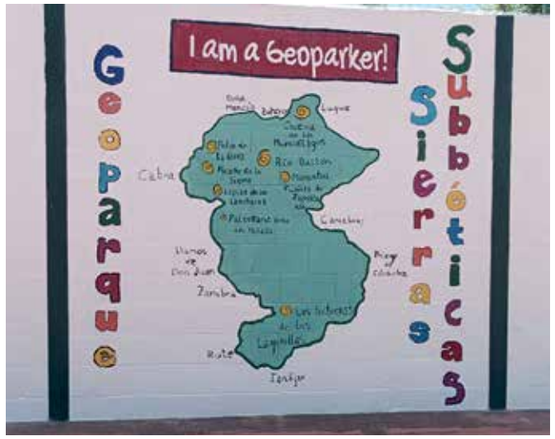
Concerning the equipment, the Santa Rita Visitor Reception Centre contains abundant interactive elements on the natural and cultural heritage of the Sierras Subbéticas. The Truffle Mycological Garden, which has created examples of the most representative ecosystems of Andalusia, with the flora, vegetation and fungi of the region.

There are nine examples of designed materials. These consist of the following products: a didactic unit of the Geopark, the book "A history written in stone" (a complete informative book about the geological history of the Sierras Subbéticas); the "Geokit" is a geological box with samples of rocks and minerals from the territory; interpretative waterproof posters in A1 size for use in the field; an in situ stratigraphic column built with rocks and natural adhesives; geological trail brochures; the Geopark Classroom for understanding geological processes is complemented by geological time benches that include samples of rocks and fossils; the "GEOTUR" project (geotourism for all natural science professionals and educational resources for teachers and students); and the didactic guide on environmental education and geodiversity.

Additionally, in recent years, different geo-artistic workshops have been provided for all ages by an artist. These, which involved, geo-painting, a puppet theatre and others have been included in the catalogue.

Finally, we have three educational projects and programmes in collaboration with educational centres that wish to participate. These include "Rangers visit your school" in which environmental agents, together with the Geopark's technicians, give talks about the natural and cultural values of the Geopark and the importance of protecting them. This also includes field trips. "I am a Geoparker!", a Global Educational project in which, since 2018, two local schools have been involved in association with four other UNESCO Global Geoparks. "Nature and you", in which guided tours and environmental workshops are led and delivered by experts.

The catalogue will allow us to disseminate all the educational materials and programmes that are available in the Sierras Subbéticas with the aim that educational centres and environmental education companies use them for support when explaining the geological history and the geological heritage to make it more understandable and dynamic. By producing a catalogue, designing educational materials and creating educational projects Sierras Subbéticas Geopark contributes significantly to SDG 4 (Quality education).



An example of the involvement of a local Early Childhood and Primary Education School students in the "I am a Geoparker" project painting the map of the Sierras Subbéticas Geopark in the schoolyard.

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Sobrarbe-Pirineos UNESCO Global Geopark, Spain

Dry Stone walls in Sobrarbe-Pirineos Geopark: from theory to action.

The terraced landscape in Bestué.

Photo by J.Izeta.

Sobrarbe-Pirineos UNESCO Global Geopark (Spain) is deeply committed to the United Nations' Sustainable Development Goals and actively works to implement projects that address the social, economic, and environmental challenges facing the world, aiming to promote equitable, inclusive, and sustainable development locally and globally.

All our projects are aligned with one or more of the Sustainable Development Goals. As an example for this article, we have chosen the work we have been doing since 2017 regarding the techniques involved in constructing of dry-stone walls.

The "Art of dry-stone walling, knowledge and techniques", inscribed on the Representative List of the Intangible Cultural Heritage of Humanity by UNESCO in 2018, represents an ancestral cultural legacy that highlights human ability to create durable and environmentally friendly structures without using mortar. Preserving this art promotes the conservation of traditional knowledge, fosters a sense of cultural identity, contributes to environmental sustainability by promoting construction techniques with reduced environmental impact, and encourages biodiversity and natural hazard prevention, offering new avenues for sustainable development for the region.

Since 2017, we have been conducting research and training activities with the aim of strengthening the transmission of this traditional technique in our Geopark. This initiative is crucial, as there is still a significant number of people in our community who know, apply, and can teach this ancestral technique

These actions not only support the social and economic growth of local communities (SDG 1 No poverty) but also contributes to the possibility of turning this traditional knowledge into a viable professional activity (SDG 8 Decent work and economic growth). Additionally, they support sustainable agriculture (SDG 2 No hunger), as this technique is fundamental for building terraces used for growing crops in Sobrarbe, promote environmentally friendly production models (SDG 12 Responsible consumption and production) and make human settlements inclusive, safe, resilient, and sustainable (SDG11 Sustainable cities and communities).

Our workshops promote the good health and well-being of the local community (SDG 3) by encouraging physical outdoor activities. The educational aspect is particularly notable (SDG 4), as we ensure lifelong learning opportunities for all and promote the understanding of Earth processes, the environment, and the effects of human activity on them. We have also incorporated women into this traditional activity, promoting gender equality and empowering women (SDG 5).

Furthermore, our projects have facilitated the connection between geodiversity and biodiversity SDG 15(Life on land) through actions to support communities and their heritage.

In 2024, the "PETRA POCTEFA PROJECT" was approved, enabling cross-border collaboration between Spain, France, and Andorra on this intangible heritage and contributing to SDG 16 (Peace justice and strong institutions), and by promoting partnership with other stakeholders and territories for global sustainable development to SDG 17 (Partnerships for the goals).

The actions carried out regarding dry stone construction are just one example of the various initiatives we undertake, all of which contribute significantly to the implementation of mitigating Climate Change and contributing to the UN's Sustainable Development Goals.

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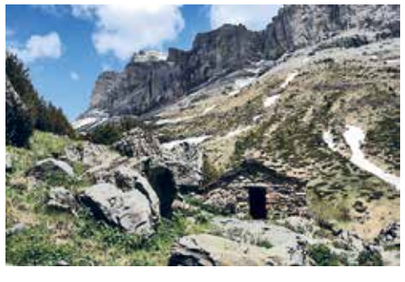
Workshop at Morillo de Sampietro.

Photo by MC.



Hut on the way to Fuenblanca.

Photo by I. Pardinilla.

Stonehammer UNESCO Global Geopark, Canada

Stonehammer Geopark: One Billion Years of Stories

Stonehammer Geopark and Fundy Biosphere Staff leading a coastal trash cleanup while examining the effects of coastal erosion along the Bay of Fundy coast in St Martins, New Brunswick.

Local students contemplating environmental impact along with natural and cultural heritage after an educational programme at Stonehammer's Reversing Falls geosite.

Stonehammer Geopark is North America's first UNESCO Global Geopark. Situated on New Brunswick's Bay of Fundy coast, Stonehammer experiences the world's highest tides, and is marked by dramatic cliffs and rock formations that provide a backdrop to the rich cultural and ecological diversity. The 60 geosites within the geopark represent a nearly continuous fossil record going back one billion years.

Stonehammer Geopark is actively engaged in the UN Sustainable Development Goals and leads progress on Goals such as SDG 4 (Quality education), SDG 8 (Decent work and economic growth), and SDG 14 (Life below water) through education delivery, tourism development, fossil protection, and conservation policy development.

Citizen science within Stonehammer Geopark leading to the discovery and preservation of a new fossil species.

