Presentation New SWP Members

2nd December 2020

SWISS WATER PARTNERSHIP

SWISS WATER PARTNERSHIP

Today's event

Presenters

Michael Szönyi
Flood Resilience Program Lead

Devi Bühler
Scientific Associate Ecological Engineering

Tatenda Lemann
Senior Research Scientist

Fabio Hüther
Founder

Prof. Dr. Michael Burkhardt
Institute Director UMTEC

Moderation **Marisa Ruoss**
Swiss Water Partnership

Support **Bernita Doornbos and Isabel Baier**
Swiss Water Partnership

Flood Resilience Alliance

Zurich Flood Resilience Alliance

Swiss Water Partnership – New Members Presentation
02 December 2020
Michael Szönyi – Flood Resilience Program Lead – Zurich Insurance Group

In partnership with:

CONCERN worldwide

IFRC

IIASA

ISET International

LSE The London School of Economics and Political Science

MERCY CORPS

PLAN INTERNATIONAL

Practical ACTION

ZURICH

Zurich Insurance Group

A global insurer

- A leading multi-line insurer serving its customers in global and local market
- Ca. 55,000 employees
- Range of property and casualty, and life insurance products and services in more than 215 countries and territories
- Zurich's customers include individuals, small businesses, and mid-sized and large companies, as well as multinational corporations

A Swiss history

- Founded in Zurich, Switzerland in 1872. Since then, we have been applying our expertise and experience so that our customers can have the very best protection for the things they value.
- Long track record working in the area of prevention and risk reduction

Photo: www.Zurich.com

The Alliance in words

“The Zurich Flood Resilience Alliance (‘Alliance’) is a multi-sectoral partnership focusing on finding practical ways to help communities in developed and developing countries strengthen their resilience to flood risk.”

Funded by the Z Zurich Foundation

The Alliance definition of resilience

“The ability of a system, community, or society to pursue its social, ecological, and economic development and growth objectives, while managing its disaster risk over time in a mutually reinforcing way.”

Vision

Floods have no negative impact on people’s and businesses’ ability to thrive.

North Star

To increase social, political and financial investment in community-based flood resilience-building through public, private and third sector partnerships.

In partnership with:

In partnership with 9 organizations, we run practical community programs on the ground to generate knowledge and leverage investment

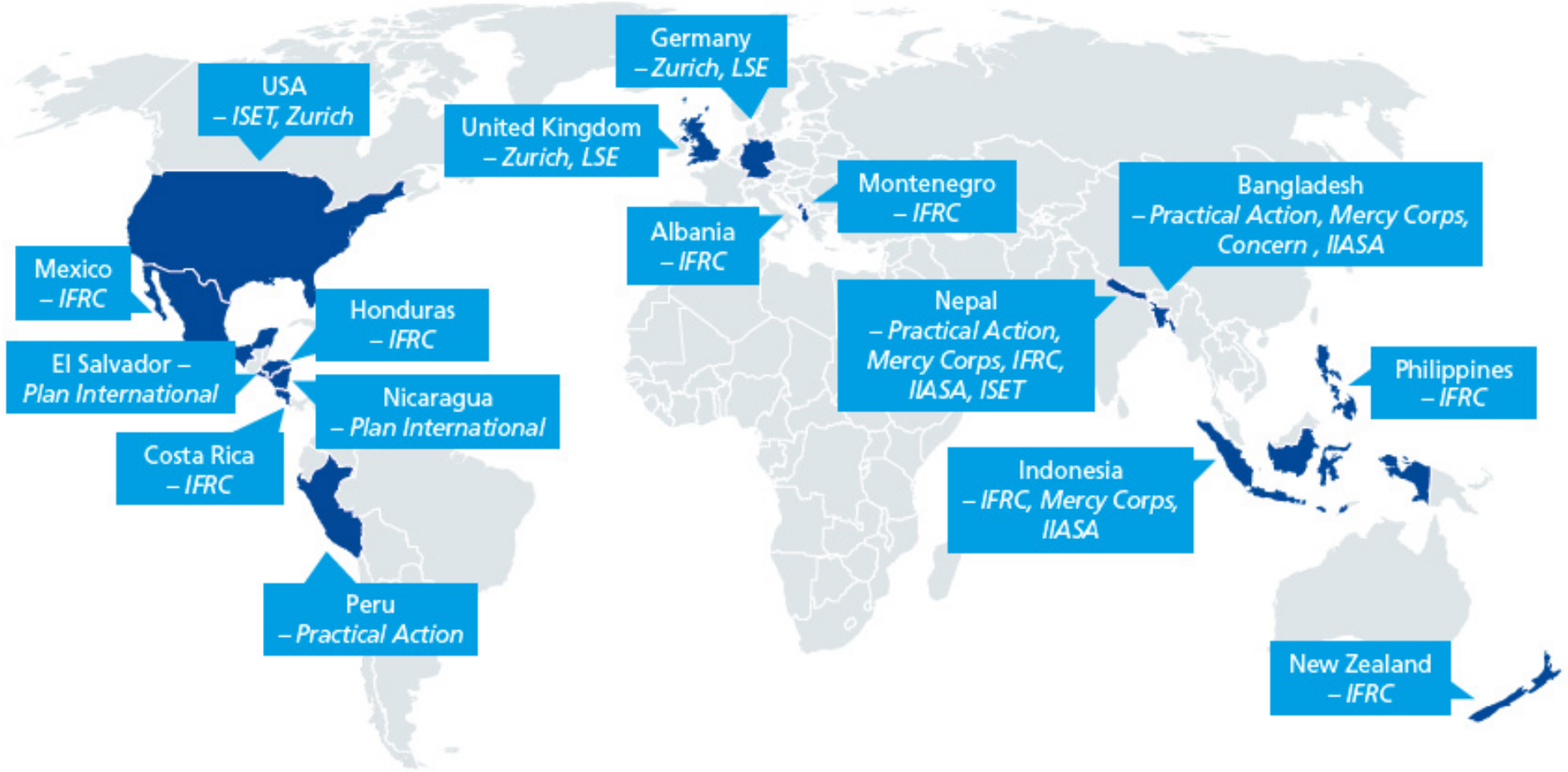
Concern worldwide · IFRC · International Institute for Applied Systems Analysis (IIASA) www.iiasa.ac.at · ISET International · LSE The London School of Economics and Political Science · Mercy Corps · Plan International · Practical Action · Zurich

Objective 1 Supporting the generation of USD 1 billion in additional funding for flood resilience

Objective 2 Policy at global, national and sub-national level is improved

Objective 3 Improve flood resilience practice, helping to make 2 million people more resilient to flooding (UNCAS commitment, 2019)

Program countries:
we work in both developing and developed countries



Map indicates community-based programs, post-event analysis (PERC), research studies and public policy advocacy.

Background (Phase 1: 2013-18; Phase 2: -2024

Beneficiaries:

225,000
+110,000

The total number of direct beneficiaries of the Alliance is approximately 225,000 in phase 1 and already 110,000 in phase 2.

FRMC:

The current version of the Flood Resilience Measurement for Communities has been used in over 110 communities in 13 programs within 9 countries. During its use over 1.25 million data points have been

Knowledge:

- **341 knowledge outputs from the alliance**
- **3 Flood Resilience Portals**
- **18 Post-Event Review Capability studies**

Advocacy:

- **Understanding Risk June 2014 – Launch of the Alliance**
- **Momentum for Change Award December 2014 – COP Peru**
- **Convergences Special Climate Prize in April / May 2015**
- **Practical Action / IFRC / Zurich side-event UNISDR Sendai December 2015**
- **UNISDR GPDRR May 2017 side-event Zurich / Practical Action / IIASA**

Q: Is the Zurich Flood Resilience Alliance considered as data generator?

A: **No!!** But consistent insights in program performance and resilience measurement and outcomes is an important component fully integrated into our programs

Academic collaboration

We work with academics

On strategic areas

- Global risk report (WEF annual reports)
- Climate change (e.g. 1.5° science-based targets; impact investment)
- Work sustainability (Agile protection research program with Oxford University)

To share and exchange knowledge and provide advice

- Gremiums, steering committees
- Advisory roles and knowledge sharing e.g. with H2020

In collaborative programs, e.g. Zurich Flood Resilience Alliance

- Flood resilience measurement: Learning and validation
- Pre-event resilience building: Economic cost/benefits and triple resilience dividend
- Role of insurance in disaster risk reduction, e.g. through Insurance Europe; Insurance Development Forum
- Compound risks; systems-thinking approaches, citizen science

Collaboration opportunities with SWP

Build a stronger DRR and integrated water-focused **position** across Switzerland

Lobby for adequate forward-looking and climate-change adaptation **advocacy focus** in relevant bodies in Switzerland, in Europe and world-wide

Network and exchange knowledge in wider water-related themes (we are flood focused); scale the **flood resilience measurement for communities** tool & framework

(…but we currently are not expanding the Alliance membership)

Role of the insurance industry – what Zurich is doing

As a donor / program supporter (Zurich Flood Resilience Alliance example):

- long-term, flexible, impact-oriented funding
- Active participation in a topic with skills and experience – provide systems-view for programming
- Advocate, work with other donors

As an investor (our Responsible Investment example):

- Resilience bonds – support development
- Increase participation as an impact investor and invest thematically, e.g. addressing water scarcity
- Divest from areas incompatible with SDGs

As an insurer (examples as part of our Sustainability Strategy):

- Committed to SDGs and 1.5° future
- Principles of ESG underwriting incl. water-relevant aspects (dam construction, mining) – working actively with our customers
- Support society to reduce total economic cost of risk beyond insurance transaction; knowledge-sharing

Flood Resilience Alliance

Any Questions?

In partnership with:

CONCERN worldwide

IFRC

IIASA

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LSE The London School of Economics and Political Science

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Disclaimer

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Institute of Natural Resource Sciences

Zurich University
of Applied Sciences

zh
aw

Swiss Water Partnership

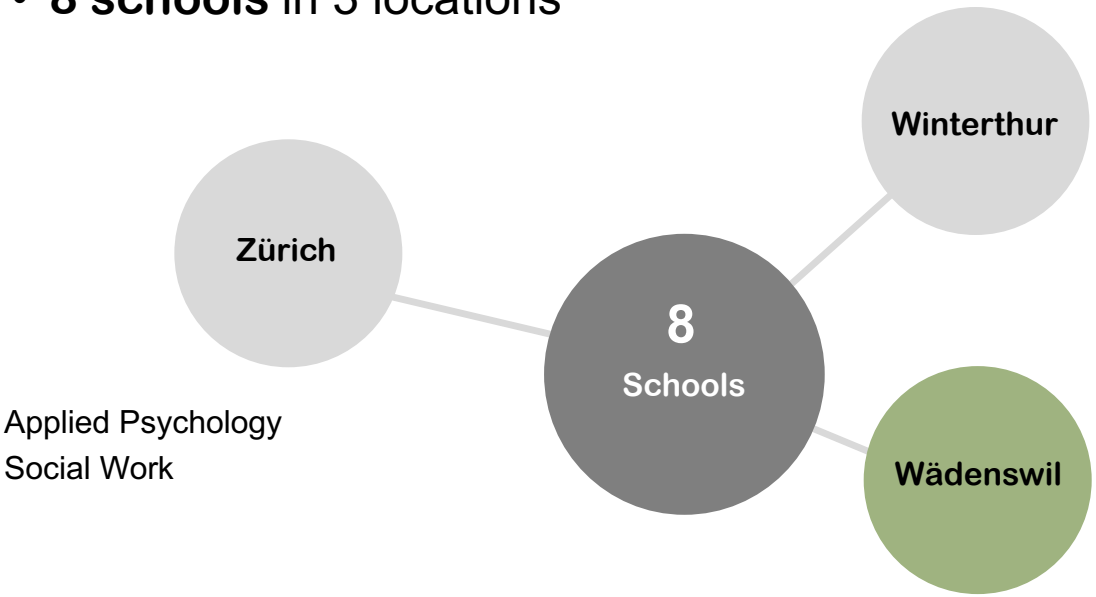
2 December 2020

Devi Bühler
devi.buehler@zhaw.ch

The ZHAW in numbers

ZHAW Zurich University of Applied Sciences

- Part of the **Zurich Universities of Applied Sciences and Arts**
- **13 000 students** (Bachelors and Masters)
- **3000 staff members**
- **8 schools** in 3 locations



Health Professions
Applied Linguistics
School of Engineering
School of Management and Law
Architecture, Design and Civil Engineering

Applied Psychology
Social Work

Life Sciences und Facility Management

School
Life Sciences und Facility Management (LSFM)

Locations

- Wädenswil
- Zürich (Technopark)
- Wergenstein

Degree programmes and continuing education

- **5 Bachelor's degree programmes**
- **3 Master's degree programmes**
- A wide range of continuing education, courses and conferences

Institutes in the LSFM School

Chemistry and Biotechnology

Food and Beverage Innovations

Natural Resource Sciences

Facility Management

Applied Simulation

Institute of Natural Resource Sciences

- **Bachelor's degree programme** in Natural Resource Sciences
- **Master's degree programme** in Environment and Natural Resources
- **Continuing education** for professionals (many MAS and CAS courses) and organisation of conferences
- **Research and services**

Facts and figures (as of December 2018)

