



H2020 Clustering Action “*Transforming Cities, Enhancing Well-being: innovating with nature-based solutions*”

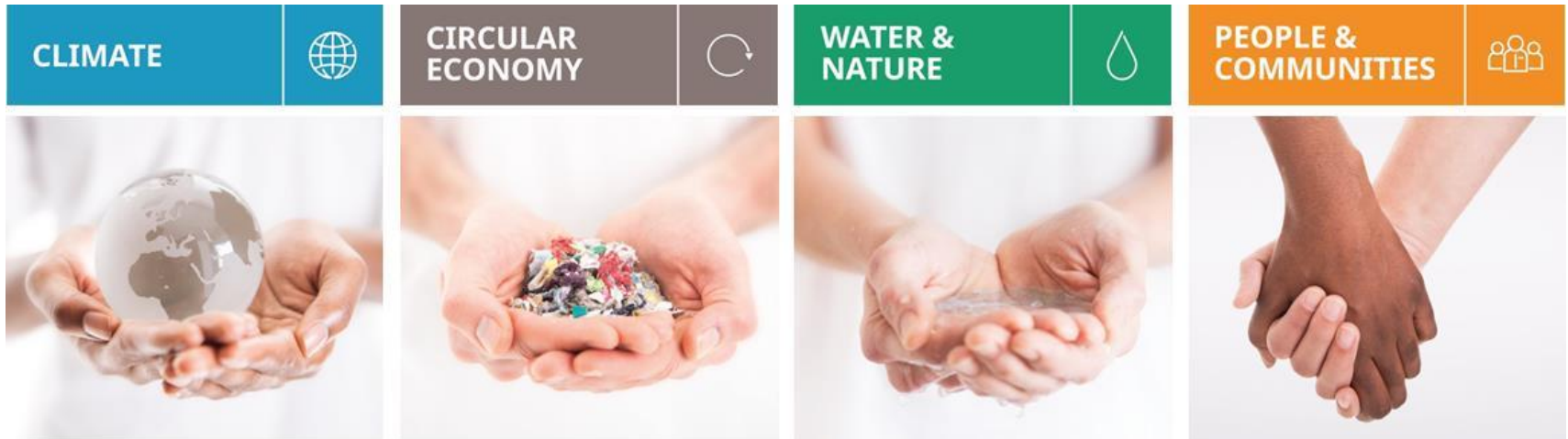
Maria Rosario Chan
16th May 2018
Coruna, Spain



LafargeHolcim at a glance

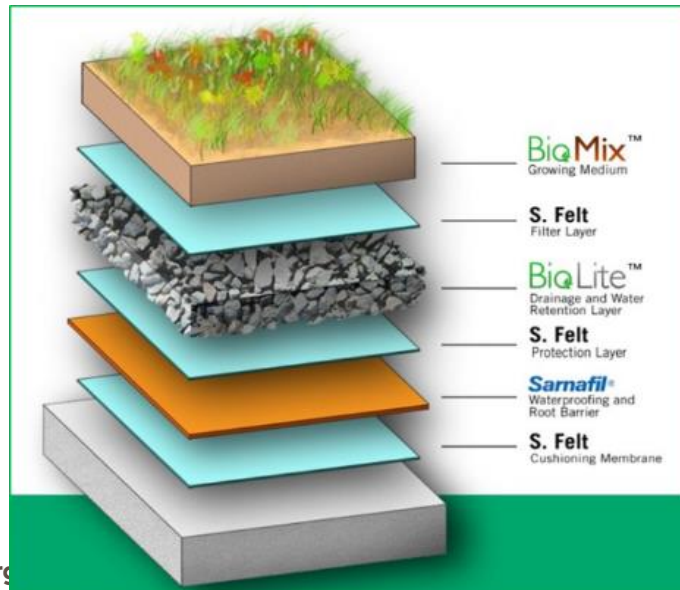


1/3 of our turnover from solutions with enhanced sustainability performance



Philippines: *Green Roof and Water Management in a Government Office Building*

- Background
 - Changing landscape due to rapid urbanization during the past 2 decades
 - Increasing challenges due to reduced open space and increased energy consumption
 - Green rating systems
- Buildings should not only be sturdy and spacious, they should also be efficient in energy consumption and adaptive to the changing environment
- LafargeHolcim Philippines partnered with Sika AG
 - Collaborate in designing and promoting concrete green roofing systems for mid-high buildings and mass housing projects