4. Quality Education

In-order to ensure that all learners acquire the knowledge and skills needed to promote sustainable development, Stonehammer delivers educational programming to three key demographics: school-aged children, the general-public, and tourists. Programmes promote environmental stewardship while focusing on the geology and heritage of the region, in addition to the climate crisis.

Programming is delivered through classroom presentations, site interpretation, field trips, educational videos, and walking tours.

8. Decent Work and Economic Growth

Together with the Fundy Biosphere Reserve, Stonehammer is leading the development of the Atlantic UNESCO Tourism Corridor in collaboration with governments, Indigenous nations and the 13 UNESCO-designated sites in Atlantic Canada. The first phase of the work has focused on the development of a strategy, rooted in the UN SDGs, UNDRIP (United Nations Declaration on the Rights of Indigenous Peoples) and the Truth and Reconciliation 96 Calls to Action, operationalizing sustainable destination development and regenerative tourism practices informed by the UN WTO (United Nations World Tourism Organization) in Biosphere Reserves, Global Geoparks, and World Heritage Sites.

11. Sustainable Cities and Communities

As stewards of our region's significant natural heritage, Stonehammer takes various actions to protect and preserve significant rock formations and fossil sites within our region through education, social media campaigns, and promotion of research being undertaken.

14. Life Below Water

Stonehammer is engaged in the Inner Bay of Fundy Conservation Initiative, a collaboration of government, First Nations, industry, and knowledge holders who are working together to co-develop targets, mechanisms, and measurement for marine and coastal ecosystem conservation. The work brings together scientific expertise and Indigenous knowledge on ecosystem services, cultural and spiritual values and economic divers, opportunities, and conflicts.

Stonehammer Geopark is advancing the SDGs by integrating education, equality, tourism, and conservation. Through educational programmes, geotourism initiatives, and policy development, Stonehammer promotes destination development, community engagement, sustainable economic growth, and conservation of natural and cultural heritage to contribute to a holistic approach to sustainable development and the achievement of the UN SDGs.

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Styrian Eisenwurzen UNESCO Global Geopark, Austria

Climate-friendly gardens in the Styrian Eisenwurzen Geopark: children learn about climate-friendly garden management

Opening of the garden in Wildalpen.

© B.Nachbagauer – NUP Eisenwurzen

The big harvest in Landl in September.

© M.Gebeshuber – NUP Eisenwurzen

In the KLAR! Nature and Geopark Styrian Eisenwurzen (KLAR! means climate change adaptation region), three gardens were created last year focussing on the adaptation of home gardens to climate change. This initiative aims to sensitise children and young people in-particular to the challenges of climate change. Pupils from the Wildalpen, Landl and St. Gallen Nature Park schools were actively involved. Together with private garden owners, plants were pre-grown, planted and even harvested together.

The 2023 gardening season started in April, accompanied by gardening expert Angelika Ertl-Marko, who gave valuable tips on how to cultivate home gardens naturally and sustainably. The KLAR! "Climate-Friendly Show Gardens" project aims to show children and adults in a practical way how home gardens can be designed in a climate-friendly way.

Pupils listen to explanations about home gardening

© M.Gebeshuber – NUP Eisenwurzen

The show gardens in the Styrian Eisenwurzen Geopark are intended to serve as experimental fields that encourage children to actively participate in adapting their gardens to climate change. Through cooperation with private garden owners and the nature park schools in Landl, St. Gallen and Wildalpen, not only are plants grown and cared for, but culinary experiences are also created together to offer the youngest participants a comprehensive insight into the world of sustainable garden management. But the adults do not miss out either.

A central aspect of the project is the promotion of natural and sustainable cultivation methods in the garden. Retaining wild meadows and hedges, refraining from regular pruning, using green cuttings as mulch, and also watering properly are just a few examples. The motto here is "neat and tidy" in-order to contribute to the preservation of biodiversity.

The KLAR! Natur- und Geopark Steirische Eisenwurzen is setting an important example for the sustainable and climate-friendly design of home gardens with this project, thereby addressing Sustainable Development Goals (SDG) No. 2 Zero Hunger, No. 4 Quality Education, No. 13 Climate Action and No. 15 Life on Land. Next year, the garden year will once again start by highlighting a workshop on "The fertile cycle in the garden: composting in the home garden".

This project is funded by the Climate and Energy Fund and carried out as part of the "KLAR! - Climate Change Adaptation Model Region" programme.

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Tabas UNESCO Global Geopark, Iran

Sustainable development and climate change with Educational and action programmes in Tabas Geopark

Delivering the nature conservation education programmes in schools.

Tabas UNESCO Global Geopark (UGGp), Iran's third UGGp, joined the UNESCO Global Geoparks Network in 2023. The Geopark, with an area of 22,771 Km2, is situated in the northwest of South Khorasan province and located between the two Iranian deserts, the Lut Desert in the east and the Dasht-e Kavir (Great Kavir) in the west. This UGGp is one of the most significant geological areas in Iran and the world and is known as the geological paradise of Iran. The hot dry climate and vast desert areas are the key features of Tabas UGGp and the territory is characterized by a rich geomorphological and ecological diversity. Naybandan, the largest wildlife refuge in Iran and the habitat of the Asiatic Cheetah is located in the south of Tabas UGGp. Also, the flora and fauna of the mountainous areas is very impressive. It includes the Senou Forest habitat geosite, mountain almond habitats, Haloxylon (an evergreen shrub) habitats and the largest Koma (Anghuzeh, a herbal medicine) habitat in Iran and the world are the most prominent plant and tree examples of this area of Iran.

Today, climate change and its effects have affected the life of all creatures both on land and in the seas and oceans, and is one of the biggest problems facing the world today. Therefore, Tabas UGGp has been carrying out programmes to promote education and protection (theoretical and practical) for visitors and local communities in-order to deal with climate change, also about the importance of conserving biodiversity.

Environmental protection training session for rural government employees.

Tree planting with school students.

These programmes include various workshops and educational initiatives for students, participation in tree planting projects, developing green spaces around Geosites (for example: in Kal-e-Jenni Geosite by a Geopark partner), signing of joint cooperation agreements with government departments and NonGovernment Organizations (NGOs), cleaning and maintaining geosites and scientific and public webinars aimed at preserving nature. In addition, in terms of geohazards, this UGGp is considered one of the most seismic regions of Iran, and the largest earthquake in Iran with a magnitude of 7.8 occurred in the south of Tabas City (September 16, 1978). Through these training programmes and interactions , participants learn how they can contribute to the overall effort to protect their habitat and the planet. Various activities and programmes are implemented in Tabas UGGp to promote sustainable development in all fields. Therefore, we are committed to increasing the awareness and education of residents and visitors through educational programmes aimed at reducing and managing natural disasters. The Geopark's educational programmes, tree planting projects and concerns for nature are significant contributions to SDG 4 (Quality education), SDG 13 Climate action) and SDG 15 (Life on land). The joint cooperation agreements contribute to SDG 17 (Partnerships for the goals). Follow us on www.tabasgeopark.com for more information.

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Taining UNESCO Global Geopark, China

Constructing a Low-carbon Scenic Area in Taining Geopark

Climate change is a pressing global challenge. In recent years, Taining Global Geopark has taken active steps to respond to climate change. One of the most important outcomes is the construction of a low-carbon scenic area.

Since 2020, Taining Global Geopark has carried out a pilot project to build a low-carbon scenic area in its Zhaixia Grand Canyon, by implementing various measures that contribute to SDG 13 (Climate action).