602 **BSc students**
85 **MSc students**
1070 **participants in continuing education**
(CAS courses, training courses, conferences)

200 **staff members**

300 on going **projects** in R&D / Services

26 million
in proceeds

As pioneers for sustainable solutions, we…

... focus on **interdisciplinary, socially relevant issues;**

... work in a **science-based** and **practice-oriented** way;

... exercise a variety of **disciplines and topics** at the institute;

... seek **cooperation** with partners from **research, industry and administration** bodies;

... are the **first faculty at a university of applied sciences** to produce a **sustainability report.**

Degree programmes

BSc in Natural Resource Sciences

Focus

Professional qualification for the environmental sector

5 Specialisations (Majors)

- Organic Agriculture and Horticulture
- Renewable Energies and Ecological Engineering
- Nature Management
- Environmental Systems and Sustainable Development
- Urban Ecosystems

Supplementary qualifications (Minors)

Species Knowledge and Identification, Education and Consulting, Field Diagnostics and Analysis, Life Cycle Assessment and Labelmanagement, Profile International

Duration

6 semesters

Degree

Bachelor of Science ZFH in Natural Resource Sciences

MSc in Environment and Natural Resources

Focus

- Interdisciplinary skills and applied research
- Extending expertise and knowledge of methods as well as improving scientific competences

Master's Research Units

Agrofoodsystems, Biodiversity & Ecosystems, Ecological Engineering

Duration

3 semesters (full-time), part-time study possible

Degree

Master of Science (MSc) ZFH in Environment and Natural Resources

Optional

Double Degree with the University of Ljubljana, Slovenia as Master of Science (MSc) in Water Science and Environmental Engineering

Internationality at IUNR

- Student exchange programmes (**SEMP, Bilateral or Free Mover**) in more than 60 partner universities in Europe and worldwide
- Wide range of **modules taught in English** each spring semester (4^{th} semester BSc; 2^{nd} Semester MSc)
- BSc or MSc − **thesis abroad**
- **Double Degree** with the University of Ljubljana, Slovenia
- **Minor International Profile**
- **Summer Schools** in different countries
- **Language courses** in home country

Further information at **www.zhaw.ch/en/lsfm/study/international**
Contact and registration:
yvonne.christ@zhaw.ch
elena.rios@zhaw.ch


Continuing Education

Continuing Education

The six research units within the Institute offer a wide range of topics:

- **Training course certificates (MAS und CAS)**
  Topics: Species knowledge and identification Environment and environmental education, Nutrition and food production
- **Continuing education, courses and conferences**
  Course range from Aquaculture to Horticulture and from «Skyfood» to Roof Greening


Research

Our focus: The interfaces between society, environment and technology

Menu Sustainability Index

Society

Environment

TubeCam

Sustainable floodplain management and hydro-power

Technology

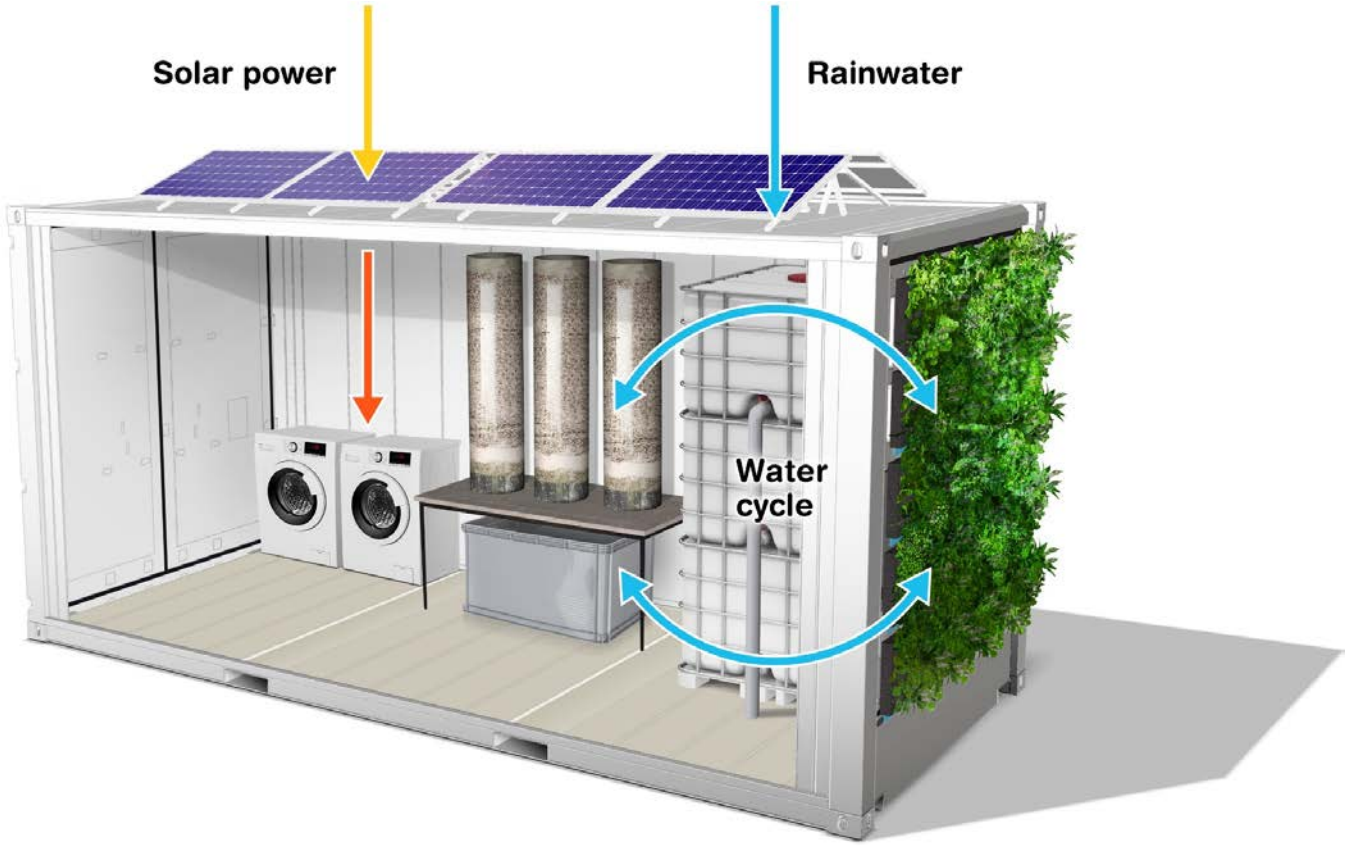
Main research areas

- **Ecological Engineering**
- Integrative Ecology
- Organic Ariculture
- Sustainability Transformation
- Tourism and Sustainable Development
- Urban Ecosystems

Ecological Engineering

- It's all about closing water and nutrient cycles!
- Decentralizes closed loop systems
- New value chains (circular economy)

Project LaundReCycle



Project LaundReCycle

Technical concept:

- Water and energy self-sufficient Laundromat
- No need of direct freshwater, sewer or grid connection
- Low-tech approach, use of natural processes
- Water treatment based on wetland technology
- Water re-use within the system “closed-loop system”
- Rainwater collection
- Stand-alone photovoltaic system for electricity supply

Implementation:

- Prototype on ZHAW Campus (2019/2020)
- Pilot plant in Cape Town (2021)
- Further development towards a marketable solution in South Africa (2022)

Prototype on ZHAW Campus Grüental

Prototype on ZHAW Campus Grüental

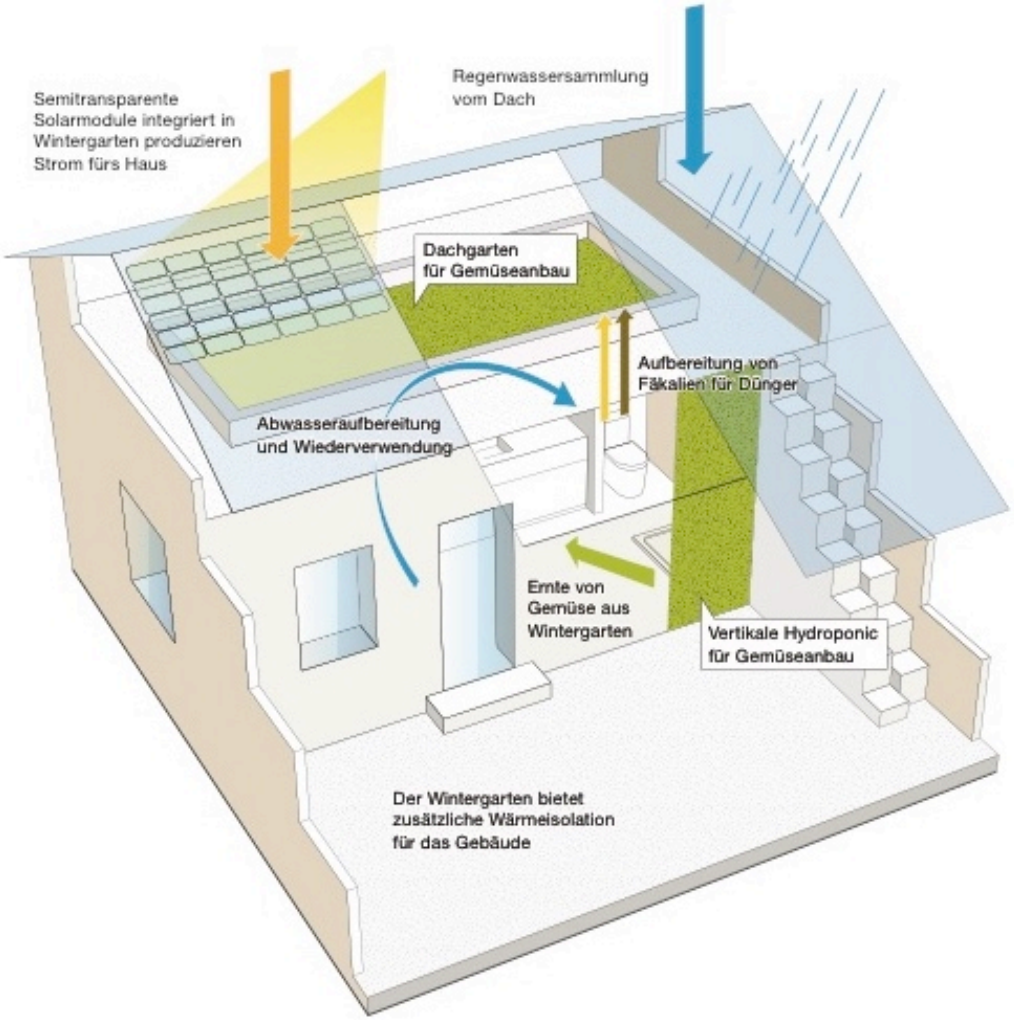
Pilot plant in Cape Town

Pilot plant in Cape Town

Project KREIS House

KREIS House =
Klima- und Ressourceneffizientes Suffizienz Haus (German)

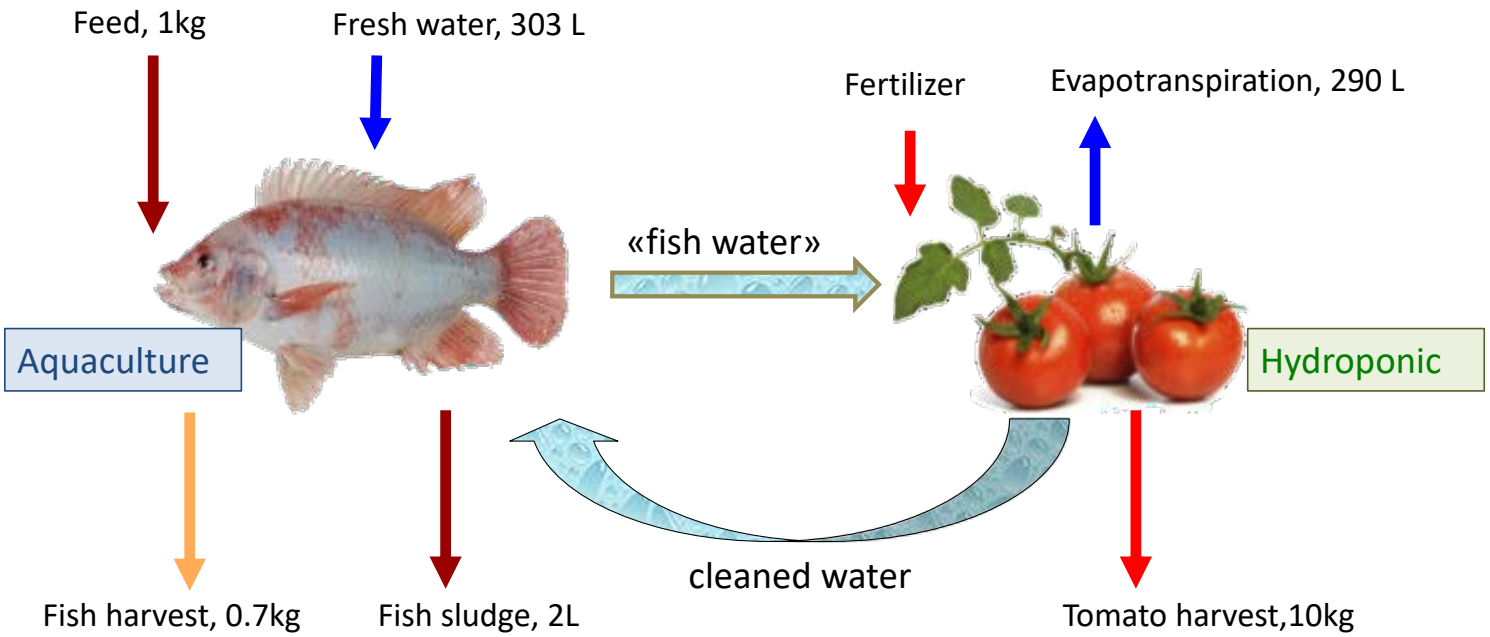
English:
climate and resource efficient sufficiency house