- **BioMix** (growing medium), a special lightweight medium which enables stable anchorage of plants' roots and provides appropriate water-holding capacity.
- **BioLite** (natural lightweight aggregates), for drainage. This natural material promotes healthy plant growth by retaining and draining water in a natural way
- Sarnafil (waterproofing and root barrier membrane), which is a fiber reinforced, multi-layer, synthetic membrane
- Felt (membrane), filter / protection / cushion layer

Philippines: *Green Roof and Water Management in a Government Office Building*

- Project

- Laguna Lake Development Authority (LLDA): new headquarter consists of two-wing, four-story green building in Quezon City.
- Green Building under the BERDE (Building for Ecologically Responsive Design Excellence) system: greened areas, wetland, two “pocket gardens” in intermediate levels, wastewater treatment system, [green roof](#)

- Benefits

- Reduction in maintenance cost
- Stormwater management / Rainwater harvesting
- Ancillary benefits (e.g., focal area for flag ceremonies, functions; relaxation area for employees, CO₂ savings, improved air quality, enhanced biodiversity by providing living space for plants and animals)

- Challenges

- Technical design and right materials
- Other key players: landscape architects, environment consultants, structural engineers.



<https://www.youtube.com/watch?v=YbDloBKVyjk>

Mombasa, Kenya: *Eco-Parks - Quarry Rehabilitation for Biodiversity conservation and environmental education*

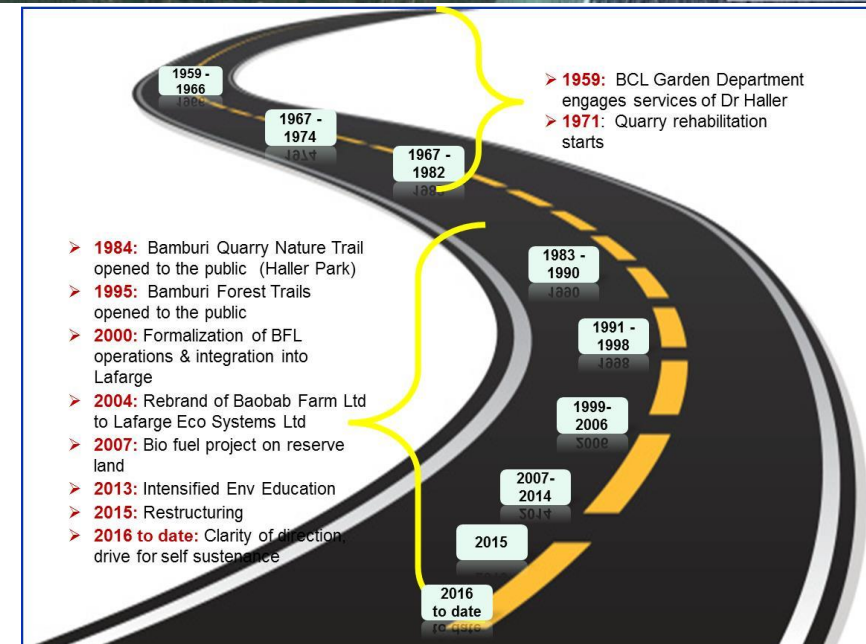
Background:

- Bamburi quarries and reserve (500 ha) is ≈10 kms from Mombasa (2nd largest city, 1.2 million people)
- 1950s and '60s, quarries were heavily mined – destroying much of the indigenous plant and wildlife. East African Coastal Forest classified as one of the 25 Global Biodiversity Hotspots