- Low-carbon renovation. The scenic area has adopted a smart and low-consumption power supply system, which is used in the monitoring system, offices, staff dormitories, restaurants, and uses solar power for lighting facilities, audio systems, etc. A commitment letter was signed with the villagers, requesting them to use gas instead of cutting firewood, and in return, additional subsidies were given to the villagers.
- Low-carbon transportation. New energy electric minibuses were purchased to shuttle between the county and the scenic area. To increase the proportion of low-carbon transportation, the scenic area has implemented traffic control for tourist vehicles, and built an eco-trail in the scenic area.
- Low-carbon construction. The design of facilities in the scenic area has paid great attention to harmonising with nature, making full use of natural conditions, such as the ecological parking lot and tourist centre. At the same time, the scenic area has improved standards for construction projects in terms of material selection, equipment selection and construction. Environmentally friendly and recycled materials have been used in these projects.
- Low-carbon management system. The Geopark has formulated a series of management regulations, including the "Low-Carbon Scenic Area Construction Management System", "Low-Carbon Office Management System", "Low-Carbon Passenger Transport Operation Management System", and so on. It also conducted regular inspections to promote the implementation of the energy conservation and emission reduction system in the scenic area.
- Low-carbon waste treatment. The scenic area adopts a "daily cleaning" cleaning system. The waste is transferred to the county waste treatment plant after collection, classification, and benign treatment. All domestic water in the scenic area is collected and discharged or reused as a resource following a three-stage treatment.
- Low-carbon publicity. Conduct regular promotion activities concerning low-carbon tourism. Use various ways to promote the low-carbon lifestyle to tourists, scenic area staff and villagers, using LED screen displays, bulletin boards and signage, printed brochures, posting it on the Wechat Official Accounts platform and Tik Tok social media platform , radio and TV broadcasts, and introducing the lifestyle through tour guides.

In the process of building the low-carbon scenic area, the scenic area has transformed its economic growth model into one with low energy consumption, low carbon emission and low pollution. This helps us to build a good image of the Geopark and sets an example for regional sustainable development.

Barrier lake in the Zhaixia Grand_Canyon.

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Eco-parking lot in the northern part of Taining Geopark.

The Eco-trail in Zhaixia Grand Canyon.

Terras de Cavaleiros UNESCO Global Geopark, Portugal

Sustainable Development Goals & UNESCO Global Geoparks – From Theory to Action in Terras de Cavaleiros UNESCO Global Geopark

Participants in one of the Geopark's educational programmes.

Boat trips powered by solar panels.

Participants in one of the activities organised for people with disabilities.

Terras de Cavaleiros UNESCO Global Geopark promotes the UN Sustainable Development Goals in all its activities, as well as with its partners, seeking to increase strategies that improve health and education, reduce inequality, and stimulate economic growth, while combating climate change, preserving ecosystems, and eradicating poverty.

There are several SDGs that Terras de Cavaleiros UGGp has endeavoured to include in its activities. Examples include:

SDG 1 (No poverty). We are concerned with contributing to social well-being and reducing socio-economic inequalities, so every year Geopark employees organise campaigns to raise funds and provisions to help needy families in the area.

SDG 2 (Zero hunger). This goal is being promoted through joint work with one of our partners. This collaboration has resulted in the creation of a hamper with products from local farmers, promoting a reduction in the transport carbon footprint and contributing to more sustainable agriculture. Everyone can join this local produce campaign, where they receive this hamper of seasonal produce at home every week, fortnight, or month.

SDG 3 (Good health and well-being). The Geopark promotes outdoor activities, encouraging healthy lifestyles. An example of this is the themed walks organised throughout the year.

SDG 4 (Quality education) We organise various educational activities that aim not only to convey concepts related to Earth Sciences, but also a set of school and genera knowledge skills that enable students and communities to interpret and act on their territory in search of better living conditions and maintaining their heritage. These activities also aim to boost and maintain economic competitiveness through the sustainable use of their territory, combined with strengthening the social capital.

SDG 10 (Reduced inequalities). Reducing inequalities in our territory is promoted by organising various activities for people with disabilities. The disabled are still in a very vulnerable situation, with a higher risk of poverty and social exclusion, unemployment, and discrimination, so these activities are always inclusive, demonstrating equal opportunities. An example of this work is the activities we organise during the bathing season with CERCIMAC - Cooperativa de Educação e Reabilitação de Cidadãos Inadaptados de Macedo de Cavaleiros.

SDG 13 (Climate action). Every year the Geopark promotes the sowing and planting of native trees in deforested areas, often due to fires. These activities are supported by all of the territory's school children, inspiring in them the values of appreciating and protecting the native forest. These activities aim to help combat climate change by sequestering carbon, the gas responsible for increasing the greenhouse effect.

These are just a few examples of the SDGs that Terras de Cavaleiros UGGp promotes in its territory. In this way we try to make our best contribution to achieving the goals of the UN's 2030 agenda.

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TERRA.vita UNESCO Global Geopark, Germany

Find your local green producer with the TERRA.season guide

The Asbrock family in Wellingholzhausen manages a farm with free-range chickens and sells the "Landeier" (countryside eggs) conveniently through vending machines. Sustainable businesses like these are featured in the TERRA.season guide.

In a few decades, globalisation and industrialisation have strongly altered traditional manufacturing methods and consumer behavior in the modern world – not always to humanity's advantage. Our unsustainable way of life is increasingly becoming apparent, leading to a growing desire for locally produced, seasonal, organic, and ecologically sustainable products. How do people find these mostly small producers often located away from large supermarket chains? The UNESCO Global Geopark TERRA.vita provides a digital guide to find local producers and sellers and collaborates through the RegioApp to address this need.

The TERRA.season guide to find regional producers and sellers is an online database available on the website of the Nature and Geopark TERRA.vita (https://www.geopark-terravita.de/de/erzeuger). As of June 2024, the website showcases 221 regional partners from the area of the Nature and Geopark.

There are various ways to utilize the database. It is possible to search directly for the name of a producer and receive a profile with information about their products. If users want to know which producers are in their vicinity, they can enter their location and specify a maximum distance as a radius in another search window. Alternatively, this information can be directly viewed on a map based on Google Maps. Furthermore, users can enter a specific item, such as "honey". This will display all producers in the region or within a specific radius offering locally produced honey. Information about weekly markets in communities and cities, where farms, in- particular, sell their products, are provided separately on a map.

Additionally, the entire database's information is regularly integrated into the "RegioApp" in collaboration with the Climate Initiative of the Osnabrück County. This app functions similarly to the TERRA.season guide but as a mobile application and includes regional producers throughout Germany.

With the TERRA.season guide to find regional producers and sellers, TERRA.vita follows its motto "From the region for the region" to promote regional economic cycles and protect historical land use practices, animal welfare, nature, and the climate, while actively engaging with regional producers, direct sellers, trade, consumers, and start-ups. In this way, TERRA.vita addresses SDGs 3 (Good health and well-being), 11 (Sustainable cities and communities), 12 (Responsible consumption and production), 13 (Climate action), 15 (Life on land) and 17 (Partnerships for the goals).