Activities in KREIS House

- Testing of new technologies in practice → support development and uptake in market
- Awareness-raising through:
    - Overnight stays for visitors
    - Didactic guided tours for groups
- Research on user behaviour and acceptance regarding water reuse and sustainable building

Aquaponics



BENEFITS

- ✓ Nutrient and water efficient technology
- ✓ Space-saving cultivation
- ✓ Combined fish and crop production

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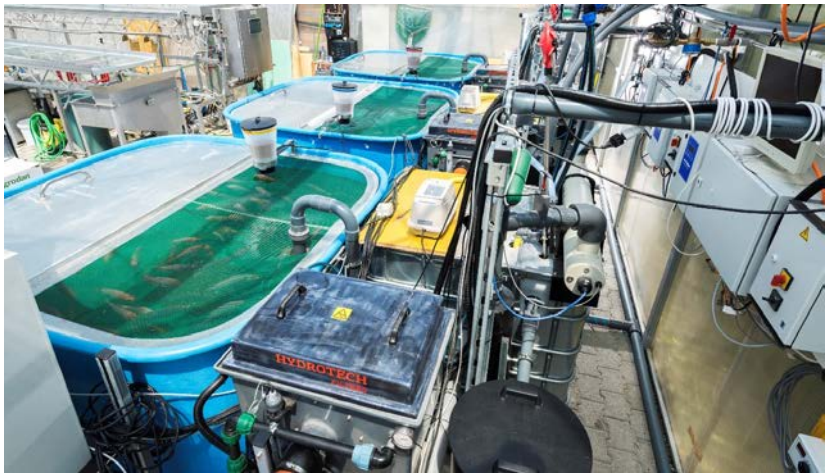
Life Sciences and
Facility Management

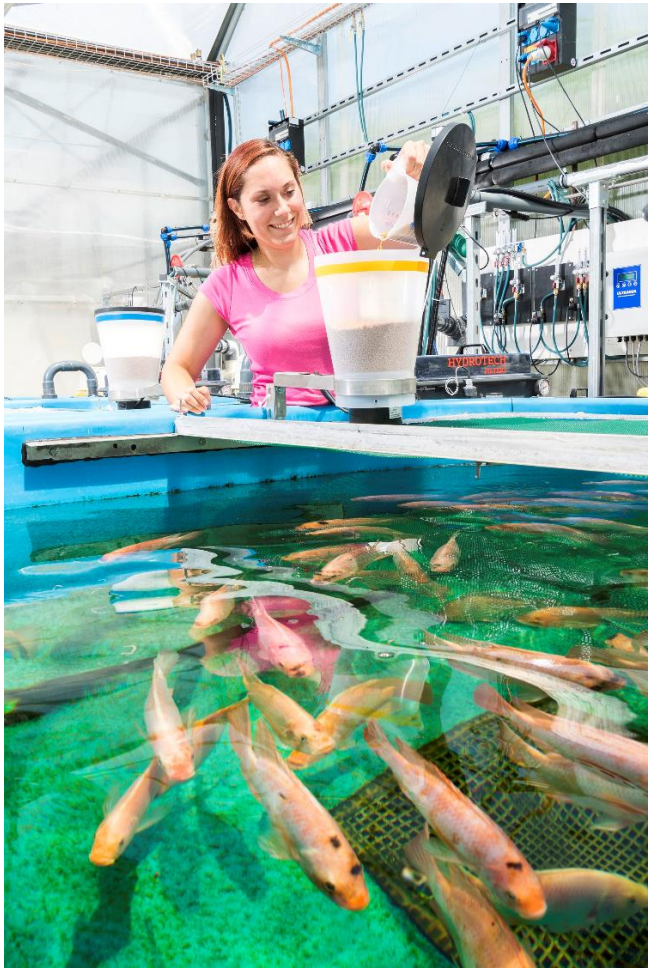
Institute of
Natural Resource Sciences

Aquaponic Demonstration Facility

Aquaponic Lab

3 separate systems as experimental setup



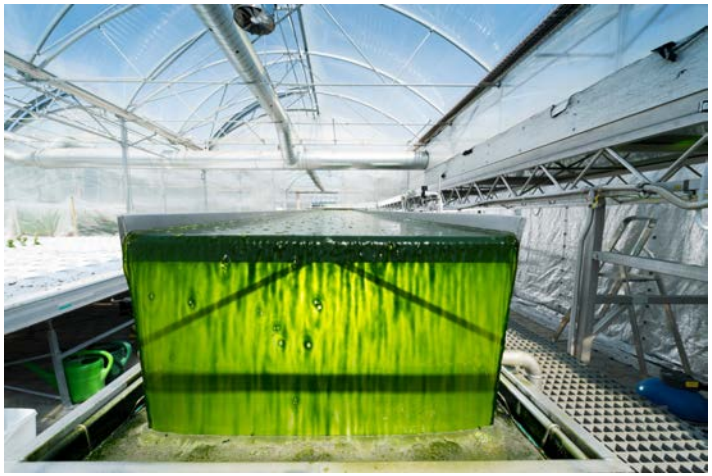


Aquaculture

Sustainable fish production in recirculating aquaculture systems

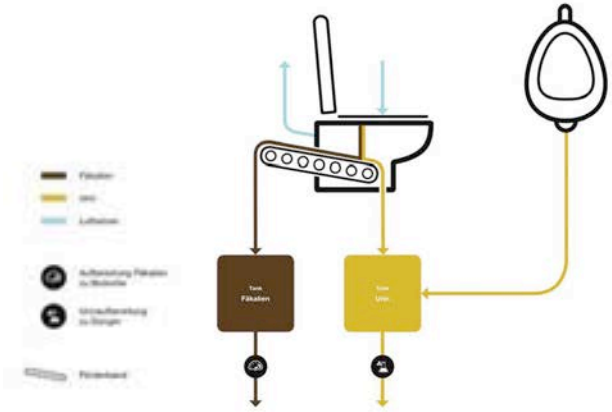
Microalgae

- Microalgae for fish feed
- Nutrient recovery from wastewater
- Bioplastic from microalgae
- Production in photobioreactor (open race track)



Dry toilet and pyrolysis

- Production of biochar from faeces
- Use as soil fertilizer



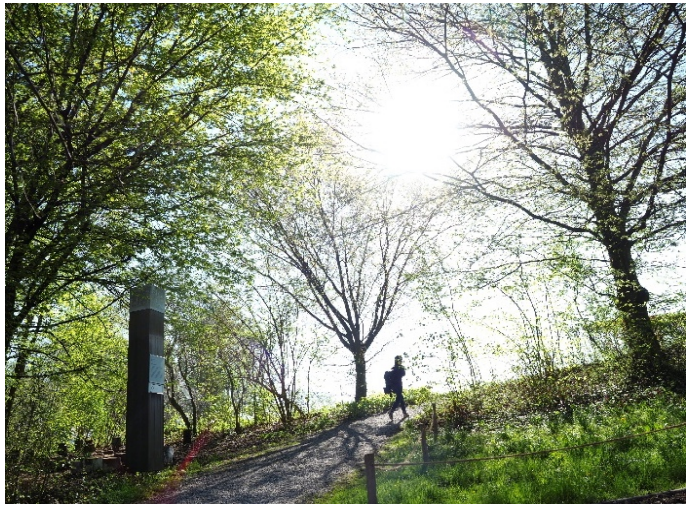
Collaboration Swiss Water Partnership

- Implementation of ”circular” solutions in practice
- Engage in multi-stakeholder approaches
- Joint research activities
- Joint communication and awareness-raising on water issues, co-organization of events
- Establish partnerships in international development cooperation
- Exchange of knowledge and experiences


Welcome to the
Grüental gardens
Schweizer Zuchtlin

The Grüental gardens

- **Unique location** with a view of Lake Zurich
- Varied gardens with over **4000 different types of plants**
- Topics are closely connected to research and study in the institute



Highlights include:

- **Grassland**: addresses the importance of the grass for our society and the difficulty of sustainable food and raw materials production
- **Display gardens**: biodiversity which you can reach out and touch
- **Medicinal plant garden**: displays the use of medicinal plants – for anyone who is interested and for those working with medicinal plants


See you…
…on Campus Grüental

Centre for Development and Environment CDE University of Bern

UNIVERSITÄT BERN

CDE
CENTRE FOR DEVELOPMENT AND ENVIRONMENT

New SWP Members Presentation, 02.12.2020

Tatenda Lemann

Knowledge for sustainable development

CDE’s overarching goal is to produce and share knowledge for sustainable development in cooperation with partners in the global North and South

CDE facts and figures

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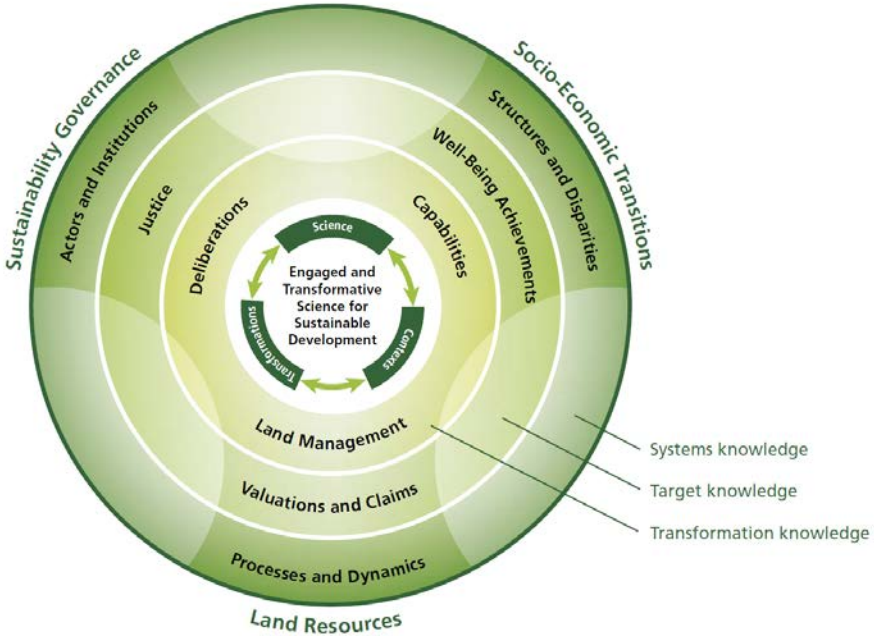
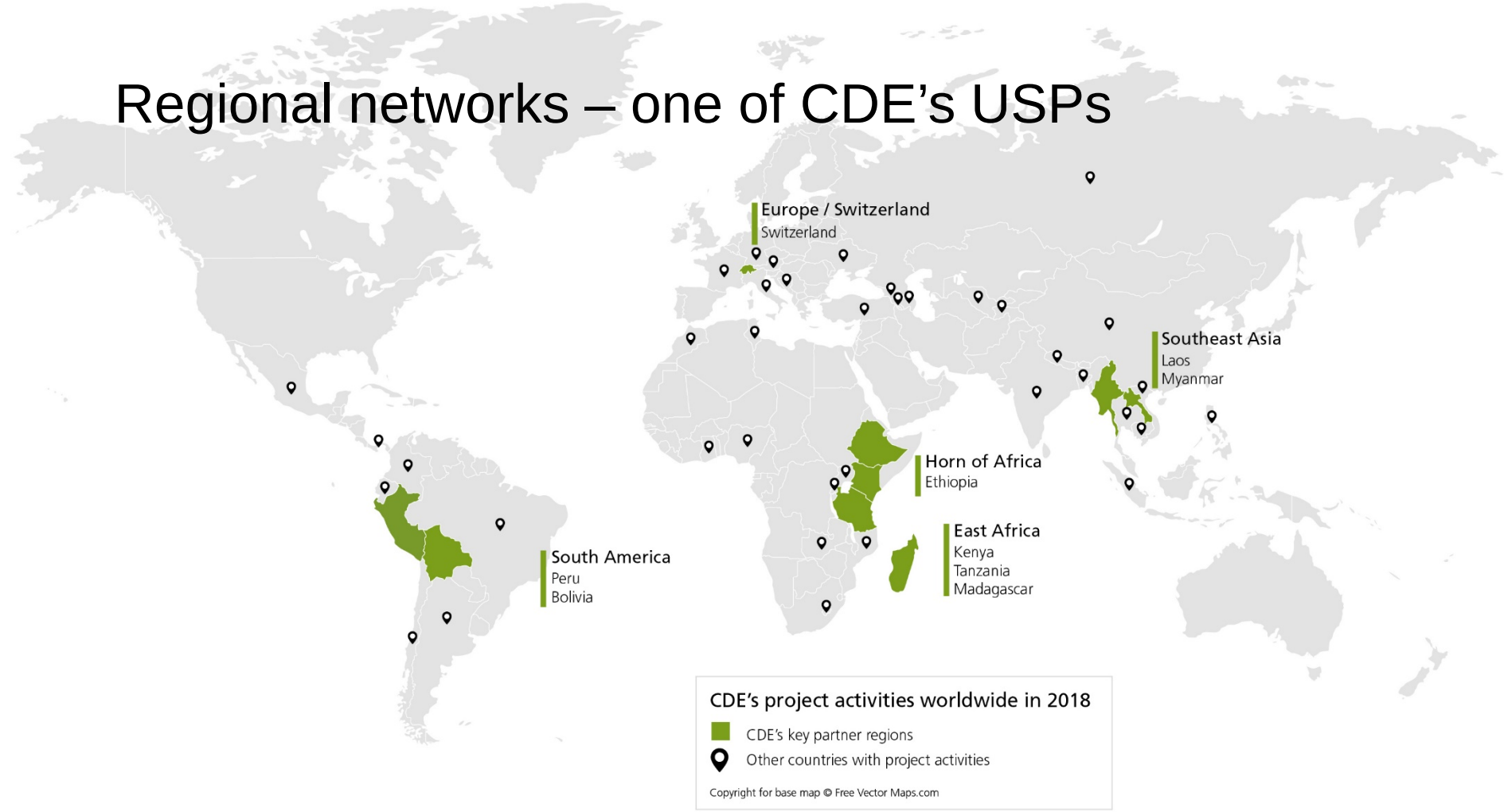