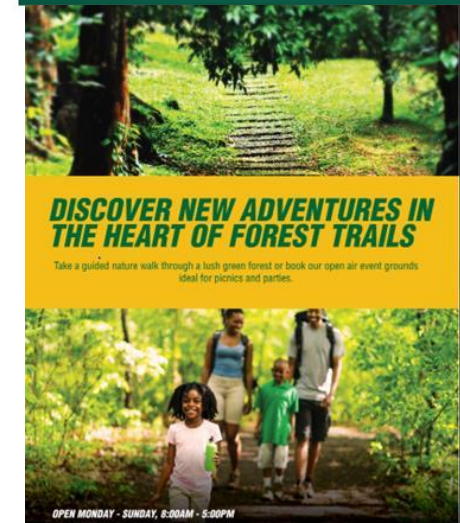
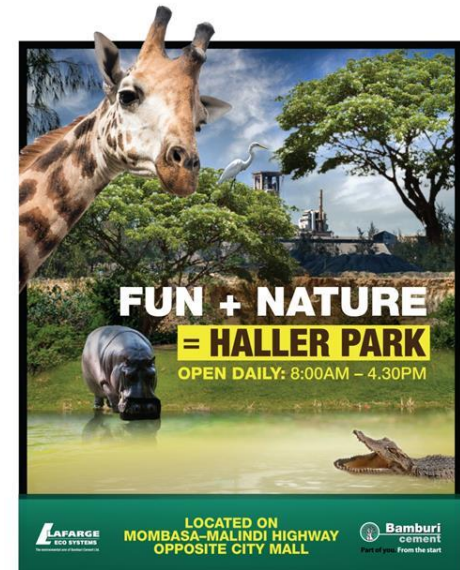
Target:

- Recreate coastal ecosystems of forests, lakes, grasslands for biodiversity conservation and sustainable utilization through education and tourism
- through *Pioneer tree planting, vegetation diversification, introduction of animals, ecosystem utilization*



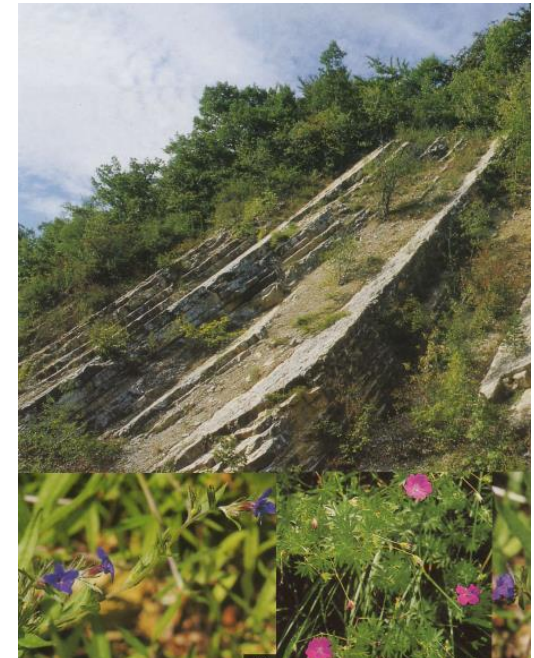
Mombasa, Kenya: *Eco-Parks - Quarry Rehabilitation for Biodiversity conservation and environmental education*

- Results: More than 300ha rehabilitated, 250ha are in advanced state.
 - Haller Park (originally known as Bamburi Quarry Nature Trails), open to the public in 1984: Diverse tropical ecosystem (wildlife sanctuary, giraffe/crocodile feeding, fish/butterfly farm, reptile park)
 - Forest Trails: lush green forest with open grassland (bird watching, fitness trails - cycling, jogging, trekking)
- Partners
 - Government organizations, local universities, local environment organizations
- Challenges
 - Rampant intrusions for firewood and tree poles, dumping of garbage, illegal mining activities, livestock grazing
 - Control invasive species, monitoring of biodiversity productivity, slow process (took more than 30 years to achieve where they are now)
 - Becoming economically self-sustaining without burdening company
- Key strategic actions
 - Internal capacity building program, more enriching customer experience, visibility campaigns (PR, advertising, word of mouth)



Switzerland: *Rehabilitation of an abandoned quarry (Holderbank Schümel) into a Nature Reserve*