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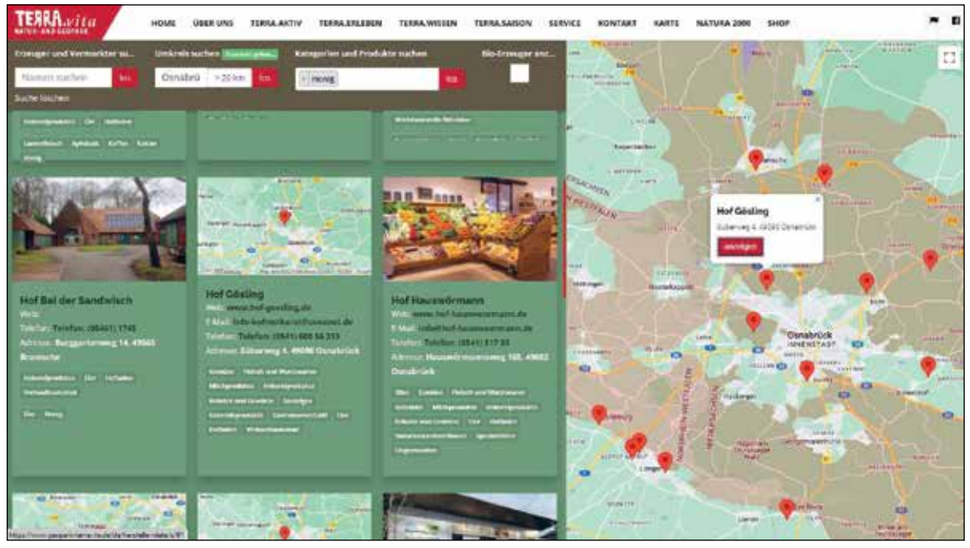
The RegioApp is a nationwide initiative by the Federal Association of the Regional Movement, supported by the Federal Ministry of Food and Agriculture.



The TERRA.season guide: In this example, a search for 'honey' was conducted within a radius of 20 km from Osnabrück.

Thuringia Inselsberg - Drei Gleichen UNESCO Global Geopark, Germany

The Education for sustainable development forest and water project in Ruhla.

Presentation of the "National Award - Education for Sustainable Development" to the German UNESCO Global Geoparks on 8 November 2023 in Schwerin.

Photo: Forum of the UNESCO Global Geoparks in Germany

The participants examine various water samples near the Ruhla forest pool.

Photo by Kerstin Fohlert

The year 2023 has been declared the "Year of Water" by the town of Ruhla. Thuringia Inselsberg Drei Gleichen UGGp adopted the topic together with the local AWO youth club "Freetime" and developed an ESD project (Education for Sustainable Development). On three project days from 10-12 July 2023, the young people devoted themselves to the issues of water and forest and their diverse interrelationships. These focused on the nature discovery trail "Am Breitenberg" (the GeoRoute 10 of the Geopark) with the Green Classroom. Through experiments with water, wood and forest soil, the children learned about the simple things everyone can do every day to use the valuable resources of water and wood carefully and prudently so that we can conserve them for the future.

The children were guided by the staff of the Geopark Management Office as well as the geotourism staff of the town of Ruhla and the tour guide of the Kittelsthal dripstone cave. A total of ten interested children from Ruhla local schools, grades 6-8, decided to take part in this holiday programme.

On Monday, the children explored the mica slate on the Breitenberg with a hammer and magnifying glass and examined the forest soil with a drill stick. At a historic charcoal kiln site, the children even found charcoal remains. In addition, each child built their own water filter and observed how filtration takes place in the soil with different materials and how much water a soil can absorb.

Tuesday was all about water. The children learned about the Earth's water cycle in a playful way and collected water samples at different places in Ruhla, which we then tested for their pH value and conductivity. One of the local lifeguards of the Ruhla Forest pool gave us an insight into the inflow and outflow as well as the purification of the pool water, which is fed by the local mountain stream.

The children from the AWO youth club "Freetime" in Ruhla received a certificate for their participation in the ESD project week.

Photo by Nancy Schröter

On Wednesday, the children were given an insight into the work of foresters. The forester of the Breitenberg district explained to us about forest conservation, forest remodelling and the current challenges of climate change faced by the forest. The children realised that wood is an important renewable local raw material, and also learned about all the important tools used by the forester and were able to try some of them out themselves. In the afternoon, the two-day homework was evaluated: each child had to measure and record water consumption using a water meter. Together we worked out in which activities water is consumed daily and how each individual can reduce the demand for water.

The last project day occurred on 13 March 2024: Together with the district forester and the young people, trees were planted along the GeoRoute 10 and tree sponsorships were adopted .

This project was one of the main reasons for receiving the "National Award - Education for Sustainable Development" on 8 November 2023, which the Geopark received together with almost all other German UGGps. The project contributes significantly to SDG 4 (Quality education). However, the activities involved in the project also contributed to an understanding of SDG 6 (Clean water and sanitation), SDG 7 (Affordable and clean energy), SDG 12 (Responsible consumption and production and SDG 15 (Life on land).

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Tianzhushan UNESCO Global Geopark, China

Tianzhushan Geopark Steadily Promotes Biodiversity Protection

Biodiversity Exhibition Hall in Tianzhushan Geopark Museum.

Photo by WANG Lixin.

Biodiversity Resources Survey. Photo by XIE Yihan.
Fig. 3. Education activity on Chinese herbal medicine plants in the field.

Photo by LING Jun.

In recent years, Tianzhushan UNESCO Global Geopark has adhered to the concept of green development for economic construction, to balance development and protection, and actively promote the investigation and protection of its biodiversity resources: through the following activities:

I. Conduct biodiversity resources surveys

Cooperating with Anqing Normal University, Tianzhushan Geopark launched a wildlife resources survey project, and an investigation team was established to conduct a one-year systematic investigation of the wildlife resources of Tianzhushan Geopark. A total of 1,351 species of higher plants assigned to 703 genera and 206 families were recorded in this survey. There are 264 species of vertebrates assigned to 26 orders and 77 families. The wild flora resources of Tianzhushan account for about two thirds of the Dabieshan area, and the fauna resources account for about 90%. Tianzhushan Geopark is endowed with abundant biodiversity resources.

II. Carry out biodiversity conservation and restoration projects

Tianzhushan Geopark replanted camphor trees, sweetgums, oaks, and sassafras to restore the forest ecosystem; investigated, registered, listed and scientifically protected ancient and famous trees; built a biodiversity exhibition hall in the Tianzhushan Geopark Museum and the Dalongwo Rare Botanical Garden; planted plants such as Schima superba and *Camellia oleifera* at important sites. The Geopark also established forest fire isolation belts and actively prevented and controlled pests such as *Dendrolimus punctatus, Dendrolimus kikuchii Matsumura* (the larvae of these moth species feed on pine needles) and *Monochamus alternatus* (a species of beetle that feeds on the bark of twigs and lays its eggs in damaged or dead trees). Tianzhushan Geopark has established a biodiversity monitoring system, with a total of 7 monitoring sites, created a forest fire video monitoring system and an early warning system for pest control.

Education activity on Chinese herbal medicine plants in the field.

Photo by LING Jun.

III. Carry out popular science publicity and education activities

Tianzhushan Geopark has held several training courses on a series of popular science activities for nature education, and led teenagers to watch birds, collect Chinese herbal medicines, and other activities. These help teenagers to establish ecological and environmental protection awareness and in learning and understanding the true meaning of "Biodiversity Protection".

In conclusion, Tianzhushan Geopark attaches great importance to protecting biodiversity. Through ecological restoration and species conservation projects, scientific research monitoring, publicity, and education, it has effectively promoted the sustainable development of local communities and has contributed to SDG 11 (Sustainable cities and communities) and SDG 15 (Life on land).