4 Thematic Clusters - 1 Service Unit

Staff members*	100 from around 25 disciplines
Ongoing projects*	79
Regions	activities in 40 countries 5 key regions
Courses in study	BSc Minor in SD MSc Minor in SD PhD Programme: IGS North-South CAS in SD

*As at 31 December 2019

Regional networks – one of CDE's USPs



Regional Networks: Ethiopia

Water and Land Resource Centre (WLRC)

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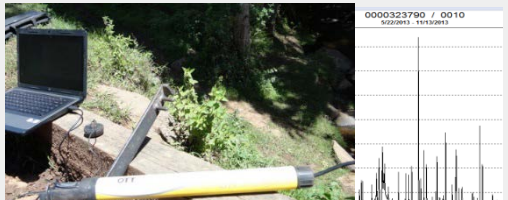
Knowledge generation	Making co-produced knowledge available and establishing dialogue	Creating awareness and strategic partnerships
• Increasing availability of data through co-production • Continous monitoring and assessment of ecological processes and socio-economic dynamics	• Making knowledge available through web-platforms • Establishing dialogue at the local level and empowering local stakeholders • Establishing dialogue and collaboration across sectors; empowering decision-makers	• Creating awareness and building capacities • Improving governance and social/institutional development • Strenthening strategic partnerships and opening new fronts of research collaboration



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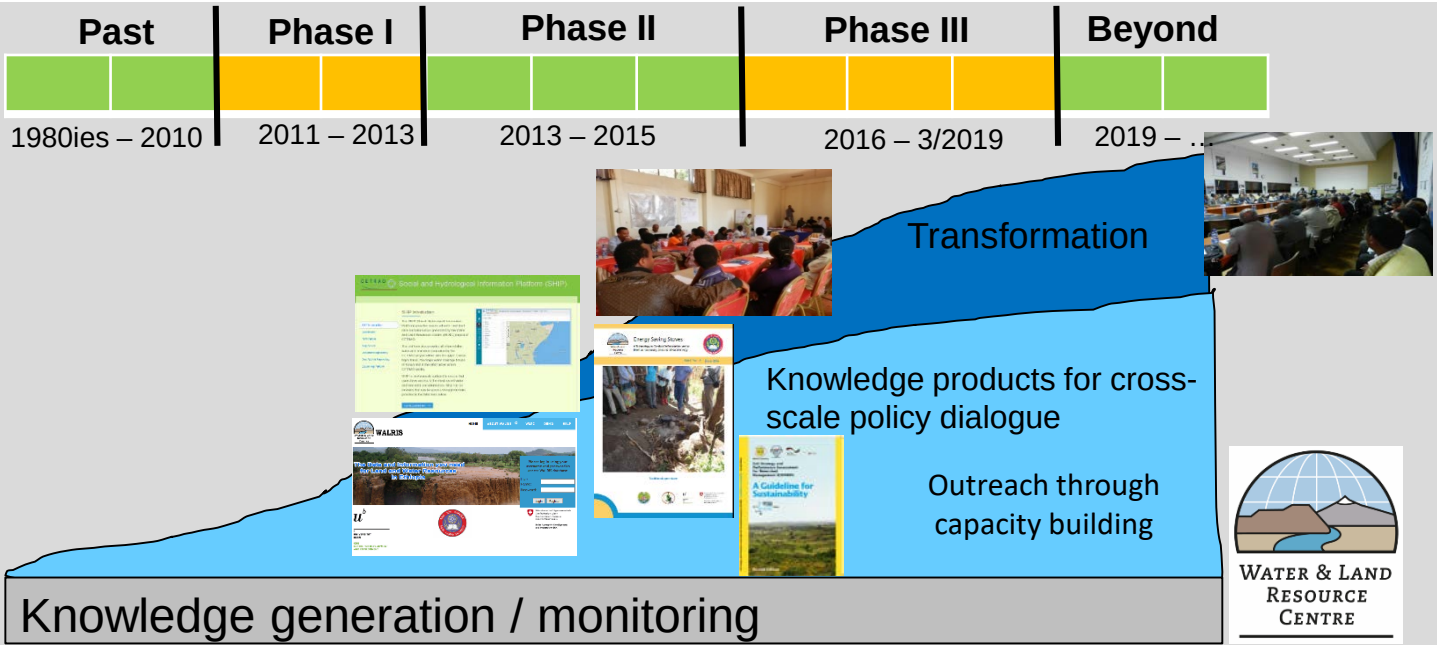

Thematic Cluster: Land resources

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- Local land system change as a cause and consequence of globalized decisions
- Assessment and valuation of ecosystem services
- Land management that benefits natural resources and ecosystem services
- Decision support for scaling out sustainable land management

Thematic Cluster: Socio-economic transitions

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- Concepts of poverty, inequality, and well-being
- Appraisal and diffusion of social and technological innovations
- Sustainable and equitable production and consumption patterns
- Knowledge-sharing tools for alternative development pathways

Thematic Cluster: Sustainability Governance

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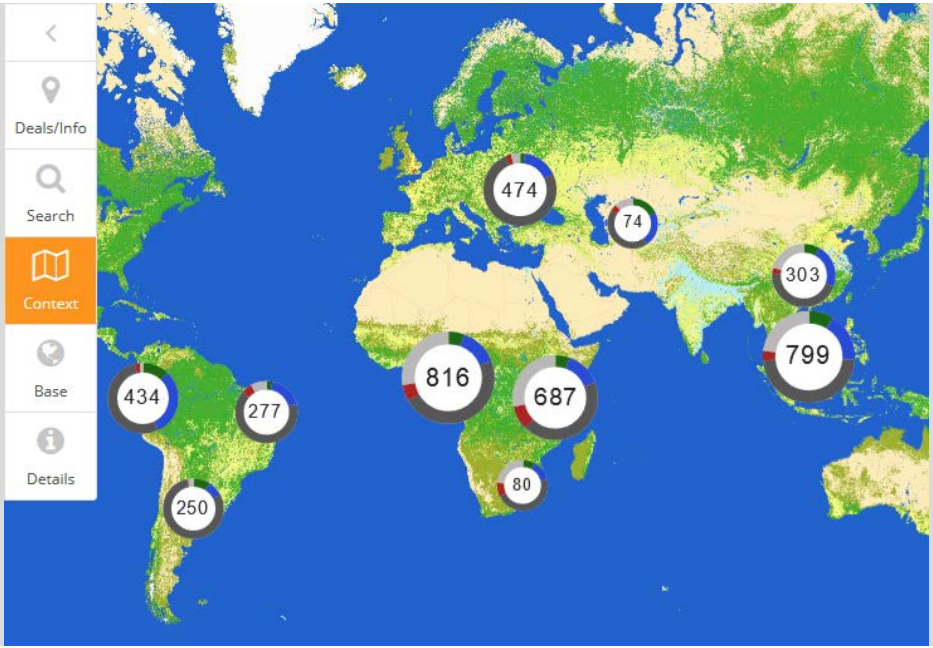

- Actors and institutions in rural change processes
- Governance of competing claims on natural resources
- Policy coherence for sustainable development and environmental justice
- Transdisciplinary knowledge co-production and deliberations

Thematic Cluster: Education for Sustainable Development

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- Presidency of COPERNICUS Alliance
- Curricula and courses to build **knowledge** and foster **skills relevant to sustainable development** among students.
- Support for lecturers who **integrate sustainable development into teaching**
- **Research** into education for sustainable development
- CDE's ongoing research findings as source of first-hand insights conveyed in our courses.

Thematic Cluster: Education for Sustainable Development

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Courses in study

- BSc Minor in Sustainable Development
- MSc Minor in Sustainable Development
- PhD Programme: IGS North-South
  CAS in Sustainable Development

Number of students*

- BSc: 402 from 21 disciplines
- MSc: 51 from 11 disciplines
- IGS North-South: 121 in total, including 37 enrolled at international partner institutions and 44 enrolled at the University of Bern

*As at 31 December 2019

CDE knwoledge hubs

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- **Global Land Programme**
- **Land Matrix**
- **Mountain Research Initiative**
- **OneMap Myanmar**
- **TABI - The Agrobiodiversity Initiative**
- **The Lao DECIDE Info Project**
- **WOCAT**
- **Water and Land Resource Project**

World Overview of Conservation Approaches and Technologies (WOCAT)

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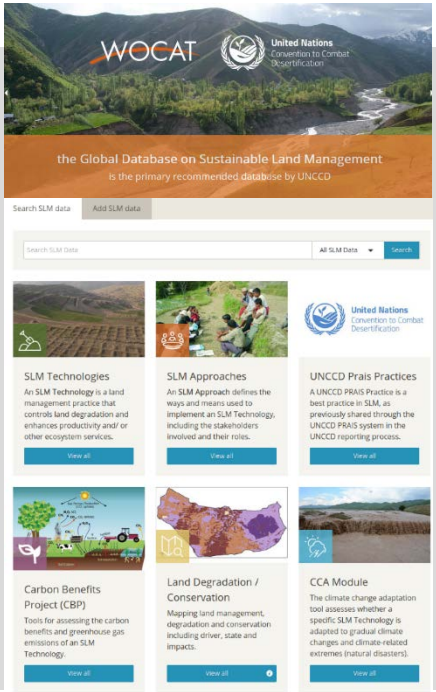
The **World Overview of Conservation Approaches and Technologies (WOCAT**) is a global network on Sustainable Land Management (SLM) that promotes the documentation, sharing and use of knowledge to support adaptation, innovation and decision-making in SLM.

The WOCAT global SLM database is **the primary recommended database by the UNCCD** for the reporting of SLM best practices.



World Overview of Conservation Approaches and Technologies (WOCAT)

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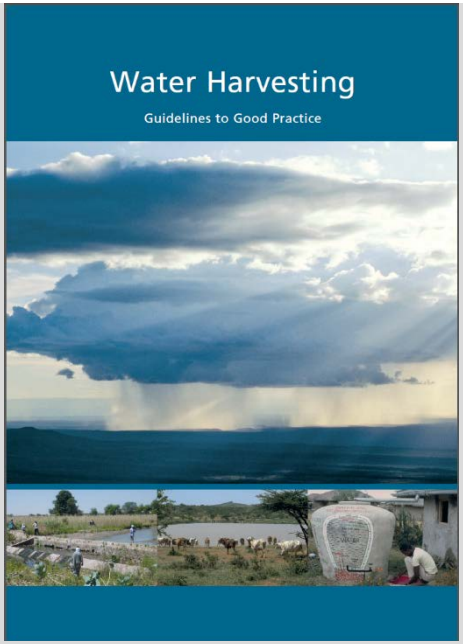

Introduces the concepts behind water harvesting and proposes a harmonised classification system.

Gives an overview of 4 **water harvesting groups** with a selection of good practices presented in the systematic, consistent and standardised WOCAT format.