- Background
 - Holderbank cement factory (1913)
 - Limestone exploitation until 1980
 - No legal obligation for rehabilitation, Royalties paid to municipality
 - Land (16 ha) owned by municipality
- Reasons for rehabilitation concept
 - New ecological awareness of population
 - Extinction of plants and animals
 - Intensive land utilization in Switzerland
 - Educational and recreational value
 - Low investment costs
- Several changes in the general design and rehabilitation concept (1979 – 1995)
 - Requirements for the restoration of mining sites have undergone significant changes (stricter, clearer provisions)
 - Increasing recognition of the importance of mining sites as a temporary replacement for rare habitats, creating or enabling habitats typical of the location and region



Switzerland: Rehabilitation of an abandoned quarry (Holderbank Schümel) into a Nature Reserve

Measures for Protection of Fauna and Flora

- As little intervention in Nature as possible
- Upkeep of ponds for spawning of amphibians
- Old tunnel for overwintering of bats
- Ruderal areas, nutrient-poor meadows for special plants

Key lessons

- Agility to adapt to changing requirements
- Open discussion and collaboration between the key players (communities, authorities, LafargeHolcim)

Benefits

- Experiential learning
- Geological importance

Today, the whole nature reserve is owned by the local citizens & residents of Holderbank

- Holcim Switzerland provided the seed money for the Schümel Foundation (CHF 500,000)

Willkommen im Schümel
Der ehemalige Steinbruch Schümel ist heute ein Naturschutzgebiet von kantonalen Bedeutung. Mit 18 ha wird dieser geschützte Lebensraum für uns als Gäste zu einem einmaligen Erlebnisraum. Das Naturschutzgebiet wird betreut und beaufsichtigt von der Schümel Naturschutzstiftung. Der Stiftungsrat verfolgt drei Oberziele:

Geotope sichtbar und zugänglich machen
Der Steinbruch Schümel ist für seine geologischen Aufschlüsse berühmt. Diese grossartigen Einblicke in das Erdinnere ermöglichen der jahrelange Gesteinsabbau. Damit sie sichtbar und auch zugänglich bleiben, sind auch an ihnen von Zeit zu Zeit Unterhaltsarbeiten notwendig.

Biotope und Lebensräume entwickeln und erhalten
Biotopschutz sichert durch gezielte, kontinuierliche Pflegemassnahmen die Entwicklung typischer Lebensräume und die Gewährleistung wertvoller Zwischenstadien ihrer Entwicklung. Diese Strategie wird hier auf Fels- und Felschuttstandorten, auf trockenen oder wechsellückigen Rohbodenflächen und in Nassstandorten und Tümpeln verfolgt.

Natürliche Prozesse schützen
In bestimmten Bereichen des Naturschutzgebietes soll die natürliche Entwicklung der Vegetation bis hin zur Bewaldung ablaufen können. Diese wird dort zugelassen, wo schlechte Zugänglichkeit und günstige Substrate die Etablierung und den Aufwuchs von Gehölzen begünstigen und der Pflegeaufwand zur Freihaltung sehr gross wäre.

Wertewandel einer Landschaft
Das Nebeneinander von Kalkstein und Mergel machte einst den kargen Waldrücken der Jurafalte Schümel für die aufblühende Zementproduktion interessant. Holderbank wurde 1913 erster Standort des heute weit weit tätigen Baustoffunternehmens Holcim. Bis 1980 wurde der wertvolle Rohstoff Kalk und Mergel abgebaut, mit verschiedensten Techniken und wenig systematisch. Bis da war aus dem einstigen Rücken eine grosse Kahlflur mit den vielfältigsten Formen und Strukturen entstanden. Der untere Teil, inzwischen vom Dorf umwachsen, wurde nun als Bauland begehrt und dafür wieder aufgefüllt. Der obere Teil wurde als Einwanderungsland von vielen seltenen Pflanzen und Tieren besiedelt. Sie fanden hier Asyl und verschafften dem wüsten Abbauland einen heute sehr hohen Naturwert.

Anreise und Zugang
• Mit Zug: Bahnlinie Aarau-Brugg, Haltestelle Holderbank; 7 Minuten zum Ausgangspunkt.
• Mit Auto: Autobahn N1, Ausfahrt Lenzburg, über Wilklegg, Parkplatz gleich unterhalb Schümel; 3 Minuten zum Ausgangspunkt.