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Toratau UNESCO Global Geopark, Russian Federation

Climate research in the Toratau Geopark.

Conducting a lecture on climate for students of the Urman-Bishkadak Village school.

Laying sites for monitoring changes in soil temperature and humidity using data loggers (schoolchildren are also involved in this process).

The Toratau aspiring UNESCO Global Geopark (Toratau aUGGp) is an area that unites geological sites of international importance and natural, historical, and cultural sites. A place where you can meet with pristine nature and get acquainted with the age-old traditions of the Bashkir land.

The Toratau aUGGp is located at the junction of the southern part of the Ural Mountains and the eastern edge of the East European Platform. The territory is rich in unique geological features of scientific, historical, and natural value.

The territory of the Toratau aUGGp has an incredible biological diversity. During a single day, you can see spacious forest-steppes, cool mountain gorges and meadow steppes with flowering grass.

In the shady spruce forests preserved from the last ice ages, you can meet wild animals and rare plants, for example, the lady's slipper.

The key and important activities in the Geopark are interacting with the local population; involvement of activists from among the local population in solving problems related to the functioning of the Geopark; creation of conditions for the preservation of natural, historical and cultural sites; interaction with the scientific community in order to conduct research and educate people about the scientific importance of the Geopark's geological, historical and cultural heritage.

One of the key studies is to study the climate and assess the consequences of climate related regional changes within the territory of the Toratau aUGGp. Also to record how the natural biodiversity responds to these changes

The Toratau aUGGp cooperates on this topic not only with research organisations, but also with public and educational institutions. For example, together with the V.Nassonov Speleoclub, Geopark employees measured changes in the ice cover in the Kinderlinskaya cave. The data are aimed at studying changes not only in the regional climate, but also in the microclimate within the cave. This allows an individual approach to solving the issues of preserving the cave and reducing the anthropogenic impact on this important feature. Every year, before the start of the active tourist season, Geopark employees hold mass clean-up days at all Geopark facilities. The Geopark informs visitors about the importance of preserving natural and historical and cultural sites, and holds additional lectures and classes with children in order to popularize cultural tourism.

Ufa University of Science and Technology, Faculty of Earth Sciences and Tourism, is the main partner of the Toratau aUGGp in the study of climate change. The data of meteorological stations for the period 1966-2015, located in the territory of the Toratau aUGGp, were analyzed. Dataloggers have been installed that record temperature and humidity, and changes in the forest areas and zones of anthropogenic influence are being recorded. The result of these studies showed an active influence on the climate within the territory of the Toratau a UGGp of the closely located mountainous folded region of the Southern Urals. Climatic differences in the western and eastern parts of the territory of the Toratau aUGGp affect precipitation, average annual temperature, and average annual wind directions. This leads not only to the zoning of flora and fauna and the destruction of karst rocks, but also to the movement of tourists. The Geopark takes into-account the data obtained during the research and carries out measures to minimize the impact on the environment, especially at sites of increased interest to tourists. The Geopark's initiatives contribute to SDG 4 (Quality education) and SDG 13 (Climate action).

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Toya-Usu UNESCO Global Geopark, Japan

Toya-Usu Volcano Meister's Disaster Risk Reduction Activities

Participants in the Volcano Meister project.

Toya-Usu UNESCO Geopark, located in Hokkaido, northern Japan, displays a unique exhibition of active volcanism on the Pacific Rim. Lake Toya was born approximately 0.11 million years ago, during a major eruption. Mt. Usu was created in the southern part of Lake Toya in southwest Hokkaido approximately 20,000 years ago. Part of the volcano collapsed approximately 8,000 years ago, and no eruption occurred until the 1600's. However, it is an active volcano that erupted nine times between 1663 to 2000. We established a system of Toya-Usu Volcano Meister System in 2008 to properly understand the characteristics of this volcano and in order to pass on the wisdom of mitigating disasters and the memory of the eruptions.

We hold the certification test for Volcano Meister every October as one of the events in the International Day for Disaster Risk Reduction. As a result of the test this year, six people passed the exam and joined the 70 accredited Volcano Meisters. The UGGp joined with the Volcano Meister's in promoting the disaster risk reduction education programmes, promoting the Geopark, and activating the development of a region.

The particular component in disaster risk reduction activities is the increase in number since 2022 of Volcano Meister projects in local elementary and junior high schools compared with the number before the COVID-19 pandemic in 2019. It is a very meaningful activity for children who did not experience the eruption to know about the characteristics of the area, and to learn about what evacuation actions are necessary when there are signs of an eruption

Japan is prone to frequent natural disasters. These include the 2011 Great East Japan Earthquake, the 2014 eruption of Mount Ontake, and the 2016 Kumamoto earthquake. We would like to let people know that disasters could happen at any time and take measures that lead to disasters with no casualties, similar to the 2000 eruption. Moreover, we hope that these activities will lead to disaster risk reduction throughout the world. The Geoparks disaster risk reduction education programmes contribute to SDG 4 (Quality education) and SDG 11 (Sustainable cities and communities).

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Six participants receive their Volcano Meister certificate.

Disaster risk reduction education on the summit of Usu volcano.

Troodos UNESCO Global Geopark (TUGGp), Cyprus

Actions for the achievements of Sustainable Development Goals in Troodos Geopark

The Troodos UGGp, in the mountainous heart of the island of Cyprus boasts an extraordinary biodiversity, based on its exquisite geodiversity which consists of colourful rocks and minerals that were created by ascending magma in the depths of the ancient Neotethys Ocean and today are exposed up to 1.952 m above sea level. The weathering and erosion of this unique geodiversity resulted in the creation of various landscapes with river valleys rich in fertile soils and river bed materials, which are the foundation on which the local population formulated their unique cultural heritage.

One pillar of actions of the TUGGp concerns the education of the local population and visitors about the natural elements of the area, through various activities. A number of educational videos, animations, interactive games, and a planetarium have been developed, presenting the Earth processes of the last 92 million years that resulted in the creation of the landscape we admire today contributing to SDG 4 (Quality In order). Furthermore, eighty-four hiking trails, twenty picnic sites and four camping sites with information panels have been created to encourage hiking and promote SDG 3 (Good health and well-being)

In order to help visitors navigate around the geosites, nature trails, UWH Byzantine Churches, monasteries, museums, environmental centres and other important elements of the TUGGp area, two Web-based Map applications were developed, one for geosites and another that supports tours in the region introducing participants to SDG 15 (Life on land)). In addition, guided tours are also provided by trained Geopark guides upon request. The training programme for guides contributes to providing decent work and economic growth (SDG 8) for the local inhabitants.

A second pillar of actions focuses on various geo-conservation projects, which are implemented in abandoned mining areas and geosites in the region. Three ongoing projects in the Asbestos, Kokkinopezoula and Agrokipia mining areas are aimed at ensuring the stability, rehabilitation and reforestation of the waste dumps and the restoration of abandoned buildings. Today, the Asbestos Mine area is reforested, and hosts, in restored buildings, the seed bank of endemic flora species,

Map of the Troodos UNESCO Global Geopark with the locations of the Asbestos Mine and Geosite 3.