WOCAT
World Overview of Conservation Approaches and Technologies

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META

RAIN

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

IFAD
Enabling poor rural people to overcome poverty

World Overview of Conservation Approaches and Technologies (WOCAT)

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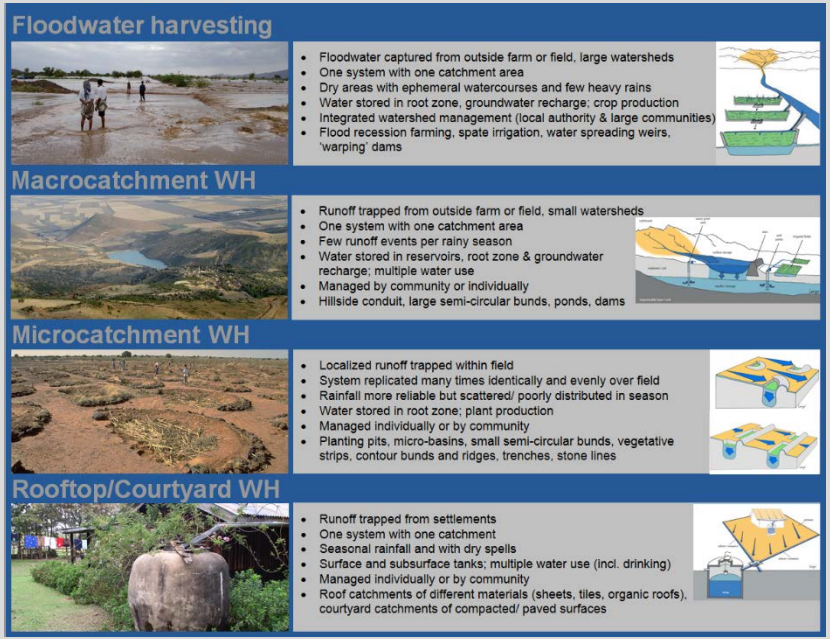
CDE CENTRE FOR DEVELOPMENT AND ENVIRONMENT



Highlights

- Rainwater harvesting can be an important strategy to increase crop yield sustainably, especially in marginal areas of the world
- Researchers identify 167 examples of successful water harvesting across the world (WOCAT database)
- All cases helped define six “archetypes” crucial for successful water harvesting

Thank you!

Contact: tatenda.lemann@cde.unibe.ch

EVODROP
we are water

www.evodrop.com

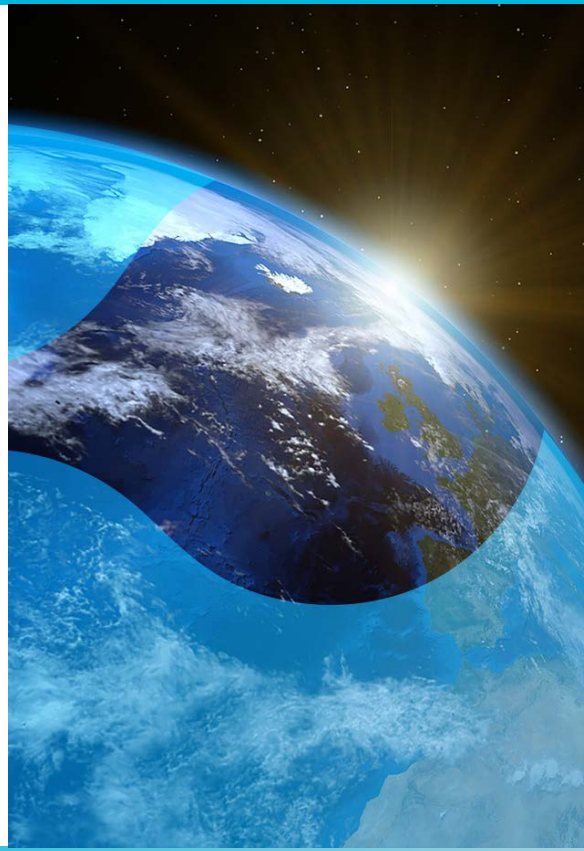
WATER

The blue gold of the 21st century

Discover the unimagined potential of innovative
and effective water treatment

Our Mission

CLEAN AND IDEAL WATER FOR EVERYONE AND EVERYWHERE!



What makes water unhealthy?

pollutants and foreign substances

Intensive agriculture

Bad bioavailability

Lie about the minerals in water

EVOdrink

A DRINKING WATER FILTER CLEANS UP

OUR PRODUCTS

- ✓ The proven best reverse osmosis membrane in the world
- ✓ Patented membrane technology
- ✓ Interest on the part of Miele and Nestle in purchasing the membrane
- ✓ Own production and Swiss Made
- ✓ Scientific evidence on the effectiveness of the membrane

EVOdrink

A DRINKING WATER FILTER CLEANS UP

OUR PRODUCTS

Microplastics, pesticides,
hormones & heavy metals

ium

EVOdrink filtration

Water

EVOcharge

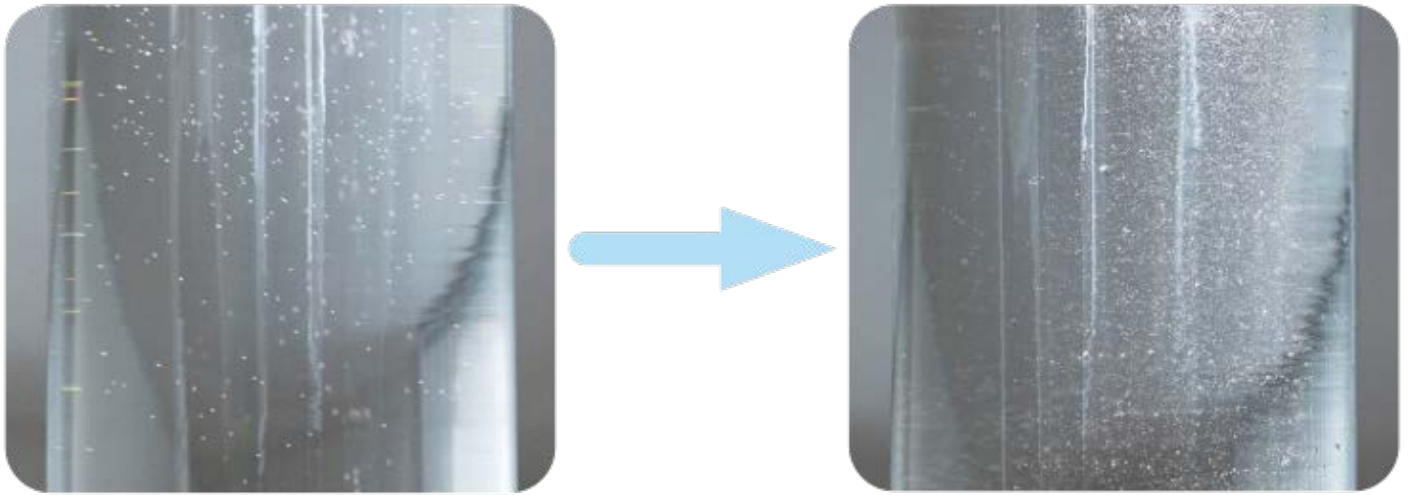
THE REFINER FOR HIGHEST CELL AVAILABILITY

OUR PRODUCTS

- ✓ Patented rotation process with unique design and functional principle
- ✓ Proven to prevent tumour formation
- ✓ Proven to be significantly better and healthier than any Swiss mountain spring water
- ✓ Completely service and maintenance-free
- ✓ The scientifically best structured water worldwide with up to 50% higher cell availability

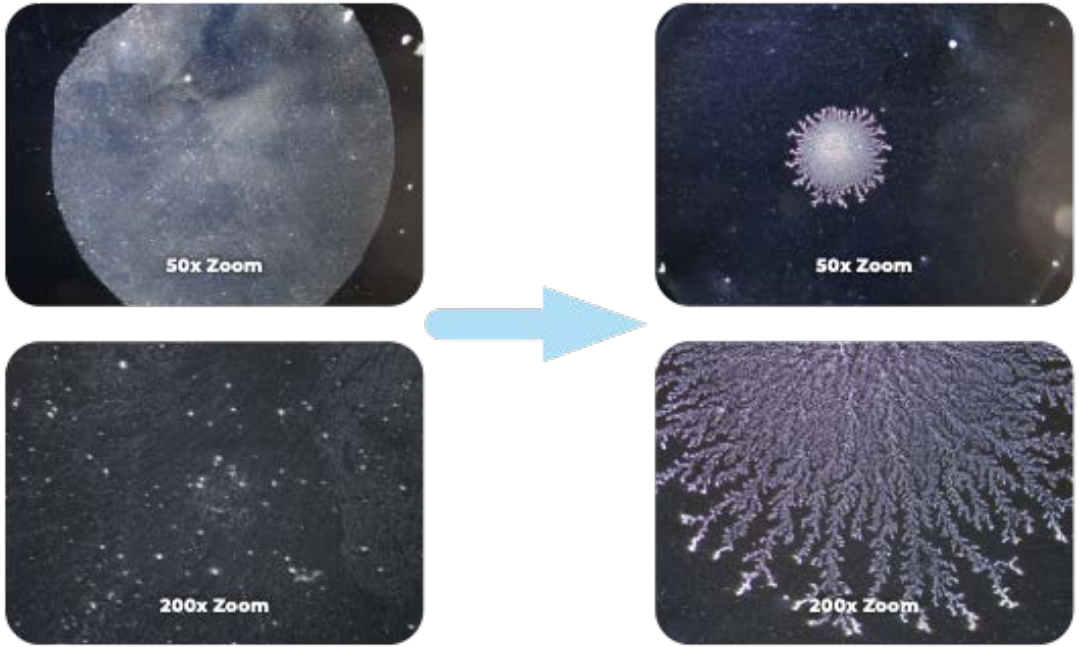
EVOcharge

THE REFINER FOR HIGHEST CELL AVAILABILITY



EVOcharge

THE REFINER FOR HIGHEST CELL AVAILABILITY



EVObooster

FULL POWER THANKS TO MOLECULAR HYDROGEN

OUR PRODUCTS

- ✓ Patented procedure with safe technology without side effects
- ✓ Proven to promote health with over 400 studies worldwide
- ✓ Low maintenance and easy to operate
- ✓ Already in use at two Swiss professional clubs

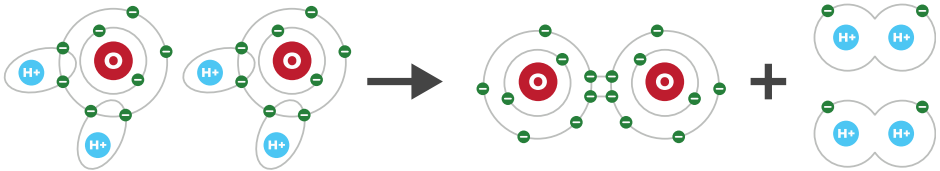
EVObooster

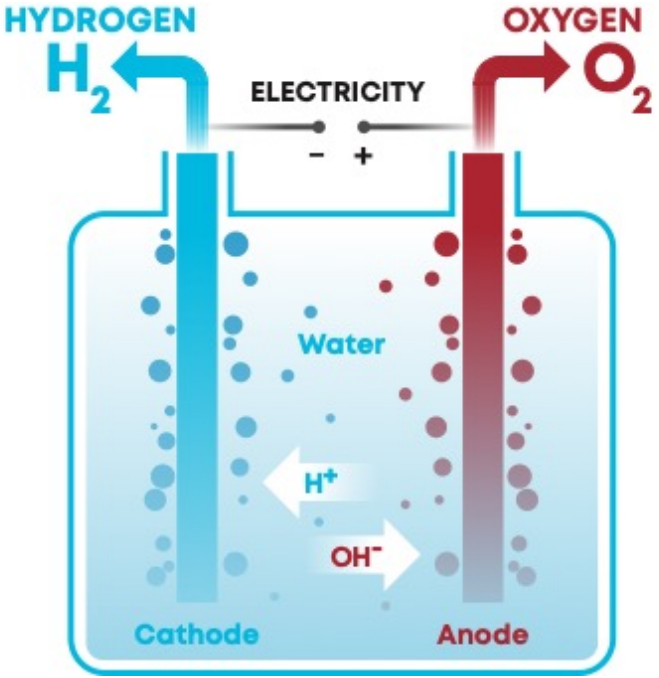
OUR PRODUCTS

FULL POWER THANKS TO MOLECULAR HYDROGEN

The overall reaction is here:

$2H_2O = O_2 + 2H_2$

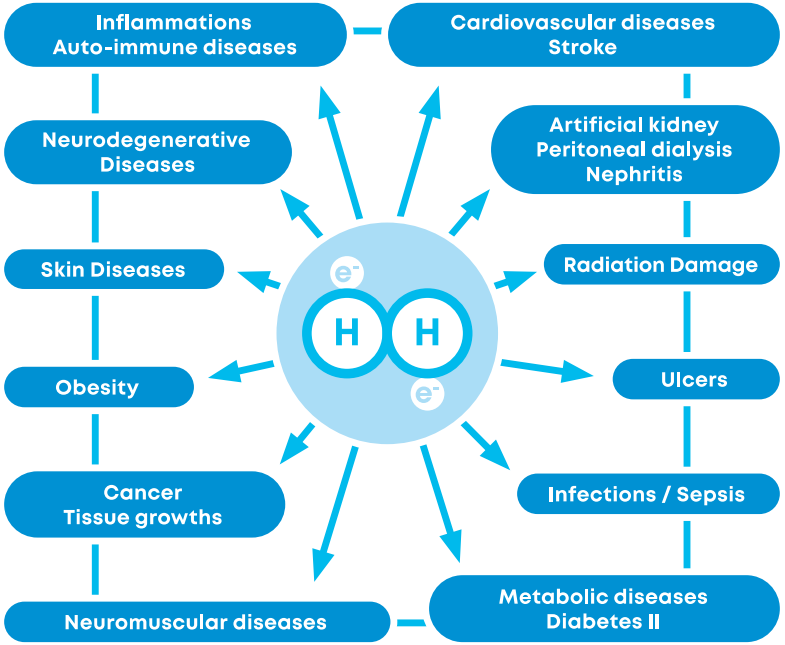




EVObooster

OUR PRODUCTS

FULL POWER THANKS TO MOLECULAR HYDROGEN



EVOadsorb

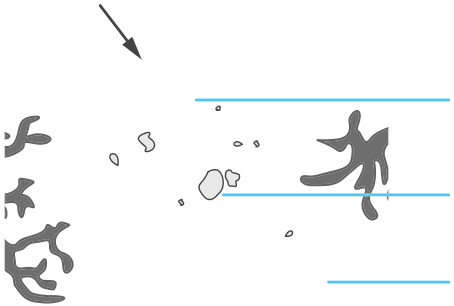
EFFECTIVE FILTRATION AND LIME TREATMENT

OUR PRODUCTS

- ✓ Specially developed adsorption material
- ✓ Filtering without flow or pressure loss
- ✓ Tested and certified by SGS (the largest testing laboratory in the world)
- ✓ Freely scalable for any project size
- ✓ Versatile in use