Unterstützt von:
Departement Bau, Verkehr und Umwelt
Holcim Ltd.
Aargauische Kantonalbank
Aargauische Kantonalbank

Steuerbegünstigte Spenden
Ihre Spende an die gemeinnützige Naturschutzstiftung Schümel können Sie in der Steuererklärung angeben.

Naturschutzgebiet Steinbruch Schümel Holderbank

Naturschutzgebiet Steinbruch Schümel Holderbank

www.schuemel-naturschutz.ch
Führungen: werner.heckendorn@bluewin.ch

LafargeHolcim Foundation for Sustainable Construction

“The LafargeHolcim Foundation for Sustainable Construction raises awareness of the important role that architecture, engineering, urban planning, and the building industry have in achieving a more sustainable future.”

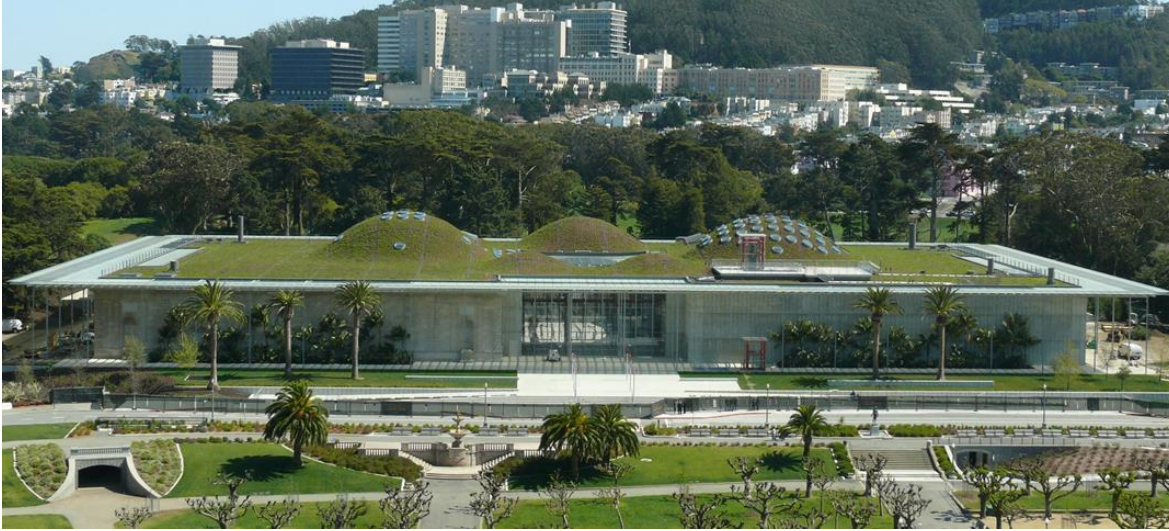
Mission of the Foundation: To select and support initiatives that combine sustainable construction solutions with architectural excellence and enhanced quality of life beyond technical solutions.

Award winning examples of Nature-based solutions

- 1) Urban flood protection infrastructure for Manhattan
- 2) Accessible water retention and treatment complex in Mexico City
- 3) Zero carbon emissions compostable structure in New York
- 4) New Sustainable California Academy of Sciences
- 6) Minimal-impact North Vancouver Outdoor School

<https://www.lafargeholcim-foundation.org/publications>

LafargeHolcim Foundation for Sustainable Construction: *Sustainable California Academy of Science*



The iconic building opened in 2008 is the largest public LEED Platinum-rated building in the world.

The project integrates concerns about sustainability and architectural design in the construction of a major public building.



This commitment to sustainability extends to all facets of the facility – from the bike racks and rechargeable vehicle stations outside the building, to the radiant sub-floor heating inside and energy-generating solar panels on top of the building.



LafargeHolcim Foundation for Sustainable Construction: *Urban flood protection infrastructure*



The Dryline (BIG U) addresses New York City's vulnerability to coastal flooding with a protective ribbon in Southern Manhattan.

The 12 km-long infrastructural barrier incorporates public space with the high-water barrier doubling as parks, seating, bicycle shelters or skateboard ramps.

Embankments add green areas and spaces beneath elevated roadways are built out with pavilions for public use. In an emergency, the shutters close forming a floodwater barrier.