Photo by Geological Survey Department.

the TUGGp Visitors Centre, the Botanical Garden and an artificial lake with a natural trail, which attracts thousands of visitors each year. The activities concerning the abandoned asbestos mines contribute to SDGs 3 (Good health and well-being), SDCG 4 (Quality education), SDG 8 (Decent work and economic growth) SDG 13 (Climate action) and SDG 15 (Life on land).

Another geoconservation project is being developed along the Maroullena riverbed hiking trail, where Geosite 3 is located. The area is the natural habitat of a significant number of endemic plants, bird species and the endemic water snake subspecies *Natrix-Natrix cypriaca.* In-order to protect these elements, small-scale environmentally friendly infrastructures have been constructed, such as a bridge with a wooden floor and railings and elevated wooden sidewalks along the riverbed. In addition, a view point was created opposite Geosite 3 that can be reached via a number of wooden steps with railings and through a path from the nearby asphalt road that in the near future will be also used by impaired people and contribute to SDGs 3, 4, 8, 13 and 15.

The above-mentioned actions show the great concern of the Troodos Geopark and local authorities for achieving the UN's sustainable development goals.

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General view of Asbestos Mine.

Photo by the Geological Survey Department.

The new view point of Geosite 3.

Photo by the Geological Survey Department.

Unzen Volcanic Area UNESCO Global Geopark, Japan

Theory into Action for a Sustainable Tomorrow in Unzen Volcanic Area Geopark

The Unzen Volcanic Area UNESCO Global Geopark, located in the Shimabara Peninsula, Nagasaki Prefecture, Japan, is distinguished by its active volcanic complex and diverse geological features. The landscape has been shaped over approximately 4.3 million years by volcanic phenomena, including the formation of lava domes, pyroclastic flows, and seismic activity. Alongside its geological characteristics, the Geopark holds a significant cultural heritage, preserving history and traditions. Being part of the Global Geoparks Network (GGN) since 2009, the Unzen Geopark promotes conservation and sustainable management, focusing on educational initiatives and environmental protection to mitigate climate change.

Students planting trees in Taira Primary School.

Taking proactive steps in combating climate change, the Unzen Geopark contributes to SDG 13 (Climate action). The tree planting project in Taira Primary School, for example, not only helps store carbon but also raises awareness about the environment among students. By stressing the importance of protecting biodiversity, this activity shows practical environmental care, encouraging future generations to take responsibility.

Another demonstration concerning SDG 13 involves participating in the Earth Time Journey Exhibition Workshop focused on "Communicating Climate Change." The Unzen Geopark encourages dialogue and knowledge dissemination by facilitating the exchange of ideas on climate change among experts and community members. These workshops empower people to translate theory into action, fostering a culture of sustainability and enabling local communities to move towards a greener future.

Furthermore, the Unzen Geopark, through its GeoZora project (science workshops), actively promotes SDG 13 (Climate action) and SDG 4 (Quality education) by fostering research and facilitating knowledge exchange. Led by Mr. Hattori from Nagasaki University, a recent study titled "Verification of the Endemicity of Miyama Kirishima Growing in the Unzen Region" has provided significant insights into climate change impacts and deepened our understanding of biodiversity and ecosystems within the region. This research project enhances our scientific knowledge while providing educational opportunities for students and the local community.

In conclusion, the Unzen Volcanic Area UNESCO Global Geopark has been directing its efforts to turn theoretical concepts into actions to achieve the UN's Sustainable Development Goals (SDGs). Through active engagement in initiatives addressing climate change and promoting education, such as tree planting and research projects, the Geopark showcases tangible steps towards sustainability. Having community involvement as its core, the Geopark aims to transform ideas into actions capable of changing the world. Ultimately, the Unzen Geopark strives daily to demonstrate how UNESCO Global Geoparks can effectively bridge the gap between theory and action, paving the path towards a more sustainable tomorrow.

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The Earth Time Journey Exhibition Workshop.

The presentation of the GeoZora Research Project.

Vestjylland UNESCO Global Geopark, Denmark

Food Camino: A Sustainable Journey in the UNESCO Global Geopark

Tour along the beach accompanied by the Geopark's geologist.

Culinary experiences with a focus on local flavours. Fig. 3. Foragin

Vestjylland UNESCO Global Geopark supports numerous activities and initiatives that blend environmental conservation, cultural heritage preservation, and community engagement year-round. Among these endeavors is Food Camino an annual initiative that commenced in 2023. With its multifaceted approach to sustainable living, Food Camino resonates with several of the UN's Sustainable Development Goals (SDGs). This initiative offers a three-day guided hiking tour through the untamed landscapes of West Jutland, incorporating educational elements along the journey to provide insights into geology, biodiversity, cultural heritage, and culinary experiences, while fostering conservation awareness.

Foraging for wild herbs and preparing beverages.

Functioning as a catalyst for healthy lifestyles and physical well-being, Food Camino promotes outdoor activities contributing to SDG 3 (Good health and well-being) in the picturesque landscapes typical for the area (sand dunes, heathlands, forests, fjords, wetlands, and the sea).

By celebrating local food products and culinary traditions, Food Camino directly supports SDG 12 (Responsible consumption and production). Participants experience the benefits of SDG 12, as they taste locally sourced delicacies and learn about sustainable food practices. This strengthens local food systems, promotes economic growth, and reduces environmental impact.

Furthermore, the initiative aligns with SDG 15 (Life on land) by fostering an appreciation of biodiversity and the conservation of terrestrial ecosystems. A part of the tour is dedicated to foraging edible wild herbs, accompanied by talks on plant medicine and folklore. Participants can explore diverse ecosystems and habitats, including birdwatching, observing wild animals, gaining insights into local fish, and visit the largest insect hotel in Denmark - a collaborative effort between an artist and the local community. The final part of the tour goes through an area where wind turbine technology undergoing testing contributes to SDG 7 (Affordable and clean energy), fostering a deeper understanding of the interconnectedness between human activities and the natural world.

Crucially, Food Camino exemplifies how partnerships can advance sustainable development goals, particularly SDG 17 (Partnerships for the goals). Vestjylland UGGp collaborates closely with local stakeholders and cultural institutions, to create an inclusive and impactful experience. These partnerships leverage collective expertise and resources, amplifying the initiative's reach and effectiveness.

In essence, Food Camino embodies a holistic approach to sustainability, addressing interconnected challenges and opportunities across multiple SDGs. By promoting health and well-being, fostering education, encouraging responsible consumption, conserving biodiversity, and fostering partnerships, Geopark Vestjylland's initiative inspires individuals to embrace sustainable lifestyles and contribute to a more resilient future.

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Vulkaneifel UNESCO Global Geopark, Germany

“Von Hier – Vulkaneifel: Fostering Sustainable Growth Through Local Initiatives”

The resurgence of a desire for local supply, heightened by both the Covid-19 pandemic and a growing environmental consciousness, has propelled consumers towards regional products and producers. Recognizing the importance of this shift, the “Von Hier – Vulkaneifel” (“From Here – Vulkaneifel” in English) project has emerged as a transformative initiative, connecting consumers, tourists, and marketers with local producers in the scenic Vulkaneifel region of western Germany.

Appreciation for regional quality is on the rise, a positive development for the Vulkaneifel region, known for its unique identity and the contributions of local producers. The project aims to make regional producers and their products more visible, foster connections among them, and raise awareness of the importance of regional products for the local environment and community.

The “Von Hier – Vulkaneifel” project has made significant strides, with the network now boasting over 50 registered members across 10 diverse product categories. This growing community showcases the region’s entrepreneurial spirit and the wealth of products, from agricultural delights to handcrafted treasures.