EVOadsorb

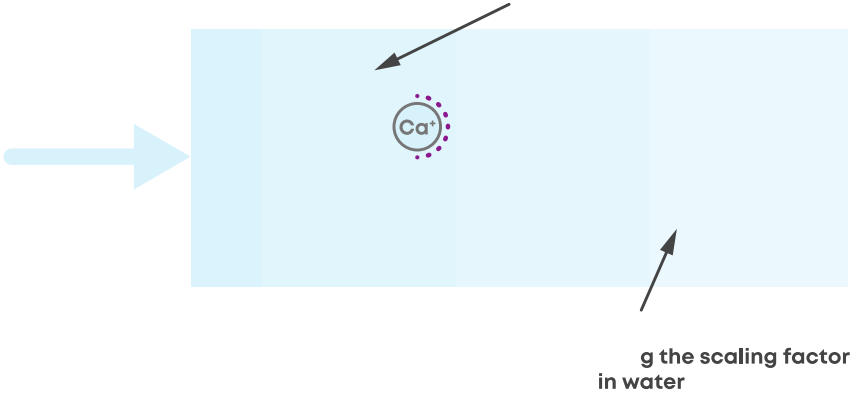
EFFECTIVE FILTRATION AND LIME TREATMENT



EVOadsorb

EFFECTIVE FILTRATION AND LIME TREATMENT

OUR PRODUCTS



EVOtransform

OUR ANSWER TO CONVENTIONAL WATER SOFTENING UNITS

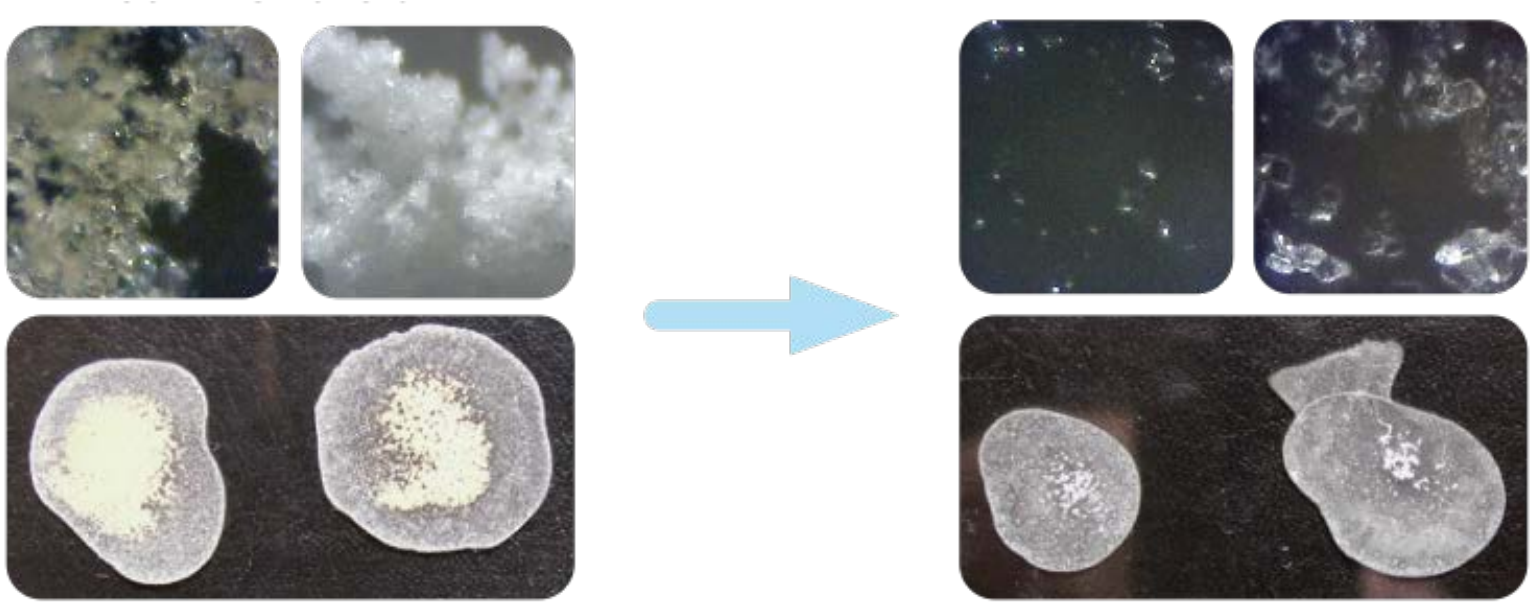
OUR PRODUCTS

- ✓ **Patented rotation process with unique design and functional principle**
- ✓ **Proven effects tested by independent laboratories and institutes**
- ✓ **Completely service- and maintenance-free thanks to purely physical operating principle**

EVOtransform

OUR PRODUCTS

OUR ANSWER TO CONVENTIONAL WATER SOFTENING UNITS



EVOagri

HEALTHY AND SUSTAINABLE PLANT GROWTH

OUR PRODUCTS

- ✓ Treatment of salt water for irrigation of plants and trees
- ✓ Healthy for people and the environment
- ✓ Enables the complete elimination of pesticides, fungicides and bactericides through the use of colloids in the nano range
- ✓ Up to 50% fertilizer savings
- ✓ Up to 20% water saving
- ✓ The accumulation of water molecules on dissolved ions (hydration) accelerates coagulation

EVOagri

HEALTHY AND SUSTAINABLE PLANT GROWTH

OUR PRODUCTS

EVOagri

HEALTHY AND SUSTAINABLE PLANT GROWTH

20
HILFSPROJEKTE WELTWEIT

9’800
MENSCHEN MIT SAUBEREM WASSER VERSORGT

82’000
GEPFLANZTE BÄUME PRO JAHR

1’787’600 KG
KOMPENSIERTES CO^2

35 LITER
GESAMMELTER ABFALL IN DER WOCHE

WWW.UMUNTUMOVEMENT.COM


Umuntu
ADEN COMMUNITY WATER PROJECT
SOLAR - POWERED BOREHOLE
In Partnership with
UMUNTU MOVEMENT, SWITZERLAND
www.umuntu.ch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movement
DRCONGO


Umuntu


MATTLAWIE ECOLOGICAL REGENERATIVE CENTER
Umuntu
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GHANA
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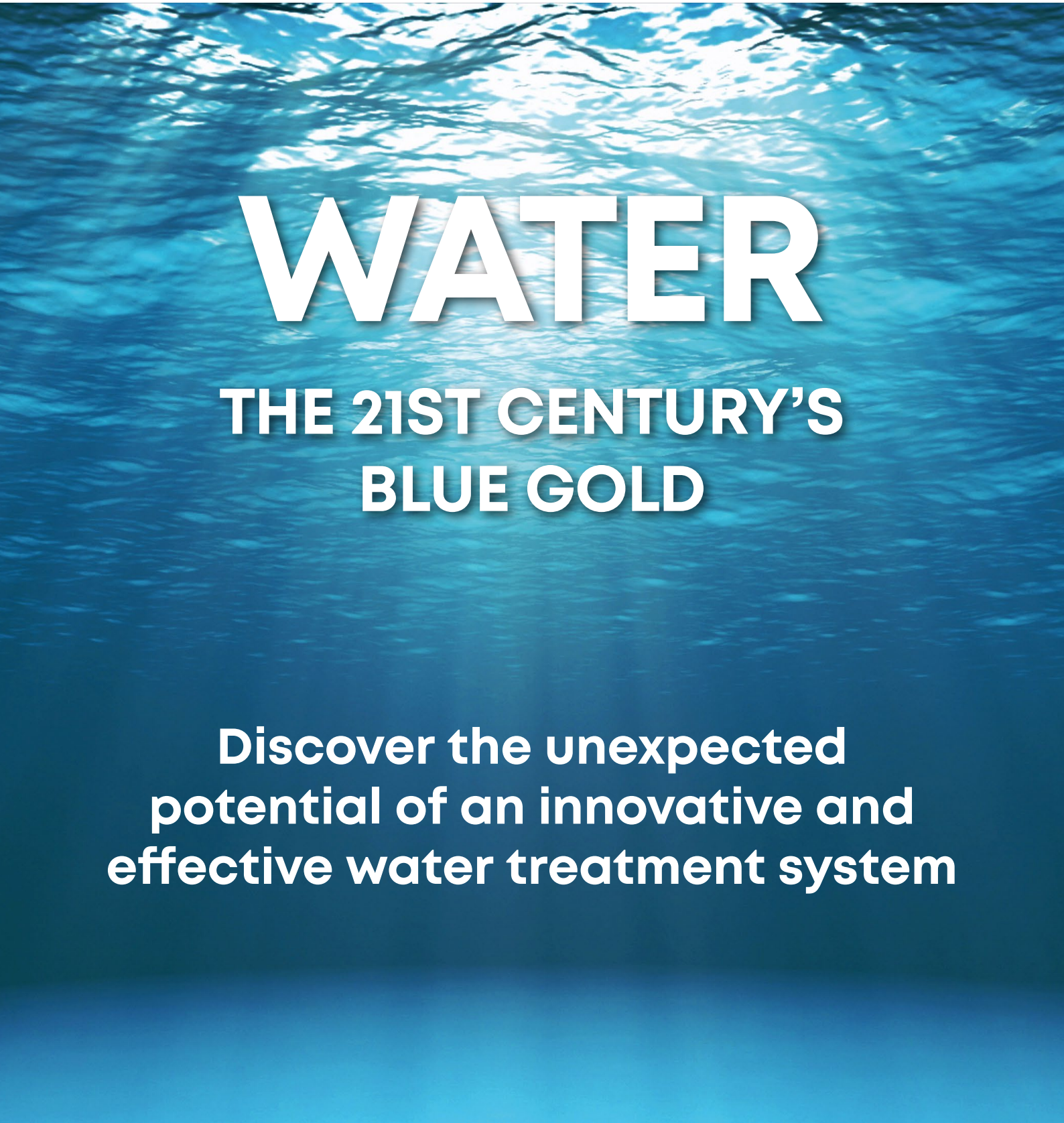
NEPAL


EVODROP

EVODROP
we are water



WATER

THE 21ST CENTURY'S BLUE GOLD

Discover the unexpected potential of an innovative and effective water treatment system

THE PROBLEM AND THE OPPORTUNITIES

THE PROBLEM

People are constantly reproducing, water doesn't do that! Rivers and lakes are slowly drying up and our water table is dropping at an alarming rate. Around five million people die every year from diseases caused by drinking contaminated water. People are starving to death because without water they can't farm and there are already armed conflicts over fresh water.

About 71% of the Earth's surface is covered with water, but 97.4% of that is seawater and of the remaining 2.6% most of it is frozen. We can only use 0.3% of the world's water resources. The fresh water that we can use isn't distributed evenly. Some regions have extreme rainfall, whilst others are dry and suffer from water shortages. Factors such as climate change, a growing population and increasing use will further exacerbate the problem in the future. Researchers are predicting extreme droughts and that by 2050 the world will have a billion refugees who will have to leave their countries because of destroyed and barren land. Two million people do not have access to clean water on a daily basis.

Water is becoming the 21st century's most valuable commodity.

OPPORTUNITIES AND VISION

The use of old, established technologies is still all too common in the water sector. These are out-of-date. The last major milestone, which came about because of space travel, was reached in the 1970s - the development of reverse osmosis. Since then there haven't been any world-changing technological advances.

Clean drinking water is only a small part of the solution. Our goal is to offer an innovative and sustainable solution to decade-old problems for every key sector in the water arena. For years we have been working on our vision to make water available for every sector. We are now ready for the next phase with our various patents and proven features of our technologies. Selling products into the various markets worldwide.

Since industrialisation, no thought has been given to clean water.
The world is crying out for sustainable solutions – we provide them.

THE MARKET AND STRATEGY

The market for water, with its several hundred billion annually, is one of the largest, most lucrative and investment-friendly sectors of our time.