Awards
Bronze 2015
Global



Awards
Silver 2014
North America

Annex

Madrid, Spain: *Building Spain's largest IKEA store through dialogue and innovation*

- Project
 - Ikea store's outdoor 10,000 m² parking lot
- Ikea's key requirements
 - Achieve optimal flatness and uniform thickness for the comfort of IKEA customers trying to navigate a busy parking lot while pushing carts loaded with bulky items
 - Guarantee maximum drainage capacity (400 liters per square meter per minute) to avoid rainwater accumulation
 - Resist heavy foot and vehicular traffic despite the holes in its surface
 - Honor IKEA's high aesthetic standards, which go above and beyond what might be expected for a parking lot
 - Be easily installed in less than 30 days
- Solution
 - Hydromedia™ permeable concrete with advanced drainage technology.
 - Combined Hydromedia™ with LH Infinicem ultra-fine cement, which offers a quicker setting time and higher resistance and durability.

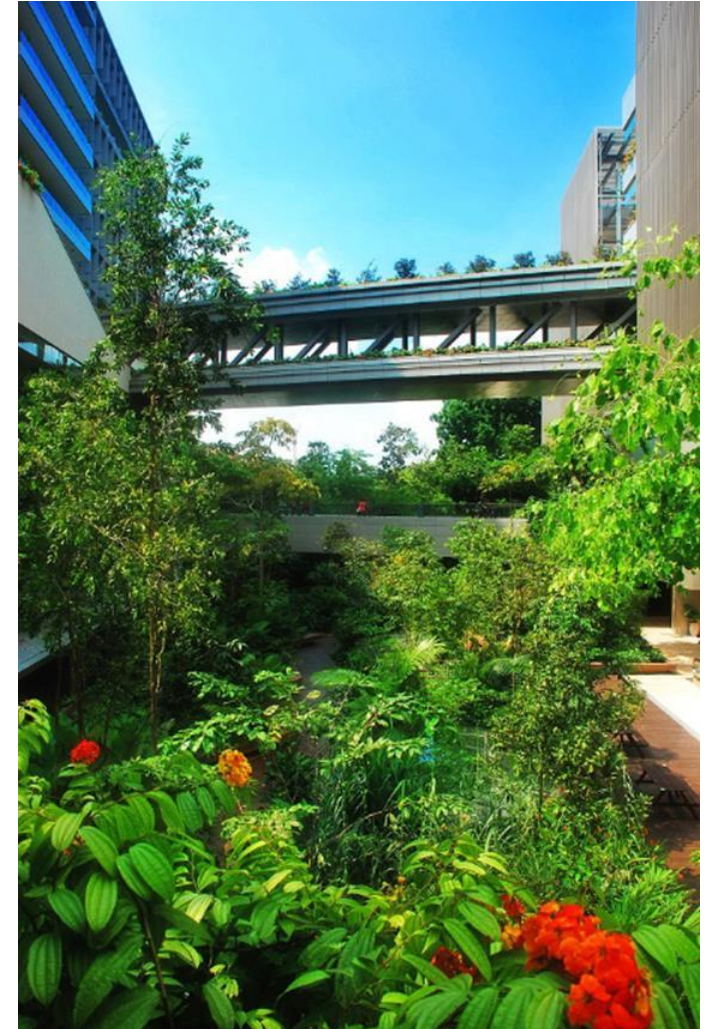


<https://www.lafargeholcim.com/lafargeholcim-builds-parking-lot-ikea-spain>

Singapore: *Khoo Teck Puat Hospital*

A healing environment through gardens

- Project
 - A 590-bed general acute care hospital serving the Northern Region of Singapore under the Alexandra Health System (AHS) cluster
- Healing environment
 - Sight, visual access to greenery and water;
 - Smell, selection of scented plants;
 - Sound of falling water;
 - Diversity of plants, birds and butterflies;
 - Community, public space situated within blue-green areas.
- Green plot ratio of KTPH – an indicator of how much greenery there is in a development – is 3.92; in other words, the total surface area of horizontal and vertical greenery combined is almost four times the size of the land that the hospital sits on



LH participation: [supplied concrete](#)