Supported by Vulkaneifel UNESCO Global Geopark, the initiative aligns its goals with the United Nations’ Sustainable Development Goals (SDGs), exemplifying a commitment to sustainable practices and community well-being. At its core, “Von Hier – Vulkaneifel” contributes to SDG 8 (Decent work and economic growth) by fostering local economic development.

Community engagement is pivotal, cultivated through regular networking events encouraging collaboration and mutual support among local producers. This dedication to fostering partnerships resonates with SDG 17 (Partnerships for the goals), highlighting the power of united efforts in driving positive change within the community.

Environmental consciousness is a fundamental pillar of “Von Hier – Vulkaneifel” aligning with SDG 12 (Responsible consumption and production). The initiative emphasises the value of regional products and supports sustainable practices, raising awareness about responsible consumer choices and the environmental impact of daily decisions.

A hobbyist beekeeping venture with 25 hives, focusing on honey production and guiding other beekeepers.

Imkerei Heinen © Von Hier – Vulkaneifel.

Beyond commerce, the initiative is also a proponent of SDG 4 (Quality education), actively engaging in capacity building by providing training to its members. From navigating social media platforms to establishing online shops, local businesses receive the tools they need to thrive in the modern marketplace.

Inclusivity is a guiding principle with “Von Hier – Vulkaneifel” offering free membership to businesses in the region. This approach promotes equal access to opportunities, contributing to the principles of SDG 10 (Reduced inequalities).

In essence, “Von Hier – Vulkaneifel” transcends being a mere network; it is a catalyst for positive change in its community. By connecting consumers with local producers and fostering a sense of community, the initiative serves as a model for regional collaboration contributing to a more sustainable and prosperous future. In the Vulkaneifel region, “Von Hier” is not just a statement; it is a commitment to a future where economic growth, environmental stewardship, and community well-being thrive hand in hand, supported by the vision of Vulkaneifel UNESCO Global Geoparks.

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Since the 1930s, the company has been renowned for creating exquisite wooden decorations for childrens’ rooms.

Heller Kinderzimmerdekoration © Von Hier – Vulkaneifel.

A farm store offering fresh, local, and seasonal vegetables with a focus on quality and sustainability.

Annas Eifelgarten © Von Hier – Vulkaneifel.

Wudalianchi UNESCO Global Geopark, China

Gender Equality Activities in Wudalianchi Geopark

A cooking training course in Wudalianchi UGGp.

Womens’ and mens’ participation in the cooking training course contributes to gender equality in Wudalianchi UGGp.

Wudalianchi Geopark contributes actively to the success of SDG 5 (Gender equality). Women and men who do the same work enjoy the same salary in Wudalianchi UGGp. Women can also enjoy six-months maternity leave and on returning to work, they are entitled to flexible work time because they need to feed their babies. On every International Day of the Girl Child organised by UNICEF and Plan International gender equality activities are carried out in schools ensuring that awareness of gender equality can be easily integrated with the school culture. Women have a one-day break on every International Women’s Day. Every year the local community provides training courses for women who stay at home and encourages them to enter the employment market using the skills acquired in attending these courses. These measures raise the possibility for women to achieve higher positions in the workplace than men. For example, women are the chief financial officer in most families. When husbands assume the role as decision makers for great events in their families while their wives make decision for minor matters, great events never happen in their families.

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Celebrating International Women’s Day in the workplace.

Xiangxi UNESCO Global Geopark,China

Geo-tourism injects new vigor and vitality into targeted poverty alleviation efforts in Xiangxi Geopark

Located in the southern part of the Xiangxi Global Geopark, Aizhai Scenic Area is renowned for its spectacular century-old roads, the charm of millennium-old Miao ethnic villages, and its scenery with millennia-old canyons. Driven by the influence of the Xiangxi Global Geopark brand, the Aizhai Scenic Area has now become a well-known travel destination for tourists from both home and abroad and is an example of the Geopark's success in contributing to SDG 1 (No Poverty).

The Aizhai Bridge, which has set four world records in design and construction, was completed, and opened to traffic in 2012. Although Aizhai has a world-class scenic bridge, it lacked the support of a world-class tourism brand, posing a significant bottleneck in its geo-tourism development. In-order to truly boost tourism in Aizhai, the Party Committee and the Government of Xiangxi Prefecture made strategic decisions to synchronize the creation, building, and promotion of the Global Geopark and a National 5A-level tourist attraction. In just over three years, various public service facilities for tourism have been built and improved in the Aizhai Scenic Area, and new tourism products such as cliff walkways and the Tianqiao Xianju homestay hotel have been provided. Within just one year after the successful nomination of the Xiangxi Global Geopark, the Aizhai-Shibadong Village-Dehang Grand Canyon Scenic Area has been successfully designated as a National 5A-level scenic site.

Today, geotourism in Aizhai is flourishing. Villagers who were once confined to the canyon can now find job opportunities in the local area. With over 600 service jobs available such as tour guides, cleaners, and ticket sellers, some poor households have even established their own free

Participants in the study tour of the Aizhai Scenic Area in Xiangxi UGGp.

stalls to sell small goods. Additionally, some villagers have opened farmhouse inns, and have begun to live a better life. Many homestay hotels, restaurants, and speciality shops are now developed along the roadsides. With the development of the tourism industry, many young people have also chosen to return to their hometowns to find jobs. In this sense, the Xiangxi Global Geopark has provided the indigenous people in Aizhai with another chance to pursue a better life.

The developments in Shibadong Village in the Aizhai Scenic Area, subsequent to the initiation of targeted poverty alleviation in 2013, are of particular note.

In 2013, Shibadong Village had a poverty incidence rate of 57%, with an average per capital net income of only 1,668 yuan (230 USD). Thanks to the geotourism development, Shibadong Village received 532,000 tourists and earned a tourism revenue of 12 million yuan (1.66 million USD) in 2022, with an average per capita net income of 23,505 yuan (3,251 USD).

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Xiangxi UGGp's new programme includes bungee jumping for tourists.

Yimengshan UNESCO Global Global Geopark, China

Taking Multiple Measures to Show Solicitude for Lives on Earth in Yimengshan Geopark

Comparison of fragile areas in the Dongwenhe River Basin before and after restoration.

In recent years, Yimengshan Global Geopark Administration has actively made efforts to protect, restore and promote the mountainous-hilly ecosystem through multiple channels. It has achieved fruitful results in ecosystem restoration, geological heritage conservation, promoting the sustainable development of park communities and supporting biodiversity research.

With the aid of national support for ecological protection in the Yimengshan area the Geopark, with a total fund of 5.494 billion yuan, established a separate management unit for improving the ecological function and stability of the forest system, water source conservation, and soil and water conservation.

In the Dongwenhe River Basin, workers carry out the afforestation of barren mountains, mine restoration, and soil and water conservation for eco-protection. At the same time, a Four Guarantee Responsibility System has been utilized to offer full process supervision through managing and protecting tree planting projects. Based on the forest chief system, new afforestation projects will be monitored and managed for a period of three years.