Even in the most modern global cities, tap water is not safe to drink. Using our high-quality filters and technologies we are looking to solve this by using a filter which guarantees the highest quality and can be installed anywhere. This solution has a lot of advantages, including healthy drinking water for everyone, no PET bottles and less CO2 emissions.

OUR GREATEST ACHIEVEMENTS

ACTION RATHER THAN WORDS

Treating salty water for plants

In Egypt, converting very salty, unusable ground water (5000ppm) into usable irrigation water and strengthening cell regeneration and the plants' immune systems without using chemicals or similar environmentally harmful substances.

A revolution in agricultural irrigation

Having researched chemical-free and environmentally friendly filtering techniques which save up to 20% water in the agricultural sector in various locations and re-infiltrate eroded soils.

Hydrogen for FC Zürich and FC St. Gallen

The evidence in the sporting arena of having improved the fitness and mental health of the Swiss Super League Team FC Zürich through drinking our hydrogen water. As well as the installation of our hydrogen unit in the Super League St. Gallen's first team's dressing room.

Sustainable solutions for pools

Being able to offer water treatment systems for pools free from chlorine and any sort of chemicals.

Water treatment for the health sector

Providing medical professionals with an alternative for their equipment and instruments so that they no longer need salt-based water softeners.

Scientific proof of our quality

+ Evidence-based studies in cell biology for our patented rotary nozzle (EVOcharge / EVOtransform) as well as our patented electrolysis (EVOagri / EVOhygiene / EVOpool) both of which have benefits in cell regeneration, inhibiting inflammation and cellulose activation.
+ Microbiological studies for our patented electrolysis which has proved that we can completely kill viruses such as (Sars-CoV-2) as well as various strains of bacteria in their entirety, that is bactericidal and antiviral effectiveness.
+ Biophysical laboratory studies for our patented rotating nozzle which demonstrate that we are able to generate nanoclusters in water. In addition, it is proven that the zeta potential (energy) in our water does not let cancer cells grow, activates anti-inflammatory properties and balances metabolism.
+ Nanoparticle analysis which illustrates that our nanoparticles never promote cell toxicity.

OUR VALUES

Timely and sustainable solutions for every area of application

Sustainable

Our products are particularly low-maintenance and last a long time.

Qualitative

The EVOdrop technologies guarantee consistently high quality and performance.

The Science

Our quality is backed up by solid research and studies.

Swiss Made

We believe in “Swiss Made” and the connected quality standards.

Environmentally friendly

We protect the environment by using pure physics and by not using any chemicals in our products.

Making a difference

Through our association Umuntu Movement we support socio-ecological aid projects.

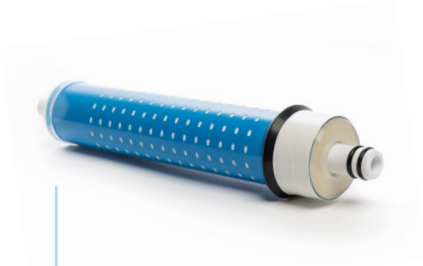
DRINKING WATER

EVOdrink - drinking water filter

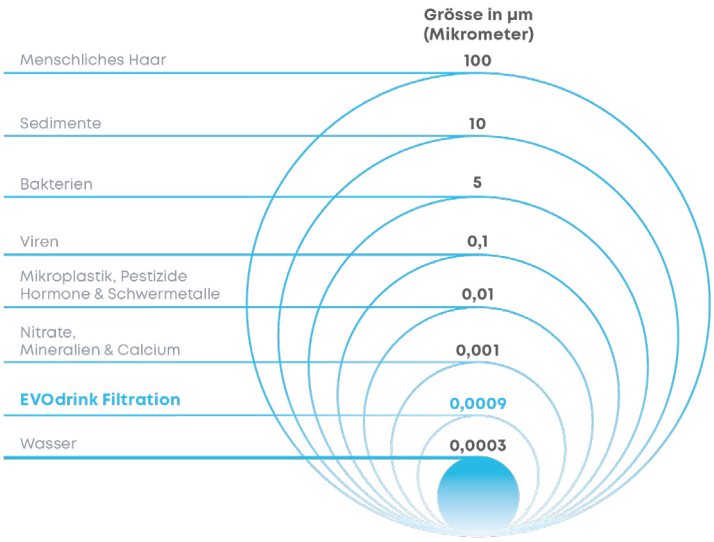
We use a nano-membrane developed by us in EVOdrink and it has been found to filter 614 different harmful substances from the water which is unrivalled worldwide. It is also cheaper and more effective than comparable filter systems.

Because of the technology registered for an international patent, the durability is three times higher than that of competitive products.

+ **Proven to be the best reverse osmosis membrane in the world**
+ **Patented membrane technology**
+ **Miele and Nestlé interested in buying the membrane**
+ **In-house production and Swiss made**
+ **Scientific evidence of the effectiveness of the membrane**



The patented nano-membrane is the key component of the EVOdrink. Effective filtering to 0.9nm.



EVObooster – hydrogen generator

Our EVObooster uses a patented, electrophysical technological system and enriches the water with molecular hydrogen.

The EVObooster enriches the water with molecular hydrogen and once you drink it the colourless and odourless hydrogen gas is distributed throughout your body.

+ **Patented procedure with safe technology and no side effects**
+ **With over 400 studies worldwide it is proven to be beneficial to health**
+ **Low maintenance and easy to operate**
+ **Already in use at two professional football clubs in Switzerland**

EVOcharge – Refiner

The EVOcharge is based on our patented rotation process and provides, soft, oxygen-rich and cell-ready water.

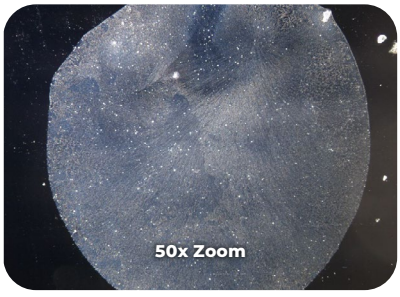
This refinement stage ensures maximum enjoyment when drinking it. The EVOcharge rotates the water at 2000 revolutions per minute. This rotational force results in a fusion of oscillating water molecules going in the same direction. This is called coherence domain.

+ **Patented rotation process with its unique design and mode of operation**
+ **Proven to prevent the growth of tumours**
+ **Proven to be significantly better and healthier than any Swiss mountain spring water**
+ **Completely service and maintenance free**
+ **Scientifically speaking the world's best structured water with up to 50% more cell availability**

Oxygen content WITHOUT the EVOcharge

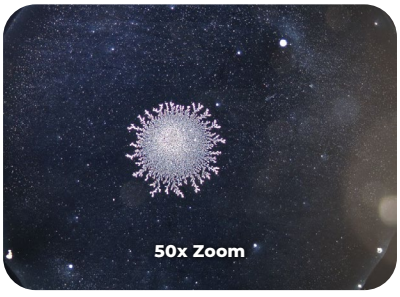
Oxygen content WITH the EVOcharge

Micro-clustering WITHOUT the EVOcharge



Water sample: Altstetten ZH

Micro-clustering WITH the EVOcharge



Water sample: Altstetten ZH

DRINKING WATER SOLUTION FOR THE CATERING INDUSTRY

EVOspark
Drinking water dispenser for cool, still and sparkling water

EVOprime
Filter for all pollutants and impurities

EVOchare
Water refiner for soft and wholesome water

quiet **cool** **bubbly**

With our catering solution, every restaurant can bottle its own wholesome, soft water for their customers. This not only saves time and effort, but also a lot of money.

The water can be cooled, carbonated or simply bottled still. Its flow rate is adequate to be able to fill quickly and efficiently. A healthy and simple alternative to regular bottled water.

+ **Sparkling instead of mildly sparkling water**
+ **Seven-stage cooling system**
+ **Low energy consumption**
+ **Virtually silent**
+ **Compact design**
+ **Hygienic casing made from pure stainless steel**
+ **Long service life**
+ **Very low maintenance**
+ **Compatible with our EVOprime pre-filter**

WATER CONSUMPTION

EVOadsorb – House filter

The EVOadsorb is based on a membrane-like adsorption material which we have developed and which has 10-15 times higher adsorption rate (binding ability) as well as durability (i.e. service life) than regular comparative filters. This can also be fitted with a modified bioactive polymer which stops any limescale deposits.

All this without any salts that are harmful to the environment and health, unlike regular water softeners which do not filter and in which germs can be detected. We filter heavy metals, antibiotics, chemicals, microplastics and microorganisms.

+ **Specially developed adsorption material**
+ **Filtering without loss of flow or pressure**
+ **Tested and certified by SGS (the largest testing laboratory in the world)**
+ **Can be easily scaled for any project size**
+ **Versatile to use**

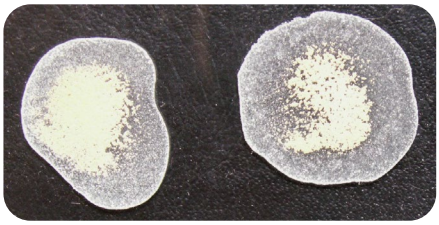
EVOtransform – Anti-scale unit

The EVOtransform is based on our patented rotation process and provides soft and ideal water for the entire household and garden.

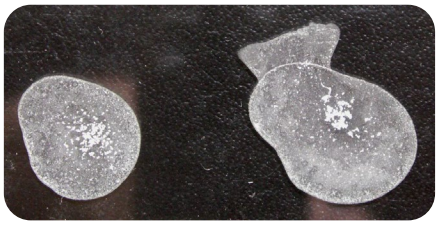
The EVOtransform is our excellent alternative to regular water softeners. In this purely physical water treatment system, the water is rotated at around 100,000 revolutions per minute.

+ **Patented rotation process with its unique design and mode of operation**
+ **Proven effectiveness tested by independent laboratories and institutes**
+ **Completely service and maintenance free due to the purely physical mode of operation**

Limescale
WITHOUT the EVOtransform



Limescale
WITH the EVOtransform



EVOagri – Agriculture

We are the only treatment system that has succeeded in converting very salty ground water (5000ppm) into irrigation water for agriculture. Only 10% of the salts end up in the ground water because we can split them into extremely small particles so that microorganisms and plants can use them.

Further tests are being planned in Australia. Because of the many forest fires, many experts believe that the EVOagri has the potential to re-penetrate the eroded soil.

+ **Multi-patented process**
+ **Unique water treatment through specially developed technologies**
+ **Cost-effective solution**
+ **Scientific research reports substantiate the mode of operation**

Increased plant growth

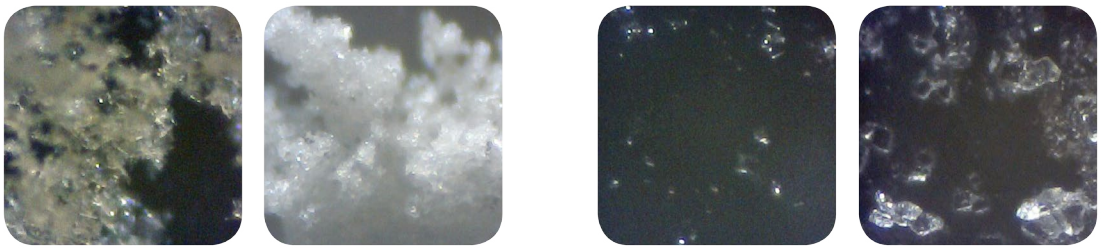
No use of chemical pesticides

Up to 20% water saving

No soil pollution

Healthy for people and the environment

Very easy to use



Salt structure BEFORE water treatment with EVOagri

Salts bind and clump together. Plants can't absorb the salts and "die of thirst".

Salt structure AFTER water treatment with EVOagri

The salts can no longer bind together. Plants can now absorb the water so much better.

EVOhygiene – Disinfection

The EVOhygiene is our timely solution for all shops and buildings, such as hospitals and medical centres, which have to carry out hygiene measures. But it is also very versatile and can be used in many ways in particularly dirty areas.

It is proven to destroy bacterial strains, algae and viruses from water. This also includes particularly difficult anti-biotic-resistant bacteria.

The water doesn't have a bad taste nor any side effects after
processing it with EVOhygiene.

+ **Dual patented techno-logies**
+ **Guaranteed scalable production**
+ **Unique technology**
+ **The mode of operation has been scientifically proven**
+ **Simple system with little maintenance**
+ **Minimal space and no additional equipment needed**
+ **Simple system based on just electro-physics**

EVOpool – Pool and bathing water

In the same way as EVOhygiene, EVOpool is proven to destroy bacterial strains, algae and viruses from water. This also includes particularly difficult antibiotic-resistant bacteria.

EVOpool is our alternative to chlorine and all harmful treat-ment systems.

+ **Dual patented techno-logies**
+ **Guaranteed scalable production**
+ **Unique technology**
+ **The mode of operation has been scientifically proven**
+ **Simple system with little maintenance**
+ **Can be easily scaled for any project size**
+ **Minimal space and no additional equipment needed**
+ **Simple system based on just electro-physics**

Institute of Environmental and Process Engineering UMTEC

Michael Burkhardt

Head of Institute

OST – Eastern Switzerland University of Applied Sciences,
Oberseestrasse 10, 8640 Rapperswil, Switzerland

SWP-Meeting, 2.12.2020

OST
Eastern Switzerland
University of Applied Sciences

UMTEC INSTITUTE FOR ENVIRONMENTAL AND PROCESS ENGINEERING

UMTEC: Institute of Environmental and Process Engineering

- **4 Professors, 20 engineers, technicians, etc. (www.umtec.ch)**
- **Teaching in Engineering: Environmental, Civil, Mechanical etc.**
- **Applied research and development**
  - Source control and end-opf-pipe measures
  - Authorities, industry, science – national & international
- **Visibility and collaboration (www.umtec.ch/index.php?id=6005)**
  - China (ECUST), Singapore (SMTC), Germany, Iceland, Liberia, South Africa etc.