The management unit is also responsible for protecting the geological heritage and for governing a new pattern for rural life in which local villagers and nature coexist harmoniously. A total of 44 ecological geological environment monitoring sites have been established in Yimengshan Geopark. Monitoring systems have been installed to observe real-time data for precipitation, water levels, geological fractures, and tilt vibrations. Electronic fences have been installed with big data platforms for real-time dynamic supervision. Besides, planting projects, establishing science popularisation sites, etc,, have encouraged and created employment for local residents through their involvement in constructing and maintaining facilities for environmental sanitation treatment. These projects which attract more and more people from all walks of life to visit the Geopark are examples of the Geopark's involvement in SDG 6 (Clean water and sanitation). The village with geological relics has therefore become a popular site for self-driving, cycling, and hiking. Local villagers have truly enjoyed the dividends of this heritage.

The management unit initiated biodiversity research in the Geopark. A background investigation of animals and plants in the Geopark resulted in the discovery of a new leaf-mining moth species of the genus *Phyllonorycter* Hübner discovered in Mengshan Mountain. The findings were published in the internationally renowned scientific journal Zootaxa.

The "Eye of the Secret Realm" observation project has been implemented, and the Geopark's staff have installed an automatic infrared camera system to monitor and protect animals in the Mengshan Mountain area. As of now, 28 rare wild animals such as civets and mandarin ducks have been detected, and the more than 200 precious video materials have played a significant supporting role in the research and protection of biodiversity in the Yimengshan Global Geopark. The Geopark's involvement in biodiversity research and animal protection contributes to SDG 15 (Life on land).

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The ecological geological environment monitoring system of Yimengshan Geopark UGGp.

Field work and initial results of research and video monitoring in Yimengshan Geopark UGGp : a) field work, b) infra-red image of a civet, c) new leaf-mining moth species of the genus *Phyllonorycter*, d) a mandarin duck.

Zhangye UNESCO Global Geopark, China

Liyuan New Village: An Example of Sustainable Development in Zhangye Geopark

The old road in Nantai Village.

Old buildings in the old Nantai Village.

Zhangye UNESCO Global Geopark is one of the youngest UNESCO Global Geoparks in China. It was nominated in 2020 and hosted its revalidation in the summer of 2023. Although Zhangye Geopark is a new member of the Global Geoparks Network, it has made great efforts in achieving sustainable development in its local communities.

Several communities in Zhangye Geopark, such as Dongmaoniu Village, Kangle Town, Songmutan Village and Liyuan New Village, have established official partnerships with the Zhangye Geopark Administration. Among these communities, Liyuan New Village is the best example in achieving developments. Liyuan New Village, also called Nantai Village, used to stand on the site now occupied by the Hongshanwan Reservoir. Due to the construction of the reservoir, the whole village was moved to its present location. The initially poor inhabitants found it hard to implement agricultural activities in the wild landscape in its natural state.

With the establishment of Zhangye Geopark and the development of tourism, Liyuan New Village started to seek new methods in developing the local economy. The village first rented a site to the Geopark to build a parking lot. This provides employment opportunities for local people, its income goes directly to the village and is shared by all villagers. Furthermore, the village purchased some shuttle buses to provide transportation services in the Geopark. The drivers are all from Liyuan New Village. Also, the Geopark encourages villagers to run their own businesses. The Geopark and the village provided local people with a loan to renovate their houses and help them start B&B hotels and restaurants. Some selected hotels and restaurants are in partnership with Zhangye Geopark.

The outcome of sustainable development of Liyuan New Village is remarkable. Liyuan New Village now has 42 hotels with 747 rooms and two major restaurants; 379 families in the village participate in the parking lot business; 28 families are involved in the shuttle bus business and 90 families have started a business producing Geopark products. More than 1000 villagers are involved in tourism and their annual income has increased up to 20000 RMB per person. All these developments contribute to achieving SDG 1 (No poverty).

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A view of Liyuan New Village.

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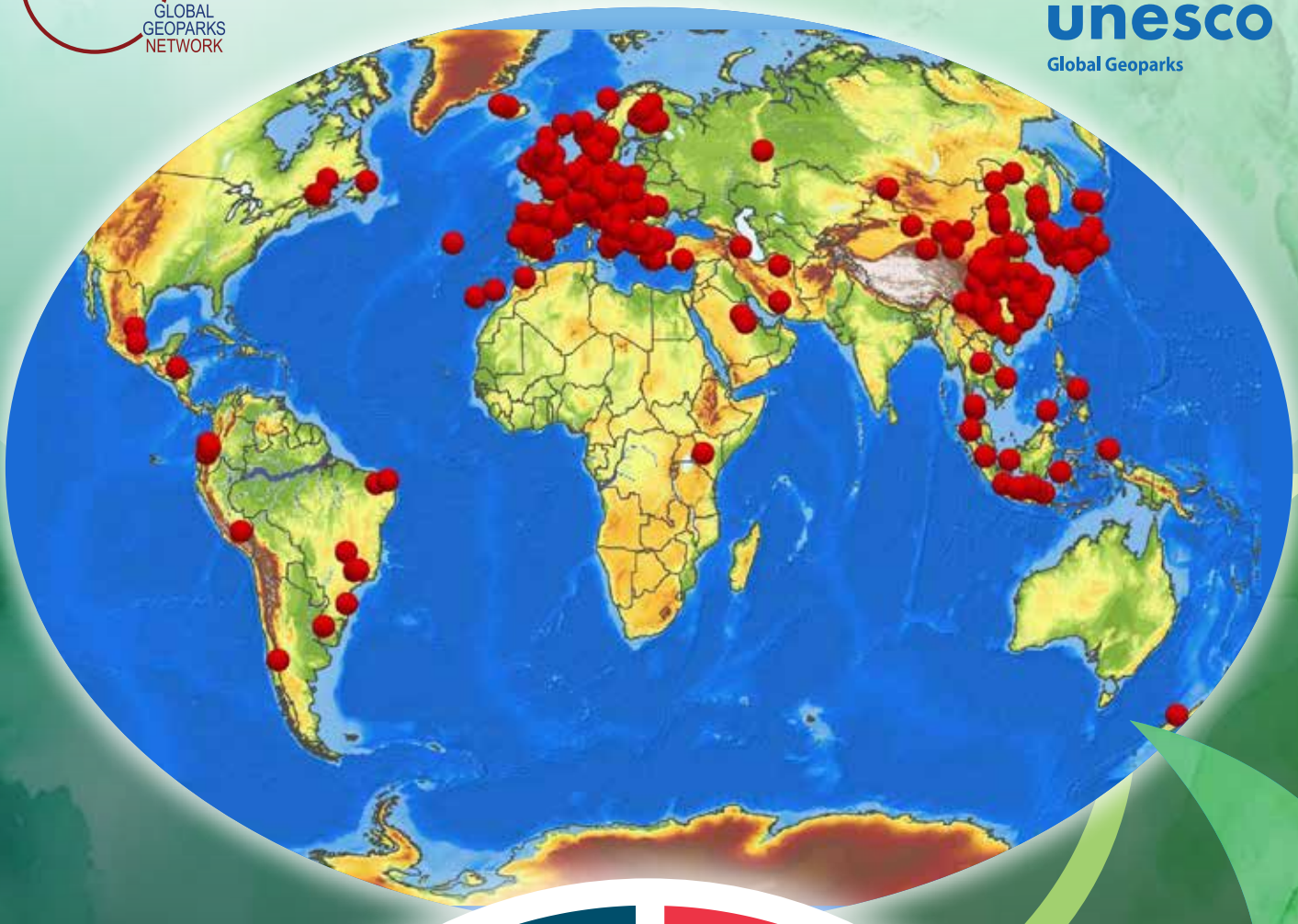

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