Processing and Recycling

Rainer Bunge

Odor and Chemistry

Jean-Marc Stoll

Water and Wastewater

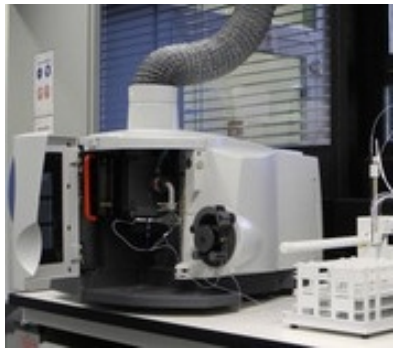
Michael Burkhardt

Advanced Materials & Processes

Andre Heel

Variety of Laboratory and Pilot Scale Equipment

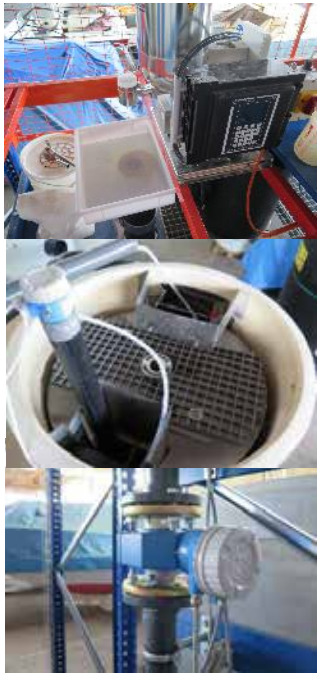
- **Physicochemical analysis, sensor technologies, sampling devices etc.**
- **Used in projects, practical courses and thesis (20 thesis per year)**
  - www.umtec.ch/index.php?id=9657&L=400

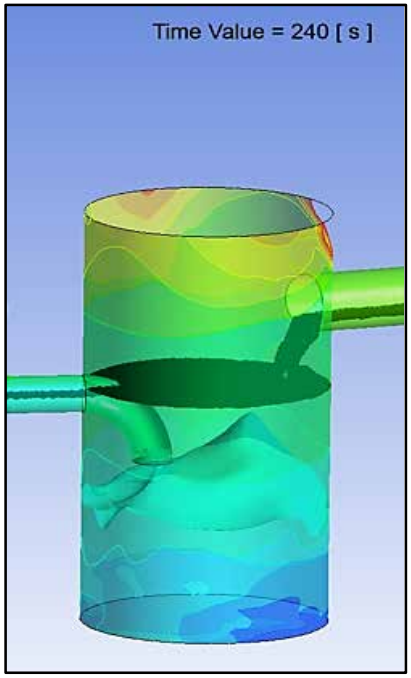





Decentralised Water Treatment

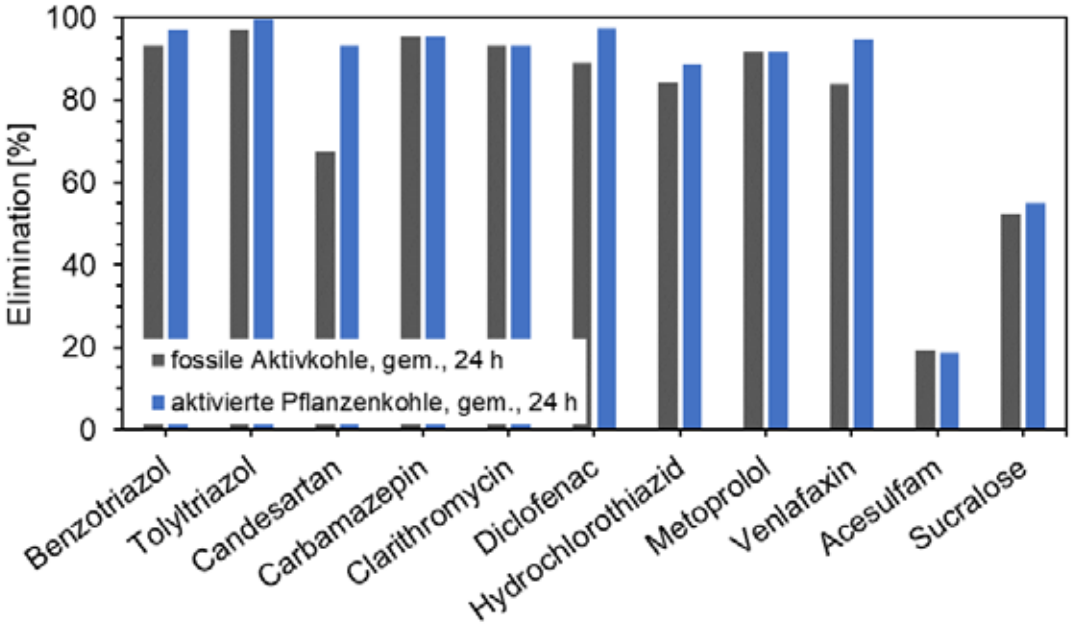
- **Treatment of wastewater and stormwater**
  - Determine and analysis of pollutants (dissolved, particulate, plastics)
  - Development from lab to full scale based using adsorption, settling etc.
- **Collaborator and Funding: authorities and companies (Creabeton etc.)**





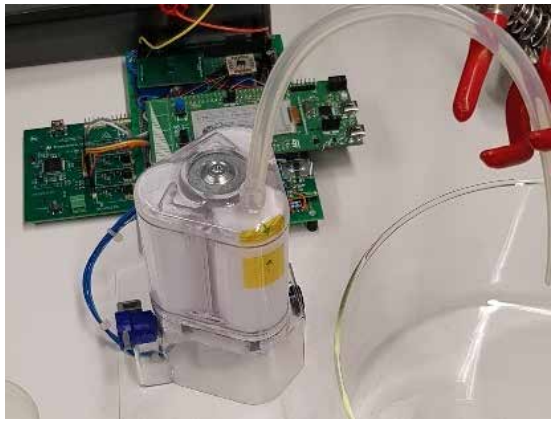
Development of a Process Chain for Biochar

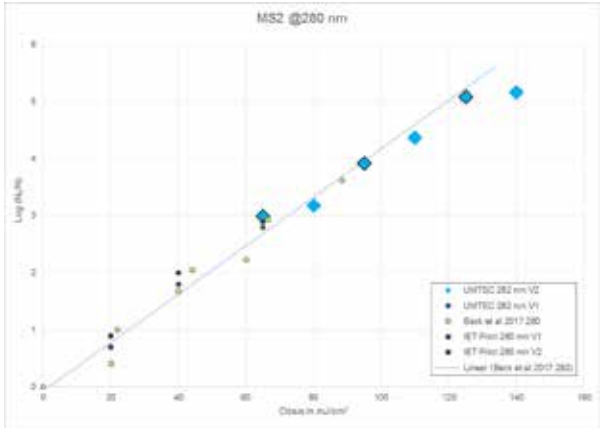
- **Biochar production using wood residuals (Pyrolysis)**
  - Substrate for plants (water and nutrient retention)
  - Activated carbon for pollutants removal
- **Collaborators: UMTEC, ZHAW, INEGA (BAFU-funding)**

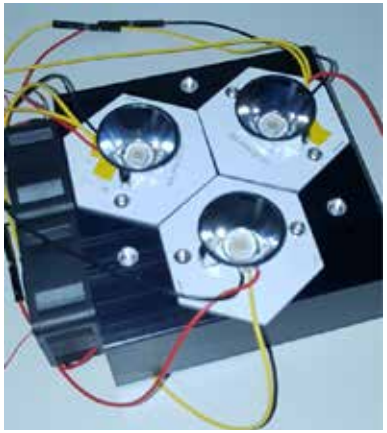


Drinking Water Desinfection

- **Development of a reactor for drinking water treatment using UVC-LEDs**
  - Mobile system powered with photovoltaic (PV) and battery
  - Prototype with continous flow desinfection
  - Available on the market soon
- **Collaborators: IET, UMTEC, IMES, IWK and Katadyn (Innosuisse-funding)**
- **Follow-up work adressing developing countries**







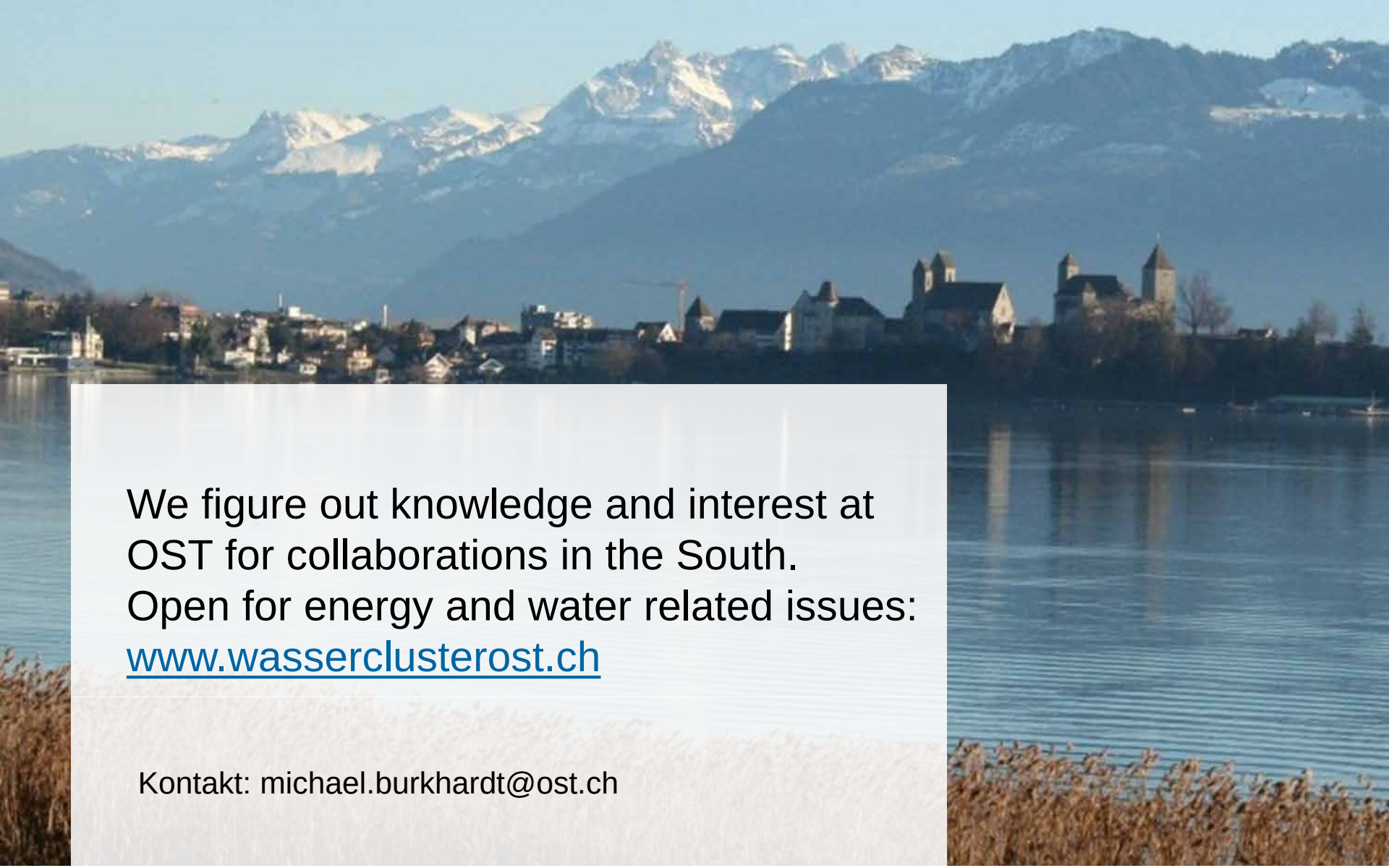
Water, Sanitation and Hygiene (WASH)

- **Liberia – Stella Maris Polytechnic (smp.edu.lr/index.html) and BTFS Foundation (www.bowier-trust.org)**
  - Solar assisted GDM-plant (1500 people) and laboratory
- **South Africa – University of Venda (www.univen.ac.za)**
  - Solar assisted GDM plant and trainings (students included

Water, Sanitation and Hygiene (WASH)

- **Consortium for Education and Research in Water, Sanitation and Hygiene (COFER-WASH), www.swissuniversities.ch/cofer-wash**
  - WASH e-learning via Moodle box (Rasperry Pi)
- **Cluster West Africa "Water & Life", www.newal.ch (ETHZ, TPH, Eawag etc.)**
  - Activities, e.g. Winter School, Online-Day, e-learning workshop etc.

Water & Life – West Africa – Winter School Kumasi, Ghana



We figure out knowledge and interest at OST for collaborations in the South.
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